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DISSERTATION

INCREASING BREAST SELF-EXAMINATION IN COLLEGE WOMEN: A COMPARISON OF FIVE TREATMENTS

Submitted by

Elizabeth Helene Winston

Department of Psychology

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Fall 2001

COLORADO STATE UNIVERSITY

August 21, 2001

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY ELIZABETH HELENE WINSTON ENTITLED INCREASING BREAST SELF-EXAMINATION IN COLLEGE WOMEN: A COMPARISON OF FIVE TREATMENTS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Advisor

Department Head/Director

ABSTRACT OF DISSERTATION

INCREASING BREAST SELF-EXAMINATION IN COLLEGE WOMEN: A COMPARISON OF FIVE TREATMENTS

Monthly breast self-examination (BSE) is a method of early detection of breast cancer (BC) that is recommended for all women over the age of 19. Yet, few women actually practice monthly BSEs consistently. The effects of five increasingly complex treatment interventions and mailed monthly reminders on increasing monthly BSE in 206 college women were investigated over a 6-month period.

The five interventions were control (no treatment), treatment A (information only), treatment B (information and videotaped testimonial), treatment C (information, videotaped testimonial, and demonstration/feedback of BSE), and treatment D (information, videotaped testimonial, demonstration/feedback of BSE, and discussion). Monthly reminders were mailed to half of the participants in each treatment condition. Participant BSE behavior, attitudes, general health behavior and stage of change (based on Prochaska and DiClemente's, 1983, transtheoretical model) were evaluated at pre-treatment and 1-month, 2 ½-months, and six-months post-treatment.

Results indicated that the most complex interventions (B, C, D) were most effective in increasing BSE behavior at 1 and 2 ½ months. Treatments C and D were also most effective at moving participants to the next stage of change. Participants in treatment C had the most improved attitudes toward BC and BSE and were most compliant with the BSE behavior at 2 ½-months.

Participants who received monthly reminders were more likely to conduct BSEs at all times than those who did not receive reminders. Implications for programs designed to increase BSE are discussed.

Elizabeth Helene Winston
Department of Psychology
Colorado State University
Fort Collins, CO 80523
Fall 2001

ACKNOWLEDGEMENTS

I would like first and foremost to thank my research partner and good friend, Crystal Tani, without whom this project would not have been initiated, conducted, or completed. She was instrumental in motivating me to keep working when I wanted to stop, imposing much-needed deadlines, and keeping track of endless details.

I would like to thank Dr. Scott Hamilton, my adviser, for providing scholarly and moral support throughout this process. His fine editing and willingness to read and return drafts quickly was very much appreciated.

Several individuals were instrumental in conducting this study and organizing the data. I especially thank Deb Morris, RN, for coordinating recruitment of Student Health Advocates to conduct treatment interventions and would like to express thanks to all of the students who ran the treatments. Numerous research assistants conducted follow-up data collection, performed numerous administrative tasks, and entered and organized data. I express thanks to all of them, but would like to make special mention of Marcie Mata, Jay Eberhard, April Tauer, and Erika Stringer.

Thank you to my good friend, Thomas Brown, who contributed graphic design work and emotional support throughout this process. Thanks always to my parents and sisters for providing unconditional love, support and belief in my abilities. They knew I would do it...and alas, it is done!

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Chapter I: Introduction

According to the American Cancer Society, one in eight women will develop breast cancer during their lifetime (American Cancer Society [ACS], 1997). Breast cancer is the second leading cancer causing death in women after lung cancer. During 1999, an estimated 175,000 new cases of breast cancer occurred in women in the United States. While incidence rates increased throughout the 1980's and leveled off in the 1990's, mortality rates have been decreasing, especially among younger women. The American Cancer Society hypothesizes that this decrease in mortality rate is due to improved treatment and earlier detection (ACS, 1999).

The prevalence of breast cancer is highest for White women (113.2 per 100,000), and lowest for American Indian women (33.9 per 100,000) (ACS, 2000). African-American women under the age of 50 are more likely than White women of the same age to develop breast cancer (ACS, 2000). Yet, African-American women of any age are more likely to die from breast cancer than are White women, most likely due to being diagnosed at a later, less treatable stage of the disease (National Cancer Institute [NCI], 1996). Hispanic and Asian-American women have a lower prevalence of breast cancer than White and African-American women.

Breast cancer incidence and mortality rates increase with age. Seventy-seven percent of new cases occur in women who are 50 and older (ACS, 2000). According to the American Cancer Society (1997), a woman's chance of developing breast cancer at

age 25 is one in 14,493 (~ .01% chance), jumps to one in 641 at age 35 (~. 16% chance) and continues to rise with age, with a one in 18 (~5.6%) chance at age 65 and a lifetime prevalence of one in eight (12.5%).

Risk factors for breast cancer include early age of menarche (before age 12) and late age of menopause (after age 50), personal history of breast disease, family history of breast cancer, and inheritance of a breast cancer-related gene (ACS, 2000; NCI, 1996). A number of suggestions have been offered to help reduce the risk for breast cancer such as regular physical activity, decreased alcohol consumption, and use of the drug tamoxifen (ACS, 2000). Although total prevention of breast cancer is not feasible at this time, a combination of risk factor reduction and early detection is most likely the best strategy for currently dealing with breast cancer. The ACS cites early detection as the "best opportunity to reduce mortality"(ACS, 1999, p. 8) and approximately 90% of all breast cancer is first discovered by a woman or her partner (Cope, 1992). It should be noted that the current five-year survival rate for localized breast cancer is 97%, and the earlier cancer is detected, the less opportunity it will have to metastasize.

In order to increase the likelihood that breast cancer is detected early, the ACS recommends that women age 40 and older receive annual mammograms and clinical breast examinations (i.e., performed by trained health care professionals) and conduct monthly breast self-examinations (BSE). Clinical breast examinations every three years and monthly BSE are recommended for women age 20-39. BSE is relatively easy to teach and can be learned in a one-session class (Dorsay, Cuneo, Somkin & Tekawa, 1988). It is simple to perform a BSE and it may be the only method of breast screening for those who do not have access to health care including clinical breast exams and mammography

(O'Malley & Fletcher, 1987). It is also the only method of breast screening for those who are unwilling to access health care that is readily available (e.g., college students).

Although some studies have found minimal to no benefit from BSE, others have found that breast cancer is more likely to be diagnosed at an earlier stage when BSE is regularly conducted (Coleman, 1991). Studies have also found that the mortality rate from breast cancer is lower in women who perform monthly BSE (Foster & Costanza, 1984). Additionally, it has been estimated that breast cancer mortality could be reduced by almost 20% through the widespread use of BSE (Greenwald, Nasca & Lawrence, 1978). It is noteworthy that studies in which no benefits have been found have documented participant non-compliance and lack of proficiency at BSE (Coleman, 1991).

Review of current literature on BSE

Numerous studies over the past twenty years have examined BSE behavior in women. These studies have attempted to elucidate the variables that predict this behavior so that health professionals can then target these variables to increase initiation and maintenance of BSE. The following review of the literature will explore theoretical models of health behavior, describe how the models have been applied to BSE, and summarize the findings of correlational and outcome studies.

Models of Health Behavior

Various models of health behavior have been used to predict BSE behavior. The Health Belief Model (HBM) and Theory of Reasoned Action (TRA) are two of the most widely used models. The HBM proposes that there are four primary components to a health behavior: (a) perceived severity of the illness, (b) perceived threat or susceptibility to the illness, (c) perceived benefit from following the health recommendation and (d)

perceived barriers to performing the health behavior (Strecher & Rosenstock, 1997). The TRA hypothesizes that attitudes and subjective norms predict behavioral intentions, which predict actual behaviors. Attitudes are developed from beliefs about the health behavior and the perceived costs and benefits of engaging in the behavior. Subjective norms relate to estimates of the importance that significant others place on the behavior and level of motivation to comply with these norms (Moore, Barling & Hood, 1998). Both models assume that individuals engage in behavioral cost/benefit analyses, with benefits needing to outweigh costs before the behavior is initiated. The models diverge on the relevance of the perceived threat of illness, the importance of significant others, and the motivation to comply with subjective norms. The HBM theorizes that personal motivation and concern about the health issue as well as perceived susceptibility are important determinants of behavior. The TRA, however, focuses on the importance of significant others' attitudes and the individual's willingness to comply with their norms. Thus, the HBM places more importance on the individual's attitudes while the TRA emphasizes others' attitudes.

Theoretical models applied to BSE

Some researchers have structured their hypotheses and methodology in strict adherence to one of these two models. Others have used components of each or combinations of these and other models as the theoretical basis for their research. For example, Victoria Champion has conducted extensive research on the usefulness of the HBM in predicting BSE frequency (Champion, 1987; Champion, 1988; Champion, 1993; Champion & Scott, 1997). Champion's 1987 investigation of the relationship of BSE to the HBM found that two major components of the model accounted for most of the

explained variance. Her survey of female patients at an outpatient medical clinic found that barriers and knowledge accounted for 26% (22% and 4%, respectively) of the total variance, or 93% of the explained variance in BSE attitudes and behavior. Champion (1987) found that as knowledge increased, perceived barriers (i.e., embarrassment, time involved, remembering to do BSE, fear of finding a lump, concern about not finding a lump) decreased and perceived benefits increased. She concluded that some aspects of the Health Belief Model (susceptibility, seriousness) failed to predict BSE in women.

Other researchers have found that perceived barriers and benefits are related to BSE behavior (Calnan & Rutter, 1988; Rutledge, 1987). In their study of over 16,000 young adults (ages 17-30) from 20 European countries, Wardle et al. (1995) found that women who rated BSE as highly important were more than fifteen times more likely to perform regular BSE than those who rated it of very low importance. They also found that only 8% of young European women performed BSE regularly. For the two European countries that did not recommend BSE (i.e., Belgium and Denmark), women had significantly lower ratings of the importance of BSE (Wardle et al., 1995). Thus, they concluded that attitudes about BSE were very closely related to behavior.

Although Champion and others have found that aspects of the model assist in predicting BSE behavior, the HBM fails to explain up to 75% of the variance related to BSE frequency (Millar, 1997). Moreover, Millar (1997) found that the emotional response to thinking about BSE accounted for more of the variance in frequency of BSE than any of the HBM variables. Other authors have discovered variables that are not accounted for by the HBM but that are related to conducting BSE such as perceived chances of developing breast cancer (Olson & Morse, 1996), wanting to allay fears about

having breast cancer (Olson & Morse, 1996), sense of self-efficacy in conducting BSE (Friedman, Nelson, Webb, Hoffman, & Baer, 1994), and self-esteem (Cope, 1992).

The TRA has also been used to predict practice and frequency of BSE. For example, Champion (1989) found that social influence was related to intent to conduct BSE but not to frequency of performance. In her retrospective study of 380 women who had no history of breast cancer, Champion (1989) found that women who had been taught BSE by a doctor performed BSE more frequently and with greater proficiency than those who were taught by a nurse. They also found that knowledge of BSE was higher for those who had been taught by a doctor or a nurse than by a non-professional. She also found a relationship between the statement, "Persons important to you think you should perform a breast self-examination" and frequency of BSE, intent to do BSE, and proficiency with BSE. This suggests that the TRA model, which emphasizes significant others' attitudes, has validity in this sample of women with no history of breast cancer. Champion does point out, however, that this one statement was more highly related to the dependent variables than the group of social influence measures, this being a relatively poor measure. Champion (1989) also found that confidence in performing BSE was important and that feedback and a return demonstration (i.e., participant demonstration of BSE) are valuable to the learning process.

The TRA was supported by the findings of Wagle, Komorita, and Lu (1997), which found that social support was related to frequency of BSE in older women (over age 55). Moore, Barling, and Hood (1998) were able to account for 29% of the variance in intention to engage in BSE through a combination of variables from the TRA model (attitudes and subjective norms). Intentions were highly predictive of behavior

(accounting for 61% of the variance), although attitudes and subjective norms alone accounted for only 10% of variance in behavior.

The Transtheoretical Model of Behavior Change

Similar to the HBM and the TRA, the transtheoretical model of behavior change attempts to explain how cognitive processes, attitudes, and behavioral intentions relate to the process of behavior change. The transtheoretical model, developed by Prochaska and DiClemente (1983) to explain the process of smoking cessation, has been applied to various health behaviors. The model has three major components: Stages of change, levels of change, and processes of change. The stages of change describe the movement toward maintenance of a health behavior in terms of behaviors, motivation and cognition. During the first stage, precontemplation, individuals are either ignorant of the problem or unwilling to change it. During contemplation, the individual weighs the pro and cons of change versus maintaining their current behavior. The preparation stage involves a decision to make a change and the intent to act within the near future (defined as the next thirty days) to implement the change plan. During action, individuals make changes and employ coping strategies as needed. The final stage, maintenance, involves integration of the changed behavior into the individual's lifestyle.

Briefly, the processes of change involve principles derived from several theoretical models. They include the self, self in relation to others and to the environment, and basic tenets of behaviorism. Employment of these processes, at the various stages, leads to movement toward the next stage.

The transtheoretical model has been applied primarily to addictive behaviors, but is useful for other types of health behavior change, including BSE. Based on their

research, Prochaska and DiClemente recommend that interventions should target the stage at which they are likely to be most effective. For example, an individual who is at the preparation stage may benefit from education concerning how to conduct a BSE as she develops her plan for implementing BSE. This education may not be effective, however, in encouraging a woman to move from pre-contemplation to contemplation. Her movement to the contemplation stage may be motivated by learning about the prevalence rate of breast cancer or by hearing a testimonial from someone who has breast cancer.

Outcome Studies

Several outcome studies have been conducted in the area of breast self-examination. These studies have used a wide range of treatment procedures to increase the practice and maintenance of BSE in various groups of women. These procedures can be classified as: (a) education (e.g., informational brochures, presentations, films about BC and BSE), (b) demonstration (e.g., BSE is demonstrated by a medical professional or paraprofessional), (c) practice (e.g., participants practice BSE), (d) reminders to conduct BSE (e.g., shower cards, calendar stickers, professional or peer support), or (e) rewards for conducting BSE. Refer to Table 1 for a summary of these studies.

The outcome literature on interventions designed to increase BSE behavior in women has identified several interventions that lead to increased knowledge, improved attitudes, and increased frequency and proficiency of BSE. For example, many of these studies have employed a lecture (e.g., Craun & Deffenbacher, 1981), film (e.g., Solomon et al., 1998) or brochure (e.g., Vietri et al., 1997) to deliver information related to BC and BSE. The studies that used an information-only treatment found either no change in

Table 1.

Procedures and Findings From Outcome Studies

Study	Population	N	Procedure	Outcome
Craun and Deffenbacher (1981)	college students	60	BC lecture	Lecture increased knowledge about BC, but did not affect behavior
Hobbs, Haran, Pendleton, Jones and Posner (1984)	adult women (unspecified age)	980	BSE instruction vs. control	Instruction increased BSE and improved attitudes
Luther, Sroka, Goormastic, Montie (1985)	high school girls	280	BSE instruction, brochures; (no control)	Instruction increased BSE, improved attitudes
[a]Marty and McDermott (1985)	College students	128	informational brochures, testimonial	Brochures and testimonials increased knowledge; testimonial improved attitudes and led to higher satisfaction with intervention
Champion and Scott (1993)	Over age 34; no Hx of BC; random sample	322	Counseling vs. brochures vs. BSE instruction and practice via in-home visits	Counseling, brochures, and BSE instruction led to increased frequency of BSE. BSE instruction improved proficiency.
Lierman, Powell-Cope, Benoliet, Georgiadou and Young (1994)	age>49, members of HMO	175	Informational presentation, BSE instruction and practice, discussion, reminder by selected-partner, peer-partner, or no-partner	Selected-partner support was found to be most helpful according to self-report. No differences found in frequency or proficiency of BSE between groups.
Champion (1995)	age 35-88	581	1-to-1 home visits, changing beliefs intervention, information about BC, BSE instruction and practice	Information and changing beliefs intervention increased BSE.

Study	Population	N	Procedure	Outcome
Vietri, Poskitt, & Slaninka (1997)	University employees	62	Presentation in BC, BSE instruction and practice, brochures, monthly reminders vs. no reminders	Increased BSE frequency across groups. Higher increase in reminder group.
Solomon et al. (1998)	age>17; residents of Florida	1945	Informational film about BC, discussion, videotape demonstration of BSE, BSE instruction and practice, calendar and sticker reminders, self-rewards, external rewards	External monetary reward combined with self-reward increased BSE frequency and proficiency over other treatments.
Audrain et al. (1999)	age 20-75; first-degree relative with BC	510	Presentation on BC and BSE, BSE problem-solving training or general health counseling	Thirty-six percent improvement in BSE adherence in both groups. Problem-solving training was most effective with individuals with higher breast cancer anxiety.

Note: Hx = history; BC = breast cancer; BSE = breast self-examination

[a]testicular cancer /testicular self-examination study

attitudes or behavior (Craun & Deffenbacher, 1981) or less change compared to other treatment procedures (Marty & McDermott, 1985; Solomon et al., 1998; Vietri et al., 1997). Researchers have also taught BSE both with (e.g., Champion, 1995; Champion & Scott, 1993; Lierman et al., 1994; Solomon et al., 1998; Vietri et al., 1997) and without (e.g., Hobbs et al., 1984; Luther et al., 1985) a demonstration and practice component. The demonstration/practice component is included to ensure that participants are learning the technique correctly and to increase self-efficacy. Results from these studies suggest that teaching women how to conduct a BSE leads to increased frequency of BSE behavior and improved attitudes. BSE instruction is also linked to greater proficiency in conducting BSE (Champion & Scott, 1993). One study included a personal testimonial about cancer (Marty & McDermott, 1985), which was found to lead to improved attitudes about cancer and the importance of self-examination. The use of reminders (Vietri et al., 1997), partner support (Lierman et al., 1994), and rewards (Solomon et al., 1998) were all linked to reported increases in BSE frequency and maintenance.

Although the results of these outcome studies appear promising, many of them were compromised by limitations in external validity and/or methodology. Problems range from the initial design of the study, to the nature of the participants, to the final report of the results. For example, Champion and Scott's (1993) study is methodologically sound and the findings are important, however the intervention is impractical due to the intense use of resources. Most communities are not able to afford to send health care providers or health educators to conduct in-home visits.

Another limitation of previous studies involves the special nature of the research participants. For example, Vietri et al. (1997) admitted that their participants were

unusual, given that they were university faculty, staff, and administration who all had health care benefits including access to health care providers and health-related information. Indeed, 70% of the participants had received a mammogram and an equal percentage had had a clinical breast exam in the year prior to the study. Due to problems in generalizing their findings, the authors recommended that their study be replicated using college students in order to, "encourage early positive health behavior practices"(p. 329).

Other studies failed to use true no-treatment control groups, failed to provide measures of behavioral outcomes, or both. For example, Lierman et al.'s (1994) study focused on the types of social support participants found most helpful in the regular performance of BSE but failed to provide outcome data on the frequency of BSE following treatment. Thus, it is unclear which components of their intervention were most helpful in increasing BSE frequency. Marty and McDermott (1985) did not investigate whether their interventions led to actual behavior change. Craun and Deffenbacher (1981) found that a lecture-style delivery of information increased knowledge, but not behavior, but failed to include a control group as a means of comparison. Hobbs et al. (1984) did not report on the BSE behavior of the control group. Luther et al. (1985) and Audrain et al. (1999) did not use true (i.e., no treatment) control groups.

Finally, some studies failed to provide pertinent statistics. For example, although Vietri et al. (1997) reported differences between groups, they did not report means and the information they do give does not appear to support their findings. It is therefore unclear whether their findings were actually statistically significant.

Designing the Study

The current study attempted to overcome many of the problems found in prior investigations by design. For example, it employed practical, multi-modal, non resource-intensive and easily implemented treatments. It focused on a population that is relatively non-selective (college women), yet an appropriate target for such an intervention. The American Cancer Society recommends that women begin practicing BSE at age 20 and many argue for establishing health practices in early adulthood (e.g., Vietri et al., 1997). Moreover, it has been proposed that BSE empowers women by giving them control and responsibility over their own health care (Budden, 1995; Sternberger, 1994). Additionally, Craun and Deffenbacher (1984) suggested that college-age women are less likely to be affected by fear of finding a lump because they are aware of their decreased susceptibility to BC compared to older women.

In order to provide comprehensive measurement and reporting of findings, this study used outcome measures of knowledge, attitudes, and a range of health behaviors at pretreatment and several post-treatment follow-up periods. It employed a no-treatment control group. It included reporting of valid and significant findings, including means and other critical statistical information.

This study also included components that have been found to be critical to self-examination programs. For example, increased self-efficacy has been found to be related to participation in screening programs, adherence to treatment, and general self-care behaviors (Lev, 1997). Therefore, this study provided participants with immediate feedback on their self-examination technique. Champion (1995) also emphasized the importance of using a BSE teaching method that includes a "return demonstration" or

practice of the BSE behavior. Additionally, because "forgetting" is cited as one of the most common reasons for not performing regular monthly BSEs (Budden, 1998; Clarke et al., 1991) and because non-performers of BSE have cited reminders as being likely to encourage them to conduct BSE regularly (Salazar, 1994), this study mailed monthly reminders to half of the participants in each treatment group in order to investigate the usefulness of reminders.

Similar to other outcome studies, this study based its hypotheses and design on a theoretical model of behavior change. Following Prochaska and Diclemente's work with the transtheoretical model, this study was oriented toward examining the relative effectiveness of different interventions across participants' stages of change. This could lead to the appropriate application of interventions to target populations and the development of more effective interventions for individuals who are not motivated for change. Additionally, follow-up data collection was conducted to investigate whether behavior changes were maintained over time. The present study followed the guidelines outlined by Prochaska and DiClemente, which could lead to greater impact on larger populations. These guidelines include using a stage paradigm, moving from reactive to proactive recruitment of participants, changing cancer programs to meet participant needs instead of expecting participants to match needs of the program, and moving towards population-based (rather than clinic-based) programs.

The investigator chose to add some new components to this study as well. For example, few studies have combined women and men in teaching about self-examination practices. This study taught both women and men about BSE and testicular self-

examination (TSE) so that college students would receive social support from not only same-sex, but also different-sex peers, including partners of either sex.

Hypotheses

Three hypotheses were made prior to implementation of this study. The first hypothesis was that the more complex treatment interventions, those which employed several instructional modalities, would lead to the largest increase and greatest maintenance of BSE behavior. Secondly, positive changes were expected to occur with respect to stage of change, knowledge about BC and BSE, and attitudes toward BC and BSE based on the different interventions over a 6 month period. Lastly, participants who were performing monthly BSE were predicted to be more likely to perform other health behaviors.

Chapter II: Method

Participants

Participants were 205 women enrolled in introductory psychology classes at Colorado State University. Participants ranged in age from 18-39, with a mean age of 19. Eighty-one percent of the sample were Caucasian, 8.9 percent were African American, 4.5 percent were Hispanic, 1 percent were Asian/Asian-American, 1.5 percent were international and 3.5 percent were other. Participants received research credit for participation in the study.

Health Advocates

A group of student health advocates (SHAs) was recruited from the Student Health Advisory Council at the University Health Service, the Premedica group on campus (a pre-medical school student group), the Counseling Psychology graduate program, and upper division psychology courses. Ten SHAs were trained at a four-hour workshop (plus one hour of individual instruction with a registered nurse) to conduct the five treatment interventions.

The SHAs were Caucasian and ranged in age from 19 to 26. They all expressed interest in the areas of health and health promotion as well as research. The SHAs were comfortable speaking in front of groups and felt confident in their abilities to conduct treatments.

SHAs were given a thirteen page manual (see Appendix A) that contained explicit instructions on how to conduct each treatment intervention and scripts to followed at each treatment group. The principal investigators conducted mock treatment sessions during the training in order to demonstrate the exact procedure. SHA's questions were answered at this time. The manual also explained what to do if a participant became upset while discussing this relatively sensitive topic and listed campus resources in case referrals were needed. During the training, a registered nurse demonstrated how to conduct breast and testicular self-examinations on the models used in the study. All of the SHAs met with this nurse individually after the training to insure that they were confident in their ability to conduct examinations correctly and to demonstrate BSE and TSE procedures to others. The total training time was approximately five hours.

SHAs were paired into female-male dyads and signed up to conduct treatment groups over the course of the 5-week data collection according to their schedules. Every effort was made to balance teams across the five treatment conditions to eliminate experimenter effects. Each dyad initially signed up to run one or two of each treatment condition (a total of five or ten treatments). SHAs conducted a total of twenty-five treatment groups (i.e., five treatment groups per treatment condition). Due to the unexpected changes in schedule and sizes of participant groups, all SHA dyads were not able to conduct all five treatment conditions. All conditions were run by at least three of the five dyads, however, most likely eliminating any experimenter effects. Table 2 provides an overview of the number of female and male participants in each treatment group across conditions.

Table 2.

Number of Females (F) and Males (M) in Each Group Within Each Condition

	No Treatment Control	Treatment A	Treatment B	Treatment C	Treatment D
Group 1	F = 9 M = 11	F = 4 M = 7	F = 11 M = 8	F = 8 M = 15	F = 11 M = 2
Group 2	F = 15 M = 4	F = 13 M = 3	F = 8 M = 11	F = 7 M = 7	F = 7 M = 7
Group3	F = 8 M = 7	F = 13 M = 5	F = 8 M = 6	F = 6 M = 6	F = 6 M = 4
Group 4	F = 4 M = 6	F = 9 M = 5	F = 3 M = 5	F = 2 M = 2	F = 12 M = 8
Group 5	F = 5 M = 6	F = 6 M = 10	F = 8 M = 4	F = 15 M = 3	F = 8 M = 9

Procedure

Participants signed up to participate in the study according to their schedules. A pure random assignment to treatments was not possible due to the inflexibility of students' schedules. Students signed up for days and times that fit their schedules and the principal investigator randomly assigned treatment conditions across days and rooms. Treatments were conducted Monday through Friday at 6:30 p.m. in two small classrooms. Participants sat at tables along the side and back walls of the room and all had an unobstructed view of the SHAs and the video screen. The treatments were conducted during weeks two through six of the Spring 2000 semester, with the majority of sessions

occurring during weeks two and three. Five dependent measures were administered at four times (at pretreatment and at one-, two-and-a-half, and 6-months post-treatment). The measures included a demographic questionnaire, health risk inventory, a stages of change measure, a knowledge measure, and an attitude measure. The treatments and follow-ups were conducted in conjunction with a parallel study aimed at increasing testicular self-examination in college men. Thus, treatments were conducted with both women and men. The number of participants in each treatment ranged from four to twenty-two, with a mean of fifteen and a median and a mode of fourteen. There were approximately equal numbers of women and men in each treatment session.

Dependent Measures

Demographic Questionnaire

The demographic questionnaire (See Appendix B) gathered basic demographic information such as age, sex, religion, family income, year in school, and history of cancer in the participant's family.

Health Risk Inventory (HRI)

The Health Risk Inventory (HRI; See Appendix C) is a sixty item questionnaire developed by Will Courtenay to measure general health behaviors. It uses a 5-point likert type scale ranging from "Always" to "Never" with a "Does not Apply" option. The HRI measures health behaviors such as "I go to all my scheduled physical and mental health appointments" and "My partner and I use a condom if we are not in an exclusive sexual relationship." Pretreatment data on the HRI were analyzed to investigate reliability of the instrument and the HRI was found to have good internal consistency (α=.77).

Stages of Change Measure (SCM)

The Stages of Change Measure (See Appendix D) was developed by the researchers and is based on Prochaska, Redding and Ever's (1998) five stages of behavior change (Precontemplation, Contemplation, Preparation for Action, Action, and Maintenance). The measure summarizes the knowledge, attitudes, and behaviors regarding breast cancer typically found at each stage and asks the participants to check the description that best describes their current thoughts and feelings about breast cancer. For example, the summary of the Contemplation stage is, "I know something about breast cancer and I think I may be at risk for breast cancer, but I have not done anything to try to detect it early (such as a breast self-exam)."

A Q-sort conducted by 10 clinical and counseling psychologists and graduate students supported the content validity of the measure in reflecting the progressive nature and order of the stages.

Breast Cancer Knowledge (BCKQ)

A fifteen-question breast cancer knowledge questionnaire (See Appendix E) and a fifteen-question testicular cancer questionnaire (See Appendix F) were developed by the researchers based on information from the National Cancer Institute. Answers to all of the questions were included in the brochures that were created for the study ("Everything you should know about breast cancer" and "Everything you should know about testicular cancer"; See Appendix G), based on the National Cancer Institute information. Both breast and testicular cancer knowledge were measured for both male and female participants. Pretreatment data on the BCKQ were analyzed to investigate reliability of the instrument. The BCKQ was found to have poor internal consistency (α=.06). A factor

analysis with varimax rotation revealed six principal components of the scale. The component with the largest eigen value (1.95) was comprised of six items from the questionnaire. Internal consistency for these six items was $\alpha = 0.48$. Due to poor reliability, this measure was not used for analyses.

Breast Cancer Attitudes Questionnaire (BCAQ)

A 21-question Attitudes about Breast Cancer and Breast Self-Examination (Breast Cancer Attitudes Questionnaire; BCAQ) was developed by the researchers (See Appendix H) based on Race and Silverberg's (1996) BSE Scale. A 5-point likert-type scale was used ranging from "Strongly agree" to "Strongly disagree" in response to statements such as, "I do not have time to regularly examine my breasts" and "I believe that breast cancer is treatable if detected early." Pretreatment data on the BCAQ were analyzed to investigate reliability of the instrument. The BCAQ was found to have good internal consistency ($\alpha = .80$).

Independent Variables

Participants received one of five interventions related to breast self-examination. These interventions were developed by dismantling a complex, multitreatment intervention in order to discern whether each component of the complex treatment had an additive value. There were 41 women in the control group, 45 women in Treatment A, 38 women in treatment B, 38 women in Treatment C, and 43 women in Treatment D. Each treatment began with participants completing the five dependent measures. The duration of each condition was related to the complexity of the condition. The control group completed the dependent measures only and the treatment lasted about 30 minutes.

Treatment Groups

Treatment A

Treatment group A (approximately 45 minutes) involved the completion of the dependent measures and participants were given an informational handout on breast cancer and on testicular cancer and asked to read the brochures for five minutes. The two brochures, "Everything you should know about breast cancer" and "Everything you should know about testicular cancer" (See Appendix H) were created for the study because no available brochures covered all of the information the researchers wanted to convey. The brochures were based on information provided by the National Cancer Institute and the American Cancer Society.

Treatment B

Treatment Group B (approximately 60 minutes) filled out the dependent measures, were given an informational handout on breast cancer and on testicular cancer and asked to read the brochures for five minutes, and watched videotaped testimonials. The videotape was produced by the researchers and was recorded with a Canon digital video camera and the videotape was edited digitally on a computer. The breast cancer testimonial was recorded outdoors and the testicular cancer testimonial was recorded indoors (due to inclement weather), on the campus where the data were collected. The breast cancer testimonial was delivered by a 31-year-old graduate student who had found a breast lump that was biopseed and found to be benign. She told her story and did not reveal until the end of her testimonial that she had not ultimately been diagnosed with cancer. She emphasized the importance of self-examination and demonstrated how to conduct a self-exam on the breast model. Her approach was friendly and encouraging.

The testicular cancer testimonial was delivered by a 30-year-old man who was diagnosed and treated for testicular cancer and had been in remission for one year. He was humorous, yet sincere in his approach and demonstrated how to conduct a self-exam on the model. Each testimonial lasted approximately 12 minutes. The videotape was projected on a white screen that was approximately 4 x 5 feet and could be easily seen by all participants. The volume was adjusted to a comfortable and audible level for all participants.

Treatment C

Treatment Group C (approximately 75 minutes) received all components of Treatment B and also received a demonstration by the SHAs on how to conduct a breast self-exam and a testicular self-exam using anatomic models. The male SHA demonstrated how to conduct the TSE and the female SHA demonstrated how to conduct the BSE. The breast model was purchased from Health Edco and is an "average breast" size and shape (approximately 6 inches high, 4 inches long, and 3 inches wide). It is made from a "BIOLIKE" synthetic tissue, which looks and feels like rubber and is tan in color. It contains five lumps.

The testicle model was purchased from the same company and made from the same materials. It measures approximately 3 inches high, 3 inches long, and 1 1/2 inches wide. One testicle is descended slightly lower than the other is and the model contains four lumps.

Next, the SHAs each brought the models to one participant at a time and had the students practice BSE and TSE on the models. Students individually practiced the breast self-exam and testicular self-exam on the models and received corrective feedback from a

student health advocate about their performance while other student participants observed.

Treatment D

Treatment Group D (approximately 90 minutes) included all components of Treatment C and also included a discussion of what it was like to practice the self-exams on anatomic models, the best times and places for the participant to conduct a self-exam in the future, and when they might next conduct a self-exam.

Reminders

Half of the participants in each treatment condition received reminders (monthly postcards, reminding them to do a self-exam) (See Appendix I) every month for six months. Reminders were mailed to arrive approximately two days before the 1-month, 2 ½-month, and 6-month follow-up periods. See Table 3 for a description of the treatments.

Follow-up data collection

At one- and two-and-a-half months post-treatment, participants returned for in-person assessment sessions and completed the five dependent measures. Participants were given reminder slips at the initial treatment session and at the 1-month follow-up for these assessment sessions. They were also phoned a few days prior to the sessions as an additional reminder. One- and 2-1/2-month follow-ups were conducted twice weekly by principal investigators and non-SHA research assistants. Participants chose one of two days on which they could attend the follow-up. To ensure confidentiality, participants were given sealed envelopes, which included their participant code so that they could place the code on their questionnaires.

At six-months post-treatment, the dependent measures were mailed to participants along with a sealed envelope that included their participant code so that they could place the code on their questionnaires and return them anonymously in the postage-paid, pre-addressed envelope. Initial return rates for the 6-month follow-up were fewer than 50%, so a second mailing was sent out approximately three weeks later. The final return rate on the 6-month follow-up was 58%.

Table 3.

Experimental Design: 5 Group X 2 Reminder/No Reminder

Conditions	Components	N
Control		**41**
reminder	Questionnaires	21
no reminder	Questionnaires	20
Treatment A		**45**
reminder	questionnaires, information	26
no reminder	questionnaires, information	19
Treatment B		**38**
reminder	questionnaires, information, testimonial/demonstration	17
no reminder	questionnaires, information, testimonial/demonstration	21
Treatment C		**38**
reminder	questionnaires, information, testimonial/demonstration, demonstration/practice	17
no reminder	questionnaires, information, testimonial/demonstration, demonstration/practice	21
Treatment D		**43**
reminder	questionnaires, information, testimonial/demonstration, demonstration/practice, discussion	22
no reminder	questionnaires, information, testimonial/demonstration, demonstration/practice, discussion	21

Chapter III: Results

Analyses were conducted on data collected at 1-month and 2-1/2-month follow-up times separately from that collected at 6-months, due to the low response rate at 6-months (58%) compared to that at 1-month (99%) and 2-1/2 months (94%).

Pretreatment Differences

Demographic Variables

Crosstabs were conducted to examine whether there were any pretreatment differences across treatment groups on nominal demographic variables (e.g., sexual orientation, religion). Group differences were found on national origin/ethnicity [$\emptyset = .44$, $p < .05$] and primary language [$\emptyset = .22$, $p < .05$], with treatment groups B and C having a significantly different ethnic composition than expected. No individual treatment group had a significantly different primary language than expected.

A one-way Analysis of Variance (ANOVA) was conducted to determine whether differences existed between treatment groups on continuous demographic variables (e.g., age, year in school). No significant differences were found (all $ps > .05$).

Outcome Measures

Data collected at pretreatment were examined to detect potential differences between treatment groups. Separate one-way Analyses of Variance (ANOVAs) were performed on all pretreatment measures. Results revealed a significant pretreatment difference for number of BSEs in the past month, [$F(4, 200) = 2.54$, $p < .05$). LSD post-

hoc comparisons revealed that the no-treatment control group and treatment C had a significantly higher rate ($p < .05$) of monthly BSEs in the month preceding the study (Ms = .41 and .50, respectively) than treatment D (M = .16). Treatment C also had a significantly higher rate of monthly BSEs than did treatment B (M = .18) at pretreatment. No pre-treatment differences were found for the SCM, BCAQ, and the HRI.

Data collected at pretreatment were examined to detect any differences across reminder/no reminder conditions. Separate oneway Analyses of Variance (ANOVAs) were performed on all pretreatment measures. No significant differences were found.

Due to pretreatment differences across treatment groups, pretreatment scores on outcome measures were covaried in order to evaluate the differential impact of treatment at the three follow-up periods.

Treatment Effects

Treatment effects were evaluated using repeated measures univariate Analysis of Covariance (ANCOVA). Pretreatment scores served as covariates and participants were evaluated at 1 month and 2-1/2-months. Separate 5 (treatment) x 2 (reminder) x 2 (time) ANCOVAs were performed on the following measures: number of BSE (i.e., number of self-examinations performed per month), SCM, BCAQ, and HRI. Six-month data were evaluated separately using univariate ANCOVAs due to participant attrition at six months. Adjusted and non-adjusted means and standard deviations for the first three measures at all times are reported in tables 4 and 5.

Table 4.

Adjusted Means and Standard Deviations For Number of Breast Self-Examinations (BSE), Stages of Change Measure (SCM) and Breast Cancer Attitudes Questionnaire (BCAQ) by Treatment and Time

Treatment and Time	Number of BSEs			SCM			BCAQ		
	n	M	SD	n	M	SD	n	M	SD
Control									
1 month FU	37	0.43	0.59	38	3.64	0.77	37	88.75	5.21
2.5 month FU	37	0.54	0.48	38	3.80	0.78	37	91.13	6.54
6 month FU	29	0.59	0.32	29	3.78	0.79	28	88.73	5.77
Treatment A									
1 month FU	43	0.63	0.59	43	3.65	0.77	42	90.09	5.21
2.5 month FU	43	0.61	0.48	43	3.86	0.78	42	89.81	6.55
6 month FU	29	0.58	0.32	25	3.95	0.78	28	91.08	5.77
Treatment B									
1 month FU	36	0.91	0.59	36	3.85	0.77	36	90.88	5.26
2.5 month FU	36	0.89	0.48	36	4.13	0.78	36	91.99	6.62
6 month FU	25	0.57	0.32	25	3.93	0.78	24	90.05	5.84
Treatment C									
1 month FU	36	1.03	0.59	36	4.15	0.77	34	93.12	5.22
2.5 month FU	36	0.96	0.48	36	4.32	0.78	34	93.87	6.56
6 month FU	17	0.65	0.32	17	4.34	0.78	16	92.13	5.77
Treatment D									
1 month FU	39	0.92	0.60	40	4.19	0.78	39	90.95	5.21
2.5 month FU	39	0.80	0.48	40	4.26	0.78	39	90.96	6.55
6 month FU	21	0.56	0.32	21	4.18	0.79	21	92.81	5.81

Table 5.

Non-Adjusted Means and Standard Deviations For Number of Breast Self-Examinations (BSE), Stages of Change Measure (SCM) and Breast Cancer Attitudes Questionnaire (BCAQ) by Treatment and Time

Treatment and Time	Number of BSEs			SCM			BCAQ		
	n	M	SD	n	M	SD	N	M	SD
Control									
Pre-Tx	41	0.41	0.63	40	3.50	1.01	40	89.20	7.23
1 month FU	37	0.49	0.56	38	3.74	0.86	37	88.68	7.52
2.5 month FU	37	0.59	0.54	38	3.89	0.98	37	91.05	9.32
6 month FU	29	0.49	0.36	29	3.90	1.01	28	88.54	9.00
Treatment A									
Pre-Tx	45	0.36	0.65	45	3.51	1.04	44	89.59	7.63
1 month FU	43	0.65	0.69	43	3.70	1.10	42	90.69	7.65
2.5 month FU	43	0.63	0.56	43	3.90	1.04	42	90.40	9.61
6 month FU	29	0.60	0.36	25	4.03	0.87	28	91.54	8.18
Treatment B									
Pre-Tx	38	0.18	0.39	38	3.32	1.19	38	87.00	8.29
1 month FU	36	0.86	0.68	36	3.78	0.99	36	89.08	7.52
2.5 month FU	36	0.83	0.57	36	4.06	1.04	36	90.22	7.29
6 month FU	25	0.53	0.35	25	3.88	1.09	24	88.29	7.14
Treatment C									
Pre-Tx	38	0.50	0.73	38	3.55	1.13	38	90.03	6.57
1 month FU	36	1.08	0.55	36	4.19	0.71	34	93.91	7.95
2.5 month FU	36	1.01	0.45	36	4.36	0.76	34	94.65	8.50
6 month FU	17	0.67	0.40	17	4.24	0.66	16	92.44	6.53
Treatment D									
Pre-Tx	43	0.16	0.43	44	3.23	0.99	44	89.91	6.99
1 month FU	39	0.85	0.59	40	4.08	0.97	39	91.33	6.69
2.5 month FU	39	0.73	0.43	40	4.15	0.86	39	91.33	6.77
6 month FU	21	0.54	0.23	21	4.05	0.86	21	94.24	7.99

One-month and 2-1/2 month follow-ups

Number of BSEs. Results revealed a significant main effect for treatment [F (4, 180) = 8.03, p <.001, eta ^{2} = .151], and for reminder [F (1, 180) = 5.97, p <.05, eta ^{2} = .03], but not for time. There were no significant interactions. Figures 1 and 2 illustrate adjusted and non-adjusted mean number of monthly BSEs by treatment condition across time.

Post-hoc LSD paired comparisons indicated that the more complex treatments, B, C, and D, had higher rates of BSE (Ms = .90, .99, .86, respectively) than the no-treatment control and treatment A (Ms = .49, .62, respectively). See Table 6 for significance levels of LSD comparisons for number of BSEs at 1-month and 2-1/2-month follow-up periods. LSD comparisons are collapsed across time because there were no main effects for time and no group x time or reminder x time interactions.

Table 6.

LSD Pairwise Comparisons for Number of BSEs Collapsed Across 1-Month and 2.5 Month Follow-Ups

	Treatment A	Treatment B	Treatment C	Treatment D
Control	NS	*	*	*
Treatment A		*	*	*
Treatment B			NS	NS
Treatment C				NS

*p < .05

Participants who received monthly reminders, regardless of treatment condition, had higher rates of BSE (M = .86) than those who did not receive reminders (M = .69).

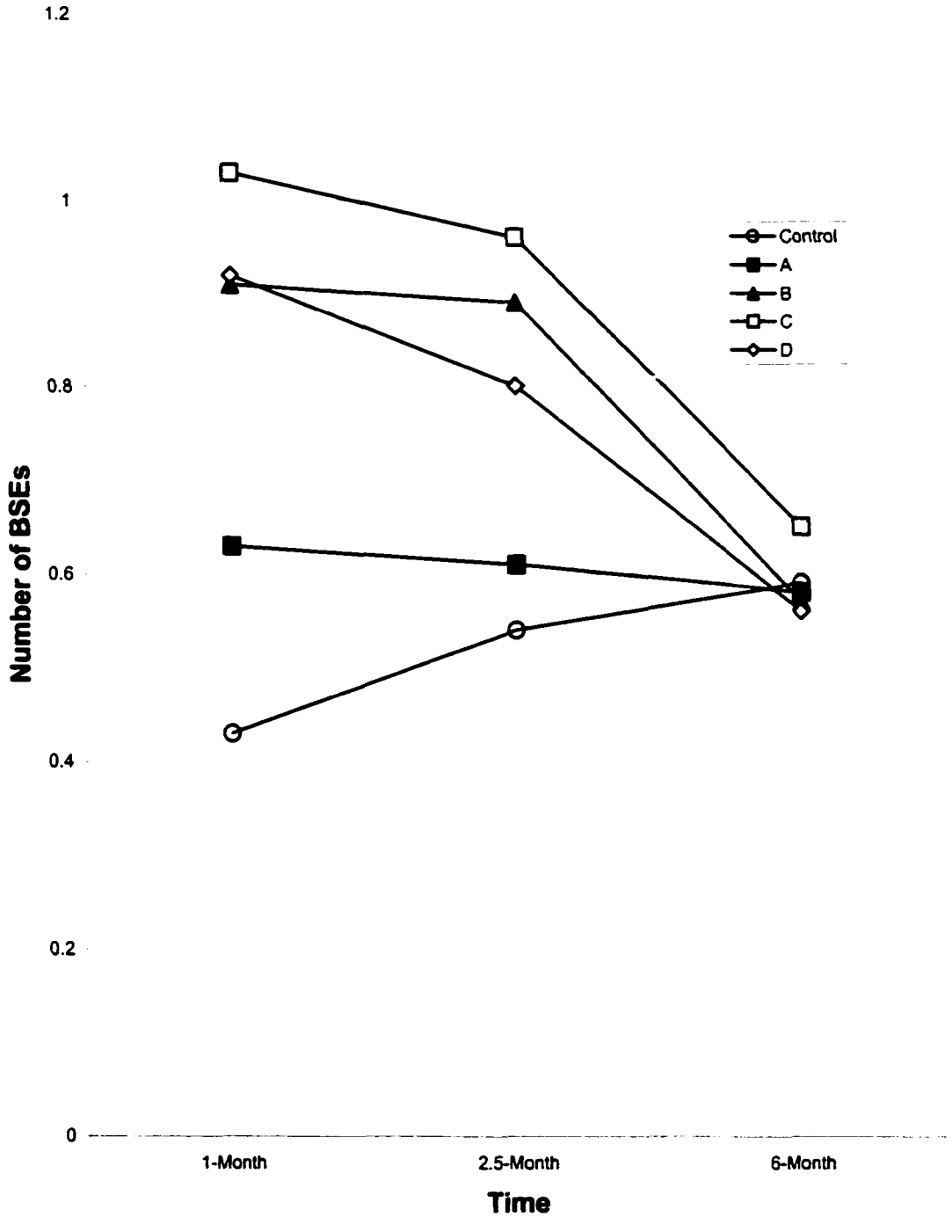

Figure 1. Adjusted means for number of BSE by treatment condition across time.

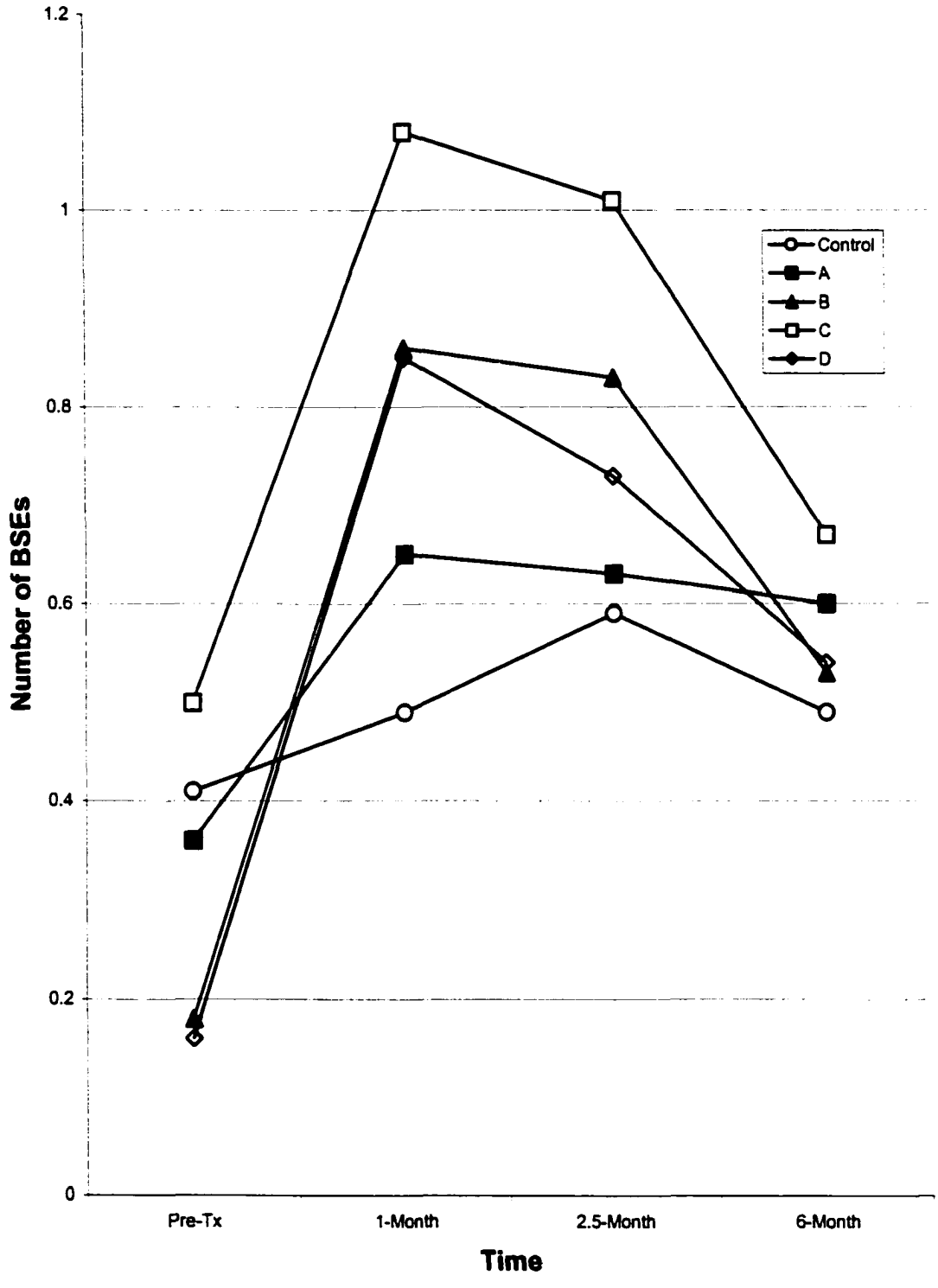

Figure 2. Non-adjusted means for number of BSE by treatment condition across time.

Stages of Change Measure (SCM). Results revealed a significant main effect for treatment [F (4, 182) = 5.36, p <.001, eta ^{2} = .105], but not for reminder or time. There were no significant interactions. Figures 3 and 4 illustrate adjusted and non-adjusted mean stages of change by treatment condition across time. Post-hoc LSD paired comparisons indicated that participants in the most complex treatments, i.e., C and D, were at higher levels in the stages of change (Ms = 4.24 and 4.23, respectively) than were participants in the no-treatment control and treatment A (Ms = 3.72 and 3.75, respectively). Treatment B did not differ significantly from the other treatments (M = 3.99). See Table 7 for significance levels of LSD comparisons for stages of change at 1-month and 2-1/2-month follow-ups. LSD comparisons are collapsed across time because there were no main effects for time and no group x time or reminder x time interactions.

Table 7.

LSD Pairwise Comparisons for Stages of Change Collapsed Across 1-Month and 2.5 Month Follow-Ups

	Treatment A	Treatment B	Treatment C	Treatment D
Control	NS	NS	*	*
Treatment A		NS	*	*
Treatment B			NS	NS
Treatment C				NS

*p < .05

Breast Cancer Attitudes Questionnaire (BCAQ). Results revealed a significant main effect for treatment [F (4, 177) = 3.02, p <.05, eta ^{2} = .064], but not for reminder or time. There were no significant interactions. Figures 5 and 6 illustrate adjusted and non-adjusted mean scores on the BCAQ by treatment condition across time.

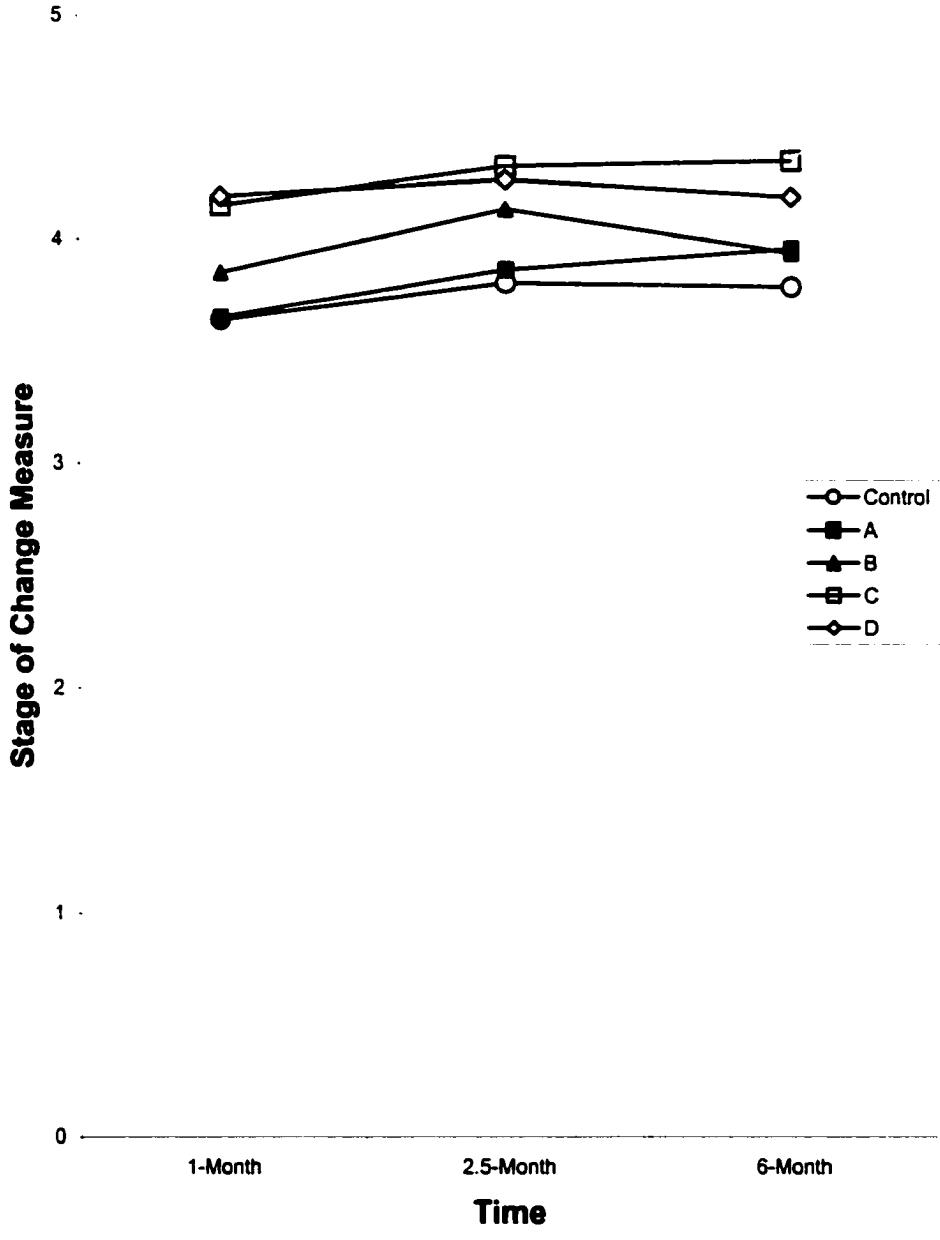

Figure 3. Adjusted means For Stages of Change Measure (SCM) by treatment condition across time.

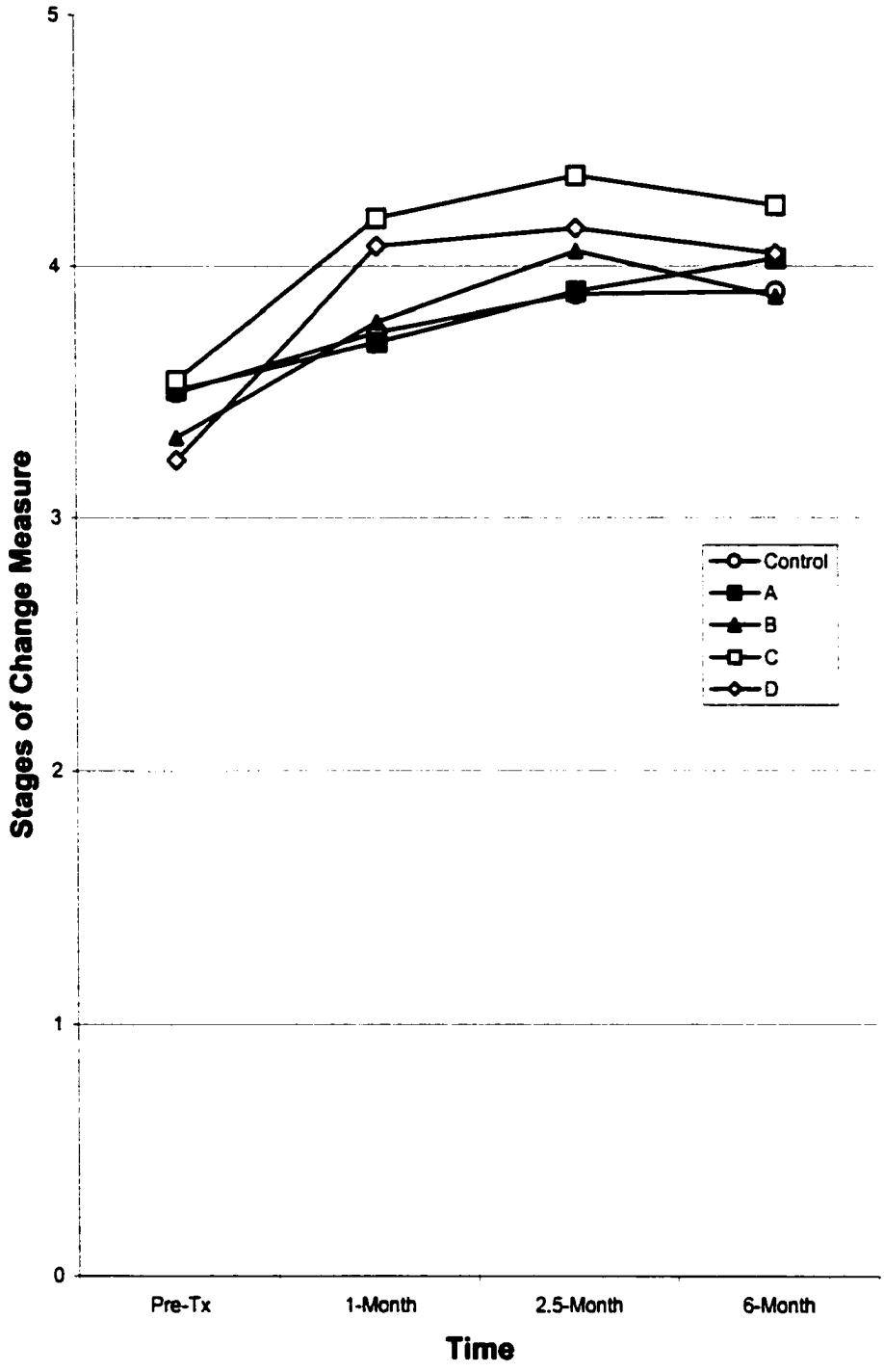

Figure 4. Non-adjusted means for Stages of Change Measure (SCM) by treatment condition across time.

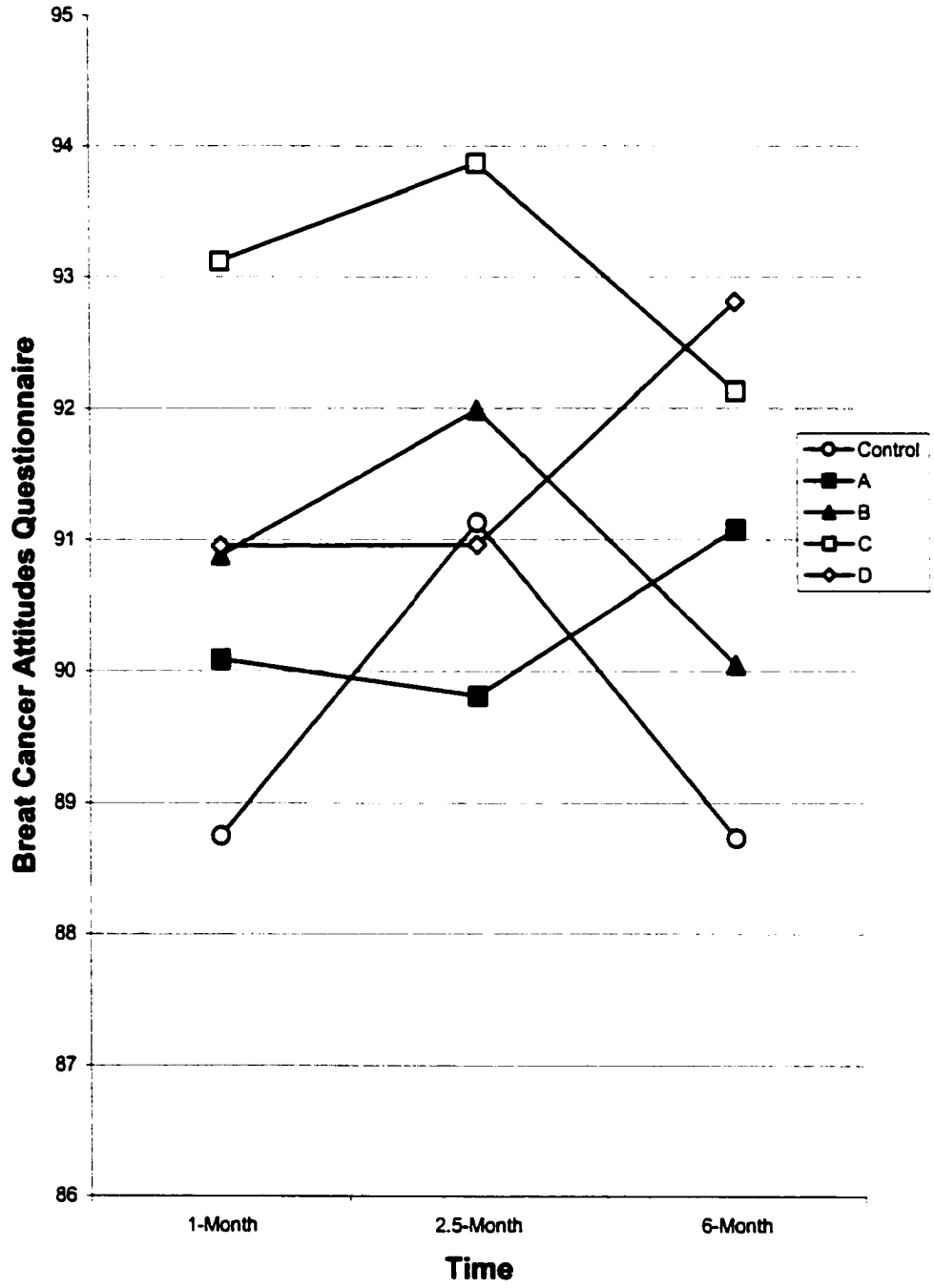

Figure 5. Adjusted means for Breast Cancer Attitudes Questionnaire (BCAQ) by treatment condition across time.

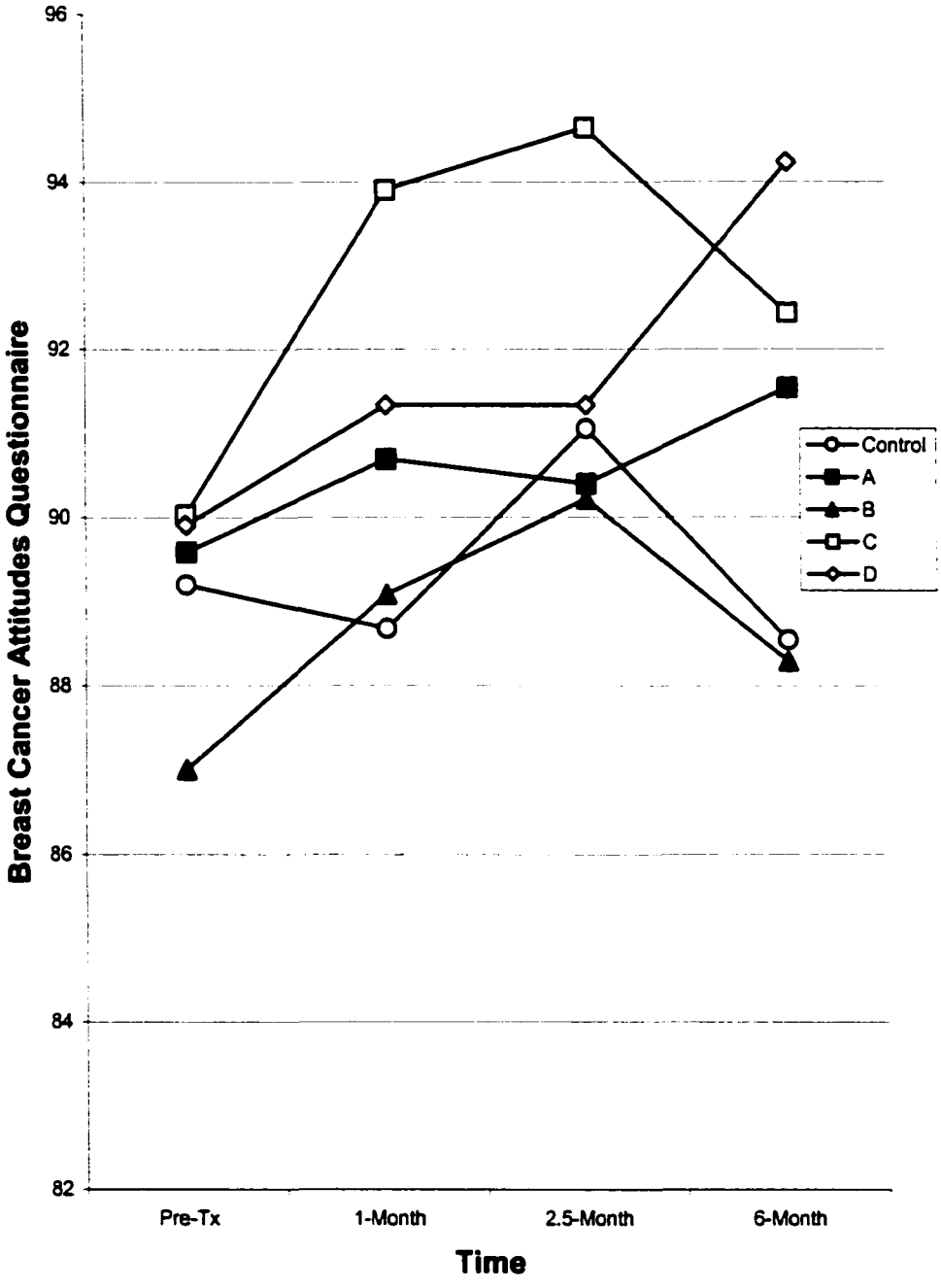

Figure 6. Non-adjusted means for Breast Cancer Attitudes Questionnaire (BCAQ) by treatment condition across time.

Post-hoc LSD paired comparisons indicated that participants in treatment C had more positive attitudes toward BC and BSE (M = 93.49) than did the participants in the control, treatment A, and treatment D (Ms = 89.94, 89.95, and 90.95, respectively). Treatment B (M = 91.44) did not differ significantly from the other treatment groups. See Table 8 for significance levels of LSD comparisons for stages of change at 1-month and 2-1/2-month follow-ups. LSD comparisons are collapsed across time because there were no main effects for time and no group x time or reminder x time interactions.

Table 8.

LSD Pairwise Comparisons for Breast Cancer Attitudes Questionnaire (BCAQ) Collapsed Across 1-Month and 2.5 Month Follow-Ups

	Treatment A	Treatment B	Treatment C	Treatment D
Control	NS	NS	*	NS
Treatment A		NS	*	NS
Treatment B			NS	NS
Treatment C				*

*$p < .05$

Health Risk Inventory (HRI). There were no main effects or interactions found between treatment conditions on the HRI (all $ps < .05$).

Six-month follow-up

Separate univariate 5 (treatment) x 2 (reminder) ANCOVAs conducted with number of BSE, SCM, BCAQ, and HRI as dependent variables revealed a significant main effect for reminder at six months, but not for treatment group, for number of BSEs. Participants who received monthly reminders had a higher average number of monthly

BSEs (M = .66) than those who did not receive reminders (M = .48). There were no significant main effects or interactions at 6-months for SCM, BCAQ, or HRI.

Nonresponse bias

Because response rate was 58% at the 6-month follow-up, demographic and outcome variables were examined to explore whether there was a significant difference between responders and non-responders (i.e., nonresponse bias; Rogelberg & Luong, 1998). Chi-square and independent samples t-tests were conducted on demographic and outcome variables. For demographic variables, significant differences were found for the frequency of attending a religious service [Ø = .197, $p < .05$], year in school [$t(200) = 2.45$, $p < .05$], and rating of overall current health [$t(169.72) = 2.18$, $p < .05$]. Examination of Pearson residuals indicated that categories of frequency for attending religious services (i.e., always, sometimes, never), were not significantly different than expected. Participants who were further along in their studies (i.e., sophomores and juniors vs. first-year students) were significantly more likely to respond at six months as were participants who reported higher ratings of overall current health at pretreatment (all $ps < .05$).

A chi-square analysis was also conducted to investigate whether there were differences across treatment groups for responders versus non-responders at the 6-month follow-up. An important non-significant trend was observed, with higher percentages of participants in the less complex treatment groups (control, A, B) responding at 6-months than those in the more complex treatment groups (C, D), [$\chi^2(4) = 8.16$, $p < .1$]. Table 9 provides ns and percentages for each treatment group at 6-months.

Table 9.

Response rates across treatment groups at 1-month, 2-1/2 month, and 6-month follow-up

	1-month	2-1/2-months	6-months
Control	98%	93%	68%
Treatment A	100%	96%	64%
Treatment B	95%	95%	66%
Treatment C	97%	95%	45%
Treatment D	98%	91%	48%

Characteristics of Compliant Participants

Chi square analyses were used to investigate differences between treatment groups for compliant participants. Compliant behavior was defined as meeting the criterion of at least one self-exam at 1-month follow-up, two self-exams at 2-1/2 months and six exams at 6 months compared to individuals who did not perform monthly exams. Refer to table 10 for numbers of compliant and non-compliant participants across groups and time.

Significant differences between treatment groups in compliance rate were found at 1-month, [χ^2 (4)= 12.17 $p < .05$] and 2-1/2 months, [χ^2 (4)= 18.89, $p < .001$], but not at 6 months. Examination of Pearson residuals revealed no significant differences at the $p < .05$ level between groups at 1-month. At 2-1/2 months, however, treatment group C had significantly higher rates of compliance than the other conditions ($p < .05$).

Table 10.

Number Of Compliant Participants and Compliance Rate Across Treatment Groups and Time

Group	Compliant	Pre-Tx	1 Month	2.5 Month	6 Month
Control n = 41	Yes	11 (27%)	16 (41%)	12 (30%)	10 (24%)
	No	30 (73%)	23 (59%)	28 (70%)	31 (76%)
A n = 45	Yes	11 (24%)	18 (40%)	13 (29%)	8 (18%)
	No	34 (76%)	27 (60%)	32 (71%)	37 (82%)
B n = 38	Yes	7 (18%)	22 (61%)	19 (53%)	11 (29%)
	No	31 (82%)	14 (39%)	17 (47%)	27 (71%)
C n = 38	Yes	9 (24%)	25 (68%)	26 (70%)	17 (45%)
	No	29 (76%)	12 (32%)	11 (30%)	21 (55%)
D n = 43	Yes	5 (12%)	29 (66%)	19 (48%)	11 (25%)
	No	38 (88%)	15 (34%)	21 (52%)	33 (75%)

Attitudes

T-tests were conducted to examine relationships between mean attitude scores on the BCAQ and compliance at pretreatment, 1 month, 2-1/2 months, and 6 months. There was a significant difference between BCAQ scores (regardless of treatment condition) for compliant vs. non-compliant participants, with compliant participants having more positive attitudes toward BSE at pre-treatment and all three post-treatment periods. Refer to table 11 for means and standard deviations.

Table 11.

Mean Score On The BCAQ For Compliant And Non-Compliant Participants Across Time

	Pre-Tx		1-month		2-1/2 months		6-months	
	M	SD	M	SD	M	SD	M	SD
Compliant	93.00	7.44	92.18	7.49	94.78	8.09	95.80	6.97
Non-Compliant	88.14	7.04	89.34	7.54	89.00	7.70	88.77	7.54
t	3.97**		2.65*		5.28**		4.73**	

Note: $p<.01$ = *; $p<.001$ = **

Attitudes and stages of change

Correlations were conducted to examine the relationship between scores on the BCAQ and the SCM. Moderate correlations were found at pre-tx, 1-month, 2-1/2 months, and 6-months. Refer to table 12 for a summary of correlations.

Table 12.

Correlations Between Scores On The Breast Cancer Attitudes Questionnaire (BCAQ) And The Stages Of Change Measure (SCM) Across Time

	Pre-Tx BCAQ	1-month BCAQ	2-1/2 months BCAQ	6-months BCAQ
SCM	.42	.47	.45	.54

Note: $p<.01$ for all correlations

Chapter IV: Discussion

The present study examined the effectiveness of increasingly complex multimodal treatment interventions on increasing BSE in women. Consistent with the primary hypothesis, the more complex treatment interventions were most effective in increasing the frequency and maintenance of this important health behavior. More specifically, treatments B, C, and D, the conditions that employed at least a knowledge and testimonial/demonstration component, were most successful in increasing BSE behavior at 1 and 2-1/2 months. This finding is consistent with past studies (e.g., Lierman et al., 1994), which have found that a combination of modalities to increase BSE has been successful.

To my knowledge, a videotaped testimonial has never been used before to increase BSE behavior in women. Thus, the utility of a videotaped testimonial is a new and potentially useful finding. Videotapes have been used to increase other types of health behavior (e.g., HIV prevention; Sanderson, 1999) and live testimonial has been used to increase testicular self-examination behavior (Marty & McDermott, 1985), but this is the first time that the two methods have been combined to increase BSE.

Viewing a young, healthy woman who had actually found a lump and recommended conducting regular BSEs may have increased participants' perceptions of their own risk and encouraged them to conduct BSEs themselves. Olson and Morse (1996) found that women were more likely to perceive their own BC risk if they knew

that "others got it." Other researchers have found that perceptions of risk are related to increase in BSE practice when women feel competent in their BSE practice (Chalmers & Luker, 1996). This feeling of competence, or self-efficacy, has been found to be important to the practice of BSE in other studies (e.g., Friedman, Nelson, Webb, Hoffman, & Baer, 1994; Persson, Ek, & Svensson, 1997). Thus, the instruction of BSE in addition to a testimonial is imperative. In this study, demonstration of the BSE skill from the videotape (treatment B), or from the videotape and the live demonstration/feedback (treatments C and D) appears to have led to increased self-efficacy, which led to decreased anxiety about conducting the self-exam and increased frequency of BSE (Lev, 1997).

The difference between treatment groups on number of BSEs was not maintained at six months, however a difference was seen between reminder/no-reminder groups at this time. It is possible that group differences diminished because women forgot to maintain their monthly practice of BSEs. The reminders served as a prompt and therefore those who received them had higher frequency and maintenance of BSE at 1, 2 ½ and 6 months than those who did not. This finding is consistent with past research which has found that forgetting is the primary reason given by women who do not practice BSE (Coleman, 1991). Maintenance of behavior change is an ongoing problem for health researchers in a number of areas (e.g., weight management) and the sending of reminders may be one solution to this problem for BSE.

Group differences with respect to other BSE-related constructs such as attitudes and related health behaviors were expected. Group differences were seen in attitudes, with the second-to-most complex treatment (treatment C) having more positive attitudes

at 1 and 2-1/2 months than the control, A and D. Group B did not differ from C or any of the other groups. Additionally, it is of note that treatment C had the highest rate of compliance (i.e., at least one self-exam at 1-month and two self-exams at 2-1/2 months) at 2-1/2 months. It is possible that participants in treatment C had the best attitudes and highest rate of compliance because they received the most complex treatment that did not involve a discussion component (Treatment D). Because women may have already been talking to one another about personal health-related concerns, the discussion may not have benefited them. Additionally, they may have been somewhat inconvenienced by this treatment component, which added an increment of 15 minutes to treatment C. Women may have felt that this extra time was unnecessary, given that they already talk about health behavior with friends. Additionally, the discussion of where and when to conduct a self-exam is probably moot for women since they are specifically instructed about these variables during BSE instruction (i.e., lying down in bed, standing in the shower, in front of a mirror; 7-10 days after your period). The discussion component may have been more relevant to men learning about TSE because TSE instruction is less explicit about where and when to conduct an exam and men may be less likely to discuss health-related behavior with friends.

General health behaviors were not found to be related to practice of BSE as predicted. The questionnaire used to measure related behaviors may have been too general to relate to one specific health behavior such as BSE.

One limitation to this study was the relatively large rate of attrition at 6 months. This was likely due to the mailing of questionnaires at 6-month follow-up. Findings indicated that students who were more advanced in their studies were more likely to

respond at 6 months. This may have been due to the increased likelihood that more advanced students actually received their questionnaires since they are less likely to have moved at the end of the academic year. (Almost all first-year students live in the residence halls and move during the summer). Additionally, those participants who made higher general personal health ratings at pre-treatment were more likely to respond at 6 months. Those who think of themselves as healthy may have greater interest in health-related matters and therefore have been more interested in BSE and more likely to respond at 6 months (Rogelberg & Luong, 1998).

Pre-treatment differences found between groups on number of BSEs may be a limitation of this study. Mean number of BSEs for Treatment C and for the no-treatment control were significantly higher than those of other groups at pre-treatment. At 1-month and 2-1/2-month follow-up times, however, participants in treatments B and D, along with those in treatment C, had significantly higher rates of BSE than did participants in the control group and treatment A. Thus, it appears that the treatment group main effects observed at follow-up times were due to treatment interventions, not pre-treatment differences.

Working with students may have been a limitation because there were other health promotion events on campus that could have affected the participants' practice of the BSE behavior. This should not have affected them differentially across groups, however.

Additionally, the relative lack of ethnic diversity, age range, and educational level in this population may affect the external validity of our findings

This study has a number of strengths. First, the design of the study allowed the investigator to examine causal relationships between treatment interventions and

measured outcomes. The study also employed a number of intervention modalities that prior researchers have found to be successful in increasing breast self-examination in women (e.g., teaching BSE with a return demonstration, reminding women to conduct BSE). In addition to these previously supported interventions, this study employed new methods of increasing BSE such as showing a videotaped testimonial of a young woman who had found a breast lump and teaching women and men together about breast self-examination and testicular self-examination. The use of student health advocates was also a new approach to this type of intervention. Student health advocates who were peers of the participants served as role models for conducting self-exams.

Most past studies involved interventions conducted by health professionals (e.g., nurses). In contrast to other studies which are resource intensive (e.g., Champion & Scott, 1993), this study utilized a non-professional videotaped testimonial and relatively briefly trained student health advocates, which greatly cut down on resources.

Conducting the study on a college campus with a large number of participants could have led to the establishment of a campus norm to conduct self-exams. Encouraging discussion of health behaviors may have led to further discussion in residence halls and on campus about important health-related issues. Finally, the training and deployment of student health advocates may have led to more widespread campus discussion and practice of an important health behavior.

Implications for further research

This study underscores the importance of using a multi-modal approach when teaching BSE and other preventative health behaviors. It also demonstrates the ease and utility of employing peers as role models and teachers of these behaviors. Teaching the

BSE skill and providing a testimonial from a peer are important aspects of this model. Consistent with prior research, those interventions that increased women's perceptions of risk while also increasing their sense of self-efficacy were most successful in increasing BSE behavior. Reminding women to conduct self-exams was the only intervention that maintained its effectiveness over time (i.e., at 6 months).

Because this approach is less resource intensive than many, it would be ideal to test this kind of approach in other community-based settings. The relative lack of diversity in our sample may restrict the generalizability of our findings, as other researchers have found that race and cultural factors (Tang, Solomon, Yeh, & Worden, 1999) as well as sexual orientation (Ellingson & Yarber, 1997) are related to rates of BSE. Yet, it is likely that the wide range of methods used would be applicable across settings. Tang et al. (1999) suggested having female spokespersons, who are well-respected in the Asian community, model cancer screening behaviors. Similarly, it would be advisable to use a testimonial that is delivered by an individual who is a respected peer and demographically similar to the target population.

Future studies could potentially minimize attrition by requiring that follow-ups be in person at each time, conducting follow-ups by phone, or studying populations that are easier to reach by mail. (College students tend to move frequently.) Additionally, the employment of true random assignment would diminish pre-treatment differences.

Conclusions

Increasing BSE behavior in college women is a relatively simple and straightforward undertaking. The use of brochures, videotaped testimonial of a peer, live demonstration and feedback of BSE by student health advocates, and discussion of where

and when to conduct BSE leads to increased frequency of this early detection behavior. Mailing monthly reminders is a good method of prompting women to maintain this important health behavior over time. Because early detection is key to decreasing mortality rates from breast cancer, teaching BSE to young women is an important part of health education of this population. The incorporation of this behavior into a young woman's lifestyle could lead to early detection later in life, as her risk for breast cancer steadily increases with age.

Results from this study can be used by college health programs to implement effective early detection programs on campus. Similar programs, targeting different populations in other types of communities, would likely be successful as well.

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Appendix A

Body Awareness and Men's and Women's Sexual Health Training Manual

Agenda For Training For Breast and Testicular Cancer Research Project

Crystal Tani, M.S. and Elizabeth H. Winston, M.S.
January 23, 2000
12 p.m. - 3 p.m.
Clark C-Wing, C-80
Refreshments Provided

I. Introductions

II. Using sexual terms

III. Filling out of research questionnaires (trainee pre-test)

IV. Discussion of personal experience with cancer.

V. Explanation of the importance of participation in the project

VI. Introduction to the research process and this specific research project

VII. Explanation of data collection timeline and organization for this semester and next semester.

VIII. Identification of Research Pairs

IX. How to:
   A. Check-in of participants and passing out of survey packets
   B. Passing out informational brochures
   C. Show videos and how to show a video
   D. Demonstration of how to do TSE and BSE (Deb Morris) (SHACs practice BSE and TSE)
   E. How to facilitate a discussion (do a mock discussion)

X. Elements of Confidentiality

XI. The importance of commitment to the project

XII. How to get in touch with us in case of emergency

XIII. Sign-up for research dates and times

Procedure for Control Group [Surveys ONLY]

1. **Get the sign-up sheets from the PY100 sign-up table (outside room C-71) at 6:20.**

2. **At 6:30 p.m., explain that you will wait 5 more minutes for latecomers.**

3. **At 6:35, take attendance using the sign-up sheet. Just say the first name of the student and place a check mark next to their name. If you are conducting the No Treatment Control Group or the Information Only Group, you can let latecomers in until 6:45 and just explain what they missed and get them started. If you are doing any of the more complex groups, do not let anyone in after you start. Tell them they need to sign up for another date and time.**

4. **Elizabeth or Crystal introduces herself and talks about the importance of the study and the importance of attendance at follow-up dates and times.**

5. **Say,** OK, now we will pass out the packets. They are slightly different for men and for women, so please raise you hand if you are a woman (***laugh)***. **Pass out surveys, each leader will pass out each gender. (REMEMBER THAT THERE IS A FEMALE VERSION AND A MALE VERSION).**

6. Now, please turn to the last page of the survey and make sure that if you are a male, the last page has an "Attitudes toward Testicular Cancer," and if you are a female, the last page has an "Attitudes toward Breast Cancer". If you have the wrong one, raise your hand. **Make any exchanges needed.** Some of the questions asked in the packet may seem like they are not for your gender, but they are. As long as you have the right last page, you have the right packet for you. Be sure to answer all questions on all pages.

7. Please fill out the top page on the packet. This page is the only one that will have identifying information on it. Only the primary researchers will have access to this, it is confidential. We need this information so that we can contact you to remind you to come to the follow-up meetings. The rest of the stuff that you fill out will only have a number on it, so we won't know it was you who filled it out. **Collect the top page when everyone is done and put it in a pile separate from everything else.**
8. The next two pages of the packet are exactly the same. Tear off the top page and take it with you. Now, read the second page carefully, initial the bottom of the front page and print you name and sign the back page. Leave this one for us. It is our ethical and legal obligation to inform you about this study, so please read carefully.

9. **When everyone is finished, say,** Notice the code in the upper right hand corner of the first questionnaire. Please write this code on the upper right hand corner of every page in your packet. You do not need to write it on both sides of each page, just the front is fine.

10. **When they are done, tell them to begin filling out the packet.**

11. **Once they have finished the packet, they may bring it up to the front of the room. Flip through each page of their packet to <u>make sure that they did not miss any questions</u>. Next, ask them whether they want more information about the study and give them the Debriefing Form, if they do. Then they are free to leave. Remind them that they will get their credit when they complete the follow-ups at 1 and 2 ½ months.**

12. **Document "No-Shows" on the no-show list at the end of the research credit sheet.**

Procedure for Treatment Group A [Information ONLY]

1. **Before you hand out the questionnaires, announce that participants should remain seated once they have completed the questionnaires.**

2. **As people finish, pass around the research credit sheet so people have something to do while they wait for everyone to finish. This also means people will not have to wait in line at the end to sign in.**

2. **After everyone is finished, say,** Now we are going to give you some information about breast cancer and testicular cancer. We would like for you to take some time, about five minutes, to read these pamphlets carefully. It is very important that you take the time to read them because we want everyone to look at them for the same length of time. If you get through both of them, please re-read them until we tell you to stop. **If someone stops reading before the five minutes are up, remind him or her to keep reading. (Don't single anyone out, just announce to everyone that they should keep reading).**

3. **Pass out the health pamphlets (each person gets a breast <u>and</u> testicular pamphlet; pass one stack around starting on the left and one starting on the right, students should take one and pass the rest down) and have them read each pamphlet (time 5 minutes).**

4. **Write "no-shows" on the no-show list.**

5. **If people have questions, refer them to the brochure, to Crystal or Elizabeth, to Hartshorn Health Service (the phone number is on back of the pamphlets), or to the American Cancer Society (see emergency phone list at the end of this document).**

6. **If people mention personal cancer stories that they seem to need to talk about, say,** Wow, it seems like that is really affecting you right now. I am sorry that I am unable to talk to you about this right now. Do you have someone who you can talk to about this? **(If not)** Would you like to talk to someone about it? **(If yes).** You may contact the University Counseling Center and talk to a counselor about this.

Procedure for Treatment Group B [Information and Testimonials and Taped Demonstration]

1. **Elizabeth or Crystal will bring in the AV equipment and set it up.**

2. **Do the surveys and brochures as explained above. About 3 minutes into the brochure reading, turn on the projector so it has time to warm up.**

3. **Then say,** Now we are going to show you a video of a woman talking about her experiences with breast cancer and a man talking about his experiences with testicular cancer.

4. **One facilitator turns off the lights while the other starts the video. Be sure the "input" button is pushed and then just press "play." Show Breast and Testicular Cancer Testimonials. Watch the video, even if you are sick of it.**

5. **When the video is over, say,** That is the end of the study. Thank you for your participation.

6. **Ask if anyone wants the debriefing sheet.**

7. **Record "no-shows"**

Procedure for Treatment Group C [Information, Testimonial and Taped Demonstration and Live Demonstration and Practice]

1. **After showing the videos, turn off the VCR and the projector and unplug the white cord from the outlet.**

2. **Next, say,** Now we are going to show you how to do self-examinations just like Josh and Sarah did in the video. Don't worry, we won't ask for volunteers! **Bring out the breast and the testicle.**
3. **The female leader will show breast self-exam. Follow the method described below:** ***See Deb Morris for a demonstration!!***
   1.

   2.

   3.

   4.

   5.

   6.

   7.

   8.

Next, the male leader will show testicular self-exam. Follow the method described below. ***See Deb Morris for a demonstration!!!***
   1.

   2.

   3.

   4.

   5.

6.

7.

8.

4. **Now, say** Now it's your turn. We would like everyone to get a chance to try both breast exam and testicular exam on our models. **Then, each leader should walk to two individuals closest to them and have each student practice on each of the models, then switch. Each leader will have one breast and one testicle model. While they practice, watch carefully and give feedback such as** "Good job, you covered the whole area of the breast" "Be sure to use your thumbs and pointer and middle fingers when doing the testicular exam" "You need to press harder to feel the lumps". **GIVE FEEDBACK TO ALL STUDENTS!!! Once each of the students has successfully completed an exam on the breast and the testicle, move to the next two students. Continue until all students have practiced. <u>If a student refuses to participate, please let us know that this happened.</u>**

5. **If students ask how many lumps there are in the models or where they are, just explain that if they have felt one, that is great. Do not spend too much time discussing where the lumps are in the models. Do not show them where the lumps are or tell them how many there are. This may confound our results.**

6. **Follow the same procedures until all students have practiced the procedure.**

7. **Say,** This is the end of the study. Thank you for your participation.

8. **Offer students a debriefing form.**

9. **Record "no-shows."**

Treatment Group D [Information, Testimonial and Taped Demonstration and Live Demonstration and Practice, Group Discussion]

1. **After the practice, have students sit down and say,** Now we are going to talk about doing self-exams. We have some questions that we will ask and we would like to have everyone share their thoughts. **Then ask the following questions:**
    a. **What was it like to perform a self-exam on the models?**
    b. **What would be the best time and place for <u>you</u> to do a self-exam?**
    c. **When do you think you will do an exam next?**
    d. **Why is it important for both genders to know how to do both breast and testicular exams? When might it be useful to know this? (guide them to talk about doing exams on sexual partners and teaching friends how to do exams)**
    e. **Why is it important for us to be able to talk about our bodies and our self-exam behaviors?**
    f. **What would be a good date that you could remember each month for conducting a self-exam? (Suggest the 1st of the month or the date of their birth)**

2. **Be sure to note if the discussion gets off topic or something weird happens. Do not let the discussion get too off topic. Bring it back to the questions above. Also, if the opportunity arises for you to correct a misconception or to offer important factual information, you may do so. Do this only if you are certain of the facts that you are presenting! Also, let us know what you said.**

3. **After you have covered the questions (about 20 minutes), say,** That is the end of the study. Thank you for your participation.

4. **Record "no-shows."**

Notes

1. What to do if students ask a question you are unable to answer:

   a. be honest, tell them you do not know the answer, that their question is important, and that you can contact the researcher and get back to them
   b. suggest that they call Hartshorn or the American Cancer Society

2. What to do if students begin to feel anxious or uncomfortable:

   a. Talk to them outside the classroom in private, use counseling skills to assess their need for further help. Don't push them too much if they don't want to talk, but if you think they should not leave alone, help arrange for a friend to come pick them up. Tell them they can contact the researcher about rescheduling if they want to. They may choose to discontinue participation in the study at any time without penalty or loss of benefits to which they are otherwise entitled.

   b. They can call the University Counseling Center, or if after hours, they can all the CSU PD if they need to talk to a counselor.

   c. Do not let people leave by themselves if they are very upset! We could get in big trouble!

Emergency Information

University Counseling Center: 491-6053
CSU Police: 491-7111
Hartshorn Health Services: 491-7121
Deb Morris: 491-1723
American Cancer Society: 226-0148

Researchers:

Elizabeth H. Winston, M.S.
ewinston@lamar.colostate.edu
Office: 491-2880
C- 54 Clark, C-Wing, Basement

Home: (303) 839-1631

Crystal Tani, M.S.
ctani@lamar.colostate.edu
Office: 491-6197
C- 48 Clark, C-Wing, Basement
Home: 207-9767

Feel free to leave messages on our office or home numbers. We check e-mail regularly.

Scott Hamilton, Ph.D.
sham@lamar.colostate.edu
Office: 491-2412
B - 222 Clark, B-Wing

In the extreme case that you are unable to make it to the experiment, here is what you need to do:

1) **Give us as much notice as possible. Don't call 1 hour before the experiment, if you knew that you couldn't make 5 hours before that, or better yet, the day before. We understand that emergencies come up and would appreciate as much notice as possible.**
2) **Call all other "health advocates" to see if they can fill in for you. It is important that there is one male and one female for each experiment.**
3) **Call Elizabeth AND Crystal and let them know you can't make it. Leave a detailed message if they are not in, including where you can be reached.**
4) Your commitment to this project is very serious. We trust that you will arrange your schedule so that you will only miss an experiment if you are ill or have a personal emergency.

Appendix B

Demographic Questionnaire

1. **Age**_____

2. **Gender** ☐Male ☐Female

3. **Year in school** ☐Freshman ☐Sophomore ☐Junior ☐Senior ☐Other

4. **National Origin/Ethnicity**

☐ African American/Black
☐ Asian American (specify: _____)
☐ Caucasian/White
☐ Hispanic/Latino (specify: _____)
☐ Native American or Alaskan Native
☐ Mixed Racial Heritage (specify: _____)
☐ Other Racial Heritage (specify: _____)
☐ International (specify: _____)

5.**Sexual Orientation**:
☐ heterosexual ☐ lesbian/gay ☐ bisexual

6. **Primary Language** (the one you are most comfortable speaking)

☐ English ☐ Spanish ☐ Other_____

7. **My family's income (include both parents, if applicable) while I was growing up was about :(check one)**

☐ $9,999 or less ☐ $10,000 - $19,999

☐ $20,000 - $29,999 ☐ $30,000 - $39,999

☐ $40,000 - $49,999 ☐ $50,000 - $59,999

☐ $60,000 - $79,999 ☐ $80,000 – $99,999

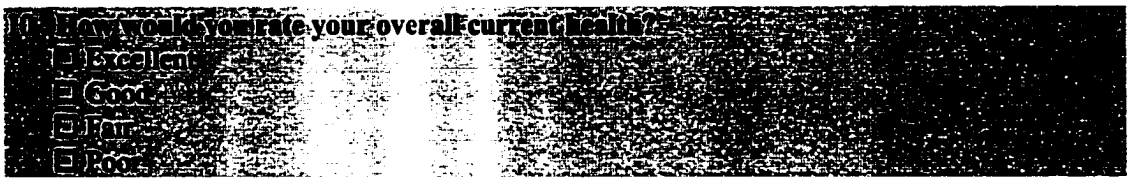
☐ $100,000 or more

8. **My Current Relationship Status is: (check)**
☐Single, never married
☐Single, divorced
☐Single, Widowed
☐In long-term relationship, **NOT** living with partner
☐In long-term relationship, living with partner
☐Married

9. **Religion**
   - ☐ Attend religious services regularly
   - ☐ Attend religious services sometimes
   - ☐ Never attend religious services

Current Religious/Spiritual Affiliation (e.g. Protestant, Catholic, Buddhist etc.)

_____



11. **How would you rate your overall health behavior (all of the things you do that could have an impact on your health, e.g. exercise, healthy eating, not smoking, abstaining from drugs, minimal alcohol use)?**
   - ☐ Excellent
   - ☐ Good
   - ☐ Fair
   - ☐ Poor

13. **What do you think your chances are of experiencing a serious injury?**
   - ☐ Definite
   - ☐ Very High
   - ☐ High
   - ☐ Low
   - ☐ Very Low
   - ☐ Zero

15. **Have you ever been treated or hospitalized for a serious illness or injury?**
   - ☐ Yes
   - ☐ No

17. **Have you seen a medical doctor on a yearly basis for most of your life?**
☐ Yes
☐ No

18. **Has anyone in your family ever been diagnosed with cancer ?**

☐ Yes ☐ No ☐ Don't Know

If yes, please specify who in your family was diagnosed with cancer and what type of cancer they had:

Who?: What Type?:

---

19. **Has someone close to you (other than family) ever had cancer (e.g. friend, teacher, neighbor)?**

☐ Yes ☐ No ☐ Don't Know

Thank you for you participation!

Appendix C

HEALTH RISK INVENTORY (HRI)
HEALTH QUESTIONNAIRE

Directions: This anonymous questionnaire contains 60 statements. The statements are about your health, your behaviors, and your attitudes and beliefs. Read the statements and check the box for the choice ("Always," "Almost Always," "Sometimes," or "Almost Never," "Never," "Does Not Apply") that best describes how often the statement applies to you. You must respond to each statement. Check the box under "Does Not Apply" only if the statement does not apply to you at all.

		Always	Almost Always	Sometimes	Almost Never	Never	Does Not Apply
1.	I eat foods high in fiber such as beans, fresh fruit or vegetables, and whole grain breads or cereals.	1	2	3	4	5	6
2.	I eat fruits and vegetables at least twice each day.	1	2	3	4	5	6
3.	I avoid chips and fried foods by choosing foods that are baked, broiled, boiled, poached or stewed.	1	2	3	4	5	6
4.	I limit the amount of red meat I eat by eating more chicken, fish or grains and beans.	1	2	3	4	5	6
5.	I limit the amount of fat I eat by choosing low-fat milk and cheeses, and by reducing the amounts of butter, margarine and salad dressing I eat.	1	2	3	4	5	6
6.	I limit the amount of salt I eat by not adding salt to my food, avoiding salty food and checking labels for sodium content.	1	2	3	4	5	6
7.	I avoid eating large amounts of sugar by limiting candy, desserts and soft drinks in my diet	1	2	3	4	5	6
8.	At least 3 times each week I engage in physical activity that lasts at least 20 minutes and makes me breathe deeply and my heart beat faster	1	2	3	4	5	6
9.	I keep my weight within 15 pounds of the optimal weight for my size.	1	2	3	4	5	6
10.	I am physically active at my job.	1	2	3	4	5	6
11.	I smoke cigarettes.	1	2	3	4	5	6
12.	I smoke one or more packs of cigarettes each day.	1	2	3	4	5	6
13.	I chew tobacco or smoke a pipe.	1	2	3	4	5	6
14.	I drink more than 2 alcoholic drinks a day.	1	2	3	4	5	6
15.	I use recreational drugs or steroids.	1	2	3	4	5	6
16.	I have been told that I use alcohol or drugs too much.	1	2	3	4	5	6
17.	I take prescription medicine only as directed by a physician.	1	2	3	4	5	6
18.	I fill my medicine prescriptions immediately.	1	2	3	4	5	6
19.	I wear sunscreen or protective clothing when I am in the sun.	1	2	3	4	5	6

		Always	Almost Always	Sometimes	Almost Never	Never	Does Not Apply
20.	I conduct a breast or testicular self-exam every month and check my skin for unusual spots or coloring every few months.	1	2	3	4	5	6
21.	I have physical and dental exams every year.	1	2	3	4	5	6
22.	I am over 40 and get a rectal or gynecologic exam every year.	1	2	3	4	5	6
23.	I sleep 7 or 8 hours every night, no more or no less.	1	2	3	4	5	6
24.	I get my blood pressure checked every year	1	2	3	4	5	6
25.	I get my cholesterol levels checked every year.	1	2	3	4	5	6
26.	I stay home and in bed to recover when I am ill.	1	2	3	4	5	6
27.	I am usually involved in long-term romantic relationships.	1	2	3	4	5	6
28.	I have a close friend for family member that I talk to about things that are bothering me.	1	2	3	4	5	6
29.	It's important for me to work out my personal problems on my own.	1	2	3	4	5	6
30.	I find it easy to express my feelings to others.	1	2	3	4	5	6
31.	I go to all my scheduled physical and mental health appointments.	1	2	3	4	5	6
32.	I consult a physician or health care provider right away when I have unfamiliar physical symptoms.	1	2	3	4	5	6
33.	I would consult a mental health professional if I ever felt sad or depressed for longer than a month.	1	2	3	4	5	6
34.	I buckle my safety belt when driving or riding in a motor vehicle.	1	2	3	4	5	6
35.	I obey traffic rules and speed limit signs when driving.	1	2	3	4	5	6
36.	I drive or ride in vehicles when the driver has had too much alcohol to drive safely.	1	2	3	4	5	6
37.	I wear a helmet if I ride a horse, bicycle, motorcycle, moped or all-terrain vehicle.	1	2	3	4	5	6
38.	I protect myself, my home or my vehicle with a gun.	1	2	3	4	5	6
39.	I get into physical fights when I get really angry.	1	2	3	4	5	6
40.	I have, or have had, two or more sex partners during the same period of time.	1	2	3	4	5	6
41.	My partner and I use a condom if we are not in an exclusive sexual relationship.	1	2	3	4	5	6

	Always	Almost Always	Sometimes	Almost Never	Never	Does Not Apply
42. I check myself for signs or symptoms of sexually transmitted diseases when sexually active and not in an exclusive relationship.	1	2	3	4	5	6
43. I get tested every 6 months for sexually transmitted diseases when I am sexually active and not in an exclusive relationship	1	2	3	4	5	6
44. When tested, my results show that I do not have STDs.	1	2	3	4	5	6
45. I find that it is easy to relax. 6		1	2	3	4	5
46. I get angry and annoyed when I am caught in traffic.	1	2	3	4	5	6
47. I get irritated and mad when waiting in lines.	1	2	3	4	5	6
48. Things build up inside until I lose my temper.	1	2	3	4	5	6
49. I drink alcohol to relieve my stress.	1	2	3	4	5	6
50. I believe a person should be able to handle problems on her or his own.	1	2	3	4	5	6
51. I believe it is important for a person to be physically strong.	1	2	3	4	5	6
52. I believe a person should always try to control her or his emotions.	1	2	3	4	5	6
53. I believe risking danger is unavoidable.	1	2	3	4	5	6
54. I believe a person should not admit being sick to others unless she or he really has to.	1	2	3	4	5	6
55. I worry about my health and my health risks.	1	2	3	4	5	6
56. I believe it is unlikely that I will have a health problem in the near future.	1	2	3	4	5	6
57. I am cautious and avoid risky situations because I am concerned that I could get hurt.	1	2	3	4	5	6
58. I do not think much about health issues because it doesn't really help.	1	2	3	4	5	6
59. I believe that how long a person lives is mostly up to fate or to luck.	1	2	3	4	5	6
60. I believe I have control over the future of my health.	1	2	3	4	5	6

Appendix D

Stages of Change Measure (SCM - women)

Read each of the following paragraphs carefully and then decide which **ONE** best describes your current thoughts and feelings about breast cancer.

_____ I **do not know** much about breast cancer and have never really thought much about it. Breast cancer is **not** something that I need to worry about because it is unlikely that I would ever get it. Even if I was at risk for it, I do not think that I need to do anything to try and prevent it or increase the chances of detecting it.

_____ I **know** something about breast cancer and I think I may be at risk for breast cancer but I **have not done** anything to try to detect it early (such as a breast self-exam).

_____ I **know** something about breast cancer and I think I may be at risk for breast cancer. Although I **have not done** anything in the **past**, I have been thinking about possibly doing something like a breast self-exam in the future and will probably **do** a breast self-exam sometime within the next six months.

_____ I **know** something about breast cancer and I think I may be at risk for breast cancer. I have tried to do a breast self-exam in the past. I probably **do** breast self-exams once in a while when I remember, but **do not do them every month**. I am planning to do one again sometime in the near future and feel **fairly confident** that I know how to do a breast self-exam correctly.

_____ I **know** something about breast cancer and I believe I am at risk for breast cancer. I have done a breast self-exam **within the past month**. I generally remember to do breast self-exams **regularly** (monthly) and I plan to continue to do so. I am **confident** that I know how to do a breast self-exam correctly.

_____ I **know** something about breast cancer and I believe I am at risk for breast cancer. I **used to** do breast self-exam **monthly for at least a year** in the past but I have **stopped** doing these regular self-exams. I am thinking about starting to do breast self-exams again in the future.

PLEASE BE SURE THAT YOU CHECKED ONLY ONE!

Appendix E

Breast Cancer Knowledge Questionnaire

Please check true (T) or False (F) for the following statements. Be sure to respond to all of them.

☐ T ☐ F 1. The best time to check for breast cancer is 7 to 10 days after a woman's period.

☐ T ☐ F 2. Women who have a family history of breast cancer have a higher risk of developing breast cancer themselves.

☐ T ☐ F 3. If you feel a breast lump you should see a doctor immediately.

☐ T ☐ F 4. Breast cancer is not the major cancer killer of women.

☐ T ☐ F 5. Early cancer is painful.

☐ T ☐ F 6. A change in the size or shape of the breast is a symptom of breast cancer.

☐ T ☐ F 7. When performing a Breast Self-Exam (BSE), you should use the palm of your hand.

☐ T ☐ F 8. It is best to perform a Breast Self-Exam (BSE) after you shower.

☐ T ☐ F 9. Women who have had children have a higher risk of breast cancer than those who have never had children.

☐ T ☐ F 10. The most common area for lumps is near the armpit.

☐ T ☐ F 11. One in eight women will develop breast cancer in their lifetime.

☐ T ☐ F 12. The earlier breast cancer is detected, the more difficult it is to treat.

☐ T ☐ F 13. Nipple discharge or inversion is normal and no matter for concern.

☐ T ☐ F 14. Women should perform Breast Self-Examination (BSE) every three months.

☐ T ☐ F 15. All women are at risk for breast cancer.

Appendix F

Testicular Cancer Knowledge Questionnaire

Please check True (T) or False (F) for the following statements. Be sure to respond to all of them.

☐T ☐F 1. All men should perform Testicular Self-Exams (TSE) once a year.

☐T ☐F 2. Abnormal lumps are usually found on the sides of the testicle, but can also show up on the front.

☐T ☐F 3. When performing a Testicular Self-Exam (TSE), one should use the thumb and forefingers of their hand.

☐T ☐F 4. Most men discover testicular abnormalities through Testicular Self examination (TSE).

☐T ☐F 5. Most young men have been taught the Testicular Self-Exam (TSE) and are aware of their risk for testicular cancer.

☐T ☐F 6. Testicular cancer is more common among older men than among younger men.

☐T ☐F 7. Testicular cancer is more common among Caucasian men than among Hispanic men and African American men.

☐T ☐F 8. Testicular Self-Exams (TSE) should be performed after a warm bath or shower.

☐T ☐F 9. If you check your testicles regularly, you do not need to have a doctor examine them during a physical.

☐T ☐F 10. Enlargement of the testicle is not a symptom of testicular cancer.

☐T ☐F 11. The number of new cases of testicular cancer diagnosed in the United States each year is fewer than 1000.

☐T ☐F 12. If you find a lump, you should wait to see if it goes away before seeing a doctor.

☐T ☐F 13. A feeling of heaviness in the scrotum is normal and no matter for concern.

☐T ☐F 14. Boys who mature early have a lower risk of testicular cancer.

☐T ☐F 15. A family history of testicular cancer or breast cancer increases your risk for testicular cancer.

Although breast cancer predominantly affects women, it can occur in men as well. There are several factors that contribute to making a person more vulnerable to breast cancer, biggest of which is being female.

What increases your risk?

- While all women are at risk, women who are older have a higher risk of developing breast cancer
- Women who have a family history of breast cancer have a higher risk of developing breast cancer themselves
- Women who have never had children have a higher risk of developing breast cancer
- Women who have their first child after the age of 30 have a higher risk of developing breast cancer

Breast Self-Exam (BSE)facts...

- The best time to check for breast cancer is 7 to 10 days after your period
- Beginning in puberty, you should conduct a breast exam once a month, and have a clinical breast exam by a health care professional every year
- Use the pads of your three middle fingers to perform BSE (see figure 2)
- After menopause or following a hysterectomy, it is a good idea to perform BSE on a monthly basis
- You should not wait until you have had your first child to practice regular breast exams

The most important thing to remember is to perform a BSE on a regular (monthly) basis, and if you feel a change in your breast, see a doctor as soon as posible!

For more information about breast cancer call Hartshorn Health Services at (970) 491-7121

All information included in this pamphlet was obtained from the National Cancer Institute and compiled by Jay Eberhard

Everything you should know about breast cancer including...

- Quick facts about breast cancer
- Symptoms of breast cancer
- Procedure for performing a Breast Self-Exam

Quick Facts about breast cancer...

- Most (8 out of 10) breast lumps are <u>not</u> cancerous
- If you feel a lump in your breast, see a doctor immediately
- 1 in 8 women will develop breast cancer at some point in their lives
- When breast cancer is discovered in a localized state, its cure rate is very high
- Breast cancer is the major cancer killer of women
- Most breast lumps are discovered during BSE (Breast Self-Exam)
- A blow to the breast does not cause breast [illegible]
- [illegible] is the second most diagnosed [illegible] in the United States
- [illegible]
- The most common area for lumps is near the armpit
- Early cancer is not painful

Symptoms of breast cancer

- A lump or thickening near the breast or underarm area
- A change in the size or shape of the breast
- Nipple discharge, tenderness, or inversion
- Ridges or pitting of the breast
- A change in the way the skin of the breast, areola, or nipple looks or feels

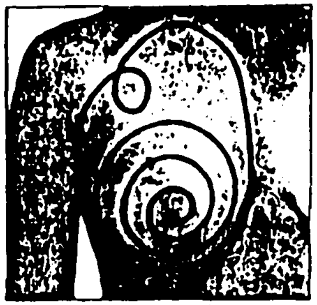

Spiral Method

figure 1 - the spiral method

Performing a Breast Self-Exam (BSE)

- Starting at the top of your armpit, make a large spiral, looking for any unusual lumps. Make at least 3 smaller spirals until you reach the nipple. See figure 1.
- After showering, stand in front of a mirror to observe any visual changes to the breast. Look for changes in size, shape, skin color or dimpling
- Gently squeeze the nipple to check for any discharge
- Lie down, and place a towel or pillow under your back with your arm bent at a 90 degree angle and repeat the spiral method
- Make sure to check all the breast tissue including the armpit and collarbone area

figure 2 - use the pads of your 3 middle fingers

Although all men are at risk for testicular cancer, there are several factors that make some men more vulnerable

What increases your risk?

- While all men are at risk, testicular cancer is most common in men ages 15-35 and less common in middle-aged and older men
- Men whose testicles have not descended, and those whose testicles descended after age 6 are at higher risk for testicular cancer
- Boys who mature early have a higher risk of testicular cancer than those who do not
- Men who have a family history of testicular cancer have a higher risk of developing testicular cancer themselves
- Testicular cancer occurs most often in Caucasian males, followed by Hispanics, with African-American males having the lowest incidence
- Males who have mononucleosis (mono) early in life have a slightly higher risk for testicular cancer than those who develop it later on or never develop it

Testicular self-exam (TSE) facts...

- Beginning in puberty, you should perform a testicular self-exam once a month, and have a clinical testicular exam with every physical
- The best time to check for testicular cancer is after you take a warm shower
- Do not mistake the epididymis (the soft tube like structure that collects and carries sperm) for an abnormal lump
- Use your *thumb* and *forefingers* when performing regular examinations
- Abnormal lumps are usually found on the sides of the testicle, but can also show up on the front

The most important thing to remember is to perform a TSE on a regular basis, and if you feel a change in your testicle, see a doctor as soon as possible!

For more information about testicular cancer call Hartshorn Health Services at (970) 491-7121

All information included in this pamphlet was obtained from the National Cancer Institute and compiled by Jay Eberhard

Everything you should know about testicular cancer including...

- Quick facts about testicular cancer
- Symptoms of testicular cancer
- Procedure for performing a Testicular Self-Exam

Quick Facts about testicular cancer...

- When detected early, testicular cancer is one of the most easily cured cancers
- If you feel a testicular abnormality, see a doctor immediately
- Most men discover testicular abnormalities themselves through TSE (Testicular Self-Exam)
- Most young men have never been taught TSE, and are unaware of their risk for testicular cancer
- More than 6,800 new cases of testicular cancer are diagnosed in the United States each year
- If you think you may have testicular cancer it is important that you see a doctor immediately

Symptoms of Testicular Cancer

- A lump in either testicle (most common)
- Any enlargement of a testicle
- A feeling of heaviness in the scrotum
- A sudden collection of fluid in the scrotum
- Pain or discomfort in a testicle or in the scrotum
- A dull ache in the lower abdomen or the groin

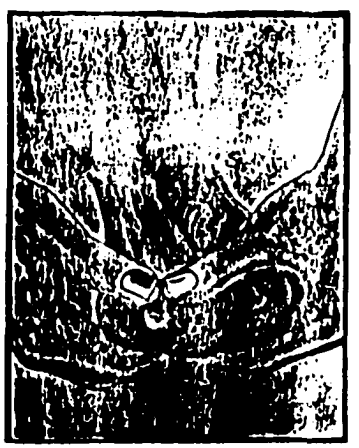


figure 1- how to properly check for testicular lumps

Performing a Testicular Self-Exam (TSE)

- Perform a testicular self-exam (TSE) once a month.
- TSE should be performed after a warm shower or bath. The heat relaxes the scrotum which makes it easier to find anything unusual.
- Stand in front of a mirror and look for any swelling on the skin or under the scrotum
- Examine each testicle with the thumbs and forefingers of both hands. Gently roll each testicle between thumbs and forefingers (See figure 1)
- If you find a lump, contact your doctor immediately. Most lumps are found on the sides of the testicle, but occasionally appear on the front
- Have your doctor check your testicles whenever you have a physical examination

Appendix H

Attitudes about Breast Cancer and Breast Self Examinations (MA - women)

Circle the number on each scale below that best describes your belief or attitude from Strongly Agree(1), Agree(2), Neither Agree nor Disagree(3), Disagree(4), and Strongly Disagree(5). Try to be as honest as possible in your responses.

1. I am confident that I know how to correctly perform a breast self-examination. 1 2 3 4 5

2. I am afraid of examining my breasts for fear of what I might find. 1 2 3 4 5

3. I am too embarrassed to touch my breasts. 1 2 3 4 5

4. I do not have time to regularly examine my breasts. 1 2 3 4 5

5. I do not have the privacy to regularly examine my breasts. 1 2 3 4 5

6. I would be embarrassed if I found a problem from my breast self-examination and it turned out to be nothing. 1 2 3 4 5

7. I am afraid to perform a breast self-examination. 1 2 3 4 5

8. My religious or cultural beliefs have taught me that touching my breasts is wrong. 1 2 3 4 5

9. I am not sure if breast self-examinations are something I need to do correctly. 1 2 3 4 5

10. I believe that breast cancer is treatable if detected early. 1 2 3 4 5

11. If I find breast cancer, I believe it will be too late to save my life. 1 2 3 4 5

12. I think that breast self-examination may be helpful in detecting breast cancer. 1 2 3 4 5

13. In addition to a breast self-examination, a clinical breast examination by a doctor is an effective way to detect breast cancer. 1 2 3 4 5

14. Most of my friends and family members think a breast self-examination is a good idea. 1 2 3 4 5

15. Conducting regular breast self-examinations serves as a positive role model for my friends and for other women in my family. 1 2 3 4 5

16. I like to be well informed in matters regarding my health. 1 2 3 4 5

17. I am embarrassed to discuss my personal medical issues with my family or my circle of friends. 1 2 3 4 5

18. I believe that people who are going to die from a disease will die regardless of what is done. 1 2 3 4 5

19. There are steps I can take to help keep a disease from getting worse. 1 2 3 4 5

20. I take responsibility for my own health. 1 2 3 4 5

21. I like myself enough to take good care of myself. 1 2 3 4 5

Appendix I

Monthly Reminder