

## **INFORMATION TO USERS**

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

**The quality of this reproduction is dependent upon the quality of the copy submitted.** Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

ProQuest Information and Learning  
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA  
800-521-0600

**UMI<sup>®</sup>**

**DISSERTATION**

**INCREASING THE FREQUENCY OF TESTICULAR SELF-  
EXAMINATION BEHAVIOR IN COLLEGE MEN**

**Submitted By**

**Crystal R. Tani**

**Department of Psychology**

**In partial fulfillment of the requirements**

**for the Degree of Doctor of Philosophy**

**Colorado State University**

**Fort Collins, Colorado**

**Summer 2002**

UMI Number: 3064027

**UMI<sup>®</sup>**

---

**UMI Microform 3064027**

**Copyright 2002 by ProQuest Information and Learning Company.  
All rights reserved. This microform edition is protected against  
unauthorized copying under Title 17, United States Code.**

---

**ProQuest Information and Learning Company  
300 North Zeeb Road  
P.O. Box 1346  
Ann Arbor, MI 48106-1346**

**COLORADO STATE UNIVERSITY**

August 15, 2001

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY CRYSTAL RIKA TANI ENTITLED INCREASING THE FREQUENCY OF TESTICULAR SELF- EXAMINATION BEHAVIOR IN COLLEGE MEN BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

\_\_\_\_\_  
*Mark Stallins*  
\_\_\_\_\_  
*Earl H. Clary*  
\_\_\_\_\_  
*Bruce Lyngren*  
\_\_\_\_\_  
*Scott B. Hamilton*  
Advisor  
\_\_\_\_\_  
*Earl H. Clary*  
Department Head/Director

## **ABSTRACT OF DISSERTATION**

### **INCREASING THE FREQUENCY OF TESTICULAR SELF-EXAMINATION BEHAVIOR IN COLLEGE MEN**

The effects of five hierarchically-ordered treatment interventions were evaluated in terms of their ability to increase testicular self-examination (TSE) in 164 college men over a 6-month period. The five interventions included: (1) No Treatment Control, (2) Informational Brochure (Treatment Condition A), (3) Video Taped Testimonial with TSE demonstration (Treatment Condition B), (4) Live Demonstration, Guided Practice, and Feedback (Treatment Condition C), and (5) Participant Discussion (Treatment Condition D). TSE behavior, behavioral intention (i.e., stages of change measure), testicular cancer (TC) knowledge and attitudes measure, and general health behaviors were examined at pre-treatment, 1 month, 2 ½ month, and 6 month follow-up periods.

In general, results indicated that the most complex interventions (i.e., B, C, and D) were most effective in increasing TSE behavior and behavioral intentions. Participants in the most complex treatment conditions (i.e., B, C, and D) were more likely than the No Treatment Control and condition A to conduct self-examinations and progress toward maintenance of TSE at the 1 and 2 ½ month follow-up. Although no differences in TC attitudes were found, knowledge of TC and TSE increased at the 1 month follow-up, for all conditions except the No Treatment Control. Regardless of condition, participants who practiced TSE regularly, compared to inconsistent self-examiners were more likely to feel confident they could correctly perform a self-examination, believed that TSE is helpful in detecting testicular cancer, and perceived their family and friends to be supportive of TSE. Regular self-examiners compared to

**inconsistent self-examiners also reported more physical and psychological health maintenance practices. Minimal differences were found between treatment conditions at the 6 month follow-up which appears to be due to a large participant attrition rate. Limitations and implications of the study are discussed along with the need for developing strategies to enhance maintenance.**

**Crystal R. Tani  
Department of Psychology  
Colorado State University  
Fort Collins, CO 80523  
Summer, 2002**

## **ACKNOWLEDGEMENTS**

I would like to thank several people who have assisted me in the completion of this dissertation. First I would like to thank Scott Hamilton, Ph.D., for his time, energy, expertise, and ongoing support. I feel very fortunate to have had your guidance throughout this complex project. I also want to thank my research assistants Marcie Mata, Jay Eberhardt, Jamie Bott, April Tauer, Lindsey Haviland, Erica Stringer, and Julie Kellaway for their hard work and dependability throughout the data collection process. Special thanks to Jim Zimbrunnen for providing me with “awesome” statistical support and the flexibility to explain things to me so that it made sense ! I also want to thank Deb Morris, RN, of the Hartshorn Health Services Center, for her ongoing interest and support during the initiation and success of this project. Moreover, I want to thank the health advocates for volunteering their time, energy, and interest in this project.

I would also like to thank my friend and colleague Elizabeth Winston, Ph.D., for her dedication, enthusiasm, wisdom, and support throughout this entire project. We did it! And to my mom, dad, and brother, thank you for your unconditional love and guidance. Finally thank you to my friends who have reminded me about the importance of having fun even when you have a dissertation to finish! I couldn't have done it without you.

## TABLE OF CONTENTS

I. INTRODUCTION .....	1
A. Review of the Literature.....	1
1. Men's Responsibility for Health Maintenance Behavior.....	1
2. Epidemiology.....	3
3. Risk Factors and Symptoms.....	4
4. The Course of Testicular Cancer.....	4
5. Psychosocial Factors.....	5
6. Recommendations by Health Organizations.....	6
7. The Pros and Cons to Teaching TSE to Young Men.....	10
8. Past Intervention Studies.....	14
B. The Present Study.....	21
C. Hypotheses.....	25
II. METHOD .....	26
A. Participants.....	26
B. Instruments.....	27
1. Demographic Information.....	27
2. Behavior Change Measure (BCM).....	27
3. Health Risk Inventory (HRI).....	27
4. Stages of Change Measure (SCM).....	27
5. Testicular Cancer Knowledge Questionnaire (TCK).....	28
6. Attitudes Toward Testicular Cancer (ATTC) Measure.....	29
C. Procedure.....	29
III. RESULTS .....	39
A. Pre Treatment Differences Across Conditions.....	39
B. Participant Attrition.....	39
C. Treatment Effects.....	40
D. Evaluation of Participants reporting Monthly TSE Versus Inconsistent TSE.....	54
E. Evaluation of Differences in General Health Behaviors and Attitudes Toward TC in Monthly and Inconsistent Self- Examiners at the 2 ½ Month Follow-Up.....	56
F. Responder and Non Responder Bias at the 6 Month Follow-Up.....	58
IV. DISCUSSION .....	60
REFERENCES .....	68

<b>APPENDIXES</b> .....	<b>79</b>
<b>Appendix A – Demographic Questionnaire</b> .....	<b>79</b>
<b>Appendix B – Health Risk Inventory (HRI)</b> .....	<b>82</b>
<b>Appendix C – Stages of Change Measure (SCM)</b> .....	<b>85</b>
<b>Appendix D – Testicular Cancer Knowledge Measure (TCK)</b> .....	<b>86</b>
<b>Appendix E – Breast Cancer Knowledge Measure (BCK)</b> .....	<b>87</b>
<b>Appendix F – Attitudes Toward Testicular Cancer and Testicular     Self-Examination Measure (ATTC)</b> .....	<b>88</b>
<b>Appendix G – Health Advocate Training Manual</b> .....	<b>90</b>
<b>Appendix H – Testicular and Breast Cancer Informational     Brochures</b> .....	<b>100</b>
<b>Appendix I – The Percentage of Participants who Responded     Incorrectly on Each True/False Knowledge Item     at Pre-Treatment and the Follow-up Sessions</b> .....	<b>105</b>

## **LIST OF TABLES**

<b><u>Table</u></b>	<b><u>Page</u></b>
1. Survey Studies on Testicular Cancer and TSE Behavior	7
2. Outcome Studies on Testicular Cancer and TSE	17
3. Health Advocate Teams By Type of Intervention Conducted	31
4. Adjusted Means and Standard Deviations of Behavior Change, Stages of Change, and Attitudes By Treatment Condition and Time	41
5. Non-Adjusted Means and Standard Deviations of Behavior Change, Stages of Change, and Attitudes By Treatment Condition and Time	42
6. Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 1 Month Follow-up	45
7. Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 2 ½ Month Follow-up	46
8. Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 6 Month Follow-up	47
9. Tukey-Kramer Pairwise Comparisons for Stages of Change at 1 Month Follow-up	50
10. Tukey-Kramer Pairwise Comparisons for Stages of Change at 2 ½ Month Follow-up	51
11. Tukey-Kramer Pairwise Comparisons for Stages of Change at 6 Month Follow-up	52
12. Number of Participants at Pre-Treatment, 1 Month, 2 ½ Month, and 6 Month FU who Performed Monthly Exams vs. those not Performing Regular Exams	55

## **LIST OF FIGURES**

<b><u>Figure</u></b>	<b><u>Page</u></b>
1. <b>Adjusted Means for Behavior Change Measure (BCM) By Condition and Across Time</b>	<b>43</b>
2. <b>Adjusted Means for Stages of Change Measure (SCM) By Condition and Across Time</b>	<b>48</b>
3. <b>Percent Correct on TC Knowledge Measure By Condition Averaged Across all Follow-up Periods</b>	<b>53</b>

## **CHAPTER 1**

### **Introduction**

#### **Literature Review**

##### **Men's Responsibility for Health Maintenance Behavior**

Responsibility for *prevention* of medical problems lies primarily with each of us as individuals. Whereas medical practitioners provide services for individuals once diseases are discovered, health maintenance is controlled primarily by the person. The U.S. Preventive Services Task Force (1996) reported that 50% of all deaths in the U.S. could be prevented through changes in personal health practices. The top ten causes of death for men in the United States (in order) include: heart disease, cancer, accidents, suicide, homicide, HIV infection, liver disease, cerebrovascular disease, diabetes, and asthma (Centers for Disease Control and Prevention, 1998). Additionally, men are more at risk for developing serious illnesses than women (Department of Health, 1992). Research also shows that men prefer to "do nothing" rather than visit their doctor (Bradford, 1995).

Of particular concern is the research which shows that young men, specifically college men, engage in fewer health promoting behaviors and, in general, have less healthy lifestyles than college women (Kandrack, Grant, & Segall, 1991; Lonquist, Weiss, & Larsen, 1992; Ratner, Bottorff, Johnson, & Hayduk, 1994). For example, college men score lower on indices of protective health behaviors including seat belt use, obtaining health information, consuming a healthy diet, and participating in regular

exercise (Weiss & Larson, 1990). Research has also shown that among first year college students, women were twice as likely as men to have sought out medical services in the prior year (Foote, Harris, & Gilles 1996). Another study found that college men were less willing to seek help for physical illness compared to women (Boehm, et al., 1993) or to follow routine health care recommendations (Courtenay, 1998). Teaching men to perform regular preventive or early detection-health practices can significantly affect longevity and potentially lead to a better quality of life. In addition, Longquist, Weiss, and Larson (1992) found that college men's participation in health practices diminish with age, while women's practices increase. This further prompts the need for health education at a young age in order to provide a foundation of knowledge concerning the benefits of life-long health care maintenance.

In general, research suggests that although men are at risk for health problems, they show minimal commitment to exerting control over their health. They are also less likely than women to perceive themselves as engaging in unhealthy behaviors or to be at risk for illness or injury (Lipnickey, 1986; Savage, 1993; US Department of Health and Human Services, 1992; Weissfeld, Kirscht, & Brock, 1990).

Unfortunately, few empirical investigations have focused on behavior change for health care maintenance in the young adult population particularly involving education, assessment, and interventions concerning young men's health needs (Hovell, Mewborn, Randle, & Fowler-Johnson, 1985). There are several possible reasons for the lack of health research involving young men. Researchers may simply ignore young men because they are viewed as healthy by others and view themselves as impervious to illness. Research indicates that women are more likely to perform health-promoting

behaviors compared to men. However, the research has suggested that men are willing to participate in health practices when given health information and provided with sufficient reasons to participate in a healthy lifestyle (Moore & Topping, 1999).

An area that warrants further clinical and empirical investigation is the exploration and identification of effective methods of teaching men how to perform testicular self-examinations (TSE). Cancer is a leading cause of death in the United States affecting men of all ages (National Cancer Institute, 1999). Testicular cancer (TC) is a rare but specific cancer affecting men at a young age (American Cancer Society, 1993).

### Epidemiology

Testicular cancer is the most common neoplasm in North American White males between the ages of 15 and 35 (Altman & Sarg, 1992; Peate, 1997; Roth, Nichols, Einhorn, Richie, & Shipley, 1993). Figures in the USA indicate that there are approximately 6,500 new cases of TC every year (Meadus, 1995). Incidence rates may, in fact, be higher due to the fact that the cancer may originate in the testes, but spread to other parts of the body and therefore be reported as another type of cancer (Reno, 1988). Whereas it is estimated that 3 American men in 1,000 will develop TC at some point in their lifetimes (National Cancer Institute, 1985), this disease accounts for one of every seven deaths in late adolescents and young adult men (Misener & Fuller, 1995). Incidence rates have increased more than 200% in the last 2 decades, although the reason for this increase remains unclear (Friman & Finney, 1990). Approximately 90 percent of tumors of the testes are diagnosed as malignant (Meadus, 1995) and about 50 percent of these tumors are diagnosed with metastases (Cummings, Lampone, Mettlin, Pontes, 1983).

Testicular cancer is 4 to 5 times more common in Caucasians than African Americans. Hispanics, Asians, and Native Americans tend to fall in between (Murphy, 1983; Schottenfeld & Warshauer, 1982; National Cancer Institute, 1985). It has also been noted that testicular cancer tends to rise with increasing socioeconomic status (Vogalzung & Lange, 1991).

### Risk Factors and Symptoms

Although the cause of testicular cancer is unknown, several risk factors have been identified by oncology researchers. Family history, trauma, heat exposure, undescended testicles, and males whose mothers took diethylstilbestrol (DES) during pregnancy are all thought to be influential, but no conclusive evidence supports an exact cause (Meadus, 1995). The most common symptoms include a lump in the testicle, a painless swelling, a dull ache, or heavy sluggish sensation in the lower abdomen, groin or scrotum. Pain is more likely to be associated with advanced stages of the cancer (Cummings, Lampone, Mettlin, & Pontes, 1983).

### The Course of Testicular Cancer

Once a malignancy is detected, the course of the cancer usually proceeds through three stages. In stage 1, the disease is confined to the testicles, epididymis, and spermatic cord. In stage 2, the disease spreads to the retroperitoneal lymph nodes on the lining of the abdominal cavity, and in stage 3 the disease spreads to the diaphragm, into the lungs, or into other vital organs such as the heart (Higgs, 1990). Stages 1 and 2 can be successfully treated through a combination of radiation therapy, chemotherapy, and surgery (Altman & Sarg, 1992; Higgs, 1990). However, prognosis at stage 3 is considerably more guarded (Oliver, 1985). The delay of diagnosis and the high growth

rate of testicular tumors leads to approximately 50 percent of the diagnoses of testicular cancer being detected after stage 2 (Prout & Griffin, 1984). Studies indicate that death or disability due to the disease is almost always the result of delayed detection (Bosl, Voelzang, & Goldman, 1981; Friman & Christopherson, 1986; Prout & Griffin, 1984).

If detected early, testicular cancer has a relatively good prognosis with total remission rates between 70% and 80% (Bosl, 1984; Jacobs, Johnson, & Wood 1966). A 95% cure rate is possible when the earliest symptom (i.e., a small painless lump on the surface of the testicle) is detected through procedures such as TSE and treatment is rapidly initiated (Cummings, Lampone, Mettlin, & Pontes, 1983; Dahl, 1985, Demetriou, 1992; Goldenring, 1985).

### Psychosocial Factors

In addition to medical sequela, men are likely to suffer many psychosocial problems resulting from a diagnosis of testicular cancer. Since TC reaches its peak incidence in early adulthood, this cancer is most likely to affect a man's occupational, sexual, and social functioning (Graham & Gibson, 1972; Heidenreich & Hofmann, 1999). Moreover, the disease affects the sexual reproductive system at a time when fertility may be of major concern (Gorzynski & Holland, 1979; Kedia, Markland, & Fraley, 1975). Testicular cancer may also lead to several types of psychological problems for young men. The disease may affect ones' psychosocial integrity, body image, sense of masculinity, sense of generativity, and sexual desire and performance (Gorzynski & Holland, 1979). There is also an additional risk for depression, anxiety, and anticipation of pain and surgical mutilation (Weisman & Worden, 1976-77). Although early death or disability from any cause is a tragedy, the death of a young man from a highly curable

disease such as testicular cancer may leave people feeling saddened and angry at health care professionals (Friman & Finney, 1990).

### Recommendations by Health Organizations

In order to decrease the delay between tumor detection, diagnosis, and treatment, health organizations commonly recommend that males conduct periodic TSEs (Cavanaugh, 1983; Garnick, Mayor, & Richie, 1980; Marty & McDermott, 1983).

Testicular self-examination is a noninvasive, private, safe, and convenient procedure that requires little time and no technical equipment (Sawyer, 1986). This is a convenient and effective way to initiate the process of early detection and body awareness. Educating young males about TSE may be motivational to adolescents and young adults who are at the peak of their curiosity about their bodies and the dynamic nature of their biological systems (Marty & McDermott, 1983). Evidence further suggests two good reasons for teaching males behavioral strategies related to self-management of health: a) to decrease unhealthy habits at a younger age in order to reduce risk of diseases, and b) to learn prevention and early detection practices applicable in later years (Johnson-Saylor, 1980; Lipnickey, 1986). Although men are entitled to being educated about their health risks, efforts to provide males with training in the early detection of cancer have lagged behind training for females in breast self-examination (BSE) (Goldenring & Purtell, 1984).

Table 1 provides an overview of survey studies that have examined knowledge of TC and TSE rates among high school and college students. These survey studies have consistently shown that men are unaware of the symptoms of TC and have little knowledge concerning their risk for developing this disease. Research has also indicated

**Table 1**

**Survey Studies on Testicular Cancer Knowledge and TSE Behavior**

<b>Study</b>	<b>Sample</b>	<b>N</b>	<b>Findings</b>
<b>Cummings, Lampone, Mettlin, &amp; Pontes (1983)</b>	<b>College Students</b>	<b>266</b>	<b>42% had knowledge of risk for TC 16 % had knowledge of TSE 5% practiced TSE</b>
<b>Goldenring &amp; Purtell (1984)</b>	<b>College Students</b>	<b>147</b>	<b>13% had knowledge of risk for TC 9 % had knowledge of TSE 6% practiced TSE</b>
<b>Blesch (1986)</b>	<b>College Students</b>	<b>129</b>	<b>31% had knowledge of TSE 61% had knowledge of risk for TC 9.5% practiced TSE</b>
<b>Thornhill, Conroy, Kelley, Walsh, Fennely, &amp; Fitzpatrick (1986)</b>	<b>College Students</b>	<b>365</b>	<b>13% had knowledge of risk for TC 8 % had knowledge of TSE 1% practiced TSE</b>
<b>Ganong &amp; Markovitz (1987)</b>	<b>College Students</b>	<b>64</b>	<b>25% had knowledge of risk for TC 18% had knowledge of TSE 8% practiced TSE</b>

<b>Reno (1988)</b>	<b>College Students</b>	<b>126</b>	<b>9.5% practiced TSE (approximately half of them regularly practiced self-exams with approximately half of them learning about it through American Cancer Society literature) 87% had no knowledge of TSE (87% of those participants stated that they would practice TSE if they were given the information)</b>
<b>Vaz, Best, &amp; Davis (1988)</b>	<b>9<sup>th</sup> Grade Males</b>	<b>1364</b>	<b>28% had no knowledge of risk for TC &lt;2% had been taught TSE</b>
<b>Martin (1990)</b>	<b>Ages 18-64</b>	<b>560</b>	<b>8 % practiced TSE</b>
<b>Neef, Scutchfield, Elder, &amp; Bender (1991)</b>	<b>College Students</b>	<b>404</b>	<b>42% had knowledge of TSE 23% practiced TSE 8% reported regularly practicing TSE</b>
<b>Singer, Tichler, Orvieto, Finestone, &amp; Moskovitz, (1993)</b>	<b>Soldiers</b>	<b>717</b>	<b>16 % had knowledge of TSE 2% reported practicing TSE</b>
<b>Wardle, Steptoe, Burckjardt, Voge, Vila, &amp; Zarczynski (1994)</b>	<b>College Students</b>	<b>16,486</b>	<b>13% had knowledge of TSE 10% reported occasional practice of TSE 3% reported regular practice of TSE Men rated TSE as less important to health than women</b>

---

<b>Katz, Meyers, &amp; Walls (1995)</b>	<b>College Students</b>	<b>78</b>	<b>9% had knowledge of risk for TC</b> <b>38% said TSE was unimportant</b> <b>75% rated knowledge of correct TSE as poor</b> <b>19% practiced regular TSE</b> <b>Participants were poorly informed about prevalence, survival rates, known risk factors, proper TSE, and knowledge that testicular tumors are usually discovered by TSE</b>
<b>Schaffner (1995)</b>	<b>Patients in a state operated clinic</b>	<b>211</b>	<b>98.5 % had no knowledge of TSE</b>
<b>Moore, Barling, &amp; Hood, (1998)</b>	<b>College students</b>	<b>116</b>	<b>18.1% practiced regular TSE</b> <b>30.2% practiced TSE 1/year</b> <b>51.8% never practiced TSE</b>
<b>Moore &amp; Topping (1999)</b>	<b>College students</b>	<b>203</b>	<b>78% interested in accessing information</b> <b>32 % had prior knowledge of TSE</b> <b>22% practiced TSE</b> <b>1 participant recognized the correct procedure and indicated regular practice of TSE</b>

---

that college male's awareness of TSE procedures ranges from a low of eight percent to a high of 31 percent. Furthermore, between one and 23 percent of male students stated that they practiced TSE, although not necessarily regularly (Cummings, Lampone, Mettlin, & Pontes, 1983; Goldenring & Purtell, 1984; Katz, Meyers, & Walls, 1995; Neef, Scutchfield, Elder, & Bender, 1991; Thornhill, Conroy, Kelley, Walsh, Fennely, & Fitzpatrick, 1986). Moreover, Moore, Barling, and Hood (1998) found that males were more likely to perceive self-examination practices as "degrading, harmful, painful, unreliable, and not important" compared to women. Another study found that over one-half of participants reported that they failed to practice TSE due to forgetfulness, one third stated that it was not necessary at their age, and one third stated they were not concerned about getting cancer (Rudolf & Quinn, 1988). On the other hand, Neef, Scutchfield, Elder, and Bender (1991) found that those who practiced TSE monthly were familiar with testicular cancer, felt comfortable with testicular self-examination, and believed that continuing to conduct exams would affect their chances of detecting cancer at an early stage. Overall, the results of empirical studies indicate that the majority of men are unaware of the risk factors and symptoms of TC, and even fewer examine themselves on a regular basis (Dieckmann, 1988). These findings reemphasize the need to create an educational environment that provides accurate knowledge, training, and perceptions of self-efficacy regarding health promotion (Bandura, 1986).

### The Pros and Cons of Teaching TSE to Young Men

Similar to teaching BSEs, TSE may lead to early detection of tumors. However, there are several arguments in the literature that may dissuade health educators from teaching TSE.

One argument given by researchers and health care providers is that TSE screening (i.e., self-examinations) is not recommended because it is not a major public health problem (Buetow, 1996). For example, there is a low incidence rate of testicular cancer, even in young men. Secondly, some health educators question the lack of evidence that screening leads to early detection and treatment, thereby decreasing mortality and morbidity rates and improving prognosis (Austoker, 1994). Thirdly, the utility of screening for a low base rate disease may lead to false positives which may produce unnecessary anxiety and financial burdens for the patient and unnecessary utilization of resources for the health care system.

Regarding the first argument, TSE is on the rise, especially within White non Hispanic populations (Swerdlow, 1993). Although incidence rates are low, teaching TSE may lead to an increase in men's body awareness and the discovery of other medical problems. Furthermore, TSE may provide knowledge about an individual's baseline for normal lumps or spots and lead to a higher internal locus of control concerning personal health care.

With regard to the second argument, TSE appears to be an appropriate technique given that the most common symptom of TC is a palpable mass in the testes (Buetow, 1996). Moreover, effective educational interventions may actually attenuate costs burdened upon the health care system and the individual by teaching participants to become familiar with their body and be able to detect physical abnormalities. Moreover, the cure rate of TC changes significantly between detection at stage 1 verses detection at stage 3. Detection of stage 1 TC has a cure rate as high as 95 percent. To the contrary, rapid growth of the tumor due to delayed detection of TC at stage 3 may carry

significantly more risk of metastasis and more intensive treatment procedures. Early detection through proper TSE practices may minimize the need for invasive surgical procedures and avoid harmful side effects induced by later stages of the disease. Feelings of anxiety may diminish when participants learn to compare and contrast typical changes expected in their body with abnormal physical changes.

With regard to the last argument, the sensitivity (i.e., the likelihood of a positive test result in men with the disease) and specificity (i.e., the likelihood of a negative test result among those who do not have the disease) of TSE practices must be explored (Buetow, 1996). A valid screening test has both high sensitivity and high specificity that should separate people with the disease from people without the disease. The ability of the test to correctly identify people is dependent on the test results of an external source which divides people into being correctly and incorrectly identified. Generally, TSE has been found to have high sensitivity or a low number of false negatives (i.e., people with the disease that are called negative) (Buetow, 1996). Evidence suggests that as many as 97% of men with TC reported a palpable testicular mass (Thornhill, Fennelly, Kelly, Walsh, & Fitzpatrick, 1987).

The case for specificity is not as strong. In fact, non experimental evidence suggests that TSE may have low specificity or a high number of false positives (i.e., people who think they have a disease, but do not) which is an important consideration, due to the burden of more invasive and unnecessary tests (Buetow, 1996). Although, changes found in the testicles may be benign, any changes in the testes which are recognized by the individual as “unusual” through proper evaluation of the testes, should be discussed with a physician. If further exploration is required, ultrasonography which is

a low risk non invasive procedure, may reduce the need for expensive surgical procedures (Buetow, 1996).

Additionally, increases in anxiety and rumination would potentially provide no benefit to many men who would perform TSE's (Goldbloom, 1985). Fortunately, teaching self-examination to young males has not been shown to significantly increase anxiety. In fact, research tends to indicate that learning to correctly perform regular self-exams may actually reduce anxiety due to increased self-efficacy and a greater sense of control over one's health (Friman & Finney, 1990; Rosella, 1994). Providing knowledge about TC risk and teaching rigorous self-examination techniques through modeling, rehearsal, and corrective feedback may be important factors to consider when developing an approach that is valid and produces fewer false positives.

Thus, although some studies suggested that there was no convincing evidence to support the efficacy of TSE (e.g., Buetow, 1996; Westlake & Frank, 1987) numerous studies, regardless of incidence rates, have promoted the teaching of TSE to the young male population (American Cancer Society, 1978; Austoker, 1994; Cavanaugh, 1983; Dieckmann, Becker, & Bauer, 1987; Einhorn, 1986; Einhorn, 1993; Friman & Finney, 1990; Goldbloom, 1985; Goldenring, 1986; Klein, Berry, & Felice, 1990; National Cancer Institute, 1985; Ostwald & Rothenberger, 1985; Prout & Griffin, 1984; Rosella, 1994; Meadus, 1995). Einhorn (1993) recommends monthly TSE due to the fast growth rate of TC tumors. The director of cancer screening for the American Cancer Society further agrees that "self examination means finding this cancer at a more treatable stage" (see Heins, 2001, p. 222). A late diagnosis may require more complex treatment or be

fatal (Higgs, 1990). All evidence considered, teaching a health promoting technique such as TSE to the college population has received the support of the health care profession.

### Past Intervention Studies

The majority of empirical investigations conducted over the last twenty years have focused on surveying men's knowledge of TC and TSE while few have studied the outcome of different intervention strategies. The following review of the literature will explore the theoretical models of health behavior, describe how these models have been applied to TSE, and summarize the findings of outcome studies.

Most intervention studies have been based on psychosocial factors associated with TSE according to theoretical models such the Health Belief Model (Blesch, 1986; Marsh, 1991; Millon-Underwood & Sanders, 1991; Reno, 1988; Rudolf & Quinn-MacEwen, 1988) and the Theory of Reasoned Action (Brubaker & Wickersham, 1990; Ganong & Markowitz, 1987; Steffen & Gruber, 1991). The Health Belief Model (HBM) describes four primary components related to practicing a health behavior: (a) perceived severity of the illness, (b) perceived threat or susceptibility to the illness, (c) perceived benefit from following health recommendations, and (d) perceived barriers to performing the health behavior (Glanz, Lewis, & Rimer, 1990). This model suggests that an individual must have cogent reasons for practicing health behavior, clear assurance that the behavior will yield health benefits, and an environment conducive to performing the behavior. The Theory of Reasoned Action (TRA) hypothesizes that attitudes and subjective norms predict an individual's intention to perform a health-related behavior. An individual's attitudes are developed from beliefs about the health behavior and the perceived costs and benefits of engaging in the behavior. A person's subjective norms are positively

influenced by family/friends who support and promote the behavior to be performed (Moore, Barling, & Hood, 1998). Both of these models assume that individuals engage in a cost/benefit analysis, with benefits needing to outweigh costs before the behavior is initiated. These theories have important implications for designing effective treatment interventions to increase health-promoting behaviors.

Another theory proposed to predict behavior change is the transtheoretical model of behavior change (Prochaska, Johnson & Lee, 1998). This model describes the stages that individuals are assumed to move through in relation to a variety of health behaviors such as smoking cessation, decline in substance use, condom usage, and regular exercise. Prochaska and DiClemente (1983) have proposed a series of five stages of health behavior change (i.e., precontemplation, contemplation, preparation for action, action, and maintenance) that have implications for the development of intervention programs. The model predicts that an individual's readiness to change is based on the perceived balance of costs and benefits. Measures based on the five stages of the transtheoretical model have been shown to possess adequate psychometric properties and have been recommended for use in outcome studies where more refined measures of change are desired (Morera, Johnson, Freels, Parsons, Crittenden, Flay, & Warnecke, 1998). Prochaska and DiClemente (1983) have suggested that different interventions may be needed to accommodate different people, depending upon where they are in the change process. For example, individuals who are less likely to be cognizant of their risky behavior may require an educational intervention, whereas individuals who are already knowledgeable may benefit from guided practice by an expert.

**These theories address the importance of beliefs and attitudes when measuring behavior change. Although the current study will not measure the validity or applicability of these theories, it will examine the beliefs and attitudes of individuals as outcome measures.**

**Past studies examining TSE have suggested different educational interventions to change health behavior practices. Rosella (1994) suggested that studies should increase knowledge of testicular cancer through the educational curricula in high schools and colleges by way of video presentations, use of silicone models to ensure that men can accurately detect lumps, and studying the compliance rate of men to perform TSE.**

**Although research is limited, Table 2 provides an overview of the intervention literature focusing on TC and TSE. Generally, studies have examined the effects of combining information pamphlets, informational films that are health related or specific to TSE, modeling and feedback concerning TSE with lifelike models, question and answer periods with a physician, and personal testimonies of testicular cancer survivors (Craun & Deffenbacher, 1981; Dachs, Garb, White, & Berman, 1989; Klein, Berry, & Felice, 1990; Marty & McDermott, 1985; Murphy & Brubaker, 1990; Ostwald & Rothenberger, 1985; Rudolf & Quinn, 1988; Walker & Guyton, 1989; Weist & Finney, 1996).**

**Reno (1988) found that approximately half of college students who practiced TSE regularly (4.5 percent) had been educated through magazines or literature from the American Cancer Society. Additionally, 87 percent of the individuals who said they had never heard of TSE stated that they would practice self-examination if they were given the information. Although Boehm, et al. (1993) found that college students indicated a**

**Table 2**

**Outcome Studies on Testicular Cancer and TSE**

<b>Study</b>	<b>Sample</b>	<b>N</b>	<b>Conditions</b>	<b>Outcome</b>
<b>Craun &amp; Deffenbacher (1981)</b>	<b>College Students</b>	<b>40</b>	<b>Participants received sex organ and self-examination information.</b>	<b>At 2-month follow-up, there was a significant increase in self-exam behavior.</b>
<b>Marty &amp; McDermott (1985)</b>	<b>College Students</b>	<b>128</b>	<b>Group A – Former testicular cancer patient presented personal medical history to participants and provided information on TC and TSE Group B – Moderator distributed 2 American Cancer Society pamphlets about TC and TSE and asked participants to read and study each carefully.</b>	<b>At a 3 month follow-up, Group A conducted more TSE, <math>p &lt; .01</math>, reported greater susceptibility to cancer, and perceived their session as having greater value. Both groups reported being more concerned about their health and well-being. No differences in knowledge were reported.</b>
<b>Ostwald &amp; Rothenberger (1985)</b>	<b>College Students</b>	<b>577</b>	<b>Participants received an audiovisual program on male preventive health behaviors with a focus on TSE.</b>	<b>77.6% reported being comfortable with performing TSE and 42.3% who had never performed TSE planned to do it in the future.</b>
<b>Rudolf &amp; Quinn (1988)</b>	<b>College Students</b>	<b>64</b>	<b>Participants received an 18 minute film about TC (incidence, symptoms, treatments, TSE technique), a pamphlet, and a demonstration by facilitators.</b>	<b>63.9% who had never previously performed and exam, did perform it at least once. At the 1 month follow-up and knowledge did not increase significantly at pretest.</b>

---

Walker & Guyton (1989)	College Students	161	<p>Control Group – No intervention</p> <p>Group A – Slide program, pamphlet, and Question (Q) &amp; Answer (A) period.</p> <p>Group B – Slide program, pamphlet, Q &amp; A period, and modeling using a lifelike model.</p> <p>Group C – Slide program, pamphlet, Q &amp; A period, modeling using a lifelike model, and guided practice under supervision of a facilitator.</p>	<p>All treatment groups increased behavior, attitudes, and knowledge compared to the control group. However, the component of modeling and guided practice did not increase knowledge or behavior compared to the other treatment groups, but did increase positive attitudes toward TSE. At a 3 month follow-up, frequency of TSE increased from 8.3% to 78.9% for the treatment groups and 12.5 % to 20 % for the control group.</p>
Dachs, Garb, White, & Berman (1989)	College Students	633	<p>Group A - Read pamphlet (risks and signs of TC and TSE technique).</p> <p>Group B – Read pamphlet (risks and signs of TC and TSE technique) and a given a 5 minute talk and Q and A period by a physician on TC.</p>	<p>Prior to study, only 4.7 % reported regular practice of TSE. At a 3 month follow-up, both interventions were effective, however, participants in Group A increased behavior 18% and Group B increased to 36%.</p>

---

Murphy & Brubaker (1990)	High School Students	99	<p>Group A – A 12 minute film based on the Theory of Planned Behavior</p> <p>Group B – An information based Film.</p> <p>Group C – pamphlet containing general health information, but did not mention TSE or TC.</p>	<p>At a 1 month follow-up, Group A reported a stronger intention to perform TSE.</p> <p>42% in Group A reported performing TSE vs. 23 % in Group B and 6 % in Group C</p> <p>TSE knowledge was higher in Group A.</p>
Brubaker & Wichersham (1990)	College Students	232	<p>All participants were given a lecture, assigned reading, and given an American Cancer pamphlet.</p> <p>At 6 weeks, half the participants were exposed to a poster in their dormitory reminding them to do an exam.</p>	<p>At 3-month follow-up, knowledge increased.</p> <p>Social pressures were influential in prediction of intention to do a self-examination. Intention and behavior correlation was stronger when given the reminder.</p>
Klein, Berry, & Felice (1990)	Males seeking Health Care at the Adolescent Medicine Clinic	66	<p>Participants received a booklet of information on TC that was designed for individualized learning and enhancing behavior motivation.</p>	<p>Pretest – 15% were aware of risk of TSE; 6% had been taught TSE by a health professional</p> <p>Posttest – 98% said booklet was helpful and 75% reported that they would perform a TSE in the future.</p> <p>2 Year Follow-up – 67% reported performing at least one TSE, 75% reported doing a TSE at least every few months since reading the booklet, and 95% were aware that a small lump was the most common symptom of TC.</p>

<b>Weist &amp; Finney (1996)</b>	<b>High School Students</b>	<b>29</b>	<b>Participants received a verbal presentation on TC and TSE or read a pamphlet by the American Cancer Society.</b>	<b>Neither training sessions led to an increase in Anxiety.</b>
<b>Weist &amp; Finney (1996)</b>	<b>College Students</b>	<b>30</b>	<b>Participants watched a film or reviewed a pamphlet on TC and TSE.</b>	<b>Neither training sessions led to an increase in Anxiety.</b>

preference for obtaining self-help information through reading material, the authors disagreed and suggested that the intervention needs to be designed for efficiency, creativity, and integration into the student's demanding lifestyle. These researchers also emphasized the importance of peer and social reinforcement of health practices to promote behavior change. Thus, information seems to be an important component of behavioral intention, but may not be sufficient for producing actual behavioral change.

Walker and Guyton (1989) found that modeling and practice of TSE increased positive attitudes toward TSE. Thus, providing students with the opportunity to practice TSE on a model may affect their attitude which in turn may play a role in changing behavior. Other studies have used personal testimonials from a former patient who had TC (Marty & McDermott, 1985) or the advise of a physician regarding the importance of performing TSE (Dachs, Garb, White, & Berman, 1989). Both studies found a significant change in behavior beyond the impact of information pamphlets alone. Participants who listened to the personal testimony of a former cancer patient reported greater susceptibility to cancer and perceived their session as having greater value. The involvement of a physician's presentation increased TSE behavior by 50 percent compared to the "information alone" condition. This suggests that an effective study would provide the testimony of an "expert," whether that be a former patient or a practicing physician.

### **The Present Study**

In general, the literature has focused on variants of four interventions to inform men about TC, to teach TSE, and to encourage regular self-examination behavior. These interventions include: (a) written information (i.e., brochures, pamphlets), (b)

testimonials of cancer survivors on the importance of self-examination, (c) guided practice and feedback regarding TSE, and (d) group discussion of the importance of TSE and encouragement for monthly self-examinations. Past studies have generally evaluated one or two of these interventions, however no studies have examined the cumulative effects of the treatment components listed above. This study employed five interventions, including a No-Treatment Control, to assess the additive efficacy of treatment modalities designed to teach college-aged students about TC and TSE behaviors. The methodology replicated previously studied interventions, but employed certain modifications and additions.

Past studies have focused on providing specific information concerning TSE behavior. However, general health beliefs and health care practices may lead to relevant predictions about individuals who practice regular TSE. Thus, this study examined the relationship between individuals performing monthly TSE and practicing other health-related behaviors (i.e., wearing a seat belt, refraining from binge drinking).

Although most of the aforementioned studies investigated feasible intervention strategies, several included the use of live testimonials by former patients or presentations by physicians. In order to be cost-effective, interventions need to reach a large number of people through easily accessible and efficient methods. Thus, a videotaped testimonial of a male testicular cancer survivor was used to provide a less expensive and more practical method for teaching TSE. Additionally, social learning theory suggests that perceived similarity of the model is positively correlated with subsequent behavior change (Bandura, 1986). Thus, a young male was chosen as the model for providing both a testimonial and a TSE demonstration.

Self-efficacy has also 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 to increase self-confidence. Additionally, because the degree of progress toward behavior change varies, a more sensitive measure (i.e., stages of change) was applied to assess behavioral intention in addition to asking participants for the frequency of performing self-exams.

Another dimension of past studies includes the education of males without the concurrent participation of females. Educating females, a population that is already more likely to perform health maintenance behavior, may increase the probability that males will learn about or be encouraged to perform self-exams due to their roles as family members, partners, or friends. This study taught both men and women about BSE and TSE so that college students would receive social support not only from the same gender, but also different gender peers, including partners. Thus, another component of this study was aimed at addressing the importance of teaching self-exam behaviors to both males and females and discussing its importance in a group discussion format. A colleague, studying the impact of the interventions on women, collected data in conjunction with the primary investigator. Thus, one hundred and ninety eight women from PY 100 also participated, but data were analyzed separately.

Additionally, the facilitators for the interventions always composed of a male and a female college-aged student. They were voluntary peers interested in campus-wide health promotion. The literature tends to indicate that “peer-led” health education is at least as effective if not more effective than “professionally led” health education

programs (Mellanby, Rees, & Tripp, 2000). Additionally, Lindsey (1997) reported that friends seek advice from friends influence the expectations, attitudes, and behaviors of their social circle.

Finally, research suggests that maintenance of health behaviors is important. Thus, teaching the behavior is only one part of integrating it into a person's life-long behavior pattern. In order to measure the effectiveness of the intervention over time, participants were evaluated at 1-month, 2 ½-months, and 6-months following termination of the intervention.

Before moving into methodology, the cumulative approach will be explained based on the modifications and additions mentioned above. Each treatment intervention builds upon the one prior. Thus, beyond the no-treatment control condition, the first treatment condition (Treatment A) was an informational brochure condition that consisted of reading pamphlets on breast and testicular cancer. The second condition (i.e., Treatment B) consisted of the informational brochure intervention plus viewing a video-taped testimonial of a young male and female testicular/breast cancer survivor who also demonstrated how to conduct a self-exam on a latex model. The third treatment condition (Treatment C) consisted of the informational brochure intervention, the taped testimonial and demonstration intervention, plus a live demonstration and guided practice on how to conduct a self-examination using both a latex breast and testicle model. Each participant was provided with feedback aimed at increasing self-confidence in correctly performing the examination. The fourth and final treatment condition (Treatment D) consisted of the informational brochure intervention, a taped testimonial and demonstration, the live demonstration and guided practice, and a group discussion in which participants were

encouraged, but not required, to discuss why it was important to conduct self-examinations and when and where they were planning to perform a self-examination.

Thus, the purpose of the current investigation was to (a) assess the efficacy of a cumulative multi-modal approach to teaching TSE to men and women, (b) evaluate the relationship of general health behaviors and beliefs about TSE performance, (c) examine knowledge and attitudes concerning TSE as a result of various interventions, (d) assess the maintenance of the behavior across a 6 month period, and (e) employ intervention strategies that are cost-effective and applicable to college populations.

Given the complexity of this study and the paucity of psychometrically sound measures, the present investigator constructed and modified several measures to adapt to the general hypotheses. The psychometric properties of assessment measures were evaluated to support the utility of this study.

### **Hypotheses**

Three hypotheses were predicted prior to implementation of this study. The first was that the more complex treatment interventions, those which employed several instructional modalities, would lead to the largest increase and greatest maintenance of TSE behavior. Additionally, positive changes were expected to occur with respect to behavioral intent (i.e., SCM), the knowledge measure, and the attitudes measure based on the different interventions over a 6 month period. Lastly, participants who were performing monthly TSE were predicted to be more likely to perform other health behaviors.

## **CHAPTER II**

### **Method**

#### **Participants**

One hundred and sixty-four men participated in this study. Students were recruited from a large state university using traditional methods for obtaining students from psychology classes. Students used in this study had the opportunity to obtain research credit for their participation.

Eighty percent of the participants were White non Hispanic, 4.3 percent were African American/Black, 4.9 were percent were Asian, 4.3 percent were Hispanic, 1.5 percent were Native American, and 5 percent were of mixed racial background, mixed other, or International students. The mean age of participants was 19.39 years (range = 18-44; SD = 2.44). Seventy-seven percent of the participants were first year college students, 10 percent sophomores, 9 percent juniors, 3 percent seniors, and 0.6 percent other. Eighty seven percent of the participants reported that they had not performed a testicular self-exam in the last month. Thirty three percent stated that they had learned about TSE in one of their high school classes, 23 percent had learned about it through their physician, and 33 percent had never learned about TSE. The remaining 11 percent had heard about TSE through other sources (i.e., family, college classes etc.).

## **Instruments**

**Demographic Information** The demographic questionnaire (See Appendix A) asked students to indicate their age, gender, ethnicity, relationship status, and to answer various questions regarding their perceptions of their own current health, health behavior, and family history of cancer. They were also asked to report where they learned about breast or testicular self-exams.

**Behavior Change Measure (BCM)** At pre-treatment, students were asked to report the frequency of TSE within the last month and within the last 6 months. At the 1, 2 ½, and 6 month follow-ups, participants were again asked to report the number of times they performed a TSE since participation in the study. Given the 1 TSE recommendation per month, participants' reports of TSE frequencies were averaged to obtain a monthly BCM score.

**Health Risk Inventory (HRI)** The HRI (Courtenay, 1996; See Appendix B) is a 60-item inventory that measures participants' general health attitudes, beliefs, and behavior. Respondents rate their responses on a Likert-type scale ranging from 5 = "Always" to 1 = "Never." Questions include, "I eat fruits and vegetables at least twice each day," "I get into physical fights when I get really angry," and "I do not think much about health issues because it doesn't really help." The author of the scale is currently evaluating the reliability and validity of this measure.

**Stages of Change Measure (SCM)** The SCM (See Appendix C), created for the present study and based on Prochaska and DiClemente's model of change (Prochaska, Johnson, & Lee, 1998), was used to assess levels of change on a continuum from minimal awareness of TC to feeling confident about correctly performing regular TSEs. This

measure was comprised of six rank-ordered scenarios, asking participants to choose the one that was most representative of their current TSE behavior. For example, a person at the first stage (scored 1) would agree with the following scenario: “I don’t know much about testicular cancer and have never really thought much about it. Testicular cancer is not something that I need to worry about because it is unlikely that I would ever get it. Even if I were at risk for it, I do not think that I need to do anything to try to prevent it or increase the chance of detecting it.” A person in stage 4 would respond, “I am at risk for testicular cancer and have done an exam within the past month. I generally remember to do testicular self-exams regularly (i.e., monthly) and I plan to continue to do so. I am extremely confident that I know how to do a testicular self-examination correctly.” Stages 5 and 6 address issues of maintenance and relapse.

**Testicular and Breast Cancer Knowledge Questionnaire** The Testicular Cancer Knowledge (TCK) and Breast Cancer Knowledge (BCK) Questionnaires (See Appendix D and E) are 15-item True/False measures of knowledge about Breast and Testicular Cancer and self-examination behavior. Sample items included: “Women who have a family history of breast cancer have a higher risk of developing breast cancer themselves” and “Testicular cancer is more common among older men than among younger men.” The measure was created by the researchers and based on information presented in “health pamphlets” that participants received in the four active treatment conditions. Participants were asked to complete both the breast and testicular knowledge assessment instrument. A 3-item Testicular Cancer Knowledge Composite measure (TCKC) was created based on the criteria that greater than 50 percent of the participants responded incorrectly to an item at pretreatment. The three items covered such topics as

frequency of self-examination, the ethnic group most likely to be at risk for TC, and the age group most at risk for TC.

**Attitudes Toward Testicular Cancer Measure (ATTC)** The ATTC is a 21-item instrument (See Appendix F) asking participants to rate certain beliefs or attitudes related to testicular cancer, self-examination behavior, and general health. Participants responded using a 5-point Likert scale ranging from “strongly agree” to “strongly disagree.” Questions included, “I am confident that I know how to correctly perform a testicular-self examination,” “My religious or cultural beliefs have taught me that touching my testicles is wrong,” and “I like to be well informed in matters regarding my health.” The measure was based on Race’s (1996) measure of attitudes toward breast self-examination. Internal consistency reliabilities for the ATTC measure at pre treatment, 1 month, 2 ½ month, and 6 month follow-ups were as follows: 0.80, 0.87, 0.87, and 0.92.

### **Procedure**

Prior to conducting the study, the primary investigator and a registered nurse solicited participation from interested juniors and seniors of the Student Health Advocate Committee (i.e., a student organization interested in promoting health issues on campus), Premedica (i.e., a campus organization involving students with medical and health-related interests), and interested graduate students enrolled in a doctoral counseling psychology program to conduct the interventions. Ten of these students were selected as “Health Advocates” (HAs) based on their interest in health promotion and their level of social skills. A 3-hour training session was conducted in which HAs were given explicit instructions on how to conduct the study (See Appendix G: Training Manual). Training of HAs took place in University classrooms which were to be used to conduct the

interventions. The HAs participated in a discussion of their own personal biases about health issues and were instructed in each aspect of the study. They were given a script to read and were encouraged not to provide additional information (e.g., personal opinions, family stories). They were given extensive information about confidentiality, consent forms, and the general rights of participants. They were also trained on how to respond to participants that may become upset or distraught during the study. The HAs participated in a “mock” demonstration of the most complex treatment, while following along in their scripts. They completed the assessment instruments, read the health brochures, watched the testimonial videos, practiced how to teach and provide feedback to participants on how to conduct a self-exam, and participated in a discussion about the importance of TSE. A registered nurse trained all HAs to properly perform testicular and breast self-examinations using latex models.

Following the training session, HAs were paired in five teams of one male and one female. Every effort was made to balance teams across the five treatment conditions within the constraints imposed by the HA’s class schedules. Thus, each pair of HAs was scheduled to sign up for all five treatment conditions ranging from 4 to 20 participants in each group. This was to help ensure that individual differences between HA Teams (i.e., personality, tone of voice, teaching experience) would not confound the results.

HA’s conducted a total of twenty-five groups (i.e., five groups per treatment condition). Table 3 provides an overview of the number of male and female participants in each group across each of the five treatment conditions. Due to the unexpected changes in schedules and size of participant groups, all HA teams were not able to

Table 3

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

	No Treatment Control	Treatment A	Treatment B	Treatment C	Treatment D
Group 1	M = 11 F = 9	M = 7 F = 4	M = 8 F = 11	M = 15 F = 7	M = 2 F = 12
Group 2	M = 4 F = 15	M = 3 F = 14	M = 11 F = 8	M = 8 F = 7	M = 7 F = 7
Group 3	M = 7 F = 8	M = 5 F = 13	M = 6 F = 8	M = 6 F = 6	M = 4 F = 6
Group 4	M = 6 F = 4	M = 5 F = 9	M = 5 F = 3	M = 2 F = 2	M = 8 F = 12
Group 5	M = 6 F = 2	M = 9 F = 6	M = 4 F = 10	M = 5 F = 15	M = 8 F = 9

conduct groups involving all five treatment conditions. As a result, each team conducted an average of three groups involving at least three of the five treatment conditions.

The study took place in environmentally similar classrooms in a large campus building. All of the classrooms used a similar lay out and maximum seating capacity. Participants were assigned to one of five treatment conditions based on the day of the week that they signed up for the experiment. All times for the experiment remained constant and the conditions were offered on 4-5 “school” days of the week. A minimum attendance of two male and two female participants were present in order for the intervention to be administered.

Participants’ class and work schedules prohibited true random assignment. Instead, a quasi-random assignment was implemented. First, participants were provided with 25 different days (all the same time of day) to sign up for participation in the study. Treatment conditions were then randomly assigned to each of the group meetings, unless the HAs requirement to conduct all five conditions were in conflict with their class and work schedules.

When students arrived at the pre-assigned classroom, the primary investigator or her colleague, introduced herself and briefly discussed the importance of the study. After attendance was taken, the “health advocates” distributed consent forms which discussed the purpose, procedures, risks, benefits, confidentiality, and liabilities of the study. Students under the age of 18 were excluded due to the delicate and mature nature of the subject matter. The students were asked to sign both copies of the consent form and take one copy for their records. Participants were evaluated on levels of general health behavior (i.e., HRI), frequency of TSE performance, behavioral intention to perform

self-examinations (i.e., SCM), TC and TSE knowledge (i.e., TCK), and attitudes toward TC (i.e., ATTC). Males were also asked to complete a knowledge questionnaire on breast cancer (BC) and BSE (i.e., BCK), however, this measure was not examined as part of the current study.

The HAs subsequently conducted the interventions based on the treatment manual and prior training. As stated previously, there were five experimental conditions related to breast and testicular self-examination.

#### **No Treatment Control Condition**

In the No Treatment Control condition, students were given a packet that included the demographic survey, HRI, frequency of TSE, SCM (gender specific version), TCK, BCK, and the ATTC (gender specific version) assessment instruments. This took approximately one-half hour to complete.

#### **Testicular and Breast Cancer Informational Brochure Condition (Treatment A)**

Condition A received the Testicular and Breast Cancer Informational Brochures (See Appendix H). Students completed the assessment instruments and were then given one informational handout on testicular cancer and one informational handout on breast cancer (See Appendix B) and were asked to read both brochures for 3 minutes. This intervention lasted approximately 35 minutes.

#### **Video Taped Testimonial and Self-Exam Demonstration Condition (Treatment B)**

Condition B received the Testicular and Breast Cancer Informational Brochures and the Video Taped Testimonial and Self-Exam Demonstration. Thus, in addition to completing the assessment instruments, students read the informational handout on testicular and breast cancer and watched a taped testimonial of a woman who found a

**lump in her breast and a male who was diagnosed with testicular cancer. This 12-minute video was produced in the summer of 1999 by the primary investigator and a colleague. Both individuals were chosen specifically for the production of the video.**

**The young 28 year-old White non Hispanic male, “Bob,” was recruited for the videotape through recommendations made by a local Oncology office. Bob is a young male who was very active in sports when he was diagnosed with testicular cancer in 1996. He had undergone extensive treatment. At the time he was contacted, Bob was active in educating others about testicular cancer and was very open to sharing his story on tape. He was provided with a brief outline (see below) of the issues to be covered in the video. Bob presented his story with humor and also demonstrated how to conduct an exam on a latex model.**

**Laura is a 31-year old White non Hispanic female who was working as a psychology intern at the University Counseling Center. She taught many classes prior to her internship and was very familiar with presenting sensitive (i.e., sexual) information to young students. The primary investigator was familiar with Laura’s history of locating a lump in her breast at the age of 29. Following a biopsy, the lump was diagnosed as benign. She shared her emotional experiences with her husband as well as the process she went through as she examined herself and followed up with the physician. In order to maintain consistency, Laura was also provided with a similar outline for her presentation.**

**Each of the testimonials covered the following topics, in order: 1) a brief introduction to TC and BC, 2) a brief description of their personal history, 3) the circumstances surrounding the discovery and treatment of the cancer, 5) their personal reactions, and 6) a demonstration of how to conduct a self-exam on a latex breast or**

testicle model provided by the researchers (See Apparatus section). This intervention took approximately 45 minutes to complete.

### **Live Demonstration, Guided Practice, and Feedback Condition (Treatment C)**

In addition to completing the written assessment instruments, Condition C received the Testicular and Breast Cancer Informational Brochure, the Video Taped Testimonial/Demonstration, and the Live Demonstration/Guided Practice. Following the brochures and the video, participants observed a demonstration performed by the HAs on how to conduct a testicular self-exam and a breast self-exam using the latex anatomic models described below. The male HA demonstrated the TSE and the female HA demonstrated the BSE on the models. Next, all students were allowed to individually practice both a TSE and BSE on each of the latex models. In order to minimize intervention duration, four models (2 of each type) were provided to allow up to four participants the opportunity practice self-examination at one time. All students received individual feedback from a HA about their performance. This intervention took approximately 1 hour and 10 minutes to complete.

### **Discussion Condition Component (Treatment D)**

After completing all assessment instruments, reading the brochures, watching the video, observing the live demonstration, and practicing on models, students in Condition D participated in a guided discussion lead by the HAs. The discussion included the following topics: 1) When and where to do a self-exam (e.g., in the shower or in front of a mirror in a private bathroom), 2) the importance for both males and females to know how to do both breast and testicular exam, due to the possibility of performing exams on a sexual partner or teaching friends how to conduct a self-exam, and 3) an emphasis on

body awareness as an important component of disease prevention and early detection behaviors. Students were not required to participate, however, the aim of having the discussion follow the video and interactive live demonstration/practice was to increase participant's comfort with each other and the facilitators, thereby allowing for a more productive guided discussion. This intervention lasted approximately 1 hour and 30 minutes.

### **Follow-Up Assessment Procedure**

The primary investigator collected data from participants at 4 points: at pretest on the day of the intervention, at posttest 1 month later, at posttest 2 ½ months later, and at posttest 6 months later. To protect participant privacy and promote candid self-reporting, each participant was given an identification code that was used to match his responses across assessment periods.

Following the completion of the various interventions at pre treatment, students received 1 month follow-up session information via several methods. First, they were provided with a 4 by 7 inch written reminder that included the date, time, and place of the follow-up assessment. The follow-up session information was also written on the blackboard in the classroom and announced at the beginning and end of the sessions. Finally, two research assistants called and reminded all participants about the follow-up two days prior to each of the of the assessment sessions. Participants were provided with the primary researchers contact information in case of an emergency or inability to return to the follow-up session.

The primary researcher, her colleague, and two research assistants conducted each of the assessment sessions which took place in large classrooms (i.e., 110 desk maximum

capacity). At the end of each follow-up session, participant “no shows” were contacted and provided with an opportunity to complete the assessment instruments within two days of the follow-up session.

At the 2 ½ month follow-up, participants also received a brief speech about the 6 month follow-up. The verbal instructions covered the following: (a) a reminder about the importance of the study, (b) the anonymity of their self-report, and (c) the anticipation of the receipt of the assessment instruments via mail. Then, participants completed a summer residence form.

The total intervention and administration of follow up assessment instruments were completed in 3 hours. All students received 3 research credits for full participation in this project (not including the 6-month follow-up). Thus, the 6 month follow-up was not required to receive credit for participation in the study.

### **Apparatus**

The latex models used for the video-taped and live TSE and BSE demonstrations, were developed and manufactured by Health Edco, a health care company. The testicle and breast, which are made of Biolike™, a pliable, rubber-like material, are of anatomically-correct size and shape. The breast contains four palpable lumps and an area of lumps that are non-palpable from BSE and could only be found through mammography. The scrotum containing two testicles contains four palpable lumps. The lumps on both models vary in size and location, but all are palpable through correct self-exam techniques. These models have been used in other educational and research settings (i.e., American Cancer Society).

The videotapes were displayed on state-of-the-art audio-visual equipment. Images were projected on an 3 ft by 4 ft screen with audio adjusted to a comfortable level. The treatments were conducted in 25 desk classrooms, with participants seated in the front of the room and close to each other and to the facilitators.

## **CHAPTER III**

### **Results**

#### **Pre Treatment Differences Across Conditions**

In order to evaluate whether pre-treatment differences existed between treatment conditions, separate oneway Analysis of Variance (ANOVAs) or Chi Square tests of significance were performed on all pre-treatment measures. Results revealed that there were no significant differences between conditions on demographic variables (i.e., age, year in school, ethnicity, family income, family history of cancer), frequency of TSE performance, behavioral intention (i.e., SCM), knowledge of TC and TSE (i.e., TCK), and attitudes toward TC (i.e., ATTC) (all  $ps > .05$ ).

#### **Participant Attrition**

Ninety-seven percent of participants returned for the 1 month follow-up assessment session and 94.5 percent returned for the 2 ½ month follow-up assessment session. Participants who dropped out of the study did so as a result of leaving the university or dropping out of their introductory psychology class. At the 6 month follow-up period, 59 percent of the participants returned the assessment instruments via mail. Thirty percent did not return the instruments and 11 percent were unable to be contacted because their summer address changed or they were not listed through the university directory.

### **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, 2 ½ month, and 6 month follow-ups. Separate 5 (treatment) X 3 (time) ANCOVAs were performed on the following measures: 1) BCM (i.e., number of self-examinations performed per month), 2) SCM, 3) ATTC, and 4) TCKC. Adjusted and non adjusted means and standard deviations for the first three measures are reported in Tables 4 and 5.

#### **Behavior Change Measure (BCM)**

Results revealed significant main effects for treatment,  $F(4, 156) = 4.11, p < .001, \eta^2 = 0.08$  and time,  $F(2, 226) = 17.41, p < .001, \eta^2 = .05$  for number of self-exams. There was also a treatment x time interaction,  $F(8, 226) = 13.30, p < .001, \eta^2 = .15$ . The  $R^2$  for the model was 0.17, (i.e., a large effect based on Cohen, 1988). Figure 1 illustrates changes in average number of TSEs performed by participants in each treatment over time.

At the 1 month follow-up, Tukey-Kramer post hoc comparisons indicated that participants in the complex treatments B, C, and D ( $M_s = 1.21, 0.99, \text{ and } 1.30$ , respectively) reported higher TSE behavior than the Control and treatment A (i.e., brochure only) ( $M_s = 0.44 \text{ and } 0.64$ , respectively). The exam behavior of participants in treatment B was not significantly different than treatments C or D, however treatment C was significantly lower than treatment D. At the 2 1/2 month follow-up, the Control, A, B, and C treatments ( $M_s = 0.59, 0.66, 0.85, \text{ and } 0.72$ , respectively) were significantly lower than the most complex treatment D ( $M = 1.15$ ). Although participants in treatment

Table 4

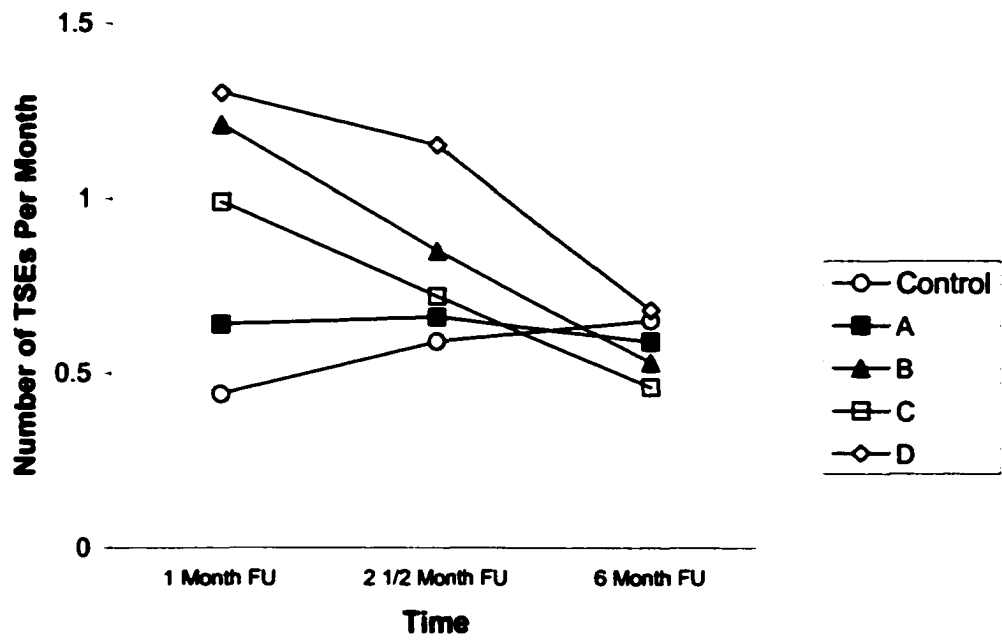
**Adjusted Means and Standard Deviations BCM, SCM, and ATTC by Treatment Condition and Time**

<b>Condition and Time</b>	<b>BCM</b>			<b>SCM</b>			<b>ATTC</b>		
	<b><u>n</u></b>	<b><u>M</u></b>	<b><u>SD</u></b>	<b><u>n</u></b>	<b><u>M</u></b>	<b><u>SD</u></b>	<b><u>n</u></b>	<b><u>M</u></b>	<b><u>SD</u></b>
<b><u>Control</u></b>									
1 month FU	33	0.44	0.60	33	2.46	1.06	33	84.01	7.12
2.5 month FU	32	0.59	0.60	33	3.19	1.06	33	86.11	7.12
6 month FU	16	0.65	0.53	17	3.48	0.95	17	84.52	6.47
<b><u>Condition A</u></b>									
1 month FU	28	0.64	0.61	28	3.23	1.06	28	88.03	7.20
2.5 month FU	28	0.66	0.61	28	3.52	1.06	27	85.47	7.17
6 month FU	11	0.59	0.52	10	3.56	0.91	12	87.44	6.34
<b><u>Condition B</u></b>									
1 month FU	34	1.21	0.60	34	3.89	1.07	32	87.42	7.07
2.5 month FU	31	0.85	0.59	33	3.75	1.06	33	87.37	7.07
6 month FU	22	0.53	0.56	24	4.03	1.00	23	86.70	6.67
<b><u>Condition C</u></b>									
1 month FU	36	0.99	0.60	35	3.78	1.06	36	88.72	7.12
2.5 month FU	34	0.72	0.60	35	3.70	1.06	34	89.55	7.06
6 month FU	18	0.46	0.54	18	3.61	0.95	18	86.28	6.41
<b><u>Condition D</u></b>									
1 month FU	28	1.30	0.59	28	4.11	1.05	28	87.77	7.07
2.5 month FU	30	1.15	0.60	30	4.15	1.07	29	88.22	7.09
6 month FU	17	0.68	0.54	16	4.34	0.96	14	85.21	6.39

Table 5

**Non-Adjusted Means and Standard Deviations for BCM, SCM, and ATTC by Treatment Condition and Time**

<b>Condition and Time</b>	<b>BCM</b>			<b>SCM</b>			<b>ATTC</b>		
	<b>n</b>	<b>M</b>	<b>SD</b>	<b>n</b>	<b>M</b>	<b>SD</b>	<b>n</b>	<b>M</b>	<b>SD</b>
<b><u>Control</u></b>									
Pretest	34	0.24	0.43	33	2.33	1.29	33	85.94	10.90
1 month FU	33	0.45	0.79	33	2.48	1.52	33	85.36	11.04
2.5 month FU	32	0.61	0.62	33	3.21	1.43	33	87.45	9.52
6 month FU	16	0.75	0.43	17	3.71	1.40	17	85.57	13.31
<b><u>Condition A</u></b>									
Pretest	29	0.07	0.26	29	2.28	0.70	29	80.48	5.76
1 month FU	28	0.60	0.69	28	3.21	1.17	28	84.82	6.46
2.5 month FU	28	0.63	0.59	28	3.50	1.11	27	82.19	6.33
6 month FU	11	0.47	0.35	10	3.70	1.06	12	84.50	8.23
<b><u>Condition B</u></b>									
Pretest	34	0.18	0.58	34	2.15	1.13	34	85.24	8.06
1 month FU	34	1.21	0.73	34	3.82	1.29	32	88.47	9.96
2.5 month FU	31	0.87	0.50	33	3.76	1.09	33	88.52	9.68
6 month FU	22	0.59	0.33	24	4.17	1.17	23	87.23	8.62
<b><u>Condition C</u></b>									
Pretest	36	0.22	0.68	36	2.22	1.22	36	85.06	9.01
1 month FU	36	1.00	0.76	35	3.74	1.15	36	89.33	9.89
2.5 month FU	34	0.76	0.57	35	3.66	1.21	34	91.00	9.93
6 month FU	18	0.53	0.36	18	3.61	0.92	18	87.33	16.26
<b><u>Condition D</u></b>									
Pretest	31	0.19	0.48	31	2.48	1.15	31	82.84	5.97
1 month FU	28	1.29	0.71	28	4.14	0.93	28	86.11	8.71
2.5 month FU	30	1.15	0.56	30	4.23	0.97	29	86.79	9.23
6 month FU	17	0.78	0.38	16	4.44	0.63	14	85.57	13.31



**Figure 1.** Adjusted means for Behavior Change Measure (BCM) by treatment condition and across time

D continued to report the highest number of self-examinations per month, ( $\underline{M} = 0.68$ ), participants in each treatment (Control, A, B, and C) were not significantly different ( $\underline{M}s = 0.65, 0.59, 0.53, \text{ and } 0.46$ ) at the 6 month follow-up. See Tables 6-8 for significance levels of Tukey-Kramer comparisons for self-examination behavior at each of the three follow-up periods.

#### *Stages of Change Measure (SCM)*

Significant differences were also found for the treatment,  $\underline{F}(4, 155) = 6.99, p < .001, \eta^2 = .10$  and time main effects  $\underline{F}(2, 231) = 5.00, p < .01, \eta^2 = .03$  for the SCM. Results revealed a significant treatment x time interaction,  $\underline{F}(8, 231) = 3.02, p < .01, \eta^2 = .09$ . The  $R^2$  for the model was .28, (i.e., a large effect). Figure 2 illustrates the adjusted means for the stages of change measure by treatment condition and across time.

Tukey-Kramer comparisons indicated that during the 1 month follow-up, participants in the intervention treatments A, B, C, and D ( $\underline{M}s = 3.23, 3.89, 3.77, \text{ and } 4.11$ , respectively) reported significantly higher scores on the stages of change measure compared to the No-Treatment Control condition ( $\underline{M} = 2.46$ ). Additionally, participants in the more complex interventions (i.e., treatments B, C, and D) reported significantly higher movement on the stages of change compared to condition A. Treatment conditions B, C, and D were not significantly different from each other. At the 2 ½ month follow-up, participants in the Control condition and treatment A were not different from each other ( $\underline{M}s = 3.19 \text{ and } 3.51$ , respectively). Treatments B ( $\underline{M} = 3.75$ ) and C ( $\underline{M} = 3.69$ ) reported increased movement on the stages of change compared to the Control condition, while treatment D ( $\underline{M} = 4.14$ ) reported significantly more movement than the Control condition and treatment A. Treatment conditions B, C, and D were not significantly different

Table 6

Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 1-Month Follow-up

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

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 7**

**Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 2 ½ Month Follow-up**

---

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Control</b>	NS	NS	NS	**
<b>A</b>		NS	NS	***
<b>B</b>			NS	*
<b>C</b>				**

---

**\*p < .05. \*\*p < .01. \*\*\*p < .001.**

**Table 8**

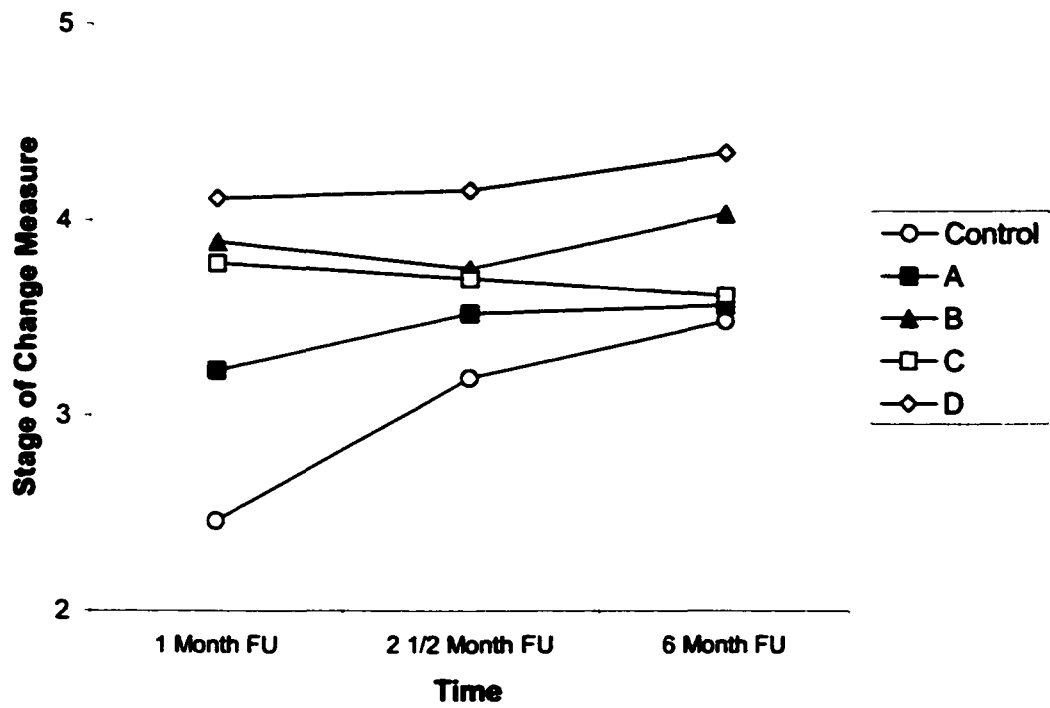
**Tukey-Kramer Pairwise Comparisons for Self-Exam Behavior at 6 Month Follow-up**

---

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Control</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>
<b>A</b>		<b>NS</b>	<b>NS</b>	<b>NS</b>
<b>B</b>			<b>NS</b>	<b>NS</b>
<b>C</b>				<b>NS</b>

---

**\*p < .05. \*\*p < .01. \*\*\*p < .001.**



**Figure 2.** Adjusted means for Stages of Change Measure (SCM) by treatment condition and across time

from each other. At the 6 month follow-up, participants in treatment D ( $M = 4.34$ ) reported significantly more movement on the stages of change measure compared to the No Treatment Control, treatment A, and treatment C ( $M_s = 3.48, 3.56, \text{ and } 3.61$ , respectively). Treatment B ( $M = 4.03$ ) was not significantly different from treatment D. Treatment conditions A, B, and C were not significantly different from each other. See Tables 9-11 for Tukey-Kramer comparisons for the stages of change measure.

#### *TC Knowledge Measure (TCKC)*

For the knowledge measure, results revealed a significant main effect for treatment,  $F(4, 152) = 7.32, p < .0001, \eta^2 = 0.14$ , but no significant effect for time,  $F(2, 228) = 2.28, p > .05$ , or the treatment x time interaction,  $F(8, 228) = 1.64, p > .05$ . The  $R^2$  for the model was .15, (i.e., a large effect). Figure 3 illustrates the percent correct on the 3-item TCKC measure by condition averaged across all three follow-up periods.

Further evaluation using Tukey-Kramer comparisons showed that the No Treatment Control condition reported significantly lower scores on the TCKC measure ( $M = 1.17, SD = 0.70$ ) compared to all four treatment conditions ( $M_s = 1.89, 1.92, 1.92, 1.90; SD_s = 0.72, 0.68, 0.70, 0.72$ ). There were no statistically significant differences between treatment conditions A, B, C, and D on the TCKC measure (all  $p_s > .05$ ). See Appendix I for the percentage of participants scoring incorrectly for each True-False item across time.

#### *Measure of Attitude (ATTC)*

The results of the ANCOVA using the ATTC as the dependent measure revealed no significant differences between treatment conditions  $F = (4, 155) = 1.21, p > .05$  or across

Table 9

**Tukey-Kramer Pairwise Comparisons for Stages of Change at 1 Month Follow-up**

---

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

---

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 10

**Tukey-Kramer Pairwise Comparisons for Stages of Change at 2 ½ Month Follow-up**

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

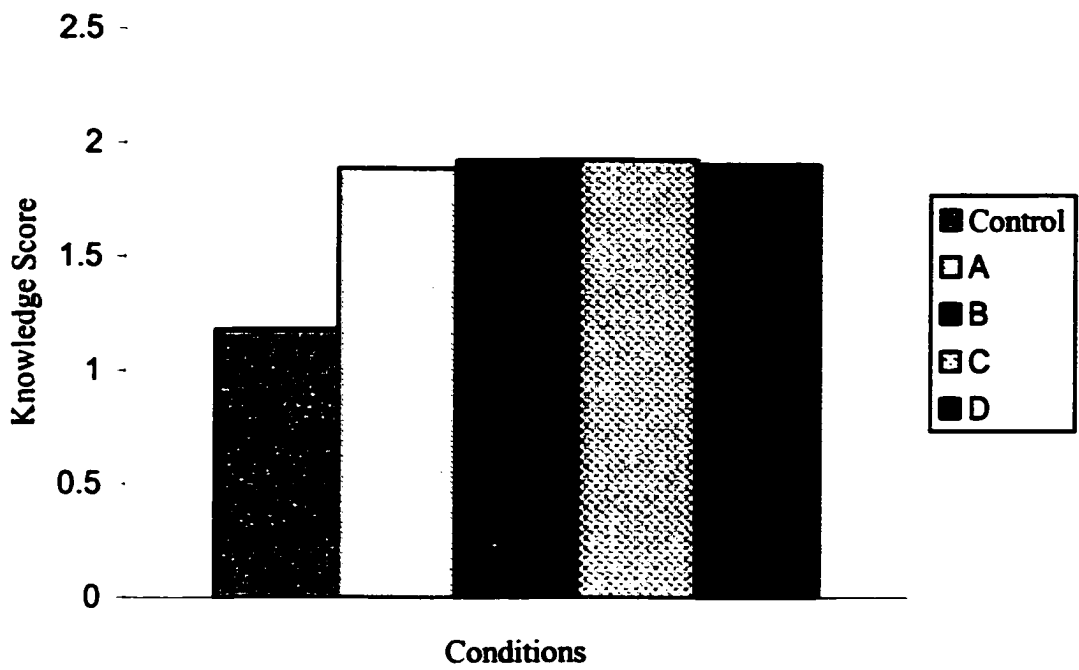
\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 11

Tukey-Kramer Pairwise Comparisons for Stages of Change at 6 Month Follow-up

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

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Figure 3.** Percent correct on Testicular Cancer Knowledge Composite (TCKC) Measure by condition averaged across all follow-up periods

time  $F(2, 226) = 1.74, p > .05$ . Thus, attitudes toward TC and TSE did not change as a result of treatment interventions.

### **Evaluation of Participants reporting Monthly TSE Versus Inconsistent TSE**

Chi square analyses and spearman correlations were also used to determine whether differences existed between the conditions for individuals meeting the criterion of performing at least one self-examination at the 1 month follow-up, two self-examinations at 2 1/2 months follow-up, and six self-examinations at 6 months compared to individuals who did not perform monthly examinations. Each of the treatment conditions were rank ordered (1, 2, ... etc.) given the hierarchical nature of the intervention model. Chi square analysis indicated whether differences existed between treatment conditions. Spearman correlations indicated how strong of a relationship existed from the No Treatment Control condition to the most complex (i.e., treatment condition D). Thus, significant differences as well as the strength of the relationship suggests how the treatment conditions compared across time. Table 12 provides a comparison of participants at each time and within each treatment condition who met these criteria as well as participants who did not.

At pretreatment, none of the conditions were significantly different from each other, including the No Treatment Control condition (all  $ps > .05$ ). The Spearman correlations were non significant ( $r = -.063$ ) (all  $ps > .05$ ) reemphasizing that there was no relationship present at pre-treatment between those who were monthly examiners and those who were not across treatment conditions. At the 1 and 2 1/2 month follow ups, Chi square analyses and spearman correlations revealed a significant difference ( $ps < .01$ )

Table 12

**Number of Participants at Pre-Treatment and 1, 2 ½, and 6 Month Follow-Ups who Performed Monthly Self-Examinations vs. Those Who Did Not**

	<u>Control</u>		<u>A</u>		<u>B</u>		<u>C</u>		<u>D</u>	
	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b><u>Pre Treatment</u></b>	8	26	2	27	3	31	3	33	5	26
<b><u>1 month FU</u></b>	10	23	14	14	29	5	26	9	24	3
<b><u>2 ½ month FU</u></b>	19	15	12	16	19	14	17	17	24	5
<b><u>6 month FU</u></b>	8	8	1	10	5	17	3	15	7	10

and a positive correlation ( $r_s = .41, .24$ , respectively) across the intervention conditions from Control to treatment D. At 6 months, the chi square was still significant at  $p < .05$ , but the spearman correlation was not significant  $r = -0.049$ . The results suggested that participants in the more complex treatments (i.e., B, C, D) were more likely to perform monthly self-examinations at the 1 and 2 ½ month follow-up compared to the less complex treatments (i.e., Control, A).

**Evaluation of the Differences in General Health Behaviors and Attitudes Toward TC in Monthly and Inconsistent Self-Examiners at the 2 ½ Month Follow-up**

Characteristics of participants, regardless of treatment condition, who were performing monthly self-exams at the 2 ½ month follow-up were examined in order to compare participants who complied with the intervention (i.e., met the monthly TSE criterion) with those that practiced inconsistent TSEs. The participants were compared at Pre-treatment and at the 2 ½ month follow-up to determine whether monthly examiners already had certain beliefs or characteristics prior to the study or if they were gained post intervention. Thus, an exploratory analysis of general health behavior (items taken from the HRI) and items taken from the ATTC questionnaire were used to compare the relationship between people who performed monthly self-exams and those who did not.

At Pre-treatment, there were no differences found with regard to items in the ATTC measure. However, t-tests on items from the HRI revealed that participants performing monthly self-examinations ( $n = 87$ ) compared to inconsistent self-examiners ( $n = 72$ ) were more likely to fill prescriptions immediately ( $p < .05$ ) ( $M_s = 1.62, 2.20$ ;  $SD_s = 1.50, 1.35$ ), conduct regular TSE/BSE and check their skin ( $p < .05$ ) ( $M_s = 3.95, 4.94$ ;  $SD_s = 1.15, 0.87$ ), consult a professional if they were depressed for more than a

month ( $p < .05$ ) ( $M_s = 2.72, 3.25$ ;  $SD_s = 1.59, 1.63$ ), and buckle their safety belt ( $p < .05$ ) ( $M_s = 1.70, 2.06$ ;  $SD_s = 0.86, 1.16$ ). Additionally, monthly examiners were less likely to believe that the length of a person's life depends on fate or luck ( $p < .05$ ) ( $M_s = 3.63, 3.18$ ;  $SD_s = 1.14, 1.25$ ).

At the 2 ½ month follow-up, t-tests revealed that monthly self-examiners compared to inconsistent self-examiners were still more likely to consult a professional if depressed for more than a month ( $p < .05$ ) ( $M_s = 2.31, 2.83$ ;  $SD_s = 1.44, 1.37$ ). However, since pretreatment, they reported that they were more likely to check for signs of STDs when sexually active or not in an exclusive relationship ( $p < .01$ ) ( $M_s = 1.19, 1.91$ ;  $SD_s = 1.30, 1.57$ ) and worry about health/health risks ( $p < .05$ ) ( $M_s = 2.79, 3.16$ ;  $SD_s = 1.11, 1.00$ ). Furthermore, monthly self-examiners reported that they were confident that they knew how to correctly perform a self-examination ( $p < .05$ ) ( $M_s = 1.56, 2.11$ ;  $SD_s = 0.72, 0.94$ ) and they thought TSE was helpful in detecting TC ( $p < .05$ ) ( $M_s = 1.27, 1.52$ ;  $SD_s = 0.44, 0.60$ ). Results revealed that people who were less likely to conduct self-exams reported embarrassment from touching their testicles ( $p < .05$ ) ( $M_s = 4.23, 4.55$ ;  $SD_s = 0.82, 0.61$ ), a lack of privacy for conducting regularly exams ( $p < .01$ ) ( $M_s = 3.68, 4.18$ ;  $SD_s = 0.99, 0.91$ ), and forgetting to perform regular TSEs ( $p < .001$ ) ( $M_s = 2.07, 3.08$ ;  $SD_s = 0.94, 1.18$ ). Conversely, monthly self-examiners believed that performing self-exams in addition to a doctor's exam was important ( $p < .05$ ) ( $M_s = 1.29, 1.58$ ;  $SD_s = 0.51, 0.68$ ), perceived that family/friends think TSE is a good idea ( $p < .05$ ) ( $M_s = 2.07, 2.47$ ;  $SD_s = 0.92, 0.83$ ), and understood that conducting TSE serves as a positive role model for others ( $p < .05$ ) ( $M_s = 2.05, 2.50$ ;  $SD_s = 0.87, 0.89$ ). Consequently, participants with specific beliefs about TSE (i.e., believed that performing self-

examinations was good) in addition to general beliefs about making healthy choices (i.e., seeking help for psychological disorders, checking for signs of STDs) were more likely to comply with the intervention and maintain this behavior over time.

### **Responder and Non Responder Bias at the 6 month FU**

Due to the significant decrease in participation at the 6 month follow-up (59% return rate), t-tests were used to examine responder and non responder bias by exploring potential differences in participant characteristics at the 2 ½ month follow-up (e.g., HRI, ATT). Results indicated that non responders were less likely to report conducting TSE and checking their skin for cancer ( $p < .05$ ) ( $M_s = 3.29, 2.91$ ;  $SD_s = 1.11, 1.21$ ), and more likely to report that TSE was too complicated to do correctly ( $p < .05$ ) ( $M_s = 4.60, 4.17$ ;  $SD_s = 0.54, 0.82$ ) and their religion/culture taught them not to touch their testicles ( $p < .01$ ) ( $M_s = 4.66, 4.33$ ;  $SD_s = 0.59, 0.89$ ) and compared to responders. Responders were less likely to believe that if they were diagnosed with TC, nothing could save their lives ( $p < .01$ ) ( $M_s = 4.52, 4.09$ ;  $SD_s = 0.78, 0.94$ ) and more likely to report that family/friends think TSE is a good idea ( $p < .01$ ) ( $M_s = 2.03, 2.45$ ;  $SD_s = 0.83, 0.92$ ) compared to non responders. Moreover, non responders were less likely to be within 15 pounds of their optimum weight ( $p < .01$ ) ( $M_s = 1.50, 1.82$ ;  $SD_s = 0.92, 1.03$ ), consult a professional if they were depressed ( $p < .01$ ) ( $M_s = 2.29, 2.89$ ;  $SD_s = 1.44, 1.36$ ), and more likely to smoke one or more packs of cigarettes per day ( $p < .01$ ) ( $M_s = 3.97, 3.28$ ;  $SD_s = 1.94, 2.18$ ).

Further examination of these variables by treatment condition revealed that the non responders in the No Treatment Control condition were more likely to report that their religion/culture taught them not to touch their testicles ( $p < .01$ ) ( $M_s = 4.25, 4.94$ ;

**SDs = 0.86, 0.24), believed nothing could save them if diagnosed with TC ( $p < .01$ ) (Ms = 3.81, 4.89; SDs = 1.11, 0.33), thought that TSE was too complicated to do correctly ( $p < .01$ ) (Ms = 3.81, 4.76; SDs = 0.98, 0.56), and consequently were less likely to state that their family/friends think TSE is a good idea ( $p < .05$ ) (Ms = 2.43, 1.82; SDs = 0.72, 0.88). Responders in Condition C were more likely than non responders to believe that family/friends think TSE is a good idea ( $p < .01$ ) (Ms = 1.72, 2.41; SDs = 0.93, 0.82). Finally, responders in condition D were more likely than non responders to conduct TSE and check their skin for cancer ( $p < .05$ ) (Ms = 2.18, 2.92; SDs = 0.75, 1.11), believe that TC has a good prognosis ( $p < .05$ ) (Ms = 3.84, 4.56; SDs = 0.63, 1.04), and not think that TSE is too complicated to do correctly ( $p < .05$ ) (Ms = 4.75, 4.08; SDs = 0.45, 1.04).**

These findings suggest that non responders were less likely to perform regular recommended health practices (i.e., smoking, weight control), seek out professional help for psychological symptoms, feel motivated to do a self exam (i.e., perceive family and friends as not supportive, culture taught that TSE may be inappropriate), and feel confident in conducting self-examinations (i.e., viewed the simple procedure as complicated). Thus, responders generally appeared to be more likely to perform responsible health behaviors, not necessarily specific to TSE. If the responders reported a higher degree of health conscientiousness and responsibility, regardless of treatment condition, they may have been more likely to report conducting self-exams, even though their specific beliefs about TSE differed across treatment conditions. This would increase the likelihood of a response bias and non significant results across conditions at the 6 month follow-up.

## **CHAPTER IV**

### **Discussion**

The current investigation was aimed at developing and evaluating a cumulative multi-modal intervention for increasing testicular self-examination (TSE) behavior in college men. The interventions included informational brochures, a video-taped testimonial, live demonstration with practice and feedback, and a participant discussion concerning TSE logistics and commitment to perform TSE. Participants in the five experimental conditions were evaluated on measures of self-examination frequency (i.e., BCM), behavioral intention (i.e., SCM), knowledge of testicular cancer (TC) and TSE, attitudes toward TC and TSE, and general health behaviors across a 6 month follow-up period. The study's strengths, limitations, primary findings, and implications for future research are discussed below.

#### **Strengths of the Study**

The present study had several strengths that bear mentioning. First, multiple intervention strategies found to be effective in prior studies were simultaneously evaluated (i.e., informational brochures, practice and demonstration on latex models, etc.), which allowed the cumulative effects of the various treatments to be measured. Secondly, the intervention program was designed to be campus-based (i.e., community-oriented) and aimed at all students rather than targeted toward those who are uninformed and unaware of TC and TSE. Third, the interventions employed were designed to be both cost-effective and easily adapted to various settings via the use of volunteer Health

Advocates (HAs), “home produced” video-taped testimonials, and flexible group intervention formats involving a single treatment session. A fourth strength of the study was the focus on peer influence in designing the various intervention components. HAs, i.e., students interested in health promotion, were specifically selected to emulate their undergraduate peer participants. Moreover, a young male diagnosed and treated for TC was specifically chosen for the taped testimonial in order to strengthen the influence of advice provided. Additionally, the discussion component in the most complex treatment condition provided peer support and included a public commitment component. A fifth strength involved the fact that the more complex interventions provided multi-sensory strategies for teaching TSE. Participants were exposed to visual, auditory, and tactile learning modalities designed to enhance feelings of self-efficacy and aid in the maintenance of TSE. Sixth, this study tracked participants at 1, 2 1/2, and 6 month follow-ups to measure changes in behavior over time. Finally, the study employed multiple dependent measures in order to comprehensively evaluate changes in attitudes, knowledge, and behavior.

#### Limitations of the Study

The current study also had numerous limitations. First, the hierarchical nature of the experimental design prevented direct comparison of individual treatment components within this study. Thus, conclusions about how the effect of the testimonial component compared with the live demonstration and guided practice component, for example, could not be directly determined. A second limitation involved differences in the duration of the five treatment conditions. The addition of treatment components to the more complex treatments (e.g., conditions C and D) created an unavoidable duration by treatment

confounds. Although "filler" activities designed to equate treatment durations were considered, this "solution" was abandoned since it would have contaminated less complex treatments and caused other problems in interpretation of results. Thirdly, external generalization to other learning environments must be considered within the context of the study design. Participants enrolled in general psychology classes received research credit for their participation. The results of the current study may not generalize to other learning environments (e.g., health and wellness classes). Moreover, the presence of female participants and the simultaneous exposure to information on breast cancer and breast self-examination (BSE) may have influenced the present findings, therefore placing limits on external validity. A fourth limitation is that the current results involved the self-report of behavior rather than actual behavior. Self-report measures can be influenced by a number of factors, including social desirability (see Kazdin, 1998). Thus, there is no assurance that reported changes in TSE frequency represented true changes in behavior. Fifth, the study involved repeated follow-up assessments which may have artificially prompted changes in behavior (e.g., served as a reminder to practice TSE). Consequently, the frequency of TSE reports by participants may have been different if follow-up assessments had not been implemented. Finally, the high participant attrition rate at the 6 month follow-up placed severe restrictions on conclusions concerning the long-term impact of treatment.

### **Primary Findings**

Three hypotheses were stated prior to the implementation of this study. The first was that the most complex treatment conditions would lead to the largest increase and greatest maintenance of TSE behavior. This hypothesis was, for the most part,

supported. The most complex treatment intervention (i.e., Condition D) which combined information, a video-taped testimonial, live demonstration with guided practice on latex models, and a peer-led discussion, was the most effective in increasing TSE behavior.

Each of the treatment components, beyond the informational brochure, appeared to be influential in changing behavior. Although the causal mechanisms underlying the various treatment components remain unclear, it can be reasonably suggested that each component had a somewhat unique impact on participants' behavior and attitude. For example, the video-taped testimonial of a young cancer survivor, who was demographically similar to the participants, may have increased motivation via social influence and modeling (Bandura, 1986; Lindsey, 1997). The live demonstration-guided practice condition likely affected feelings of self-efficacy by providing corrective feedback on how to perform a self-examination (Bandura, 1997). The discussion component normalized communication concerning a "sensitive" issue and may have promoted a subjective norm (i.e., group support for the behavior to be performed) (Moore, Barling, & Hood, 1998). Finally, the participant discussion component provided opportunities for peer influence via public commitment (Tedeschi, Schlenker, & Bonoma, 1971) and problem-solving concerning when and where to perform TSE (Heppner & Hillerbrand, 1991).

The second hypothesis predicted increased behavioral intentions (i.e., SCM), greater knowledge of TC and TSE, and more positive attitudes toward TSE as a result of more complex interventions. The SCM measure revealed analogous, but perhaps more sensitive findings compared to the BCM outcome measure with respect to the impact of treatment conditions on changes in TSE over time. In general, participants in the most

complex treatment conditions (i.e., B, C, and D) reported significantly higher movement on the SCM compared to the less complex conditions (i.e., Control and A).

The results of the TC knowledge measure appear consistent with previous studies that found participants to report increases in knowledge scores when information was provided by the intervention (Kelin, Berry, & Felice, 1990, Rudolf & Quinn, 1998). All participants who received the informational brochure (i.e., conditions A, B, C, and D) reported more knowledge at the 1 month follow-up compared to the No Treatment Control condition. Beyond the 1 month follow-up, the amount of knowledge learned remained inconsequential in all treatment conditions. Thus, providing a brochure enhanced knowledge of TSE and TC, but was insufficient to produce measurable behavior changes.

No differences in attitude towards TC and TSE (i.e., ATTC) were found over time and between treatment conditions. A study by Rudolf and Quinn (1988) found that perceptions of susceptibility and disease seriousness (i.e., attitudes) were unrelated to increases in knowledge or behavior change. Thus, men may change their behavior without initiating or admitting to substantial changes in attitude. Another possible reason for non significant attitude changes is poor content validity. The ATTC may not measure what we expected it to measure.

Lastly, in addition to demonstrating the differential impact of interventions, the current study also examined the relationship between participants who practiced monthly examinations versus participants who reported inconsistent TSE practice, regardless of treatment condition. Prior to participation in the study, “monthly examiners” were more likely to report filling medicine prescriptions immediately, seeing a professional for

mental health concerns, buckling their seat belt, performing TSE or checking their skin for spots, and believing they had a certain degree of control over their longevity. These characteristics suggest that monthly TSE examiners place a higher value on physical and psychological health and that TSE practices may simply represent part of a broader orientation toward health promotion and maintenance.

At the 2 ½ month follow-up, monthly self-examiners continued to believe that psychological and physical health practices were important. However, following treatment intervention, they also felt more confident compared to inconsistent self-examiners about how to correctly perform a TSE. They were also more likely to believe that TSE was helpful in detection, perceive that their family and friends to be supportive of TSE, and agree that performing TSE serves as a positive role model for others. Inconsistent self-examiners compared to monthly examiners were less likely to worry about their health and more likely to give reasons for not performing a self-examination (i.e., forgetfulness, lack of privacy, or being embarrassed).

#### *Implications for Future Research*

As reflected in this study, future research should continue to explore the benefits of TSE interventions that are multi-modal in design, incorporate peer role modeling and support systems, provide corrective feedback for proper TSE procedures, and incorporate guided group discussions to promote body awareness and commitment to perform the procedure. Future studies should also investigate the reasons given by participants who were not conducting TSEs every month (i.e., forgetfulness and embarrassment). Forgetfulness is a commonly cited reason for women who do not conduct regular monthly BSEs (Budden, 1998), thus it is not surprising that men experienced similar

barriers. Future research should investigate strategies for reducing forgetfulness as a barrier to conducting TSE. For example sending reminders, displaying posters in dormitories, and requiring short booster sessions in their health class that review basic TSE technique and support the importance of body awareness should be considered. Reminders may also have implications for relapse prevention. Numerous psychological and behavioral problems are prone to relapse (e.g., smoking, substance use) (Valanis et al, 2001; McCarthy, 2001; Echeburua, Fernandez, Montalvo, & Baez, 2000) and providing “reminders” or triggers to remember to conduct TSE may prevent or delay relapse.

Another common barrier, embarrassment, was found to be a result of men not feeling comfortable touching their genitals due to cultural or familial unacceptability. Future studies may want to consider consulting with culturally knowledgeable health care professionals in their community to develop interventions (e.g., a video) that tailor information about TSE and TC in a manner that is sensitive to the cultural background of the target population. Culturally appropriate strategies might include using ethnically similar role-models or designing “authentic” appearing latex models familiar to the population of interest (i.e., coloring of latex models may need to be culturally sensitive).

Future studies may also want to consider monitoring TSE behavior with longer follow-up periods (e.g., at 1 year, at 2 years). This would provide a good opportunity to assess relapse rates and evaluate the effects of various interventions on long-term maintenance. Maintenance is defined not only by behavior, but also attitude, knowledge, and intentions to change. Thus, multiple outcome measures, tapping all response modalities may lead to greater understanding and possible prevention of setbacks in

conducting the behavior. Moreover, studies should examine whether long term behavior changes are influenced by personality characteristics (e.g., motivation, health conscientiousness), which likely influence compliance with follow-up data collection as well as relapse of the behavior.

### **Conclusions**

The results of this study support the employment of early cancer prevention programs. Combining informational brochures, a video-taped testimonial and demonstration by a peer, live demonstration/practice and corrective feedback on latex models, and a peer-led discussion of TSE was most effective in increasing TSE behavior in college men. Educators should consider integrating this low-cost, easily adaptable program in health and wellness programs in university and community settings.

Additionally, TC is an important, although rare cancer that should be discussed with college students. Multi-faceted programs such as the one presented, have the potential to increase TSE behavior, decrease false positives, increase early detection, and reduce mortality. Although only a small percentage of male participants in such programs will benefit due to the low occurrence of TC, the benefits for one individual could mean a life.

## REFERENCES

- Altman, R., & Sarg, M. (1992). The cancer dictionary. Facts on File: New York.
- American Cancer Society (1993). Cancer facts and figures. New York: Author.
- American Cancer Society. (1978). Facts on testicular cancer. New York: Author.
- Austoker, J. (1994). Screening for ovarian, prostate, and testicular cancers. British Medical Journal, 309, 315-320.
- Bandura, A. (1986). Social learning theory. New Jersey: Prentice Hill.
- Blesch, K. S. (1986). Health beliefs about testicular cancer and self-examination among professional men. Oncology Nurse Forum, 18, 29-33.
- Boehm, S., Selves, E. J., Raleigh, E., Ronis, D., Butler, P. M., & Jacobs, M. (1993). College students' perception of vulnerability/susceptibility and desire for health information. Patient Education and Counseling, 21, 77-87.
- Bosl, G. J. (1984). Status and prospects of the treatment of disseminated germ-cell tumors. World Journal Urology, 2, 38-42.
- Bosl, G. J., Voelzang, N. J., Goldman, A., Fraley, E. E., Lange, P. H., Levitt, S. H., & Kennedy, B., J. (1981). Impact of delay in diagnosis on clinical stage of testicular cancer. Lancet, 2, 970-972.
- Bradford, N. (1995). Men's health matters: The complete A-Z of male health. London: Vermillion.
- Brubacker, R. G., & Wickersham, D. Encouraging the practice of testicular self-examination: A field application of the theory of reasoned action. Health Psychology, 9, 154-163.

Budden, L. (1998). Registered nurses' breast self-examination practice and teaching to female clients. Journal of Community Health Nursing, 15, 101-112.

Cavanaugh, R. M. (1983). Genital self-examination in adolescent males. American Family Physician, 28, 199-201.

Center for Disease Control and Prevention (1998). Ten leading causes of death, United States. Retrieved July 10, 2001, from <http://www.cdc.gov/nchs/products/pubs/pubd/nvsr/nvsr.htm>.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Lawrence Erlbaum Associates.

Courtenay, W. H. (1998). College men's health: an overview and a call to action. College Health, 46, 279-290.

Craun, A. M., & Deffenbacher, J. L. (1981). Cancer knowledge and examination frequency in college students. Journal of American College Health Association, 30, 123-126.

Cummings, M., Lampon, D., Mettlin, C., & Pontes, J. (1983). What young men know about testicular cancer. Preventive Medicine, 12, 326-330.

Dachs, R. J., Garb, J. L., White, C., & Berman J. (1989). Male college students' compliance with testicular self-examination. Journal of Adolescent Health Care, 10, 295-299.

Dahl, O. (1985). Testicular carcinoma: A curable malignancy. Acta Radiol Oncologia, 24, 3-15.

Dieckmann, K. P., Becker, T., & Bauer, H. W. (1987). Testicular tumors: presentation and role of diagnostic delay. Urologia Internationalis, 42, 241-247.

Demetriou, E. (1992). Male reproductive conditions. In E. McAnarney, R. Kriepe, D. Orr, & G. Comerci (Eds.), Adolescent medicine. Philadelphia, PA: WB Saunders.

Department of Health. (1992). The health of the nation. London: HMSO.

DiClemente, C. C., & Prochaska, J. O. (1998). Toward a comprehensive, transtheoretical model of change. In A. Miller & C. Heather (Eds.), Treating Addictive Behaviors (pp. 3-23). New York: Plenum Press.

Dieckman, K. P. (1988). Testicular self-examination: Is it still necessary? Postgraduate Medical Journal, *64*, 64-250.

Echeburua, E., Fernandez-Montalvo, J. & Baez, C. (2000). Relapse prevention in the treatment of slot-machine pathological gambling: Long-term outcome. Behavior Therapy, *31*, 351-364

Einhorn, L. (1986). Cancer of the testis: A new paradigm. Hospital Practice, *21*, 165-178.

Einhorn, L. H., Richie, J. P., & Shipley, W. U. (1993). Cancer of the testes. In V. T. DeVita, S. Helman, & S. Rosenberg (Eds.), Cancer: Principles and practices of oncology (pp. 1126-1151). Philadelphia: Lippincott.

Elise, L. L. (1997). Bandura's theory of self-efficacy: Applications to oncology. Scholarly Inquiry for Nursing Practice: An International Journal, *11*, 21-37.

Foote, J. A., Harris, R. B., & Gilles, M. E. (1996). Physical advice and tobacco use: a survey of 1<sup>st</sup>-year college students. Journal American College Health, *45*, 129-132.

Friman, P. C., & Christophersen, E. R. (1986). Biobehavioral prevention in primary care. In N. Krasnegor, J. Arasteh & M. Cataldo (Eds.), Child Health Behavior: A Behavioral Pediatrics Perspective (pp. 254-280). New York: Wiley.

- Friman, P. C., & Finney, J. W., (1990). Health education for testicular cancer. Health Education Quarterly, 17, 443-453.
- Ganong, L. H., & Markovitz, J. (1987). Young men's knowledge of testicular cancer and behavioral intentions toward testicular self-exam. Patient Education and Counseling, 9, 251-261.
- Garnick, M. B., Mayer, R. J., & Richie, J. P. (1980). Testicular self-examination. New England Journal of Medicine, 302, 297.
- Glanz, K., Lewis, F. M., & Rimer, B. K. (1990). Health behavior and health education: Theory, research, and practice. San Francisco, CA: Jossey-Bass.
- Goldbloom, R. (1985). Self-examination by adolescents. Pediatrics, 76, 126-128.
- Goldenring, J. M. (1985). Teaching testicular self-examination to young men. Contemporary Pediatrics, 2, 73-78.
- Goldenring, J. M. (1986). Equal time for men. Journal of Adolescent Health Care, 7, 273-274.
- Goldenring, J. M., & Purtell E. (1984). Knowledge of testicular cancer risk and need for self-examination in college students: A call for equal time for men in teaching of early cancer detection technique. Pediatrics, 74, 1093-1095.
- Gorzynski, G., & Holland, J. C. (1979). Psychological aspects of testicular cancer. Seminal Oncology, 6, 25-29.
- Graham, S., & Gibson R. W. (1972). Social epidemiology of cancer of the testis. Cancer, 50, 337-340.
- Heidenreich, A., & Hofmann, R. (1999). Quality of life issues in the treatment of testicular cancer. World Journal of Urology, 17, 230-238.

Heins, K. M. (2001, March). Cancers below the belt. Better Homes and Gardens, 220-222.

Heppner, P. P., & Hillerbrand, E. T. (1991). Problem-solving training: Implications for remedial and preventive training. In C. R. Snyder & D. R. Forsyth (Eds.), Handbook of social and clinical psychology: The health perspective (pp. 681-698). New York: Pergamon Press, Inc.

Higgs, D. J. (1990). The patient with testicular cancer: Nursing management of chemotherapy. Oncology Nursing Forum, 17, 243-249.

Hovell, M. F., Mewborn, C. R., Randle, Y., & Fowler-Johnson, S. (1985). Risk of excess weight gain in university women: A three year community controlled analysis. Addictive Behavior, 10, 15-28.

Jacobs, E. M., Johnson, F. D., & Wood, D. A. (1966). Stage III metastatic malignant testicular tumors. Cancer, 19, 1697-1704.

Johnson-Saylor, M. (1980). Seize the moment: Health promotion for the young adult. Topics in Clinical Nursing, 2, 9-19.

Kandrack, M., Grant, K. R., & Segall, A. (1991). Gender differences in health related behavior: some unanswered questions. Social Science Medicine, 32, 579-590.

Katz, R. C., Meyers, K., & Walls, J. (1995). Cancer awareness and self-examination practices in young men and women. Journal of Behavioral Medicine, 18, 377-384.

Kazdin, A. E. (1998). Assessing methods and strategies. In A. E. Kazden (Ed.), Research design in clinical psychology (pp. 263-302). Needham Heights, MA: Allen and Bacon.

Kedia, K., Markland, C., & Fraley, E. E. (1975). Sexual function following high retroperitoneal lymphadenectomy. Journal of Urology, *114*, 237-239.

Klein, J. F., Berry, C. C., & Felice, M. E. (1990). The development of a testicular self-examination instructional booklet for adolescents. Journal of Adolescent Health Care, *11*, 235-239.

Lev, E. L. (1997). Bandura's theory of self-efficacy: applications to oncology. Scholarly Inquiry for Nursing Practice: An International Journal, *11*, 21-37.

Lindsey, B. J. (1997). Peer education: A view point and critique. Journal of the American College of Health, *45*, 187-189.

Lipnickey, S. C. (1986). The potential for formulating a healthy lifestyle: An assessment of health instruction and the university student. Evaluation of the Health Professions, *9*, 487-506.

Lonnquist, L. E., Weiss, G. L., & Larsen, D. L. (1992). Health value and gender in predicting health protective behavior. Woman and Health, *19*, 69-85.

Marty, P. J., & McDermott, R. J. (1983). The effectiveness of alternative cancer education programs in promoting knowledge, attitudes, and self-examination behavior in a population of college-aged men, (ERIC Publication No. 241521). Fayetteville, AR: Author.

Marty, P. J., & McDermott, R. J. (1985). Three strategies for encouraging testicular examination among college age males. Journal of American College Health, *34*, 253-258.

McCarthy, B. W. (2001). Relapse prevention strategies and techniques with erectile dysfunction. Journal of Sex and Marital Therapy, *27*, 1-8.

- Meadus, R. J. (1995). Testicular self-examination. The Canadian Nurse, 41-44.
- Mellanby, A. R., Rees, J. B., & Tripp, J. H. (2000). Peer-led and adult led school health education: A critical review of available comparative research. Health Education Research, 15, 533-545.
- Million-Underwood, S., & Sanders, E. (1991). Testicular self-examination among African-American men. Journal of the National Black Nurses' Association, 5, 18-28.
- Misener, T. R., & Fuller, S. G. (1995). Testicular versus breast and colorectal cancer screening: Early detection practices of primary physicians. Cancer Practice, 3, 310-316.
- Moore, S. M., Barling N. R., & Hood, B. (1998). Predicting testicular and breast self-examination behavior: a test of the theory of reasoned action. Behavior Change, 15, 41-49.
- Moore, R. A., & Topping, A. (1999). Young men's knowledge of testicular cancer and testicular self-examination: A lost opportunity ? European Journal of Cancer Care, 8, 137-142.
- Morera, O. F., Johnson, T. P., Freels, S., Parsons, J., Crittenden, K. S., Flay, B. R., & Warnecke, R. B. (1998). The measure of stage of readiness to change: some psychometric considerations. Psychological Assessment, 10, 182-186.
- Murphy, G. P. (1983). Testicular cancer. Cancer, 33, 100-104,
- Murphy, W. G., & Brubaker, R. G. (1990). Effects of a brief theory-based intervention on the practice of testicular self-examination by high school males. Journal of School Health, 60, 459-462.

National Cancer Institute (1985). Research report: Progress in treatment of testicular cancer. (NIH Publication #85-6454). Washington DC: US Government Printing Office.

Neef, N., Scutchfield, F. D., Elder, J., & Bender, S. J. (1991). Testicular self-examination by young men: an analysis of characteristics associated with practice. College Health, 39, 187-190.

Oliver, R. T. D. (1985). Testicular germ cell tumors: a model for a new approach to treatment of adult solid tumors. Postgraduate Medical Journal, 61, 123-131.

Ostwald, S. K., & Rothenberger, J. (1985). Development of a testicular self-examination program for college men. Journal of American College Health, 33, 234-239.

Peate, I. (1997). Testicular cancer: The importance of effective health education. British Journal of Nursing, 6, 311-316.

Prochaska, J. O., Johnson, S., & Lee, P. (1998). The transtheoretical model of behavior change. In S. A. Schumaker & E. B. Schron (Eds.), Handbook of health behavior change (2<sup>nd</sup> ed., pp. 59-84). New York: Springer Publishing Co.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.

Prout, G., & Griffin, P. (1984). Testicular tumors: delay in diagnosis and influence on survival. American Family Practice, 29, 205-209.

Ratner, P. A., Bottorff, J. L., Johnson, J. L., & Hayduk L. A. (1994). The interaction effects of gender within the health promotion model. Research Nursing Health, 17, 341-350.

Reno, D. R. (1988). Men's knowledge and health beliefs about testicular cancer and testicular self-examination. Cancer Nursing, 11, 112-117.

Rosella, J. D. (1994). Testicular cancer health education: an integrative review. Journal of Advanced Nursing, 20, 666-671.

Roth, B. J., Nichols, C. R., & Einhorn, L. H. (1993). Neoplasms of the testis. In J. F. Holland, E. Frei, R.C. Bast, D. W. Kufe, D. L. Morton, & R. R. Weichselbaum, (Eds.), Cancer Medicine (pp. 1592-1619). Philadelphia: Lea & Febiger.

Rudolf, V. M., & Quinn, M. K. (1988). The practice of TSE among college men: effectiveness of an educational program. Oncology Nursing Forum, 15, 45-48.

Schottenfeld, D., & Warshauer, M. E. (1982). Testis. In Schottenfeld, D., & Fraumeni, J. (Eds.). Cancer epidemiology and prevention. (pp. 847-957). Philadelphia: WB Saunders.

Savage, I. (1993). Demographic influences of risk perceptions. Risk Analysis, 13, 413-420.

Sawyer, P. (1986). Breast self-examination: Hospital based nurses aren't assessing their clients. Oncology Nursing Forum, 13, 44-48.

Singer, A. J., Tichler, T., Orvieto, R., Finestone, A., & Moskowitz, M. (1993). Testicular carcinoma: A study of knowledge, awareness, and practice of testicular self-examination in male soldiers and military physicians. Military Medicine, 158, 640-643.

Steffen, V. J., & Gruber, V. A. (1991). Direct experience with a cancer self-exam: Effects on cognitions and behavior. The Journal of Social Psychology, 131, 165-177.

Swerdlow, A. J. (1993). The epidemiology of testicular cancer. European Urology, 23, 35-38.

Tedeschi, J. T., Schlenker, B. R., & Bonoma, T. V. (1971). Cognitive dissonance: Private ratiocination or public spectacle? American Psychologist, 26, 685-695.

Thornhill, J., Conroy, R., Kelley, D., Walsh, A., Fennely, J. J., & Fitzpatrick, J. (1986). Public awareness of testicular cancer and the value of self-examination. British Medical Journal, 293, 480-481.

Thornhill, J., Fennely, J. J., Kelley, D., Walsh, A., & Fitzpatrick, J. M. (1987). Patient's delay in the presentation of testis cancer in Ireland. British Journal of Urology, 59, 447-451.

US Department of Health and Human Services. (1992). Health United States 1991 and Prevention Profile. Hyattsville, MD. (Publication PHS 92-1232)

US Preventive Services Task Force. (1996). Guide to clinical preventive services. (2<sup>nd</sup> Ed.) Baltimore, MD: Williams & Wilkins.

Valanis, B., Lichtenstein, E., Mullooly, J. P., Labuhn, K., Brody, K., Severson, H. H., Stevens, N. (2001). Maternal smoking cessation and relapse prevention during health care visits. American Journal of Preventive Medicine, 20, 1-8.

Vaz, R. M., Best, D. L., & Davis, S. D. (1988). Testicular cancer. Journal of Adolescent Health Care, 9, 474-479.

Vogalzang, N. J., & Lange, P. H. (1991). Tumors of the testes. In A. R. Moossa, S. C. Schimpff, & M. C. Robson (Eds.), Comprehensive textbook of oncology (pp. 1110-1121). Baltimore: Williams & Wilkins.

Walker, R., & Guyton, R. (1989). Modeling and guided practice as components within a comprehensive testicular self-examination cancer education program. College Health, 37, 211-215.

Wardle, J., Steptoe, A., Burckhardt, R., Vogele, C., Vila, J., & Zarczynski, Z. (1994). Testicular self-examination: attitudes and practices among young men in Europe. Preventive Medicine, 23, 206-210.

Weiss, G. L. & Larson, D. L. (1990). Health value, health locus of control, and the prediction of health protective behaviors. Social Behavior Personality, 18, 121-136.

Weissfeld, J. L., Kirscht, J. P., & Brock, B. M. (1990). Health beliefs in a population: The Michigan Blood Pressure Survey. Health Education, 17, 141-155.

Weisman, A. & Worden, W. (1976-1977). The existential plight in cancer: Significance of the first 100 days. International Journal of Psychiatry Medicine, 7, 1-15.

Weist, M. D., & Finney, J. W. (1996). Training in early cancer detection and anxiety in adolescent males: a preliminary report. Developmental and Behavioral Pediatrics, 17, 98-99.

Westlake, S. J., & Frank, J. W. (1987). Testicular self-examination: an argument against routine teaching. Family Practice – An International Journal, 4, 143-148.

Zimmerman, R. S., & Conner, C. (1989). Health promotion in context: The effects of significant others on health behavior change. Health Education Quarterly, 16, 57-75.

## Appendix A

### 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.)

---

**10. How would you rate your overall current health?**

- Excellent
- Good
- Fair
- Poor

**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

**12. What do you think your chances are of experiencing a serious illness in the future?**

- Definite
- Very High
- High
- Low
- Very Low
- Zero

**13. What do you think your chances are of experiencing a serious injury?**

- Definite
- Very High
- High
- Low
- Very Low
- Zero

**14. Have you ever had a serious illness or injury?**

- Yes
- No

15. **Have you ever been treated or hospitalized for a serious illness or injury?**

- Yes  
 No

16. **Have you ever been diagnosed with a sexually transmitted disease?**

- 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

20. **Have you ever been diagnosed with breast or testicular cancer?**

- Yes       No

**Thank you for you participation!**

## Appendix B

### 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," "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 or 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.	1	2	3	4	5	6
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 C

### Stages of Change Measure (SCM - men)

Read each of the following paragraphs carefully and then decide which one best describes you current thoughts and feelings about testicular cancer.

\_\_\_\_\_ I do not know much about testicular cancer and have never really thought much about it. Testicular cancer is not something that I need to worry about because it is unlikely that I would ever get it. Even if I were 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 testicular cancer and I think I may be at risk for testicular cancer but I have not done anything to try to detect it early (such as a testicular self-exam). Although I have not done anything in the past, I have been thinking about possibly doing something like a self-exam in the future and will probably do it sometime within the next six months.

\_\_\_\_\_ I am possibly at risk for testicular cancer and have tried to do a testicular self-exam in the past. I probably do testicular 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 it.

\_\_\_\_\_ I am at risk for testicular cancer and have done a testicular self-exam within the past month. I generally remember to do testicular self-exams regularly (monthly) and I plan to continue to do so. I am extremely confident that I know how to do a testicular self-examination correctly.

\_\_\_\_\_ I am at risk for testicular cancer. I have done a testicular self-exam monthly for the past six months and plan to continue to do testicular self-exam regularly. I am sure that I know how to do testicular self-exams correctly.

\_\_\_\_\_ I am at risk for testicular cancer. I have done testicular self-exams regularly (for at least 6 months) in the past, but have stopped doing them. I have thought about starting to do testicular self-examinations again.

**PLEASE BE SURE THAT YOU CHECKED ONLY ONE !!!**

## Appendix D

### 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.

## 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

### Attitudes about Testicular Cancer and Testicular Self-Examinations

**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.**

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
1. I am confident that I know how to correctly perform a testicular self-examination.	1	2	3	4	5
2. I am afraid of examining my testicles for fear of what I might find.	1	2	3	4	5
3. I am too embarrassed to touch my testicles	1	2	3	4	5
4. I do not have time to regularly examine my testicles.	1	2	3	4	5
5. I do not have the privacy to examine my testicles.	1	2	3	4	5
6. I would be embarrassed if I found a problem from my testicular self-examination and it turned out to be nothing.	1	2	3	4	5
7. I often forget to perform a testicular self-examination.	1	2	3	4	5
8. My religious or cultural beliefs have taught me that touching my testicles is wrong.	1	2	3	4	5
9. I think that testicular self-examinations are too complicated to do correctly.	1	2	3	4	5
10. I believe that testicular cancer is treatable if detected early.	1	2	3	4	5
11. If I were to get testicular cancer, I believe nothing could be done to save my life and/or my testicles.	1	2	3	4	5

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
12. I think that testicular self-examination may be helpful in detecting testicular cancer.	1	2	3	4	5
13. In addition to a testicular self-examination, a clinical testicular examination by a doctor is an effective way to detect testicular cancer.	1	2	3	4	5
14. Most of my friends and family members think a testicular self-examination is a good idea.	1	2	3	4	5
15. Conducting regular testicular self-examinations serves as a positive role model for my friends and for other men 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 G**

**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 your 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 make sure that they did not miss any questions. 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  $\frac{1}{2}$  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 and 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. If a student refuses to participate, please let us know that this happened.**
- 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 you 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 1<sup>st</sup> 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 call the CSU PD if they need to talk to a counselor.**
  
  - c. **Do not let people leave by themselves if they are very upset!**

## **Contact 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](mailto: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](mailto: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](mailto: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.

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 Harshorn 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

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 possible!**

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 not 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 cancer
- Breast cancer is the second most diagnosed cancer in the United States
- If breast cancer is detected, the chances are good to treat successfully
- 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

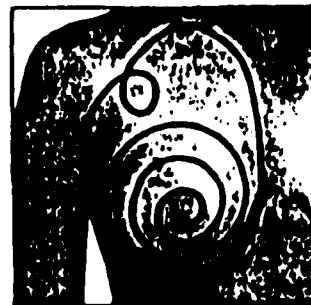


figure 1 - the spiral method

## 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

## Appendix I

### The Percentage of Participants who Responded Incorrectly on Each True/False Knowledge Item at Pre-Treatment and the Follow-up Sessions

	Pre-Treatment	1 Month FU	2 ½ Month FU	6 Month FU
Q1	82.1	55.1	57.0	55.2
Q2	6.8	0.6	3.7	1.1
Q3	3.1	0	1.9	2.3
Q4	31.5	18.4	22.0	25.3
Q5	18.5	12.0	14.5	11.5
Q6	69.8	38.6	40.9	31.0
Q7	58.0	25.9	34.0	28.7
Q8	21.0	5.7	6.9	3.4
Q9	4.9	5.1	6.7	6.9
Q10	28.4	22.2	22.0	29.9
Q11	24.1	21.7	24.7	26.4
Q12	5.6	4.4	7.5	5.7
Q13	19.1	12.0	13.8	13.8
Q14	3.17	10.4	12.6	20.7
Q15	4.9	3.8	5.7	4.6