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A study of 18-25 year old female undergraduates was conducted to describe their level of breast health awareness, evaluate changes in awareness after a breast health workshop, and determine the effectiveness of the education. Variation in responses were evaluated using a pre/post-questionnaire design . Participants scored lower at baseline on knowledge and proficiency variables. The knowledge/proficiency score was significantly higher at post-questionnaire in both study groups. Lack of skill was identified as a barrier to breast self-examination, but fear, embarrassment, and forgetfulness were not. Lack of knowledge was not a barrier of BSE frequency. BSE skill and frequency were significantly higher in the intervention group post-intervention.

BREAST HEALTH 101: A WORKSHOP DESIGNED FOR THE UNIVERSITY SETTING

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BREAST HEALTH 101: A WORKSHOP DESIGNED FOR THE UNIVERSITY SETTING

THESIS

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CHAPTER I

INTRODUCTION

Statement of the Problem

Undergraduate female college students are not adequately educated on the subjects of breast cancer, breast health, or breast self-examination (BSE) (Craun & Deffenbacher, 1981; Mamon & Zapka, 1985; Hailey, 1987; Maurer, 1997; Strickland, 1997). It is likely that many myths and misconceptions regarding breast cancer also exist among this age group. Two common misconceptions of breast cancer identified among women in general include (1) women under 35 do not really have to worry about breast cancer and (2) a woman with no family history of breast cancer is not likely to develop it (Drumm, 1992). One study estimated that overall, an average of 40% of a college student sample misunderstood popular press reports of health research extracted from widely circulated newspapers. However, reader misunderstanding reached as high as 50% for some of the 16 articles under study (Yeaton, Smith, & Rogers, 1990). Five health topics were researched for reader understanding and treatment for breast cancer was among the topics included. The study was conducted on five campuses and 82% of the sample was between 18-25 years old. Media reports, disseminating information secondarily, may be a potential source of misconception and myth regarding breast cancer.

In addition, undergraduate women do not practice breast self-examination because they are neither competent in breast self-examination nor confident in their ability to detect an abnormality (Craun & Deffenbacher, 1981; Mamon & Zapka, 1985; Maurer, 1997; Strickland, 1997). In a study of undergraduate college women, less than one in four practiced monthly breast self-examinations (Hailey, 1987). Even a convenience sample of nursing students previously exposed to breast cancer and breast self-examination in their coursework reported low regular BSE frequency. Only 27% of these respondents reported practicing breast self-examination 9-12 times in the previous 12 months (Budden, 1995).

Background and Significance

Women are diagnosed with breast cancer more than any other cancer. Breast cancer is the second leading cause of cancer death in the United States. In 1998, an estimated 178,700 women will be diagnosed with breast cancer and an estimated 43,900 women will die due to breast cancer in the United States (American Cancer Society [ACS], 1998). While morbidity estimates are slightly decreased from the previous year, still one in eight women will be diagnosed with breast cancer in their lifetimes.

The 1990-1994 age-specific incidence rate of breast cancer in 20-24 year old women is 1.3 per 100,000, 1.0 for white women, and 2.7 for black women. The 1990-1994 age-specific incidence rate of breast cancer in 25-29 year old women is dramatically higher at 7.2 overall, 6.9 for white women, and 9.4 for black women (Table 1). Disregarding the age of the patients, the 1994 overall incidence rate of breast cancer is 109.7 per 100,000, 112.8 for white women, and 100.5 for black women (Table 2). The 1990-1994

percentage of incident cases for all races is estimated to be 0.0 % for women under 20 and 2.2 % for women aged 20-34 (Table 3). The estimated mortality rate for the years 1990-1994 in women aged 20-24 is 0.1 per 100,000 for all races, 0.1 for white women, and 0.2 for black women. The 1990-1994 mortality rate for women aged 25-29 is 1.1 per 100,000 for all women, 0.9 for white women, and 2.3 for black women (Table 4). Disregarding the age of the patients, the 1994 overall mortality rate of breast cancer was 25.5 per 100,000 overall, 25.2 for white women, and 31.3 for black women (Table 5) (Department of Health and Human Services, 1997). Data on incidence and mortality of breast cancer was not reported for races and ethnicities other than white and black. In summary, incidence and death from breast cancer is low, however, black women are more likely to be diagnosed with breast cancer and also to die from the disease.

Furthermore, one study (Newman & Alfonso, 1997) of women diagnosed with breast cancer between 1990-1994 found that significantly ($p = 0.008$) more black women (32%) were under 50 years of age at diagnosis when compared to white women (20%) in the sample, independent of socioeconomic status. The mean age at diagnosis for black women was 56, while for white women it was 63 years. Black women were more likely to be diagnosed in their 60s, while white women were more likely to be diagnosed in their 70s.

In addition, significantly ($p = 0.049$) more young black women (27.3%) were diagnosed with Stage III and IV breast cancer, indicative of a more advanced stage of breast cancer than white women (18.6%). This finding was not apparent, however, among the older patients. The young black patients comprised one-third of the total

number of black patients in the study, but were only one-fifth of the patients diagnosed with the less invasive *in situ* and stage I breast cancer. One-fifth of the white patients were categorized as young, consistent with one-fifth of white patients having a diagnosis of *in situ* or Stage I breast cancer. It is apparent that more aggressive screening and public education programs directed toward younger black women are needed.

Targeting women for breast health education when they are least at risk, yet old enough to assimilate the information, makes good sense and is a good public health education strategy. Good public health exists in the creation and maintenance of healthy communities, not unlike a college campus. Early detection of breast cancer for increased survival and encouragement of health skill development, self-care, and empowerment in health matters are components of good public health.

Although many theories of how to prevent breast cancer exist, there are still no proven methods of prevention. Therefore, early detection and treatment are central to survival following a diagnosis of breast cancer. The current five-year survival rate for localized breast cancer is 97%. However, the five-year survival rate if breast cancer has spread regionally is 76% and 21% for distant metastases (ACS, 1998). Approximately 90% of palpable breast lumps are detected by the woman herself (ACS, 1997a). Breast self-examination has the potential to lead to the earlier discovery of cancer. Tumors missed during a clinical breast examination or mammogram may be detected with monthly breast self-examination because tumors may develop between these types of periodic screenings. In addition, breast self-examination is easily learned, safe,

convenient, may be performed frequently and is an economical method of early breast cancer detection (Ferris et al., 1996; Hailey, 1997).

Purpose of the Study

The purpose of this study was to describe the level of breast health awareness in 18-25 year old female undergraduate students prior to a breast health intervention. A second purpose of the study was to evaluate changes in responses following the intervention using a pre/post questionnaire design and hence, determine the effectiveness of a breast health awareness workshop for female undergraduate women. More generally speaking, the study served as a means to empower young women to take charge of their own health care and impact others with the information learned at the breast health awareness workshop.

Hypotheses

In order to test the effectiveness of a breast health workshop and to determine its worth as a teaching tool and format for undergraduate women, several hypotheses were generated. The primary study hypotheses were:

1) When tested on their knowledge of breast cancer and breast self-examination prior to a breast health awareness intervention, undergraduate women will score lower at the baseline measurement.

2) Undergraduate women do not practice breast self-examination for a variety of reasons, including fear, embarrassment, lack of skill or knowledge of BSE, and forgetfulness.

3) Undergraduate women will demonstrate improvement in both knowledge and attitude scores between pre-questionnaire and post-questionnaire.

4) Undergraduate women will report increased frequency and proficiency of BSE following breast health awareness training.

The secondary study hypotheses were:

1) Undergraduate women will express greater confidence in performing BSE proficiently following breast health awareness training.

2) Undergraduate women will be more likely to discuss breast health issues with other women, including friends and family members following breast health awareness training.

3) Undergraduate women who report having examined their breasts on the pre-questionnaire will be more likely to report continuing the health behavior on the post questionnaire.

4) Undergraduate women reporting the practice of other positive health behaviors will be more likely to report a higher frequency of breast self-examination in the previous three months or to adopt the practice of BSE by the time of the post-questionnaire measurement following BSE instruction.

5) Differences in voluntary attendance to a breast health workshop and/or the practice of breast self-examination will exist across different racial/ethnic groups.

CHAPTER II

Review of Literature

College-aged Women

The target population is less likely to be educated with regard to breast health education (Hailey, 1987), but may be more amenable to a changes in its health behaviors. The typical college-age woman may be more likely to incorporate breast self-examination into her lifestyle because she is more likely to be in the process of developing lifetime self-care behavior patterns. It is possible that because of the comparatively lower risk of breast cancer in 18-25 year olds, young women may feel less anxiety about potentially detecting cancer in a breast self-examination.

Even women as young as college age may develop breast cancer. In fact, young age (<35 years) is a characteristic of poor prognosis. High rates of in-breast recurrence of breast cancer, despite irradiation, is characteristic of young breast cancer patients (Kaufmann, 1996). Cancer is the fifth leading cause of death among 15-24 year olds, following AIDS, accidents, homicide and suicide (Neinstein, 1996). Thus, young women should be armed with the truth about breast cancer and early detection.

Given the potential for person years of life lost by young adults, college health providers should feel the responsibility to initiate cancer screening and early detection on their campuses. Currently, breast cancer screening is not a recommended component of

young adult health (Grace, 1997). The Healthy People 2000 objectives do not specifically address breast cancer for 18-25 year olds. However, an overall reduction in breast cancer cases to 20.6 cases per 100,000 is outlined as an objective for the nation (U. S. Department of Health and Human Services [DHHS], 1991).

Women age 18-25 are understudied with regard to breast cancer knowledge and breast self-examination (BSE) frequency and proficiency primarily because of the perception that young women are at low risk for breast cancer. However, some researchers who have studied this population have provided enlightening findings. Few recent studies of young women and breast health have been conducted based on a literature search of medical, cancer, and health behavior databases. Thus, a similar study of female undergraduate women aged 18-25 bears replication with some modifications.

A previous study (Mamon & Zapka, 1985) evaluated an education program targeted to undergraduate and graduate college women of a large public university between 1980-1982. A pre-test/post-test design was used to measure improvement in frequency and proficiency of breast self-examination, as well as to measure the effectiveness of the breast self-examination education program delivered by peer educators. The pre-test/post-test design found a 26% increase in current BSE performance, a 29% increase in bimonthly or greater BSE performance, and a 22% increase in proficiency in BSE.

However, the increase in frequency and proficiency of BSE may not be completely attributed to the intervention because a university-wide campaign on breast health awareness was also in progress during the study. In addition, not all of the intervention participants were pre-tested, nor were all the controls administered a post-test. This

represents a flaw in the study design and weakens the strength of the findings. Improvement cannot be assessed without a pre-test in the intervention experimental subjects. With both the control and experimental group, there is a possibility that simply completing a breast health awareness pre-questionnaire alone will raise awareness and initiate a change in health behavior (Craun & Deffenbacher, 1987; Fletcher, 1990). If control groups are not asked to complete a post-test, an adjustment for this effect cannot be made.

In a later study (Mamon & Zapka, 1986; Zapka & Mamon, 1986), undergraduate and graduate female students were assessed separately by phone interview regarding characteristics associated with frequency and proficiency of BSE. The constructs of the Health Belief Model and Social Learning Theory guided the explanation of the findings. Using multivariate logistic regression, the researchers found the two groups to be very different in the factors that influenced whether or not they performed BSE. Predictors of a more proficient BSE also varied between undergraduate and graduate female students. Personal, social, and environmental factors were evaluated as predictors of BSE proficiency.

Variables identified as predisposing to examination for undergraduate women included the perception that they were performing BSE correctly, they were confident in their ability, and they were not embarrassed by examining their breasts. On the other hand, graduate women were found to be predisposed to performing BSE when they were confident in their ability to perform BSE, felt they had control over health matters, had received care for a breast problem, and had engaged in preventive health behaviors. The

researchers evaluated BSE frequency and proficiency separately as these characteristics of BSE are not always correlated. Factors that predicted a more proficient BSE among undergraduates included knowing the correct time of the month to perform BSE, an awareness of BSE, and the perception that BSE is beneficial and is effective in early cancer detection. In graduate students, the factors that predicted a more proficient BSE included knowledge of the time of the month that BSE should be performed, having bra cup size less than or equal to size B, and concern that having breast cancer would cause family problems. Frequency of BSE was not found to be highly correlated with proficiency. As a result of the variation in undergraduate and graduate participant responses, the researchers recommended breast health education be targeted to specific age groups, as a means of having the greatest impact on a change in health behavior.

Another study of the self-reported behavior and attitudes toward BSE was conducted among female undergraduate psychology students using a questionnaire (Hailey, 1987). This study assessed primarily juniors and seniors in accordance with the American Cancer Society's recommendation of initiating BSE at age 20. Examiners and non-examiners were evaluated separately with different questionnaires. Women who examined their breasts at least six times a year were more familiar with BSE, possessed a more accurate awareness of their personal vulnerability, and were more willing to increase their knowledge about BSE. The leading reasons non-examiners gave for not doing BSE were that they do not remember to do it, they are in good health, and they do not know how to perform BSE. Examiners also reported missing a BSE most often because of forgetfulness. Non-examiners reported that they would be more likely to

practice BSE if they were reminded to do it, knew someone their age with breast cancer, or a family member was diagnosed with breast cancer. Because of the association found between a more accurate awareness of personal vulnerability to breast cancer and actually engaging in BSE, the researcher recommended combining BSE instruction with breast cancer facts.

In addition to psychosocial variables related to performing BSE, the researchers assessed frequency of BSE and methods of teaching that most appealed to the participants. Although the majority of the respondents did not practice BSE (75%), most of the women were initially exposed to BSE through their male physician or magazines, but would have preferred a female nurse or physician to have taught BSE to them.

A study of both male and female college students enrolled in an undergraduate human sexuality course had some interesting findings (Craun & Deffenbacher, 1981). Researchers set out to determine whether personality determined which of the students would practice BSE, have a Pap smear, or perform testicular exams. College students were categorized as repressors, neutrals, or sensitizers, using the Byrne Repression-Sensitization Scale. Education regarding cancer of the breast, cervix, and testicle was provided to the students eight weeks after administration of a personality test and pre-questionnaire testing their breast, cervical and testicular cancer knowledge and frequency of early detection examinations for each of the cancers. A post-questionnaire was administered the last week of the semester.

There was no difference in cancer knowledge or exam frequency from pre-lecture to post-lecture questionnaire among the three personality categories. However, cancer

knowledge significantly increased post-lecture for both men and women. No change in frequency of BSE was found. The frequency of Pap smears decreased and testicular exam increased. No correlation between knowledge and exam frequency was apparent for any of the three types of cancer. Women who were engaging in BSE post-lecture were more likely to have already been doing so pre-lecture.

Researchers hypothesized that a relationship, unrelated to cancer knowledge, might have existed between whether a person was "health conscious" or not and practice of early cancer detection techniques. It seemed the health conscious students practiced the appropriate exams, while those who were not health conscious did not. Health consciousness could not be assessed because health behaviors other than those related to breast, cervical, or testicular cancer were not addressed on the questionnaire.

A later study by the same researchers (Craun & Deffenbacher, 1987) evaluated three approaches to increasing BSE frequency in college-aged women. The three formats were education, demonstration, and prompt. The educational format provided information on breast cancer and BSE. The demonstration format involved practice and demonstration of BSE on models. The prompt format consisted of monthly reminders to perform BSE. Introductory psychology students were divided into eight treatment groups that used at least one or a combination of the three formats. After evaluating questionnaires administered one month, three months and six months post-intervention, the researchers concluded that exam frequency increased only when the prompt format was utilized. No increase in exam frequency was apparent with the education and demonstration formats.

Overall exam frequency increased to 59% from 19% in the pre-intervention measurement.

Knowledge was not a predictor of BSE frequency. On the other hand, cues to action and confidence in BSE performance were determined to be consistent variables significantly correlated with exam frequency. The demonstration format was thought to provide an opportunity for observation and practice, but instilled confidence in the participants for only one month. The three and six month post-tests did not indicate any significant differences in confidence levels of demonstration treatment groups. In addition, exam frequency increased in the control group, indicating that assessment alone may be a sufficient behavior prompt in BSE.

University Setting

A large proportion of 18-25 year olds are enrolled in college. The national enrollment rate in 1995 for 18-19 year olds was 59.4, for 20-21 year olds 44.9, and for 22-24 year olds 23.2 (U. S. Department of Commerce, 1997). In addition, breast health education on the college campus is appropriate given the increased focus on health promotion on many college campuses (Steenbarger, Conyne, Baird & O'Brian, 1995; Jackson & Weinstein, 1997). The group setting provides more opportunity for multiple teaching techniques and may generate accountability among the participants with regard to practicing BSE routinely.

Behavior Theories

The Health Belief Model (HBM) attempts to understand and explain the maintenance and change of an individual's health behavior and has been used successfully as a guide

for health behavior interventions and secondary preventive screening including BSE (Janz & Becker, 1984; Calnan & Rutter, 1986; Glanz et al, 1997). Originally, HBM was designed in the 1950s by social psychologists in the U.S. Public Health Service to explain non-participation in prevention and early disease detection programs (Hochbaum,1958; Rosenstock, 1960, 1966, 1974). Later, HBM was expanded to specifically address compliance with medical recommendations (Kirscht, 1974). HBM constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. This model is especially strong in its description of interaction effects between an individual's perceptions, modifying factors, and the likelihood of a change in health behavior (Figure 1). Cues to action, health locus of control, and health consciousness are also important components of the HBM.

The HBM holds that an individual will perform breast self-examination if she regards herself as susceptible to breast cancer and if she believes breast cancer to have potentially serious consequences. Perceived susceptibility relates to the participant's perception of her risk of being diagnosed with breast cancer, while perceived severity relates to the seriousness of a diagnosis of breast cancer or of leaving it untreated. Severity may include both clinical and social ramifications. Together, the constructs of perceived susceptibility and perceived severity comprise the overall perceived threat of breast cancer. The two constructs are intimately linked. Even if a woman feels susceptible to breast cancer, the likelihood that she will perform BSE is not very high without a heightened sense of severity.

In addition, before engaging in the routine practice of breast self-examination, the subject must deem BSE to be personally beneficial to her. In the eyes of the subject, the anticipated barriers to performing BSE must not be thought to outweigh the potential benefits of BSE. It must be apparent to the woman that BSE is effective in decreasing the threat of breast cancer through early detection. One barrier to performing BSE may lie in lack of self-efficacy. HBM explains self-efficacy as confidence in one's ability to skillfully perform breast self-examination to the level where a lump might be detected at a stage when breast cancer is more successfully treated. Lack of a health locus of control is also a barrier to performing BSE. Health behaviorists define health locus of control as the feeling of control over matters of health. Health locus of control is related to self-efficacy. Of all the HBM constructs, perceived barriers are the most powerful single predictors of how likely a woman is to perform monthly BSE and other breast cancer screening methods (Fulton et al., 1991;Glanz et al., 1997). Even still, perceived benefits and perceived barriers are likely to be stronger predictors of behavior when the perceived threat is high than when it is low.

Other variables, such as sociodemographic characteristics may also have an indirect effect on health behavior in that they influence perceived susceptibility, severity, benefits and barriers. Subjective norms and the consequences or outcomes of performing BSE, a component of the Theory of Reasoned Action (Glanz, et al., 1997), may also influence a person's decision of whether or not to perform BSE. Given that a woman feels appropriately susceptible to breast cancer, believes its consequences to be serious if untreated, and believes the benefits of BSE to far outweigh the barriers, other factors or

cues to action may play a large role in bringing about the desired behavior change of practicing monthly breast self-examination

According to Social Learning Theory, behavior is learned through cues in the environment and one's interpretation of those cues (Glanz et al., 1997). Social Learning Theory discusses the integration of predisposing, enabling, and reinforcing factors in health behavior change. Predisposing factors involve motivation to act. However, this motivation may facilitate or hinder behavior change. Enabling factors refer to the specific skills and resources one needs to initiate a health behavior. Reinforcing factors include both encouraging and discouraging influences on behavior change. Reinforcing factors are generally thought to be supportive of positive health behavior. Social Learning Theory holds that reinforcements or rewards that bring about a response are linked to stimuli. In addition, humans acquire drives, or physiological processes, that motivate behavior according to Social Learning Theory (Glanz et al., 1997). Reinforcements and factors involved in motivation vary from person-to-person with regard to bringing about a desired change in health behavior. The multi-media education format increases the likelihood that a participant's most successful method of learning is included, thereby increasing the opportunity for the development of motivation and reinforcement for breast self-examination. The breast health workshop is in and of itself an enabling factor in increasing the skill practice of BSE.

Women with knowledge of breast cancer and BSE, possibly learned through the media may be predisposed to performing BSE, but may not necessarily take action (Craun & Deffenbacher, 1981, 1987; Mamon & Zapka, 1986). Women may be

motivated to change their behavior, but lack the resources and skills necessary to initiate a change in their behavior patterns. However, teaching breast cancer education and BSE, whether on an individual basis or in a group setting, has been identified as an enabling factor in the practice of routine BSE (Mamon & Zapka, 1986; Champion, 1992; Strickland, 1997).

Multi-media Education

Increased breast health knowledge and increased frequency and proficiency of breast self-examination has been positively and significantly associated with information that is delivered in an integrated setting via a variety of modes, including videotapes, pamphlets, discussion and practice (Strickland, et al., 1997). A study conducted with 10^{th} graders to test the incorporation of a youth cancer risk assessment software program into a cancer prevention curriculum was not significant using multivariate analysis of variance (Rohwer & Wandberg, 1997). Using the software in the cancer prevention instructional format did not differentially influence learning or adoption of health behaviors related to cancer prevention. However, an overall increase in knowledge following the intervention was found. No change in health behaviors was noted. Cancer sites included in the teaching module included breast, testicle, skin, lung, oral cavity and uterine cervix. The authors reported these sites to be the six leading cancer sites in adolescents. A pre/post-questionnaire design was utilized to assess student knowledge and self-reported behavior. Knowledge was post-tested immediately following the educational intervention, while behavior was assessed four weeks later.

BSE Prompts

One of the primary reasons reported by young women for not practicing breast self-examination is forgetfulness (Hailey, 1987; Ferris et al., 1996). An interesting approach to prompting a health behavior change, specifically breast self-examination, was studied when researchers conducted a study to determine if a BSE prompt on oral contraceptive packaging would increase frequency and timing of BSE in women aged 13-40. The oral contraceptive prescription was accompanied by an American Cancer Society general health promotion pamphlet that included one section on the BSE technique. The actual pill pack had "best time to perform BSE – 7 days after period ends" imprinted above the estimated time period on the pill pack to perform BSE. The message was small in compliance with FDA labeling policies.

Participants were administered a 23-item baseline survey of their health behaviors and practices and were given a free three month supply of oral contraceptives. The subjects were then divided into two groups, one receiving oral contraceptives with the prompt and one receiving oral contraceptives with no prompt provided. All study subjects participated in BSE education. At three months, participants completed a 24-item survey to assess compliance with BSE, with questions focused primarily on BSE and the prompt. Questions from the pre-questionnaire were repeated for comparative purposes. Participants completing the two questionnaires and three months of oral contraceptives were given an additional three months of oral contraceptives without the prompt. At six months, a sample of the participants were contacted by telephone for an 8-item survey regarding continued BSE compliance.

At baseline, 49.3% of the participants performed BSE, but only 24.5% performed BSE at the recommended time. By the time of the first post-questionnaire, 36.4% of the group that received only the education began BSE, while 40.3% of the education + prompt group began BSE. Of all the prompt group participants performing BSE, 68.1 % were performing BSE at the appropriate time of the month, while 62.2% of the education only group performed BSE at the recommended time. Of the sample of participants phone interviewed six months after baseline measurements, 57.4% of the prompt group and 48.9% of the education only group were still performing BSE. When asked about whether they remembered seeing the prompt on the oral contraceptive packaging, only about half recalled seeing the prompt. Interestingly enough, 4.6% of the education only group reported seeing the prompt. BSE frequency significantly increased in both the education and prompt groups. However, 63% of the participants did report that BSE was difficult to remember to do. The six month telephone survey did note a decrease in BSE frequency in the absence of the prompts when compared to the three month survey, but frequency remained higher than at baseline. It was estimated that the prompt increased BSE frequency by 40% in participants who were non-examiners at baseline.

CHAPTER III

Methods

Population and Sample

The eligibility criteria included undergraduate female students aged 18-25 currently attending Texas Woman's University, Texas Christian University, or University of Texas at Arlington. Texas Woman's University was chosen as a target school because of its primarily female enrollment. Texas Christian University represented a private institution, while University of Texas at Arlington represented a public institution attended primarily by commuter students. Subjects were volunteer recruits from residence halls and sororities who responded to an invitation to attend a breast health awareness workshop. In addition, instructors of the Texas Woman's University Health Studies Department who answered requests for assistance with a research study volunteered classroom subjects.

A control group who did not participate in a breast health workshop was also assessed to better measure whether or not the intervention objectively increased breast health knowledge and breast self-examination (BSE) frequency and proficiency. Control group criteria also included undergraduate female students age 18-25 currently enrolled at Texas Woman's University, Texas Christian University, or University of Texas at Arlington. Control subjects were taken only from classrooms by invitation of

the instructor. It was not felt that enough women would volunteer to participate in completing two questionnaires without the provision of breast health education or other benefits. With the assistance of sociology and psychology departments at the chosen universities, classroom subjects were encouraged to assist in the study. Some students were able to fulfill a course requirement by participating in the study. One control group consisted of health education majors due to the unplanned oversampling of health education majors in the intervention phase. Sociology and psychology students were chosen because a large number of undergraduate students of all majors tend to enroll in these introductory social science courses. In addition, research methodology is a large component of the subjects addressed in both courses.

Procedure

The university setting permitted access to a large number of women in the desired age category. The residence hall and sorority houses provided a casual environment outside the usual school schedule where opportunities for question and answer were not inhibited by time constraints. Intervention groups were limited to 30 persons to provide a setting conducive to discussion and active participation. The classroom served as a comparison setting where the workshops were delivered during a typical school day schedule with its many time constraints and in the presence of the usual instructor.

Participants were invited to attend a 1 – 1 ½ hour breast health workshop specifically designed for 18-25 year old women. Immediately preceding the workshop, attendees were asked to read a description of the study. The project's intentions, an overview of how the study and workshop would be conducted, the risks and benefits of participation

in the study, and expectations of participation were described to the participant. Participants were asked to sign this form giving their informed consent for participation in the study. Control group participants were given the same description excluding the information regarding the workshop.

A 58-item questionnaire was administered immediately prior to beginning the workshop. Participants coded the electronic answer sheet with their age and last four digits of their social security number. In addition, participants were asked to give their name, address, phone number, and last four digits of their social security number on a separate card so that a post-questionnaire could be sent to them by mail. Participants in the study and control groups were encouraged to answer all questions to the best of their knowledge with only one response and as honestly as possible.

The workshops were conducted in classrooms and community living spaces. A multi-media workshop format was chosen in accordance with Social Learning Theory. A brief videotape instruction of BSE began the workshop. The videotape primarily depicted a young Hispanic woman, about the same age of the study participants, performing the steps of BSE. Women of other ages and races were also depicted performing various stages of BSE. BSE for larger-breasted women and women with implants were also included in the videotape instruction. The American Cancer Society recommends women begin breast self-examination at age 20. Participants were encouraged to adopt breast self-examination as a component of a healthy lifestyle no matter what their age, as women need to become familiar with their own breast tissue and how it changes throughout life to maximize early detection of breast cancer.

Following the viewing of the videotape, a lecture was conducted by a female breast health educator using the teaching module designed for this study and the recommendations of the American Cancer Society as a guide. The lecture was presented using a computer-aided slide show. This type of presentation was felt to be more likely to hold a young audience's attention with its use of current technology, thereby increasing the potential for assimilation of the information delivered. For example, bullet points, presented singularly, were highlighted and faded when the next bullet point was being discussed. Progression through the slides was smooth and did not interrupt the flow of the workshop. The graphics were interesting and scanned and downloaded pictures provided additional visual stimuli. The lecture addressed current breast cancer statistics, cancer development, risk factors and possible risk factors for breast cancer, symptoms and characteristics of breast cancer, breast self-examination, breast anatomy, benign breast conditions, breast screening guidelines, methods of diagnosing breast cancer, especially mammography, and treatment of breast cancer. Questions were encouraged and accepted throughout the lecture.

Participants were given the opportunity to practice differentiating normal breast tissue from abnormal breast tissue using breast models. Breast models with and without malignant-type lumps were available, as were a dense breast model and a benign-type fibrocystic breast model. Multiple pamphlets, shower cards, and reminder stickers were distributed to participants following the workshops as a reinforcement of the workshop's breast health awareness message. It was hoped that shower cards and reminder stickers might serve as a cue to action and aid the participants in remembering to do their monthly

breast self-examination. Extra materials were available for study participants to take to other women who did not attend the workshop.

All workshop topics covered and materials provided were uniform across all workshops. All workshop presenters were individually trained on the use of the computer-aided slide show and the teaching module. The overall workshop was designed to emphasize increased awareness and an accurate portrayal of a young woman's personal vulnerability rather than anxiety. Throughout the workshop, participants were encouraged to share the information presented with family members and friends. Control group study participants were administered only the informed consent and questionnaire. In addition, no breast health education materials were provided to them. Control group participants were told that a second questionnaire would be needed to measure the effect of time on their responses and would be mailed to them.

A post-questionnaire was mailed to both the intervention and control groups 30 days after administration of the pre-questionnaire. The post-questionnaire enabled a follow-up comparison of knowledge, attitudes and skills after the education intervention to knowledge, attitudes and skills before the intervention. An addressed and stamped envelope was provided for the return of the questionnaire. If no response was received 30 days after mailing, a second post-questionnaire was sent. After an additional 30 days, non-respondents were called and sent a third questionnaire. Due to time constraints at the end of the study, 20 of the intervention subjects received only one post-questionnaire and one reminder phone call. Of all the control subjects, 39 received only one post-questionnaire and no reminder phone calls, and of the remaining non-responding control

subjects a second post-questionnaire was mailed, but no reminder phone call was initiated.

Instrumentation

A questionnaire appropriate for the target population that assessed all interests of the study was not found by searching medical literature and cancer databases. Using the constructs of the Health Belief Model (HBM) (Glanz et al., 1997) and other breast health education instruments (Zapka & Mamon, 1986; ACS, 1988; Fulton et al., 1991; Maurer, 1997) as a guide, a questionnaire was constructed. The questionnaire was reviewed by two health behavior academics and an expert nurse breast health educator. The study questionnaire was approved by University of North Texas Health Science Center Institutional Review Board and similar human subjects review committees at the study target institutions. The questionnaire asked about demographic information, personal and family history of cancer and breast cancer, BSE frequency and proficiency, attitudes regarding breast cancer and BSE, and breast cancer and breast health knowledge. In addition, subjects were asked to report seatbelt use, exercise, frequency of dental visits and Pap smears, all health behaviors that should have been adopted by female undergraduates as part of a healthy lifestyle (U. S. Preventive Services Task Force, 1996). Participants were also asked whether or not they had discussed breast cancer and BSE with others. The questions reflected information that would be addressed in the workshop designed for an 18-25 year old audience.

In this study, HBM was employed as a means of describing why some college-age women practice breast self-exam and why some do not. Perceived susceptibility and

severity were addressed in 10 items on the questionnaire. For example, participants were asked if their chance of not being diagnosed with breast cancer in the next 10 years was excellent, good, fair, or poor. Participants were also asked to determine whether or not healthy women could still be diagnosed with breast cancer. In addition to the perceived susceptibility or severity constructs, four questions simultaneously addressed another HBM construct. The close relationships between the HBM constructs cannot be severed in designing a questionnaire so that each question measures only one HBM construct.

Perceived benefits and barriers to BSE were assessed using the questionnaire. Subjects were asked to what degree they were confident in performing BSE and whether they thought BSE was worthwhile to find breast cancer early. Potential barriers to performing BSE also included fear, embarrassment, and pain. To assess health locus of control, subjects were asked to determine whether they thought a physician could detect a lump sooner than they could. Benefits and barriers were assessed in a total of 33 questions. Of these, 18 questions addressed self-efficacy specifically.

The decision of whether or not to perform BSE may be impacted by modifying factors, or factors that influence an individual's perceptions and way of thinking. The questionnaire measured some of the potentially modifying factors, such as knowledge of breast cancer and BSE, specific knowledge of risk factors of breast cancer, skill knowledge related to BSE (for example, the recommended frequency and time of the month it should be performed), and knowledge of the impact of breast cancer on American women. Other health behaviors, such as dental visits, exercise, seatbelt use,

and getting a Pap smear were also assessed as a measure of health consciousness. Age, year in college, major and race were collected as well for descriptive purposes and as potentially confounding variables. Modifying factors were assessed in 7 questions.

A cue to action measured by the questionnaire included a verbal reminder from a physician or nurse to do BSE. The questionnaire measured other cues to action including whether or not the participant discussed BSE with a friend or family member and whether or not the participant had a family history of cancer or breast cancer. Participants were also asked to state their level of agreement with the statement "People would think it unusual if I did BSE." This question intended to address a subjective norm in its inquiry of others' opinions of their behaviors. Subjective norms are not a component of the Health Belief Model, but a question addressing a subjective norm was felt to be important to assess as a precursor to future studies. Participants were provided a wallet-sized BSE reminder sticker and a shower card with BSE instructions at the workshop as a prompt for BSE. The breast health workshop itself also served as a cue to action. Eight questions addressed cues to action. Three additional questions addressed reinforcing factors of breast cancer, such as how they are reminded to do BSE, i.e. through a physician or nurse, media, etc.

Although HBM was the primary guiding health behavior theory, Social Learning Theory also guided some of the questions from a different learning perspective. Predisposing, enabling, and reinforcing factors, components of the Social Learning Theory (Glanz et al., 1997), were assessed. Predisposing variables included the practice of preventive health behaviors, perceived susceptibility to breast cancer, perceived

benefits of BSE, knowledge including risk factors for breast cancer, skill knowledge and breast cancer statistical knowledge, and sociodemographic variables. Other predisposing variables assessed involved health locus of control, confidence levels in performing BSE, attitudes, and dependence on health care providers. Discussion of BSE with family and friends was evaluated as an enabling and reinforcing factor and reminders by health care providers and media as reinforcing factors.

Treatment of the Data

Five subjects were excluded from the analysis. An intervention subject was excluded when it was found that six questions were answered with a "c" response, when the choices were only "a" and "b." Three subjects, one intervention and two control subjects, were excluded due to the suspicion that they may have gotten off track in numbering on the response sheet. Instead of answering 58 questions, only 56 or 57 questions were answered. No other reason for not responding to these questions was apparent. Finally, one control subject was excluded when it was observed that only "a" responses were chosen for the entire questionnaire. After excluding post-questionnaires returned with no forwarding address and participants who moved during the course of the study and were not able to be located, the response rate was 42.8% for the intervention group and 50.6% in the control group. Three post-questionnaires were returned with no identifying codes and could not be linked with a pre-questionnaire. One post-questionnaire was received after the termination of the study and could not be included in the analysis.

In the event that a participant changed her major between pre- and post-questionnaires, the response to the major variable on the pre-questionnaire was retained as the participant's major. If years of enrollment increased by one year, the original class level was retained. If the years of enrollment decreased or increased by more than one year, class level was coded as a non-response since a determination could not be made of which questionnaire response was correct. A change in race between pre- and post-questionnaire was also coded as a non-response.

Breast health knowledge, attitudes, and behavior were related to the optimal responses for women of the target population. If two or fewer responses were coded with choices not made available to the participant or a question was skipped, the answer sheet was conservatively scored as an incorrect response for the breast cancer knowledge and BSE proficiency variables. The pre-questionnaires were hand-scored and summed for the 23 knowledge and proficiency questions and the percentage correct was calculated, thereby creating a continuous variable. To account for the potential for change in knowledge/proficiency scores from pre- (P1) to post-questionnaire (P2), an effectiveness index was calculated using the formula:

$$\frac{(P2-P1)}{(100-P1)} * 100$$

It was important to assess these questions not only for correctness, but also for which of the incorrect answers were most frequently chosen. Since the specific proficiency variables were of special interest to the study, these variables were entered into regression analysis as either correct (1) or incorrect (0) without regard to which of the incorrect

answers were chosen. Re-coding facilitated a more distinct separation between participants who answered proficiency questions correctly and those that did not and simplified the interpretation of the analysis. In order to address both research hypotheses regarding BSE frequency, it was necessary to re-code BSE frequency from the continuous variable to a categorical variable. Examiners (1) were defined as having examined their breasts at least once in the previous three months, while non-examiners had not examined their breasts at all in the previous three months (0).

Besides the computation of a knowledge/proficiency score, an attitude and health consciousness score were also calculated. The creation of these scores aided in grouping similar variables together for ease in analytical interpretation. Attitudes towards BSE were calculated as a mean of the 18 questions that addressed attitudes. One of the attitude variables was re-coded to fit the Likert scale of the other 17 items. Participants not responding to the attitude questions were excluded from the attitude portion of the analysis. Attitude scores ranged from 2 to –2 in keeping with the original Likert scale of the questions.

A health consciousness score was calculated using the respondent's self-report of getting a Pap smear, wearing a seatbelt, going to the dentist, and exercising. These health behavior variables were Likert scale items, ranked strongly agree (2) to strongly disagree (-2) as to their participation in the health behavior. The item corresponding with getting a Pap smear was originally coded as an ordinal variable and was re-coded to fit the 2 to –2 scale of the other health behavior measures. The responses to the four items were summed and a mean was calculated to obtain a health consciousness score. Non-

response to any of the health behavior variables resulted in exclusion of the participant in the analysis of health consciousness. Participants were defined as health conscious or not health conscious for analytic purposes. A positive health consciousness score was labeled health conscious, while a negative score was labeled not health conscious.

The data were analyzed using SPSS, a computer statistical software package. Descriptive statistics were performed for each variable included on the questionnaire and for each derived score. Chi-square analysis was used to test for significant differences between control and intervention subjects on the categorical variables, while independent samples t-tests were used in evaluating the continuous variables. A paired samples t-test was used to test for differences between pre- and post-questionnaire measurements. Linear regression was employed to control for confounding, baseline measurements, and other variables of interest when the dependent variables were continuous in nature. When the dependent variables were dichotomous, logistic regression was used instead. Two variables of special interest that may predict breast health outcome measures were race and major. The race variable was collapsed to include three categories, African-American, White Non-Hispanic and other, and was re-coded as dummy variables. The academic major variable was collapsed to a dichotomous variable, nursing, science, and health-related majors vs. business, liberal arts and other majors. Collapsing and re-coding the race and major variables facilitated regression analyses, thereby permitting adjustment for race and major in the analyses.

CHAPTER IV

RESULTS

Overall, the study subjects' mean age was 19.88 years, 19.53 for the control group and 20.67 for the intervention group. Despite the closeness in age of the subjects, a statistically significant difference ($p < 0.001$) between the control and intervention groups was identified using a t-test. The mean years of enrollment in one of the three target universities was 2.07 years overall, 1.79 for the control group, and 2.69 for the intervention group. A statistically significant difference ($p < 0.001$) was also found for number of years enrolled between control and intervention subjects, although the means show the two study groups to be less than a year apart in class level.

A nursing, science, or a health-related major was reported by 45.2% of the respondents. The remaining 54.8% majored in business, liberal arts, or other majors. Using chi-square analysis, there was a significant difference ($p = 0.02$) in majors between the intervention and control groups prior to collapsing the race variable. After collapsing the major variable, the 42.8% of the control group majored in nursing, science or a health-related major, while 50.6% of the intervention subjects majored in these subjects. Fifty-six percent of the study population was White Non-Hispanic, 23.7% African American, and 20.3% another race or ethnicity. Chi-square analysis also found a significant difference ($p = 0.03$) in race between intervention and control groups. After

collapsing the variable into three races, the control group was made up of 24.7% African American, 55.4% White Non-Hispanic, and 19.8% other. The intervention group was made up of 21.3% African American, 57.3% White Non-Hispanic, and 21.4% other.

At the baseline measurement, 69.7% of all the respondents reported a family member or a close friend with cancer. A family history or close friend with breast cancer was reported by 42.5% of the total number of subjects. There was a significant difference ($p = 0.04$) in controls and intervention subjects with regard to reporting a family history or a close friend with cancer on the pre-questionnaire using chi square analysis. More of the intervention subjects (78.7%) reported a family member or close friend with cancer than control subjects (65.7%). Some of the subjects coded a family history or close friend with breast cancer, but did not code a family history or close friend with cancer. It could not be determined where the mistake in coding occurred. Discrepancies were noted in eight of the sample subjects pre-questionnaires.

Almost one-half (47.3%) of the total number of subjects incorrectly thought breast cancer was primarily an inherited disease, especially passed on from mother to daughter. Only about 5-10% of breast cancer cases are due solely to inheritance (American Cancer Society [ACS], 1998), although a significant family history of breast cancer is a risk factor for the development of breast cancer. The risk factors of being a woman, aging, and a family history of breast cancer were correctly identified by most of the study subjects. In addition, the acceptable methods for the early detection of breast cancer and the reason why mammograms are an ineffective early detection tool in young women were known to most of the study subjects. The lifetime risk of developing breast cancer

in the United States, 1 woman in 8, was correctly identified by only 31.4% of the study sample. Most of the remaining subjects thought the lifetime risk was higher, 1 woman in 5 (40.9%), or lower, 1 woman in 10 (25.6%)

Most of the study subjects (76.4%) did not correctly identify the primary purpose of performing breast self-examination (BSE), to become familiar with one's breast tissue. The most popular response (57%) was to observe for any lumpiness in breast tissue. Only 10.8% of the study sample had examined their breast three times in the past three months at baseline and 50.6% had not once examined their breast in the past three months. The BSE frequency reported on the post-questionnaire was significantly different ($p = 0.04$) between intervention and control groups. The intervention group was more likely to be performing BSE at the post-questionnaire measurement. The race category including all races except African American ($p = 0.001$) and classroom setting ($p = 0.05$) were significant predictors of BSE frequency at baseline using linear regression.

A chi-square analysis revealed that statistically significant differences ($p < 0.001$) existed with regard to the outcome of voluntarily attending a breast health workshop between the three race categories. African Americans may have been less likely to voluntarily attend the workshop. When they did attend, African Americans were more likely to be a classroom intervention subject. Neither the White Non-Hispanic ($p = 0.85$) nor the African American ($p = 0.50$) race categories were predictors of whether or not participant would be an intervention subject or control subject using collapsed, dummy variables in logistic regression. The baseline BSE frequency was a significant predictor

($p < 0.001$) of BSE frequency at the time of the post-questionnaire measurement according to linear regression analysis. Controlling for the baseline BSE frequency, membership in the intervention group did not predict BSE frequency on the post-questionnaire. Even collapsing BSE frequency to a dichotomous variable, examiner or non-examiner, did not result in intervention status ($p = 0.85$) predicting post-questionnaire examiner status, controlling for baseline examiner status in logistic regression.

Using the re-coded BSE frequencies, which defined participants as examiners or non-examiners, the variable addressing knowing how to perform BSE at the baseline measurement was a significant ($p < 0.001$) predictor of BSE at baseline identified by logistic regression. This variable continued to be a significant ($p = 0.003$) predictor of BSE at the post-questionnaire measurement in addition to the baseline examiner status ($p < 0.001$) and baseline report of a family history or close friend with cancer ($p = 0.02$). A paired samples t-test revealed that the baseline and post-intervention BSE frequencies were significantly different from one another in the intervention group ($p = 0.03$), but not for the control group ($p = 0.21$).

Seventy-six percent of the sample knew BSE should be performed on a monthly basis, however, only 25.2% of respondents identified the correct time to perform BSE as five to seven days after the menstrual period begins. More than one-half (51.7%) of the sample thought BSE should be performed five to seven days after the menstrual period ends. Knowing how often to perform BSE at the post-questionnaire measurement was significantly predicted by both the baseline measurement ($p = 0.02$) and having a family

history or close friend with cancer ($p = 0.02$), as analyzed by logistic regression. Knowing the correct time to perform BSE was only predicted by the baseline measure ($p = 0.02$) for this same variable.

Most respondents identified the proper hand technique when performing BSE (87.2%) and the necessity of continuous motion during the exam without lifting the fingers (82.6%). Many (60.1%) of the respondents knew the area above and below the collarbone was included in BSE. Answering correctly on the questionnaires regarding BSE technique ($p < 0.001$), including the area above and below the collarbone ($p = 0.02$), and continuous pressure throughout the BSE ($p = 0.006$) could be significantly predicted by the baseline measures for these variables using logistic regression. Only 49.5% of the study subjects knew about the correct arm placement and using a pillow behind the shoulder of the breast being examined for a more proficient exam or that varying amounts of pressure is needed throughout the exam (15.3%). Using varying amounts of pressure in BSE and knowing correct arm placement and to use a pillow to better distribute the breast tissue are measures of BSE skill proficiency. The variable measuring whether or not correct arm placement and use of a pillow was thought to be important in BSE was significantly different between intervention and control subjects ($p = 0.01$) on the pre-questionnaire using chi-square analysis. Logistic regression identified that these outcome variables at the post-questionnaire measurement could be predicted by membership in the intervention group ($p = 0.02$; $p = 0.001$ respectively) and the baseline measurement ($p = 0.002$; $p = 0.004$ respectively).

Only 28.5% of the study subjects correctly identified how long a BSE should take for each breast as five minutes. Most (65.3%) of the subjects underestimated the time necessary at three minutes per breast. Logistic regression identified a nursing, science, or health-related major ($p = 0.007$), membership in the intervention group ($p < 0.001$), and the baseline variable measurement ($p = 0.006$) as predictors of the outcome variable measuring the time necessary to perform BSE analysis at the post-questionnaire measurement. The intervention subjects were more likely to answer this question correctly on the pre-questionnaire.

Eighty-eight percent of the study sample knew that in observing the breast in BSE, one is looking for dimpling, puckering, and retraction. The race category including all races except White Non-Hispanic was a significant predictor ($p = 0.01$) at the second measurement of the observation outcome variable. Most of the study sample (96.3%) underestimated the reported percentage of breast lumps originally detected by the woman herself, consistent with 50.6% of the sample who reported they strongly agreed or agreed that a physician could find a lump sooner than they could. Most of the women (81.0%) knew that a breast lump was not necessarily an indication of breast cancer. They realized that older women are more likely to get breast cancer than younger women (71.5%) and that women in good health can still get breast cancer (97.5%). Most (65.1%) of the subjects rated their chances of not getting breast cancer in the next ten years as excellent or good, yet the remaining 34.8% reported they thought their chances were only fair or poor.

Confidence in finding a lump if one was present centered around neutrality (0) on the Likert scale measured as 2 to -2. An independent samples t-test indicated that the difference in mean confidence levels reported in the controls and intervention groups were not significant at pre- ($p = 0.4$) or post- ($p = 0.09$) intervention. A significant difference was detected in the baseline and post-intervention confidence variable in the intervention group ($p = 0.04$) using a paired samples t-test. However, a pre/post-questionnaire difference in the control group was not detected ($p = 0.16$). Confidence at the post-questionnaire measurement was significantly predicted by membership in the intervention group ($p = 0.02$) and baseline confidence ($p < 0.001$) using linear regression.

However, 61.9% of the women sampled reported that they either strongly agreed or agreed that they were not sure how to do BSE properly and 54.3% of the women reported they either strongly disagreed or disagreed that they could tell the difference between normal and abnormal breast tissue. A significant difference ($p < 0.001$) in the mean responses between controls and intervention subjects on the variable related to not knowing how to perform BSE was found on the post-questionnaire using an independent samples t-test. Intervention subjects were more likely to report that they strongly disagreed with the statement "I am not sure how to do BSE properly." Paired samples t-test analysis indicates that this variable was significantly different from pre- to post-questionnaire for the intervention subjects ($p < 0.001$), but not for the controls ($p = 0.40$). The BSE skill variable was a significant predictor of BSE examiner status at baseline ($p < 0.001$) and at post-questionnaire ($p = 0.003$) using logistic regression.

About one-half (50.2%) of the respondents reported that they either strongly agreed or agreed that BSE was difficult to remember and that BSE requires starting a new habit, which is difficult (46.5%). After reviewing the frequencies, discomfort, embarrassment, fear, worry, pain, or others' opinions were not apparent as reasons the study sample women neglected to perform BSE. However, a significant difference ($p = 0.04$) between the mean responses of the control and intervention group at post-questionnaire was apparent when a comparison of the variable addressing embarrassment was made using an independent samples t-test. Intervention subjects were more likely to respond that they strongly disagreed with the statement "It is embarrassing for me to look at my breasts" at the post-questionnaire measurement.

The questionnaires attempted to evaluate potential reinforcing factors in BSE, particularly reinforcement from persons close to the subject, a physician or nurse, and media reminders. Only 15% of the study subjects reported that they strongly agreed or agreed that someone close to them encourages them to do BSE. When evaluating encouragement from physicians and nurses as a reinforcement, 46.4% of the sample responded that they strongly agreed or agreed that they were encouraged to do BSE. Many (43.2%) of the respondents reported that they strongly agreed or agreed that they are reminded to do BSE by things they hear or see as in television or a poster. Those participants who were reminded by media were not significantly more likely to perform BSE on the post-questionnaire in either the control ($p = 0.15$) or intervention groups ($p = 0.07$) according to chi-square analysis.

Only 31.1% of the sample reported that they strongly agreed or agreed that they had discussed BSE with someone in the past six months. An independent samples t-test found a significant difference ($p = 0.001$) between control and intervention groups in the discussion variable on the post-questionnaire. Intervention subjects were more likely to have discussed BSE with someone in the past six months by the post-questionnaire measurement. The discussion variable at post-questionnaire could be significantly predicted by baseline measurements of family history or a close friend with cancer ($p = 0.04$) and the health consciousness score ($p = 0.007$), as well as the baseline discussion variable ($p = 0.001$) using linear regression. Membership in the intervention group was also a significant predictor ($p = 0.01$) of discussion at the post-questionnaire measurement. The discussion variable response was significantly different from baseline to post-questionnaire in the intervention subjects ($p < 0.001$) and in the control subjects ($p = 0.02$) using paired samples t-test analysis.

Overall, the sample scored a mean of 59.8% correct responses on the pre-questionnaire, 65.6% on the post-questionnaire. The control group scored a mean of 58.8% on the pre-questionnaire and 62.4% on the post-questionnaire, while the intervention group scored a mean of 61.9% on the pre-questionnaire and 76% on the post-questionnaire. An independent samples t-test found a significant difference between the control and interventions groups in percent correct in both the pre- ($p = 0.028$) and post-questionnaires ($p < 0.001$). On both the pre- and post-questionnaires, intervention subjects were more likely to answer the knowledge questions correctly. A significant

difference on the post-questionnaire is expected since only the intervention group received breast health education.

Significant differences were also revealed between the percent correct variable from pre-test to post-test in both the intervention ($p < 0.001$) and control ($p = 0.009$) groups using paired samples t-test analysis. A nursing, science, or health-related major ($p = 0.04$) and the race category White Non-Hispanic ($p = 0.01$) were significant predictors of baseline percentage correct using linear regression, while membership in the intervention group approached significance ($p = 0.06$). The post-questionnaire percentage correct was significantly predicted by membership in the intervention group ($p < 0.001$) and the baseline measurement ($p < 0.001$), according to linear regression analysis. There was a significant difference ($p < 0.001$) in the mean effectiveness index between control and intervention groups. The mean effectiveness index in the intervention group was much greater than in the control group.

In general, attitudes toward BSE and its usefulness in early detection of breast cancer were positive. The overall mean attitude score on the pre-questionnaire was 0.668 and 0.759 on post-questionnaire. The control group mean attitude score on pre-questionnaire was 0.656 and 0.692 on post-questionnaire. The intervention group mean attitude score on pre-questionnaire was 0.694 and 0.993 on post- questionnaire. An independent samples t-test found a significant difference ($p = 0.001$) between control and intervention groups in the post-questionnaire attitude score. Intervention subjects were more likely to have a positive attitude toward BSE at the post-questionnaire measurement. Furthermore, the attitude scores at baseline and post-intervention were significantly

different from one another in the intervention subjects ($p = 0.007$), but not in control subjects ($p = 0.29$) using a paired samples t-test. Linear regression found that membership in the intervention group ($p = 0.001$) and the baseline attitude score ($p < 0.001$) were significant predictors of the post-questionnaire overall attitude score.

The overall mean health consciousness score was 0.829 at baseline and 0.906 on the post-questionnaire. The control group had a mean health consciousness score of 0.764 at baseline and 0.875 on the post-questionnaire. The intervention group mean health consciousness score was 0.976 at baseline and 1.010 on the post-questionnaire. An independent samples t-test indicated a statistically significant difference ($p = 0.03$) between control and intervention groups with regard to the health consciousness score of the pre-questionnaire. The intervention group was more "health conscious" at the time of the baseline measurement. The baseline and post-test health consciousness scores were significantly different from one another in the intervention subjects ($p = 0.02$), but not the controls ($p = 0.11$) using paired samples t-test analysis. Using the original BSE frequency measurement, linear regression did not detect health consciousness scores as predictors of BSE frequency at either baseline ($p = 0.55$) or post-questionnaire ($p = 0.30$). Health consciousness scores did not predict examiner status at the pre- ($p = 0.99$) or post-questionnaire ($p = 0.24$) measurement using logistic regression.

Participants who had previously examined their breasts were compared to non-examiners. Baseline examiner status did not vary between control and intervention subjects ($p = 0.58$) using chi-square analysis. However, at post-questionnaire, intervention and control subjects approached significant difference in examiner status (p

= 0.05). More intervention subjects adopted the habit of BSE from pre- to post-questionnaire. Stratifying the data by the intervention status, examiners in the intervention ($p < 0.001$) and control ($p = 0.02$) groups were significantly more likely to be examiners at the post-questionnaire measurement. Women who had previously examined their breasts were more likely to examine their breasts on the post-questionnaire using chi-square analysis. Knowing how to perform BSE ($p <0.001$) was a significant predictor of baseline BSE examiner status. Logistic regression also indicated baseline BSE examiner status ($p < 0.001$), knowing how to perform BSE ($p = 0.003$) and the variable reporting a family history or close friend with cancer ($p = 0.017$) to be predictors of post-questionnaire BSE examiner status, controlling for intervention status.

CHAPTER V

EVALUATION OF RESULTS

Summary

College-aged women are important targets for breast health education. They are young enough to incorporate breast self-examination (BSE) into their lifestyles at a point when they are at the lowest risk of breast cancer. Young women are not performing breast self-examination. They are not skilled in this method of self-care or adequately educated with regard to breast cancer or BSE. Myths and misconceptions about breast cancer exist among college-aged women.

The study was conducted using a pre/post study design. Volunteer subjects were invited to participate in a breast health workshop designed for 18-25 year old women. Control subjects were also undergraduate college students attending the same target universities. The breast health workshop included videotaped instruction of BSE, a lecture accompanied by computer-aided slide slow, and breast models. Data was analyzed using descriptive statistics, chi-square analysis, paired and independent samples t-tests, and linear and logistic regression.

The control and intervention groups varied on age, class, major, race, family history or close friend with breast cancer, and the baseline health consciousness score variables. Control and intervention subjects reported statistically significant different post-

questionnaire BSE frequencies, but membership in the intervention group did not predict post-questionnaire BSE frequency when controlling for the baseline frequency. However, examiners at baseline were found to be more likely to be examiners post-intervention, controlling for intervention status. The different race categories volunteered as an intervention subject differentially, but race was not a predictor of intervention/control status. Intervention subjects were more likely to know about arm placement and the use of a pillow, measurements of BSE proficiency, than the controls at post-questionnaire. Participants who reported being reminded by media messages to do BSE were not more likely to be examiners. Although intervention subjects were not found significantly more likely to have greater confidence in detecting a breast lump than control subjects at the post-questionnaire measurement, the confidence measures from pre- to post-questionnaires were significantly different in the intervention subjects only.

Subjects who participated in a breast health education workshop were more likely to report examining their breasts, knowing how to perform BSE properly and that they were less embarrassed to touch their breasts. Reminders to perform BSE may prompt some young women to perform BSE as this variable approached significance in the intervention group on a stratified chi-square analysis. Intervention subjects were more likely to have reported that they had discussed BSE with someone in the past six months, when measured on post-questionnaire. Control subjects also increased their discussion of BSE as this variable differed significantly from pre- to post-questionnaire, as in the intervention subjects. The percentage correct, at baseline and post-intervention, were higher for the intervention subjects. In addition, the effectiveness index was higher in the

intervention subjects. The post-intervention attitude and health consciousness scores were higher for the intervention group than for the controls.

Discussion

The control and intervention subjects were statistically different on important demographic variables. Even though the study groups varied on age and class, this difference was small in reviewing the descriptive statistics. Few students had ages in the upper limit of the age inclusion criteria. The mean ages for the study groups were little more than one year apart. Intuitively, students one year apart in age are not that different. The class level difference between the intervention and control subjects was less than one year apart. Statistical significance in both of these variables was most likely due to very small variances in the sample, thereby decreasing the denominator of the t-statistic. For this reason, age and class were not considered confounding variables and were not controlled for in the regression analyses.

Differences in academic major and race may have significant implications in this study. Since the intervention group comprised volunteer subjects, the likelihood of observing participants that major in nursing, science, or another health-related field does not seem unexpected. A major in nursing, science, or another health-related field was a confounder in baseline knowledge/proficiency percentage correct and baseline knowledge of the amount of time BSE should take for each breast.

This same reasoning also explains the difference in health consciousness scores and the knowledge/proficiency scores between control and intervention subjects. Baseline health consciousness was a confounding factor in discussing breast health issues at the

second measurement. Intervention subjects may be more aware of family members or friends with cancer, explaining the difference in reporting this variable at baseline. Reporting a family history or close friend with cancer was a confounding variable in post-questionnaire discussion of breast health issues, examiner status, and skill level.

Differences in race between control and intervention groups may imply that volunteer participation varies across races. Stratification by race confirmed that African American women may have been less likely to be volunteer subjects, except in the classroom setting where a professor encouraged their participation. This finding could not be determined definitively as it could not be determined whether equal opportunity to attend the workshops were in place. Advertisement of the workshop was left to the discretion of the workshop contact person. The White Non-Hispanic category did not predict intervention status, but did predict baseline knowledge/proficiency percentage correct and the post-questionnaire measurement of knowing what to look for in observing the breast. The African American race category did not predict intervention status, but being of a race other than African American did confound the baseline BSE frequency and examiner status.

As would be expected in the intervention group, knowledge, BSE frequency, confidence, skill, attitude, and discussion outcomes were significantly higher post-invention in the participants who attended the breast health workshop. The mean effectiveness index was higher in the intervention subjects primarily because their scores were higher in the beginning and a subsequent score increase on the post-questionnaire was more meaningful than an increase in the score of a control who scored lower at

baseline. Participants reporting having examined their breasts at least once in the previous three months at baseline could be differentiated from non-examiners at the post-intervention measurement, with examiners being more likely to be examiners at the second measurement. At baseline and post-intervention, reported skill level at the respective measurements confounded examiner status.

Not voluntarily attending the breast health awareness workshop was a confounding variable in BSE frequency at baseline. Expectedly, membership in the intervention group predicted post-intervention BSE frequency, confidence, discussion, attitude, knowing the amount of time required to examine each breast, and knowing about arm placement and use of a pillow in BSE.

Conclusion

A workshop format including the American Cancer Society videotaped "Instructions on Breast Self-Examination, an age-appropriate lecture using current computer technology and based on the American Cancer Society breast health awareness course, and breast models is an effective breast health education teaching module for undergraduate college women. When tested on their knowledge of breast cancer and BSE prior to a breast health awareness intervention, undergraduate women scored lower at the baseline measurement. BSE skill predicted examiner status at baseline and post-questionnaire.

Variables assessing fear, embarrassment, and forgetfulness were not identified as predictors of examiner status pre- or post-questionnaire. Furthermore, knowledge scores were not predictors of being an examiner or not at either measurement time.

Undergraduate women demonstrated improvement in knowledge and attitudes between pre- and post-questionnaire. Undergraduate women reported increased frequency and proficiency of BSE following breast health awareness training. Undergraduate women expressed greater confidence in performing BSE proficiently and a greater likelihood of discussing breast health issues with other women, including friends and family members following breast health awareness training.

Undergraduate women reporting having examined their breasts on the pre-questionnaire were more likely to report continuing the health behavior on the post-questionnaire. Undergraduate women reporting the practice of other positive health behaviors were not more likely to report a higher frequency of BSE in the previous three months or to adopt the practice of BSE following instruction. Differences in the voluntary attendance to a breast health workshop existed between racial/ethnic groups. Race was a predictor of BSE frequency at baseline, but race did not predict examiner status at baseline or post-questionnaire.

Limitations

The primary limitation in the study was a small intervention group. A small sample size decreases statistical power and makes differences more difficult to detect. Volunteer participation was much more difficult to attain than expected. In addition, staging of the breast health workshop or administration of only the questionnaire, as in the control group, could only be accomplished by invitation of a professor, sorority, or residence hall. It was even more difficult to retrieve post-questionnaire measurements in both study groups. Response rate was low due in part to a highly mobile population.

The study was also limited by effects that could not be objectively measured. A study of this nature has the potential to be affected by selection, or volunteer, bias. Important targets for breast health education who would not ordinarily volunteer may be missed. In addition, because this study was interested in college-age women, those women who did not attend college were not eligible. Excluding women who do not attend college may limit access to women of low income status. Low-income status has been identified as a barrier to breast health education (Burnett, Steakley, & Tefft, 1995).

All of the data was self-reported, hence it is subject to the participant's way of defining their feelings. All questions were subject to the participant's interpretation of the question. There was evidence to suggest that some participant's may have misinterpreted some of the questions, for example, in coding errors found in reporting family history of cancer and breast cancer. In addition, the questionnaire itself was lengthy and may have resulted in participants completing the electronic answer sheet without actually reading the question. This may explain why some women gave responses that were not available to them on the electronic answer sheet. Finally, the intervention subjects cannot be considered to have been blinded to the study hypotheses. It is possible that intervention subjects felt compelled to report increased BSE frequency, for example, at post-intervention. However, knowledge/proficiency scores remained a more objective measurement of improvement from pre- to post-questionnaire.

Recommendations

It was surprising how many professors permitted the staging of the breast health workshop or administration of the questionnaire. Complete volunteer participation

resulted in a low sample size. The classroom setting may generate more subjects and better response rates. If possible, the post-questionnaire should also be administered in the same setting as the pre-questionnaire rather than sent through the mail. This would also improve response rate. If administration of the post-questionnaire is not possible, efforts to generate a more expedient return of the post-questionnaire are in order. For example, if a post-questionnaire is not received within two weeks, the subject should receive a phone call reminder. Participants were not called until two post-questionnaire were sent with no response.

African American women are important targets for breast health education especially in light of the background information provided in chapter one. Social marketing strategies need to be employed to increase their participation in breast health education. This study did not identify any barriers to the practice of BSE other than not knowing the skill. Future studies may want to address specific barriers to the practice of BSE in young women. Future studies should also study prompts more in depth. The significance of prompts could not be completely determined in this study, but there was evidence to suggest that prompts might influence the decision to perform BSE in at least some of the subjects. Efficacy of BSE has yet to be elucidated. One barrier to determining BSE efficacy is the fact that no standard good method of teaching and standard method to study outcome measures has been determined. Efficacy cannot be determined unless the methods and techniques used to compare different studies are standardized. Until a determination of the efficacy of BSE can be made, the merit of BSE will not be universally accepted.

APPENDIX

Figure 1. Health Belief Model Components and Linkages (adapted from Glanz et al., 1997)

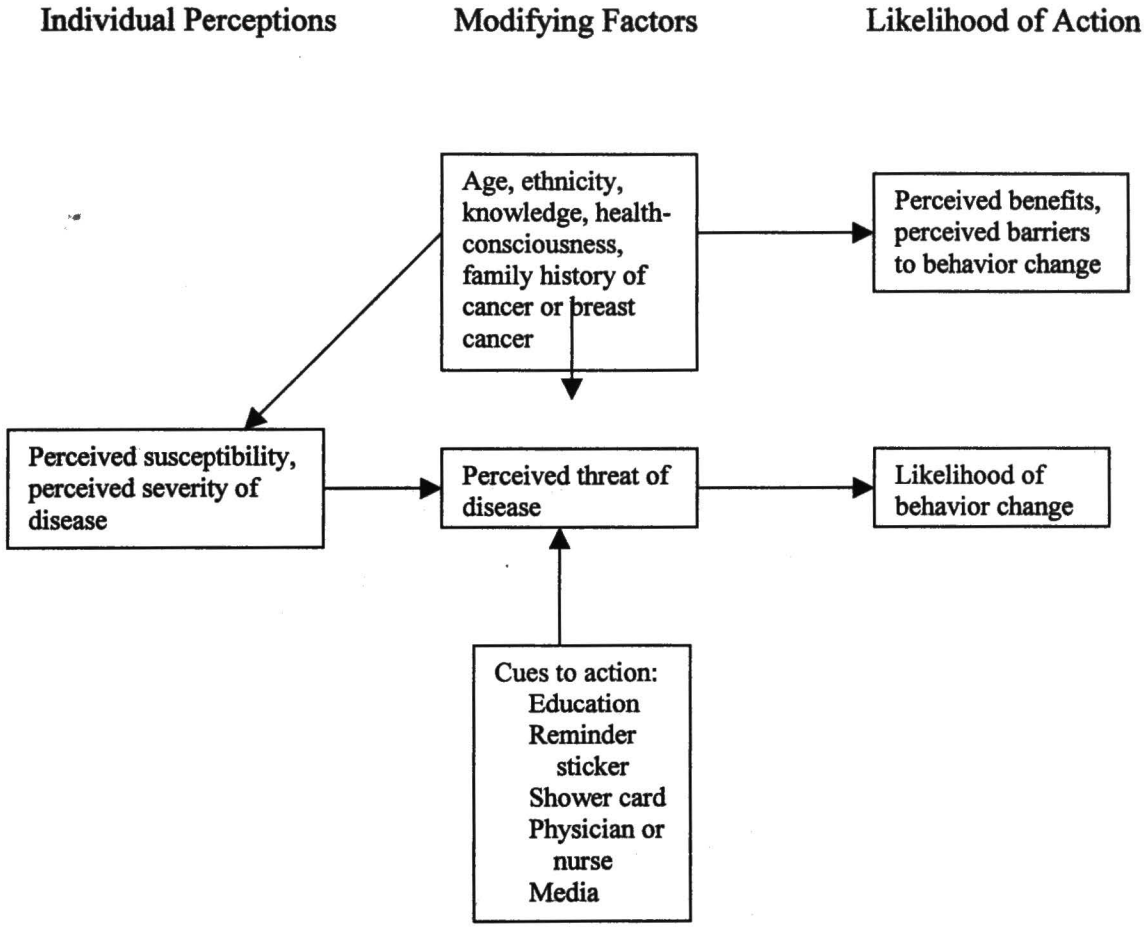

Table 1

Age- and Race-specific Incidence Rate (per 100,000) of Breast Cancer for 1990-1994 (U. S. Department of Health and Human Services)

Age	Overall	White	Black
20-24	1.3	1.0	2.7
25-29	7.2	6.9	9.4

Table 2

Incidence Rate (per 100,000) of Breast Cancer by Race, 1994 (U. S. Department of Health and Human Services)

Overall	White	Black
109.7	112.8	100.5

Table 3

Percentage of Incidence Cases of Breast Cancer for 1990-1994 (U. S. Department of Health and Human Services)

Age	Overall
<20	-
20-34	2.2%

Table 4

Age- and Race-specific Breast Cancer Mortality Rate (per 100,000) for 1990-1994 (U. S. Department of Health and Human Services)

Age	Overall	White	Black
20-24	0.1	0.1	0.2
25-29	1.1	0.9	2.3

Table 5

Mortality Rate (per 100,000) of Breast Cancer by Race, 1994 (U. S. Department of Health and Human Services)

Overall	White	Black
25.5	25.2	31.3

Table 6

Baseline Demographic Information and Significance

Variable	Overall Mean	Intervention Mean	Control Mean	p-value
Age	19.88	20.67	19.53	<0.001*
Class	2.07	2.69	1.79	<0.001*

Note. *significant difference at $p < 0.05$

Table 7

Baseline Demographic Information and Significance

Variable	Overall %	Intervention %	Control %	p-value
Major:				0.02*
Nursing, Science, or Other Health-Related	45.2	50.6	42.8	
Business, Liberal Arts, Other	54.8	49.4	57.2	
Race:				0.03*
White Non-Hispanic	56.0	57.3	55.4	
African American	23.7	21.3	24.7	
Other	20.3	21.4	19.8	
Family History Of Breast Cancer	42.5	65.3	45.8	0.11
Family History Of Cancer	69.7	78.7	65.7	0.04*

Note. *significant difference at $p < 0.05$

Table 8

Comparisons of control and intervention groups using chi-square analysis

Item/Outcome	Pre-p-value	Post-p-value
Better results are achieved when: (the arm is placed behind the head to stretch the breast tissue and a pillow is placed behind the shoulder)	0.62	0.01*
The BSE technique does not include the area just under the collarbone. (false)	0.66	0.14
When performing the BSE technique, the motion should be continuous without lifting the fingers from the breast. (true)	0.72	0.07
The BSE technique does include checking the nipple for any discharge. (true)	0.84	0.99
How often should BSE be performed? (every month)	0.16	0.49
The correct time to perform BSE is: (5-7 days after the menstrual period begins)	0.13	0.50
Proper hand technique when performing BSE includes: (a circular motion with the pads of several fingers)	0.91	0.58
Examiner (yes)	0.58	0.05

Note. (optimal response), *significant difference at $p < 0.05$

Table 9

Comparisons of control and intervention subjects using the t-test

Outcome/Item	Pre-p-value	Post-p-value
I am confident I could find a lump in my breast if one was there. (strongly agree)	0.42	0.09
I am not sure I know how to do BSE properly. (strongly disagree)	0.12	<0.001*
It is embarrassing for me to look at my breasts. (strongly disagree)	0.85	0.04*
I don't do BSE because I am afraid of finding a lump. (strongly disagree)	0.74	0.78
Because someone close to me encourages me, I do BSE. (strongly agree)	0.08	0.48
Because my nurse or doctor encourages me to, I do BSE. (strongly agree)	0.64	0.64
I have discussed BSE with someone in the past six months. (strongly agree)	0.43	0.001*
I am reminded to do BSE by things I see or hear, for example, a poster or television. (strongly agree)	0.50	0.37
When I think about BSE, it's not the recommended time of the month, so I don't do it. (strongly disagree)	0.11	0.89
BSE frequency	0.94	0.04*
Knowledge/Proficiency Raw Score	0.03*	<0.001*
Attitude score	0.50	0.001*
Health Consciousness Score	0.03*	0.38

Note. (optimal response), *significant difference at $p < 0.05$

Table 10

Comparison of Pre- and Post- Questionnaire and Significance

Paired Variables	Intervention p-value	Control p-value
Knowledge/Proficiency Score	<0.001*	0.01*
Attitude Score	0.01*	0.29
BSE Frequency	0.03*	0.21
Health Consciousness Score	0.02*	0.11
Confidence	0.04*	0.16
Skill Knowledge	<0.001*	0.40
Discussion	<0.001*	0.02*

Note. *significant difference at $p < 0.05$

Table 11

Linear Regression of Baseline BSE Frequency

Variable	p-value
Race (White Non-Hispanic)	0.76
(not African-American)	0.001*
Classroom setting (yes) Voluntary attendance (no)	0.050*
Health Conscious (yes)	0.56
Major (nursing, science, other health-related)	0.67
Family history of cancer (yes)	0.21
Intervention status (intervention)	0.11
Knowledge/Proficiency Score	0.83

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 12

Linear Regression of Baseline Knowledge/Proficiency Score

Variable	p-value
Race (White Non-Hispanic)	0.01*
(African-American)	0.79
Classroom setting (yes) Voluntary attendance (no)	0.26
Health conscious (yes)	0.84
Major (nursing, science, or health-related)	0.04*
Family history of cancer (yes)	0.13
Intervention status (intervention)	0.06

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 13

Linear Regression of Baseline Attitude Score

Variable	p-value
Race (White Non-Hispanic)	0.77
(African American)	0.03*
Health Conscious (yes)	0.06
Major (nursing, science, other health-related)	0.03*
Family history of cancer (yes)	0.22
Intervention status (yes)	0.76

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 14

Logistic Regression of Baseline Examiner Status

Variable	p-value
Race (White Non-Hispanic)	0.97
(African-American)	0.28
Health Conscious (no)	0.99
Major (business, liberal arts, other)	0.95
Family history of cancer (yes)	0.48
Intervention status (intervention)	0.25
Skill Knowledge (+ response)	<0.001*
Embarrassment (- response)	0.58
Remembering (- response)	0.19
Fear (- response)	0.83

Note. (direction of relationship),*significant predictor at $p < 0.05$

Table 15

Linear Regression of Post-Questionnaire BSE Frequency

Variable	p-value
Race (White Non-Hispanic) (not African-American)	0.67 0.47
Classroom setting (yes) Voluntary attendance (no)	0.81
Health conscious (yes)	0.30
Major (business, liberal arts, other)	0.33
Family history of cancer (yes)	0.17
Intervention status (intervention)	0.36
BSE frequency – baseline	<0.001*
Knowledge/Proficiency Score	0.36

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 16

Linear Regression of Post-Questionnaire Knowledge/Proficiency Score

Variable	p-value
Race (White Non-Hispanic)	0.35
(African-American)	0.74
Classroom setting (no) Voluntary attendance (yes)	0.50
Health conscious (no)	0.24
Major (nursing, science, other health-related)	0.77
Family history of cancer (yes)	0.14
Intervention status (intervention)	<0.001*
Knowledge/Proficiency Score – baseline	<0.001*

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 17

Linear Regression of Post-Questionnaire Attitude Score

Variable	p-value
Race (White Non-Hispanic)	0.60
(African-American)	0.84
Health conscious (yes)	0.29
Major (nursing, science, other health-related)	0.40
Family history of cancer (yes)	0.68
Intervention status (intervention)	0.001*
Attitude score – baseline	<0.001*

Note. (direction of relationship), *significant predictor at $p < 0.05$

Table 18

Logistic Regression of Post-Questionnaire Examiner Status

Variable	p-value
Race (White Non-Hispanic) (not African-American)	0.31 0.48
Health conscious (yes)	0.24
Major (business, liberal arts, other)	0.10
Family history of cancer (yes)	0.02*
Intervention status (control)	0.85
Baseline examiner status (examiner)	<0.001*
Skill knowledge (+ response)	<0.01*
Embarrassment (- response)	0.22
Remembering (- response)	0.25
Fear (+ response)	0.24

Note. (direction of relationship), *significant predictor at $p < 0.05$

Participant:_____

Principal Investigator: John Licciardone, DO, MS, MBA

Title of project:

BREAST HEALTH 101
A WORKSHOP DESIGNED FOR THE UNIVERSITY SETTING

Purpose:

I understand that I am invited to participate in a research study assessing the beliefs and attitudes of college women regarding breast health issues both prior to and following an educational workshop.

Procedure:

I will be asked to complete a breast health questionnaire geared toward college women prior to the beginning of the workshop. Completion of the survey is estimated to take 10-15 minutes. The breast health workshop will consist of a videotape addressing breast self-examination, a short lecture and practice on breast models. The workshop is estimated to take 1-1 1/2 hours. Approximately 30 days following the workshop, I will be asked to complete a follow-up questionnaire which will be mailed to me.

The questionnaire will inquire on a variety of areas including demographic information, personal and family history of cancer and breast cancer, BSE frequency and proficiency, other health behaviors, attitudes regarding breast health and BSE, and general breast cancer and breast health knowledge.

A videotape entitled "Instuctions for Breast Self-Exam" will begin the workshop. The video-instuction begins with an explanation of breast anatomy and then proceeds with a demonstration of the BSE technique using various aged models of different races. The instruction ends with a review of the process and American Cancer Society guidelines for breast screening. The overall emphasis of the video lies in early detection for increased survival.

The lecture will be conducted by a female nurse breast health educator who will review the BSE technique, address myths and misconceptions of breast issues, provide general breast health and care information, and take questions from the participants.

Risks/Benefits:

There are no apparent risks in participation in the study. However, I have an opportunity to better educate myself and others with regard to breast health and BSE. I will gain knowledge and skills that will continue to benefit me throughout my lifetime. In addition, research may gain a better understanding of how college-aged women regard breast health and in turn, become better able to educate this population.

Voluntary Participation:

Participation is voluntary and I may refuse to participate or withdraw consent at any time without penalty.

Confidentiality:

The confidentiality of all my responses will be protected and maintained throughout the length of the study and will not be revealed in any publication that may result from this study. Responses to the questionnaire will be made available to only the Investigators of the study and to the University of North Texas Health Science Center Institutional Review Board.

Costs:

I will be charged no fees for participation in this study. In addition, I will receive no reimbursements for participation in the study.

Problems or Questions:

Should any problems or questions arise with regard to my rights as a research participant, I may call the principal investigator at (817) 735-2252. I may also ask questions or state concerns regarding my rights to Jerry C. McGill, Ph.D, Chairman, Institutional Review Board, University of North Texas Health Science Center, (817) 735-2561. In addition, I may contact a human research representative at my respective university, Texas Christian University Institutional Review Board - Nancy Meadows, Ph.D at (817) 257-6780 or Jan Fox at (817) 257-6518; Texas Woman's University Office of Research and Grants Administration (940) 898-3377; or University of Texas at Arlington Human Subjects Review Committee - Carolyn Cason RN Ph.D (817) 272-5774

If I am injured or suffer any adverse effects while participating in this study, all routine medical and emergency costs will be paid by my personal medical insurance. Financial compensation for lost wages, disability, or discomfort due to this type of injury is not routinely available. The University of North Texas Health Science Center, Texas Christian University, Texas Woman's University, and University of Texas at Arlington assumes no responsibility for my participation in this study. I understand, however, that I have not waived any of my legal rights by signing this form.

I have read this informed consent, and have been given the opportunity to ask questions and discuss the study. I understand the research procedures. I understand that I may withdraw from the study at any time. I hereby give my consent to this study.

_____ _____

Participant's signature Date

I have explained the above to the participant

_____ _____ _____

Investigator's signature Date Phone number

Participant:_____

Principal Investigator: John Licciardone, DO, MS, MBA

Title of project:

BREAST HEALTH 101
A WORKSHOP DESIGNED FOR THE UNIVERSITY SETTING

Purpose:

I understand that I am invited to participate in a research study assessing the beliefs and attitudes of college women regarding breast health issues.

Procedure:

I will be asked to complete a breast health questionnaire geared toward college women. Completion of the survey is estimated to take 10-15 minutes. Approximately 30 days following the initial questionnaire, I will be asked to complete a follow-up questionnaire which will be mailed to me.

The questionnaire will inquire on a variety of areas including demographic information, personal and family history of cancer and breast cancer, BSE frequency and proficiency, other health behaviors, attitudes regarding breast health and BSE, and general breast cancer and breast health knowledge.

Risks/Benefits:

There are no apparent risks in participation in the study. However, researchers may gain a better understanding of how college-aged women regard breast health and in turn, become better able to educate this population.

Voluntary Participation:

Participation is voluntary and I may refuse to participate or withdraw consent at any time without penalty.

Confidentiality:

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If I am injured or suffer any adverse effects while participating in this study, all routine medical and emergency costs will be paid by my personal medical insurance. Financial compensation for lost wages, disability, or discomfort due to this type of injury is not routinely available. The University of North Texas Health Science Center, Texas Christian University, Texas Woman's University, and University of Texas at Arlington assumes no responsibility for my participation in this study. I understand, however, that I have not waived any of my legal rights by signing this form.

I have read this informed consent, and have been given the opportunity to ask questions and discuss the study. I understand the research procedures. I understand that I may withdraw from the study at any time. I hereby give my consent to this study.

_____ _____

Participant's signature Date

I have explained the above to the participant

_____ _____ _____

Investigator's signature Date Phone number

Breast Health 101

Participant Pre-Questionnaire

Please write your age on the name line of the scantron and fill in the last four digits of your social security number. Please indicate on your scantron sheet the one answer you feel is most correct to the following questions.

1. What is your year in college?
   a. freshman
   b. sophomore
   c. junior
   d. senior
2. What is your major?
   a. nursing
   b. business
   c. liberal arts
   d. other health-related
   e. natural science
   ab. other
3. What is your race?
   a. African-American
   b. Asian
   c. Hispanic
   d. Native American
   e. Pacific Islander
   ab. White Non-Hispanic
   ac. Other
4. The lifetime risk of developing breast cancer in the United States is now:
   a. 1 woman in 5
   b. 1 woman in 8
   c. 1 woman in 10
   d. 1 woman in 12
5. Which of the following are considered risk factors for developing breast cancer?
   a. being a woman
   b. aging
   c. family history
   d. all of the above
6. Breast cancer is primarily an inherited disease, especially passed on from mother to daughter.
   a. true b. false
7. Acceptable methods for the early detection of breast cancer include:
   a. mammography, magnetic resonance imaging, and radiographic scanning
   b. breast self-examination (BSE) and chest radiographs
   c. breast self-examination (BSE), clinical examination, and mammography
   d. clinical examination and mammography
8. Mammograms are ineffective in young women because:
   a. the rays are not strong enough to penetrate breast tissue in young women
   b. they are ineffective because of the breast tissue found in young women
   c. they are ineffective because they require too much radiation for young women
   d. they are too costly to benefit young women
9. The primary purpose for performing BSE is:
   a. to find a cancerous lump
   b. to become familiar with one's breast tissue
   c. to detect a pea size or smaller breast lump
   d. to observe for any lumpiness in breast tissue
10. How often should BSE be performed?
    a. every week
    b. every 2 weeks
    c. every month
    d. every 6 months
11. The correct time to perform BSE is:
    a. during ovulation
    b. 5-7 days after the menstrual period begins
    c. 5-7 days after the menstrual period ends
    d. on the 1st day of the menstrual period only
12. After menopause, BSE should be performed:
    a. only if taking estrogen
    b. randomly once a month
    c. the same day every month
    d. the same day every 6 months
13. Proper hand technique when performing BSE includes:
    a. a circular motion with the palm of the hand
    b. a horizontal motion with the pads several fingers
    c. a circular motion with the pads of several fingers
    d. a vertical motion with the palm of the hand
14. When performing BSE, better results are achieved when:
    a. the arm is place behind the head to stretch the breast tissue
    b. a combination of circular and horizontal motion is used
    c. a pillow is placed behind the shoulder
    d. a & c only

15. When performing BSE, how long should it take to examine each breast?
    a. 3 min for each breast
    b. 5 min for each breast
    c. 7 min for each breast
    d. 10 min for each breast

16. What percentage of breast lumps are originally detected by the woman herself?
    a. 50%
    b. 75%
    c. 80%
    d. 90%

17. The BSE technique does not include the area just under the collarbone.
    a. true b. false

18. The BSE technique does include checking the nipple for any discharge.
    a. true b. false

19. When performing the BSE technique, the motion should be continuous without lifting the fingers from the breast.
    a. true b. false

20. When performing the BSE technique, you should apply the same amount of pressure throughout the exam.
    a. true b. false

21. When observing the breasts in the mirror, you are observing for any dimpling, puckering, or retraction.
    a. true b. false

22. A ridge of fat at the bottom of the breast is not normal.
    a. true b. false

23. Most breast lumps are an indication of breast cancer.
    a. true b. false

24. Older women are more likely to get breast cancer than younger women.
    a. true b. false

25. Women who are in good health can still get breast cancer.
    a. true b. false

26. Men never get breast cancer.
    a. true b. false

27. How often have you examined your breasts in the past 3 months?
    a. not once
    b. one time
    c. two times
    d. three times

28. What do you feel are your chances of not getting breast cancer in the next ten years?
    a. excellent
    b. good
    c. fair
    d. poor

29. When was the last time you had a pap smear?
    a. less than one year ago
    b. between one and two years ago
    c. between two and three years ago
    d. more than three years ago
    e. never

30. Have you personally been diagnosed with some type of cancer at any point in your life?
    a. yes b. no

31. Have you personally been diagnosed with breast cancer?
    a. yes b. no

32. Has anyone in your family or a close friend been diagnosed with some type of cancer?
    a. yes b. no

33. Has anyone in your family or a close friend been diagnosed with breast cancer?
    a. yes b. no

*** On the next set of questions, please indicate your agreement with the statement. Choose SA if you strongly agree, A if you agree, N if you neither agree nor disagree, D if you disagree or SD if you strongly disagree

34. BSE is worthwhile to find cancer for early treatment.
a. SA b. A c. N d. D e. SD

35. There are effective ways of treating breast cancer.
a. SA b. A c. N d. D e. SD

36. If I found cancer early with BSE, treatment would be less extreme.
a. SA b. A c. N d. D e. SD

37. I am confident I could find a lump in my breast if one was there.
a. SA b. A c. N d. D e. SD

38. A doctor could detect a lump sooner than I could.
a. SA b. A c. N d. D e. SD

39. BSE is useless, I cannot tell what I am feeling.
a. SA b. A c. N d. D e. SD

40. I am not sure I know how to do BSE properly.
a. SA b. A c. N d. D e. SD

41. I am able to tell the difference between normal and abnormal breast tissue.
a. SA b. A c. N d. D e. SD

42. I am reminded to do BSE by things I see or hear, for example, a poster or television.
a. SA b. A c. N d. D e. SD

43. It is difficult to remember to do BSE.
a. SA b. A c. N d. D e. SD

44. When I think about BSE, it's not the recommended time of the month, so I don't do it.
a. SA b. A c. N d. D e. SD

45. BSE requires starting a new habit, which is difficult.
a. SA b. A c. N d. D e. SD

46. I am comfortable with touching my breasts.
a. SA b. A c. N d. D e. SD

47. It is embarrassing for me to look at my breasts.
a. SA b. A c. N d. D e. SD

48. I don't do BSE because I'm afraid of finding a lump.
a. SA b. A c. N d. D e. SD

49. I don't do BSE because I don't want to be unnecessarily worried.
a. SA b. A c. N d. D e. SD

50. I would rather not know if something was wrong with my breast(s).
a. SA b. A c. N d. D e. SD

51. Self breast exams can be painful.
a. SA b. A c. N d. D e. SD

52. People would think it unusual if I did BSE.
a. SA b. A c. N d. D e. SD

53. Because someone else close to me encourages me, I do BSE.
a. SA b. A c. N d. D e. SD

54. Because my nurse or doctor encourages me to, I do BSE.
a. SA b. A c. N d. D e. SD

55. I have discussed BSE with someone in the past 6 months.
a. SA b. A c. N d. D e. SD

56. I wear my seat belt every time I drive.
a. SA b. A c. N d. D e. SD

57. I go to the dentist for a check-up and cleaning every six months.

58. I exercise frequently.
a. SA b. A c. N d. D e. SD

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