BREAST SELF-EXAMINATION AMONG COLLEGE-AGED FEMALES
AN INTERVENTION STUDY

A Thesis
by
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FOREWORD

This thesis is written in accordance with the style of the *Publication Manual of the American Psychological Association (6th Edition)* as required by the Department of Psychology at Appalachian State University

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Dedication

I wish to dedicate this thesis to my parents, Regina and Charlie Short, and my brother, Ryan Toomey. Their enduring support and encouragement has made my graduate school experience possible.

Breast Self-Examination Among College-Aged Females:

An Intervention Study

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Abstract

Although 95% of women report awareness of recommendations to perform monthly breast self-examinations (BSEs), only about 17-36% of women comply with this recommendation. Many intervention studies aim to increase BSE behavior in women by providing them with information about breast cancer, the importance of BSEs, and the proper way to conduct BSEs, but few seek to address the underlying cognitive and emotional reasons why women fail to engage in this healthy behavior. This study investigated whether combining Motivational Interviewing (MI) and a Health Belief Model based (HBM) intervention would promote intentions to engage in BSE behaviors. Thirty-three females were randomly assigned to an HBM based psychoeducational intervention using MI (PE/MI; $n = 17$) or a no-treatment control group ($n = 16$). Together, the HBM constructs predicted intentions to engage in BSE, $F(6, 24) = 3.07$, $p = .03$. The PE/MI participants reported significantly greater self-efficacy, $F(1, 27) = 7.31$, $p = .01$, awareness of BSE cues, $F(1, 30) = 12.81$, $p = .001$, and intentions to conduct monthly BSEs, $F(1, 30) = 15.48$, d = 1.38, $p < .001$, at post-test than control participants. The groups did not differ on other HBM constructs ($ps > .11$). MI appears to be a promising strategy for promoting BSE.

Breast Self-Examination Among College-Aged Females: An Intervention Study

Breast cancer is currently one of the most frequent causes of mortality among women in the United States. The National Cancer Institute estimates that, based on current rates, one in eight women born today will be diagnosed with breast cancer at some time in her life (American Cancer Society, 2009). This is a dramatic increase since 1977, when the rate was one in fourteen women (George, 2000). In 2010, approximately 207,000 women were diagnosed with breast cancer and about 39,840 women died from this disease (American Cancer Society, 2010).

Although curative treatment for breast cancer is increasingly successful, early detection and treatment are critical in reducing mortality rates among women (American Cancer Society, 2009; Champion & Miller, 1992; Erblich, Bovbjerg, & Valdimarsdottir, 2000). According to the American Cancer Society, the five-year survival rate for early, localized breast cancer approaches 100%; however, if the cancer has spread, the survival rate is only 60% (American Cancer Society, 2009).

The three screening methods currently recommended by the American Cancer Society (2010) for early detection of breast cancer are clinical breast examination (CBE), mammography, and breast self-examination (BSE). CBEs, conducted by a health care professional, are recommended every three years for women aged 20-40 and yearly thereafter. A baseline mammogram is recommended for women between 35 and 39 years of age, with subsequent mammography every one to two years for women between 40 and 49 years, and yearly after age 50 (Janz, Becker, Anderson, & Marcoux, 1989). BSE is a relatively simple, convenient, non-invasive, minimal-risk, and inexpensive method of early

detection recommended for women. Women should begin this routine in their 20s to learn the look and feel of their healthy breast so that they may report any changes in their breasts to a health expert immediately (Janz et al., 1989).

The widespread use of screening mammography has decreased the percent of breast cancers found by the patient herself from about 80% a quarter-century ago, to about 35% today (Lannin & Ponn, 2005). Because women younger than 35 years of age are not routinely invited for mammography screening and are only encouraged to have a CBE once every three years, it is less likely that breast cancer in younger women will be detected using these screening techniques. Thus, BSE is typically the only means of discovering tumors at a stage where treatment and clinical cure are possible for younger women (Fry & Prentice-Dunn, 2006). Also, though the risk of breast cancer below the age of 35 is rather low, women who do develop the disease in their 20s and 30s have a much poorer prognosis than women diagnosed at an older age (Umeh & Rogan-Gibson, 2001). Younger women tend to have a reduced survival rate compared to older women due to their cancers being at advanced stages or having lymph node involvement at diagnosis (Fry & Prentice-Dunn, 2006). Accordingly, it is important to promote regular BSE in young women.

BSE allows women to perform an examination independently (i.e., without relying on a health care professional). It also is often the only screening method available for women without access to professional health care services, such as those that lack adequate health insurance (Erblich et al., 2000).

The evidence regarding the effectiveness of BSE is equivocal. A recent study conducted by Thomas and colleagues (2002) in Shanghai, China tested the effectiveness of an education campaign among 266,000 women in improving breast cancer outcomes. In this

study, half of the women were provided instruction about the importance of BSE and its appropriate practice, and received frequent reminders, reinforcement, and medical supervision for 10-11 years. At the conclusion of the study, the breast cancer mortality rates were statistically similar to a no-treatment control group. Rates of detected cancer were similar in the control and instruction groups and survival time from diagnosis and staging of the disease did not differ significantly by group. Researchers reported that the teaching of BSE did not cause breast cancers to be detected at a sufficiently earlier stage to affect the course of the disease, suggesting that BSE might not play as significant a role in decreasing breast cancer mortality rates as previously thought (Thomas et al., 2002).

Conversely, a meta-analysis by Hill, White, Jolley, and Mapperson (1998) found BSE to be effective in detecting the early symptoms of breast cancer. This meta-analysis of 12 studies, including 8,118 patients with breast cancer, related the practice of BSE to regional lymph node state or tumor diameter. An analysis of six studies showed that 39% of patients who reported having conducted BSEs at least once before being diagnosed with breast cancer had evidenced cancer in the lymph nodes compared with 50% of women who had not conducted a BSE. Additionally, an analysis of eight studies examining tumor diameter to indicate the extent of the disease showed that significantly fewer women who had practiced BSE before the illness (56%) had tumors 2 cm or more in diameter compared with women who had not practiced BSE (66%). Researchers suggested that these findings evidence the benefits of engaging in regular BSEs (Hill et al., 1998).

Currently, the American Cancer Society recommends that women be aware of the benefits and limitations of BSE practice, and use BSE only if they have no existing symptoms of breast cancer or are not at a significantly higher-than-average risk for the

disease (Fry & Prentice-Dunn, 2006). Women who have symptoms of breast cancer or are at a higher risk for the disease are encouraged not to rely solely on BSE, but also to supplement this behavior with clinical breast exams and mammograms. Despite controversy concerning BSE's effectiveness in discovering tumors at an early stage, it is generally accepted as an important adjunct to other detection methods, especially among young women where other screening methods are not routinely used (American Cancer Society, 2010).

Although BSE has been recommended for many years, research indicates that less than 36%, with some estimates as low as 17%, of women complete this procedure monthly (Champion & Miller, 1992; Millar, 1997). These low rates are not attributable to a lack of awareness of the recommendations, as the American Cancer Society (1987) estimated that 95% of women are aware of recommendations to perform a monthly BSE (Millar, 1997). Even among women who routinely conduct BSEs, adherence to specific recommendations is low. Only 20% of women examining their breasts carry out more than half of the recommended steps (Luszczynska, 2004). Furthermore, though some lumps are found during a planned BSE and some are found accidentally, research shows that completing monthly BSE is significantly more effective than accidental discovery in detecting the disease at an early stage (Kaplan, Weinberg, Small, & Herndon, 1991). The one third of breast cancers found by the patient herself still account for close to 70,000 cancers each year in the United States (Lannin & Ponn, 2005).

In addition to detecting breast cancer in early stages, conducting BSE in young women has other benefits. Young women who perform BSEs will familiarize themselves with their healthy breasts, which will assist them in identifying any abnormalities or differences that may become more likely to occur later in their lives. Establishing health

practices that can help when one moves into the age group at risk for breast cancer (45 years and older) is ideal (Budden, 1995). Utilizing an established model of health behavior, such as the Health Belief Model, can aid in designing effective interventions to promote BSE among young women.

Health Belief Model

The Health Belief Model (HBM) emphasizes cognitive and attitudinal influences, and is the most widely used model to predict BSE behavior (Champion & Miller, 1992). This model posits that six factors relate to the performance of a surveillance behavior: perceived severity of the disease (also referred to as perceived seriousness), perceived susceptibility to contracting the disease, perceived benefits of engaging in the screening behavior, perceived barriers to engaging in the screening behavior, self-efficacy to maximize its utility, and cues to action where physical symptoms, health education, physician recommendations, and the like also influence the likelihood of performing screening behaviors regularly (Erblich et al., 2000; Norman & Brain, 2005). These last two factors, self-efficacy and cues to action, were not part of the original HBM model, and were added more recently to improve the model's predictive power.

According to the HBM, women who perceive themselves as susceptible to breast cancer and believe the disease is serious are more likely to be motivated to take action against the health threat. Also, women who believe that performing BSE has more benefits than barriers are more likely to take part in regularly practicing BSE. This model also proposes that increased self-efficacy concerning the behavior and exposure to more cues regarding the behavior will increase the likelihood that the behavior will be practiced regularly (Luszczynska & Schwarzer, 2003; Norman & Brain, 2005).

A number of studies have applied the HBM to the prediction of BSE behavior. These studies have shown that the strongest predictor of BSE frequency is perceived barriers (e.g., Champion, 1988, 1990; Fung, 1998). Significant relationships have also been reported for perceived benefits, perceived susceptibility, self-efficacy, and cues to action (Champion, 1988, 1990; Luszczynska & Schwarzer, 2003; Massey, 1986; Norman & Brain, 2005). Non-significant findings are typically reported for perceived severity, regardless of the specific behavior under investigation (Murray & McMillan, 1993; Norman & Brain, 2005). Despite the lack of significant findings for the perceived severity construct, researchers continue to assess it in order to maintain fidelity to the HBM.

For example, in a study by Champion (1987), among female patients at an outpatient medical clinic, barriers and knowledge of proper BSE performance combined to account for 26% (22% and 4%, respectively) of the total variance, or 93% of the explained variance, in BSE attitudes and behavior. Additionally, as knowledge of the behavior increased, perceived barriers (embarrassment, time involved, fear of finding a lump, etc.) decreased, and perceived benefits increased. Champion concluded that some aspects of the HBM (perceived susceptibility and severity) failed to predict BSE in women (Champion, 1987).

Despite some encouraging findings, several criticisms of the HBM have been noted. Sheeran and Abraham (1996) questioned the unidimensionality of the perceived barriers construct, arguing that it may cover both practical barriers (e.g., time, expense) as well as psychological barriers (e.g., pain, embarrassment, fear). It may be the case that one type of barrier is more important in predicting BSE than the other (Sheeran & Abraham, 1996).

Although Champion (1990) found that a number of HBM variables remained as significant predictors when controlling for past BSE behavior, Calnan and Rutter (1986)

found that past BSE behavior was the sole predictor of future BSE behavior when considered in conjunction with the HBM variables. Several researchers have expanded the HBM to include self-efficacy in the model, and many studies have reported significant relationships between self-efficacy and BSE, such that women who report confidence in their ability to perform BSE are more likely to conduct BSE on a regular basis (Luszczynska & Schwarzer, 2003; Norman & Brain, 2005).

BSE Intervention

Though BSE training has been shown to increase self-efficacy and behavior in some individuals, some research has shown that even among women who have attended BSE training sessions, the rates of adherence to monthly BSE practice are poor. For example, a study by Lindberg, Stevens, Smith, Glasgow, and Toobert (2009) attempted to use a simple and practical intervention program to increase the appropriate use of BSE in a sample of 616 women ranging in age from 40-70 years old. This intervention consisted of a 20- to 45-minute individual counseling session that featured BSE instruction, training, and practice with silicone models, identification of barriers to BSE, and problem solving training. This intervention was followed by two brief follow-up telephone calls. A dietary intervention, similar in format, served as the control group. At the 12-month follow-up, a majority of individuals in the BSE intervention group (59%) reported significantly higher regular BSE practice than those in the control group (12.2%; $p < .001$). The results suggest that a brief intervention, with an individual counseling session, is an effective model that may be used to encourage self-screening behaviors. This study was conducted at a large health maintenance organization in Portland, Oregon; thus, participants were limited to women with health

insurance, and the generalizability of the results to other populations is unknown (Lindberg et al., 2009).

In a study by Luszczynska (2004), 720 college-aged women were recruited for an intervention designed to enhance self-efficacy in order to increase BSE performance among those who either do not perform routine BSEs at all or do not regularly perform all components of the self-examination. Participants were randomly assigned to either a no-treatment control group or the intervention group. The intervention was designed to increase optimistic self-beliefs about a person's ability to perform self-exams regularly and to increase beliefs about one's capabilities to cope with barriers. Self-efficacy was targeted through the use and mastery of conducting exams on silicone breast models. Results indicated that, compared to the control group, participants in the intervention group exhibited significantly greater behavior change. However, the intervention and control groups did not differ in maintenance of self-efficacy when measured three months later, indicating that the effects of the intervention were short-lived. These results suggest that in order for an intervention to result in enduring change, it needs to target more than a woman's self-efficacy to conduct BSE properly (Luszczynska, 2004).

Audrain and colleagues (1999) sought to assess the impact of a single-session stress management/coping intervention (problem-solving training) versus a general health counseling control condition on BSE adherence among relatives of newly diagnosed breast cancer patients. Participants consisted of 510 women between 20-75 years old with one first-degree relative with a diagnosis of primary breast cancer. Problem solving training is defined as a cognitive-behavioral coping skills intervention that includes five components: (a) problem definition, (b) solution generation, (c) solution evaluation, (d) decision-making, and

(e) solution implementation. Additionally, participants in this group were provided with printed handouts about breast cancer risk factors, references for additional breast cancer literature, breast cancer screening guidelines, and recommendations for a healthy diet. The general health counseling assessed and discussed current health practices including diet, physical activity, and smoking. At the three-month follow-up, 36% of all participants showed improvements in BSE adherence. The problem solving training and general health counseling groups were not significantly different in terms of improvement in BSE adherence (36.6% and 35.8% improvement, respectively). This study found that women with heightened perceived risk of breast cancer were two times more likely to improve in BSE adherence than women low in perceived risk, indicating that women with a family history of breast cancer who feel they are highly at risk may be most likely to benefit from a behavioral coping skills intervention. Because this study consisted of only individuals with a first-degree relative diagnosed with primary breast cancer, it is uncertain if these results generalize to the general population (Audrain et al., 1999).

Fletcher and colleagues (1990) sought to compare different methods for teaching BSEs. In this study, women between 20 and 68 years of age were randomly assigned to one of three groups: one receiving instruction based on the Mammacare method (Mammacare group), one receiving instruction based on an approach advocated by the American Cancer Society (traditional group), and one receiving no nurse instruction (control group). Additionally, a randomly selected half of patients in each of the three groups were assigned to be encouraged by a physician to practice BSE. The Mammacare group met with a registered nurse for 45 minutes of standardized instruction in BSE that used manufactured silicone models. The traditional group met with a registered nurse for a standardized 30-

minute session. During this session, each woman viewed a 10-minute video-tape, then disrobed and practiced proper BSE while the nurse provided feedback. Follow-up interviews were conducted at one month and one year. Women who were in the Mammacare group significantly improved their detection of small lumps in manufactured breast models. Overall, results indicated that women in both the traditional and Mammacare groups found more lumps in the manufactured breast models than women in the control group and the addition of physician encouragement did not result in significant one-year increases in BSE behavior any of the three groups. Across all groups, self-reported examination frequency over a six-month period rose (5.1 times in the traditional group, 4.2 times in the Mammacare group, and 3.9 times in the control group). Results also indicated that Mammacare instruction provided more long-term improved examination technique than did groups with only traditional instruction or physician encouragement (Fletcher et al., 1990).

Mamon and Zapka (1985) conducted a randomized trial to improve BSE performance among college-aged women at a large public university. The 1,682 women who participated in this study attended an educational BSE program in either a classroom or workshop setting. The goal of the educational program was to enhance frequency or regularity of performance, emphasize skill development via multiple teaching techniques, and target the cognitive and affective components known to be related to breast cancer detection behaviors. All workshop participants received a six-month follow-up questionnaire. The educational interventions were associated both with an increase in the proportion of women who performed BSE and with greater proficiency of performance. Additionally, post-intervention analyses of attitudes found that women had less fear and a more realistic perception of the incidence and prevalence of breast cancer than at pre-intervention. Limitations of this study included the

use of self-report data measuring proficiency of BSE performance, rather than a more objective measure, thus replication and expansion is necessary. Also, one-on-one problem solving in addition to educational intervention might have improved the results of this study (Mamon & Zapka, 1985).

Based on social learning theory, Kenney, Hovell, Newborn, and Elder (1989) designed a study to evaluate the effects of an instructional program on BSE skills, confidence, and anxiety. In this study, 73 college-aged women were assigned to either a no treatment control group or an intervention group consisting of a BSE training program. The training program consisted of one hour of BSE group instruction, which included a lecture, video, and practice with silicone models, and 5-15 minutes of practice on oneself with feedback from a trained observer. Results from the pre-test indicated that prior to training, 56% of the population did not practice BSE, although 97% of individuals were aware of BSE practices. Results from analyses of covariance indicated that the BSE training session improved BSE skill and confidence and decreased anxiety related to performance of BSE and fear related to breast cancer. The findings of this study are limited by the small sample size and by a very brief (one week) follow-up period (Kenney et al., 1989).

In a review of BSE intervention studies, Janz and colleagues (1989) argued that proficiency is as important to target as frequency of BSE, citing that there is considerable evidence that women's perceived level of confidence in their performance is related to BSE practice. They emphasized the importance of strategies aimed at enhancing feelings of self-efficacy, such as skills-development training through modeling, self-demonstration, corrective feedback, and lump-detection training on synthetic breast models (Janz et al., 1989).

Though research suggests that most women are aware that BSE is a positive health behavior that is recommended by officials, many women do not conduct BSEs on a regular basis. Many of the intervention studies aim to increase BSE behavior in women by providing them with information about breast cancer, the importance of BSEs, and the proper way to conduct BSEs, but few seek to explore the underlying cognitive and emotional reasons why women often fail to engage in this healthy behavior.

Motivational Interviewing

Motivational Interviewing (MI) is described by Miller and Rollnick (2002) as "a way of being with people…designed to resolve motivational issues that inhibit positive behavior change" (p. 41). MI is an intervention style often used to assist individuals in recognizing problems related to their current situation, reach a decision to change, and build commitment towards the desired behavior. This style of counseling respects the individual's autonomy to choose and is based on the belief that each individual possesses the potential for change. MI is a collaborative approach in which the counselor evokes the individual's own intrinsic motivation and resources for change. Four broad principles underlie the specific method of MI, which are to: (a) express empathy, (b) develop discrepancy, (c) roll with resistance, and (d) support self-efficacy. Within these principles, it is important for the therapeutic style to be client-centered, where the client, rather than the counselor, presents the arguments for change, and change is motivated by a perceived discrepancy between present behavior and important personal goals or values (Miller & Rollnick, 2002).

Miller and Rollnick (2002) proposed that trying to convince individuals to change often decreases the likelihood of change for a variety of reasons (e.g., individuals will become defensive). Therefore, within an MI framework, therapists work with individuals to

explore discrepancies between individuals' present behaviors and their own goals and values to encourage them to consider new perspectives of change. Resolving ambivalence is accomplished using client-centered directive interviewing to elicit change-related statements from the client in a non-confrontational manner. In the end, the individual, not the counselor, is responsible for choosing to change and for carrying out strategies to enact change. The overall goal of MI is to resolve ambivalence and start the change process (Miller & Rollnick, 2002). Research suggests that taking a collaborative approach to enhance motivation for change, such as the style used in MI, may increase one's willingness to change and encourage the adoption of various health behaviors (Newman, 1994).

MI has been used predominantly in the field of addictive behaviors and research has provided evidence that it is effective in this area (Burke, Arkowitz, & Menchola, 2003; Miller & Rollnick, 2002). More recently, MI has been tailored for use in public health settings with health behaviors such as human immunodeficiency virus (HIV)-risk behaviors, diet adherence, smoking cessation, diabetes control, and pain management (Miller & Rollnick, 2002). Because of the quick pace of public health settings and the lack of time for intensive training, variations of MI have been utilized in these settings. Adaptations of Motivational Interviewing (AMIs) are defined as interventions that incorporate non-MI techniques while retaining MI principles, as well as interventions that have been specifically adapted for use by non-specialists. Though many AMIs are used in interventions with individuals engaging in substance use and other risky behaviors (e.g., HIV-risk behaviors), a few studies have been conducted to test the effectiveness of AMIs on increasing healthy behaviors (e.g., diet adherence, promoting physical activity, exercise adherence; Berg-Smith et al., 1999; Reniscow, Jackson, Wang, Dudley, & Baranowski, 2001; Smith, Heckemeyer,

Kratt, & Mason, 1997; Woollard et al., 1995). Lundahl and colleagues (2010) conducted a meta-analysis of 119 studies utilizing MI as an intervention for substance use (i.e., tobacco, alcohol, drugs, marijuana) and health-related behaviors (i.e., diet, exercise, safe sex). Results indicated that MI yields significant positive effects across a wide range of problem domains (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Overall, available evidence suggests that MI holds considerable promise as a behavior change approach for public health and medical settings (Burke et al., 2003).

Current Study

Much of the research surrounding BSE behavior has examined BSE behavior in the population considered at highest risk for breast cancer (women over 45 years of age). Few studies have examined BSE behaviors in college-aged women. It is important to increase regular BSE practice in this population so that they may familiarize themselves with their healthy breasts, which will assist them in identifying any abnormalities as they age (Budden, 1995). Though it is relatively uncommon, breast cancer can occur in young women, thus regular BSEs may help them detect cancer at an early stage, just as they do in older women who are at objectively greater risk.

Although research suggests that most women are aware that BSEs are a positive health behavior that is recommended by officials, many women do not conduct BSEs on a regular basis. Many of the intervention studies aim to increase BSE behavior in women by providing them with information about breast cancer, the importance of BSEs, and the proper way to conduct BSEs, but few seek to discuss the underlying cognitive and emotional reasons why women fail to engage in this healthy behavior. MI has been adapted in the public health setting for many healthy behaviors including medication adherence, diet, and

increasing physical activity, and has been demonstrated to be effective in several studies in increasing these behaviors (Miller & Rollnick, 2002).

The current study compared a psychoeducational intervention (PE) with an MI component (PE/MI group) to a no-treatment control group. During the MI session with a trained clinician, individuals discussed benefits as well as barriers that result from conducting regular BSEs in an effort to resolve ambivalence about the behavior and take steps toward behavior change. Individuals also discussed fears surrounding contracting breast cancer, their thoughts about the perceived severity of the disease, as well as facts on susceptibility. The trained clinician used directive interviewing to elicit change-related statements from the individual in a non-confrontational manner. Within an MI framework, the trained clinician worked with participants to explore discrepancies between the participants' present behaviors and their own goals and values to encourage them to consider new perspectives of change and resolve ambivalence regarding BSE.

In addition, this study examined BSE behavior through the HBM model, placing an emphasis on cognitive and attitudinal influences. Using this model, the intervention targeted each of the six factors related to the performance of BSE behavior: perceived severity of the disease, perceived susceptibility to contracting the disease, perceived benefits of engaging in the screening behavior, perceived barriers to engaging in the screening behavior, self-efficacy in order to maximize its utility, and cues to action where physical symptoms, health education, physician recommendations, and the like also influence the likelihood of performing screening behaviors regularly (Erblich et al., 2000; Norman & Brain, 2005).

The present investigation sought to test the following hypotheses: Hypothesis 1, consistent with past research, the HBM constructs of perceived severity, perceived

susceptibility, benefits, barriers, self-efficacy, and cues to action would collectively account for significant variance in intentions to engage in BSE. Specifically, the HBM constructs of perceived severity, perceived susceptibility, perceived benefits, self-efficacy, and cues to action were expected to be positively associated with BSE intentions and the HBM construct of perceived barriers was expected to be negatively associated with intentions. Hypothesis 2, participants in the PE/MI group were expected to report higher levels of perceived severity, perceived susceptibility, perceived benefits, self efficacy, and cues to action, and lower levels of perceived barriers from Time 1 to Time 2, compared to participants in the no-treatment control group. Hypothesis 3, participants in the PE/MI group were expected to report higher levels of intentions to conduct regular BSEs than participants in the no-treatment control group at Time 2. Research has shown that targeting each HBM construct predicts intention to engage in the behavior. Because the PE/MI intervention targeted the HBM, it was hypothesized that individuals in this intervention group would report more of a willingness to engage in regular BSE behavior compared to individuals in the no-treatment control group. Hypothesis 4, it was expected that intentions to engage in BSE would be partially mediated by the HBM constructs (taken collectively), which are thought to be the most proximal predictors of behavior

Method

Participants

One hundred and seventy-seven participants were recruited to complete the online screening measure. Of those, 117 participants qualified and were contacted via email or telephone. Thirty-three females from a southeastern university volunteered to participate in the study in exchange for course credit. Participants ranged in age from 18 to 25 years; the

mean age was 19.28 years (*SD* = 1.38). Ethical principles were adhered to throughout the duration of the study. The consent process and research protocol were approved by the Institutional Review Board for the Protection of Human Subjects at Appalachian State University (Approval number: 11-0132; see Appendix A).

Measures

Past BSE behavior. This instrument included ten questions designed to assess engagement in regular and effective BSE behavior at the start of the study (*n* =177). This assessment exhibited good internal consistency (Cronbach's α = .85). Questions assessing family history of breast cancer were also included (Appendix B).

HBM/BSE questionnaire. This instrument assessed BSE beliefs based on the HBM model (see Appendix C). This measure was newly generated for this study based on conventions in the literature for testing the HBM. It contained the HBM variables of perceived severity, perceived susceptibility, benefits, barriers, self-efficacy, and cues to action measured on separate subscales. This instrument is composed of 57 items, with the number of items on each subscale ranging from seven to eleven. Subscales utilized a 7-point Likert scale with end points labeled *strongly agree* and *strongly disagree*. For all subscales, a mean across items was calculated and used in analyses.

The Perceived Severity subscale consists of ten items aimed to measure the perceived personal threat if breast cancer occurred (e.g., "I would feel like less of a woman if I were diagnosed with breast cancer"). This subscale exhibited good internal consistency in the current study (α = .75 and .86 at pre- and post-test, respectively).

The Perceived Susceptibility subscale consists of nine items aimed to assess the perceived probability of getting breast cancer (e.g., "My chances of getting breast cancer are

great"). This subscale exhibited good internal consistency in the current study (α = .88 and .87 at pre- and post-test, respectively).

The Benefits subscale consisted of ten items aimed to measure the perceived benefits relative to conducting regular BSEs (e.g., "BSE is a low cost method of detecting cancer early"). This subscale exhibited very good internal consistency in the current study (α = .92 and .95 at pre- and post-test, respectively).

The Barriers subscale consisted of eleven items aimed to measure the perceived barriers relative to conducting regular BSEs (e.g., "BSEs are time consuming"). This subscale exhibited good internal consistency in the current study (α = .87 and .81 at pre- and post-test, respectively).

The Self-Efficacy subscale consisted of ten items aimed to assess one's confidence in accurately performing a BSE (e.g., "I feel confident that I could accurately perform a BSE"). This subscale exhibited very good internal consistency in the current study (α = .91 and .94 at pre- and post-test, respectively).

The Cues to Action subscale consisted of seven items aimed to measure any instruction or education that the individual has received (e.g., "I have spoken with my doctor about BSE"). This subscale exhibited adequate internal consistency in the current study (α = .74 and .77 at pre- and post-test, respectively).

BSE measure of intent. This is a five-question instrument designed to assess how likely it is that the individual will engage in BSEs in the next six months (Appendix D). A mean across items was calculated to yield a score with higher scores representing stronger intentions to engage in BSEs. This subscale exhibited good internal consistency in the current study (α = .83; scale was used at post-test only).

Procedure

Prior to participating, individuals were provided with an informed consent form (Appendix E). Participants then completed an online screening measure to ensure that they did not currently engage in regular and effective BSE behavior. This survey consisted of a demographic questionnaire, as well as a measure assessing BSE beliefs based on the Health Belief Model (HBM/BSE Questionnaire; Appendix C). Due to the personal nature of the questions, participants were asked to complete all measures in this study alone in a private, distraction-free environment. Those who denied engaging in regular BSE, and/or reported conducting ineffective BSEs were randomly assigned to one of two groups: the psychoeducation plus MI group (PE/MI group), or the no-treatment control group. Prior to participating in this phase of the study, participants were provided with a second informed consent form to read and sign (Appendix F). Following the intervention, participants completed a post-test consisting of the HBM/BSE Questionnaire, and the BSE Measure of Intent. To ensure treatment fidelity across all sessions, research assistants followed a detailed procedure outline. A checklist of relevant information to be covered during each session was used to confirm that all information was addressed in the intervention.

Motivational Interviewing clinicians. Two graduate-level researchers received specific training in MI principles and skills by a licensed psychologist trained in MI. Graduate-level researchers reviewed the principles of the style of MI, practiced delivering the intervention to other graduate-level researchers, and practiced delivering the intervention to undergraduate researchers prior to providing the intervention to subjects. Graduate researchers received supervision by a licensed psychologist as needed throughout the course of the study.

Motivational Interviewing group (PE/MI group). Participants randomly assigned to this group (n = 17) met in groups of one to four individuals and attended a two-part session. One part of the session focused on providing PE regarding breast self-exams in a group format and the remaining portion of the study consisted of an individual 15-20 minute MI session. Of participants randomly assigned to the PE/MI group, some were randomly assigned to undergo the MI session prior to (n = 7) the PE session, and some were randomly assigned to undergo the MI session following the PE session (n = 10). Prior to participating, individuals were provided with a second informed consent form to read and sign (Appendix F).

During the PE portion of the intervention, a short video on proper BSE performance was shown to the group. A trained undergraduate assistant then provided standardized instruction in BSE using manufactured silicone breast models for 15-20 minutes. Participants were encouraged to practice proper BSE with these models and ask questions about BSE. Feedback about effective BSE was provided to participants by the trained undergraduate assistants (See Appendix G for full description of components of the PE session).

The MI session began with a description of the rationale for the session, informing participants that they would be discussing their thoughts and feelings regarding conducting regular breast self-exams (see Appendix H for full description of components of the MI session). Researchers clarified that the responsibility for change was upon the participant, and there would be no intent to coerce any type of behavior change during the session. The researcher encouraged the participant to discuss positive aspects of engaging in regular BSE behavior, as well as the negative aspects of engaging in regular BSE behavior through the use of the decisional balance worksheet (Appendix I). During the use of the decisional balance

worksheet, the researcher sought to highlight any ambivalence and discuss any concerns about engaging in regular BSE behavior with the participant. The graduate clinicians responded to questions and statements in an empathic fashion while using reflective listening skills. Lastly, future plans regarding the participant's BSE behavior were discussed, goals were set, and means to reach those goals were discussed. In discussing future plans regarding implementing BSEs into their current regimen, participants were encouraged to conduct BSEs following the last day of their menstrual cycle.

Upon completion of the study, participants were provided with pamphlets discussing the importance of early detection of breast cancer, stickers to place on their personal calendar to serve as a monthly reminder to complete regular BSEs, as well as a shower placard to remind them of the correct way to conduct BSEs. Participants were then instructed to complete a post-test online within 24 hours of completing the intervention. The post-test consisted of the HBM/BSE measure as well as a measure of intent to engage in BSE behavior.

Control group. After completing the pre-test measures, participants in the no-treatment control group (n = 16) were yoked to participants in the intervention group and completed a post-test consisting of the HBM/BSE measure as well as a measure of intent to engage in BSE behavior at a similar time point as their yoked participant. For a summary of the schedule of when measures were completed by participants, see Appendix J.

Results

Preliminary Analyses

To determine the success of random assignment, an independent samples t-test was conducted to compare the HBM constructs (i.e., severity, susceptibility, benefits, barriers,

self-efficacy, cues to action) and intentions to engage in BSE at Time 1. There was a significant difference between the control group (M = 2.40, SD = .83) and the PE/MI group (M = 3.06, SD = .91), $t(31) = -2.18$, $p = .04$ for susceptibility, indicating that those participants in the PE/MI group perceived a greater personal susceptibility to breast cancer at the beginning of the study. This difference was controlled for in the main analyses through the use of including time 1 in the mixed model analysis of variance.

Evidence of differential levels of attrition across condition was examined by comparing data at pre-test of those who completed the study versus those who were eligible for, but did not complete, the intervention session (n = 117); no differences were found (all ps > .05). Additionally, independent samples t-tests were conducted to determine any differences between MI clinician and order of PE/MI intervention (i.e., MI session before or after educational session). No statistically significant differences were found (all ps > .05). Therefore, data were collapsed across MI clinician and order for the remainder of the analyses.

Analyses to Test Directional Hypotheses

To test Hypothesis 1, a multiple regression was conducted in which BSE intentions was regressed onto the HBM variables. Results indicated that, when taken together, the HBM constructs accounted for significant variance, $F(6, 18) = 3.07$, $p = .03$, $r^2 = .51$, in intentions to conduct BSEs. However, no single predictor was significantly associated with intentions, over and above the other predictors (ps ≥ .07).

To test Hypothesis 2, a series of mixed-model ANOVAs was conducted to assess differences by groups across time for each of the variables of the HBM model (severity, susceptibility, benefits, barriers, self-efficacy, and cues to action). In each model, a

significant time by condition interaction would support the directional hypotheses. See Table 1 for means and standard deviations for each HBM construct by condition and time.

There was no significant interaction between condition and time on perceived severity, $F(1, 29) = .19$, $p = .67$, $\eta_p^2 = .01$. There was also no main effect for time, $F(1, 29) = .39$, $p = .54$, $\eta_p^2 = .01$ or condition, $F(1, 29) = .05$, $p = .82$.

There was not a significant interaction between condition and time on perceived susceptibility, $F(1, 30) = 2.63$, $p = .12$, $\eta_p^2 = .08$, and there was no evidence for a main effect of condition, $F(1, 30) = 2.34$, $p = .14$. There was a significant main effect for time, $F(1, 30) = 10.36$, $p = .003$, $\eta_p^2 = .26$, such that participants, across condition, exhibited an increased perception of susceptibility to breast cancer at post-test compared to at pre-test.

There was not a significant interaction between condition and time on perceived benefits, $F(1, 28) = 1.63$, $p = .21$, $\eta_p^2 = .06$. The main effect of condition was not significant, $F(1, 28) = 2.07$, $p = .16$. However, there was a significant main effect for time, $F(1, 28) = 7.92$, $p = .01$, $\eta_p^2 = .22$, such that, across conditions, study participants tended to perceive more benefits to BSE at post-test than at pre-test.

There was not a significant interaction between condition and time on perceived barriers, $F(1, 29) = 2.19$, $p = .15$, $\eta_p^2 = .07$. There was also no significant main effect for time, $F(1, 29) = 2.53$, $p = .12$, $\eta_p^2 = .08$, or condition, $F(1, 29) = .28$, $p = .60$.

There was a significant main effect of time on self-efficacy, $F(1, 27) = 9.03$, $p = .006$, $\eta_p^2 = .25$, and a main effect of condition, $F(1, 27) = 5.10$, p .03. These main effects were qualified by a time by condition interaction, $F(1, 27) = 7.31$, $p = .01$, $\eta_p^2 = .21$. Consistent with the hypothesis, participants in the PE/MI condition exhibited an increase in self-efficacy from pre- to post-test, whereas those in the control condition did not.

There was a significant effect of time on cues to action, $F(1, 30) = 38.38$, $p < .001$, $\eta_p^2 = .56$, and a significant effect of condition, $F(1, 30) = 6.05$, $p = .02$. These main effects were again qualified by a significant interaction between condition and time on cues to action, $F(1, 30) = 12.81$, $p = .001$, $\eta_p^2 = .30$. Specifically, and consistent with the hypothesis, while both conditions exhibited an increase in cues to action from pre-test to post-test, the increase was larger in the PE/MI group than in the control group.

Hypothesis 3, that post-test intentions would differ by group, was tested with an independent samples *t*-test. The PE/MI group reported significantly higher intentions to engage in BSEs ($M = 5.53$, $SD = .80$) than the control group ($M = 4.11$, $SD = 1.20$), $t(30) = -3.93$, $p < .001$; according to Cohen (1988), this is a very large effect ($d = 1.39$).

Lastly, following the recommendations outlined by Baron and Kenny (1986), a series of multiple regressions was conducted to test whether the effects of condition on intentions were mediated by the other HBM constructs (taken collectively; Hypothesis 4). Baron and Kenny (1986) suggest several steps to demonstrate mediation. First, the mediator must be shown to relate to the independent variable; second, the dependent variable must be significantly related to the independent variable; and third, when the dependent variable is regressed onto both the independent variable and the mediator, the effect of the independent variable should be attenuated or eliminated.

The first step in the mediation analysis was supported, as intentions differed by condition (see Hypothesis 3 above). The second step in the mediation analysis was partially supported, as self-efficacy and cues to action differed by condition (see Hypothesis 2 above). To complete the test of mediation, BSE intentions was regressed onto both condition and the HBM variables. In this analysis, the effect of condition was attenuated as compared to the

simple effect of condition on intentions, but was still significant, $t(17) = 2.16$, $p = .05$. The HBM constructs, taken together, partially (but did not completely) mediate the effect of condition on intentions; this suggests that the effects of condition on intentions are partly unaccounted for by perceptions of severity, susceptibility, benefits, barriers, self-efficacy, and cues to action.

Discussion

The current study investigated whether combining MI and an HBM intervention would promote intentions to engage in BSE behaviors compared to an assessment only control condition. Overall, results indicated that participants in the PE/MI group reported greater intentions to perform monthly BSEs at post-test compared to participants in the no-treatment control group, suggesting that a brief PE/MI session may strengthen intentions to engage in regular BSEs. The effect size for intentions to engage in BSEs was very large despite the small sample size in this study, making it unlikely that this was due to Type I error and providing further support that a PE plus MI intervention for BSE is a promising strategy for promoting BSEs.

Several studies suggest that the HBM constructs of perceived severity, perceived susceptibility, benefits, barriers, self-efficacy, and cues to action tend to collectively account for significant variance in intentions to engage in BSE (Champion, 1988, 1990; Luszczynska & Schwarzer, 2003; Massey, 1986). This hypothesis was supported in the present investigation. Although, contrary to predictions of the HBM that perceived severity, perceived susceptibility, benefits, self-efficacy, and cues to action are positively associated with intentions and perceived barriers are negatively associated with intentions, no specific predictor was significantly associated with intentions, over and above the other predictors.

Previous studies have shown the strongest predictor of BSE frequency to be perceived barriers (Champion, 1988; Fung, 1998). This finding was not replicated in this study, as participants in the PE/MI group did not significantly differ on levels of perceived barriers, indicating that individuals in both groups reported similar levels of perceived barriers across time and condition. Furthermore, previous interventions have led to increases in perceived susceptibility and perceived benefits, yet this was not replicated in the present study, as participants in the PE/MI group and no-treatment control group did not differ on these variables. The current study's small sample size may have contributed to the differences in findings, as many of the previous studies had more robust samples. Also, much of the previous research on BSE interventions has targeted samples of older women. Because older women are at an objectively greater risk of developing breast cancer, interventions to promote BSE might cause them to perceive more benefits of completing BSEs and they may feel more susceptible to developing breast cancer, compared to younger women. Moreover, in the current study, participants in the PE/MI group had higher levels of perceived susceptibility at Time 1, potentially masking any positive effects of the intervention on this construct. Non-significant findings are typically reported for perceived severity (Murray & McMillan, 1993; Norman & Brain, 2005). Consistent with previous research, no differences were found for perceived severity by group from Time 1 to Time 2.

Self-efficacy and cues to action were added more recently as components of the HBM, and many studies have reported significant relationships between these factors and BSE (Luszczynska & Schwarzer, 2003; Norman & Brain, 2005). This finding was replicated in the present study, as participants in the PE/MI group reported greater self-efficacy and awareness of BSE cues from pre- to post-test compared to those in the control group. This

may suggest that providing PE regarding proper BSEs through the use of silicone breast models may increase young women's confidence in performing this behavior. Also, one of the four basic principles that underlies the style of MI, as described by Miller and Rollnick (2002), is increasing client efficacy. This provides some evidence that through the use of MI, participant's confidence in performing BSE increased by engaging in client-centered directive interviewing to implement behavior change.

Additionally, it is evident that this intervention may have increased participants' awareness of existing cues, as these were discussed during the MI session and may have primed participants to the cues in their regular environments. Also, the intervention may have provided new cues to participants, as those in the PE/MI group were provided with several items including a shower placard and stickers to place on their personal calendar to serve as a monthly reminder to perform BSEs following the PE/MI session. Future research would benefit from tracking the specific cues attended to by participants. It may be that, unlike perceptions of barriers, benefits, severity, and susceptibility, which were targeted only in the PE or MI parts of the intervention, self-efficacy and cues to action were targeted in both the PE and MI portions of the intervention, hence the significant findings.

There were some constructs with a main effect of time, including perceived susceptibility and perceived benefits. This finding may be attributed to testing effects, in that simply responding to the measure at Time 1 may have changed individuals' levels of perceived susceptibility and perceived benefits. Particularly if individuals have not considered the idea that they may develop breast cancer, or the benefits of conducting monthly BSEs, simply responding to these items may have impacted their perceptions of susceptibility and benefits. Recall, also, that participants differed in their perceived

susceptibility at Time 1. Therefore, the overall increase in perceived susceptibility over time may have been due to regression to the mean among those in the control condition.

Previous research suggests that the HBM constructs, taken collectively, tend to be the most proximal predictors of behavior, thus an intervention that targets each of these constructs should affect intentions to engage in the behavior (Champion & Miller, 1992). Results from this study indicated that the HBM constructs, taken together, partially mediated the effects of condition on intentions suggesting that the effects of condition on intentions are partly unaccounted for by perceptions of severity, susceptibility, benefits, barriers, self-efficacy, and cues to action. Identification of these additional factors is an important area for future research. Additional mediators would provide additional targets for future interventions to increase BSE in this population.

Limitations and Implications

The results of this study should be interpreted with the following limitations considered. First, the small sample size *(n* = 33) is a limitation in this study. The lack of findings on several HBM constructs that are typically found in previous research including perceptions of barriers, benefits, and susceptibility may be attributed to the small sample size. Replication of this study with a more robust sample size is encouraged to determine the effects of the intervention on these constructs. However, in spite of the small sample size, individuals in the PE/MI group reported significantly greater levels of self-efficacy, cues to action, and behavioral intentions from pre- to post-test than the control group, indicating that even with little power, the intervention was effective at increasing these. Particularly notable is the large effect size for intentions to engage in BSEs (*d* = 1.39).

The use of self-report data as a measure of intentions at post-test rather than using an objective measure of behavior is also a limitation of this study. While the use of self-report is the norm in the literature, a more objective measure would reduce the potential social desirability effects that may impact the responses on the self-report measure. Researchers attempted to mitigate social desirability concerns by requiring participants to complete all measures online rather than in person. Also, because individuals were randomly assigned to condition, it is expected that participants prone to respond in a more socially desirable way will be equally distributed across conditions, thus minimizing these effects on the overall findings of the study.

Additionally, by conducting this study with only college undergraduates at a moderately sized university in a rural area, the generalizability of this study is an area of concern. Expanding this research to test the effects of MI on BSE in other populations of young women, including those in a more urban university setting, or in a population of young women that are not currently seeking an undergraduate degree, is encouraged.

Furthermore, though previous research has demonstrated intentions to be associated with future behavior, using intentions as the outcome variable is a limitation of this study. Though the Theory of Planned Behavior posits behavioral intentions are the best predictor of behavior and this has been demonstrated to be the case in a number of domains (e.g., Ajzen, 1991; Armitage, 2005), future research should consider using an objective measure of behavior at post-test. Moreover, only measuring intentions at Time 2 is a limitation of the present study and also measuring intentions at Time 1 to determine if the intervention increased one's intention to engage in BSE is suggested for future research. Additionally because behavior was not objectively measured at a longer duration follow-up period, long-

term effects of the intervention on behavior are unknown. To improve the understanding of the effects of an MI intervention on BSE behavior and to improve the understanding of the long-term continuation of behavior, future research should utilize longitudinal methods wherever possible.

Another limitation of this study is related to the different settings in which the study was conducted. Because the no-treatment control group completed this study online only, and did not have any in-person contact, it is difficult to disentangle the impact of the MI intervention from the effects of attending an in-person intervention session of any kind. Using an alternative intervention group (i.e., a diet intervention) as the control group, where both groups would receive the intervention and require similar in-person contact, would be one way future researchers can address this concern.

Lastly, it is unclear whether the effects of the intervention can be attributed to the PE session, the MI session, or the combination of the two. Though a limitation of previous research is that researchers have mostly focused on providing PE to individuals and have failed to address the underlying cognitive issues that MI seeks to address, combining these two interventions makes it difficult to determine where the benefits of the intervention lie. Future research should consider testing the current intervention against more stringent alternative treatments, such as a solely PE-based intervention, to determine if the addition of MI enhances the positive effects of the intervention.

If the MI intervention techniques are shown to be effective, future research investigating the mechanism and duration of the MI session is recommended. For instance, research regarding the impact of MI session length in relation to outcomes (e.g., how brief can a session be to still be effective?) is encouraged. Also, it would be advantageous to learn

the benefits of implementing MI as an effort to maintain BSE behavior change in routine physician visits. Available evidence suggests that MI holds considerable promise as a behavior change approach in public health and medical settings (Burke et al., 2003), and because this MI session was brief, it is therefore amenable to implementation in a primary care setting where time devoted to behavior change efforts is limited. Because of the quick pace of public health settings and the lack of time for intensive training, variations of MI have been utilized in these settings. AMIs, or interventions that incorporate non-MI techniques while retaining MI principles, have often been adapted for use by non-specialists such as nurses and primary physicians.

Additional research regarding what type of individual may benefit from MI or specific personality characteristics that may forecast a positive or negative response to an MI intervention would also be useful in terms of implementing this intervention. For example, Need for Cognition, or the enjoyment of engaging in effortful cognitive activities, has been found to play a role in the interpretation and utilization of health messages used in interventions targeting BSE. In one study, individuals high in Need for Cognition who presented with threatening breast cancer information reported more motivation to start performing regular BSEs compared to individuals low in Need for Cognition (Ruiter, Verplanken, De Cremer, & Kok, 2004). Future research should consider personality characteristics such as NFC when developing an intervention, as tailoring the intervention to an individual's personality characteristics may be more beneficial than a general approach.

Conclusion

The current results offer encouraging initial results regarding the effectiveness of a HBM-based intervention with an MI component as a method to increase intentions to engage

in monthly BSEs in a population of college-aged women. Unfortunately, there has been a deficit in past research regarding interventions targeting young women that implement components related to the cognitive factors underlying BSE non-compliance. Given the importance of this factor in increasing BSE behavior, future research regarding the benefits of this type of intervention is encouraged so that future health educators, physicians, and nurses may employ an intervention such as this in practice. Interventions based on models such as the HBM that have an MI component are relatively in cost, are low in time commitment, and are relatively easily replicable. As such, they offer a promising avenue for changing public health.

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Table 1. Means and standard deviations for HBM constructs by condition and time.

	n	*M*	*SD*
Severity			
Time 1: Control	14	4.13	.79
MI	17	4.26	.98
Time 2: Control	14	4.26	.76
MI	17	4.28	1.07
Susceptibility			
Time 1: Control	16	2.40	.83
MI	16	3.07	.94
Time 2: Control	16	3.05	.88
MI	16	3.29	1.03
Benefits			
Time 1: Control	14	5.17	.92
MI	16	5.46	.86
Time 2: Control	14	5.35	.97
MI	16	5.93	.78
Barriers			
Time 1: Control	16	3.47	1.08
MI	15	3.49	1.00
Time 2: Control	16	3.48	1.01
MI	15	3.81	.61
Self-Efficacy			
Time 1: Control	16	4.08	1.39
MI	13	4.62	.98
Time 2: Control	16	4.12	1.25
MI	13	5.40	.76
Cues to Action			
Time 1: Control	16	2.61	.96
MI	16	2.94	.63
Time 2: Control	16	2.91	1.21
MI	16	4.05	.69
BSE Intentions			
Time 2: Control	16	4.11	1.20
MI	16	5.53	.80

Note. HBM = Health Belief Model; MI =Motivational Interviewing; BSE = breast self-examination.

Appendix A

ATTN: Kelsey Toomey
Psychology
CAMPUS MAIL

From: Dr. Timothy Ludwig, Institutional Review Board

Date: 2/07/2011

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

Study #: 11-0132

Study Title: Breast Self-Examination Among College-Aged Females: An Intervention Study

Submission Type: Modification
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.

Approval Date: 2/07/2011
Expiration Date of Approval: 12/06/2011

This submission has been approved by the Institutional Review Board for the period indicated. It has been determined that the risk involved in this modification is no more than minimal.

Investigator's Responsibilities:

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects occur it must be reported immediately to the IRB.

Appendix B

DEMOGRAPHIC QUESTIONNAIRE

Age:_____

Academic Status: ____Freshman ____Sophomore ____Junior ____Senior

What is your religion? _____

Have you ever received a diagnosis for an anxiety disorder? Yes No

If yes, what diagnosis did you receive? _____

I have completed a breast self-examination.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I complete regular breast self-examinations.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I have completed a breast self-examination in the past month.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I do not complete breast self-examinations regularly.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I complete breast self-examinations occasionally.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I have been diagnosed with breast cancer. Yes No

Do you have now, or have you ever had, a first-degree relative (parent, sibling, or child) who has been diagnosed with breast cancer? Yes No

If yes, who was diagnosed? _____

If yes, what was the outcome of the diagnosis?

Remission
In treatment
Death

Please indicate if you use one of the following contraceptives:

- Combined Oral Contraceptive Pill
- Progestogen-Only Pill ("mini pill")
- Intrauterine Device (IUD; ex: Mirena)
- Vaginal Ring (ex: Nuva Ring)
- Injected Contraceptives (ex: Depo-Provera)
- Contraceptive Patch (ex: Ortho-Evra)

I have a/an:

- Regular menstrual cycle
- Mostly regular menstrual cycle
- Somewhat regular menstrual cycle
- Irregular menstrual cycle
- I do not have a menstrual cycle

Do you have no, or have you ever had a friend or acquaintance that has been diagnosed with breast cancer? Yes No

If yes, what was the outcome of the diagnosis?

- Remission
- In treatment
- Death

A correct breast self-examination is a three-step process. First, you examine your breasts while standing in the shower, because the hands glide more easily over wet skin. Second, you inspect your breasts both in front of a mirror with your arms at your sides and also with your arms raised above your head. Then, while still in front of the mirror, you put your hands on your hips and flex your chest muscles and inspect the breasts again. Third, you lie down and examine your breasts starting at the nipple and feeling in ever-widening circles until you have covered the whole breast.
BSE should be done monthly, at the same time every month, using the three-step procedure.

I have completed a breast self-exam as it is described above.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I have completed a breast self-exam as it is described above in the past month.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I feel that I am able to complete a breast self-exam as it is described above.

Strongly Agree				Strongly Disagree
1	2	3	4	5

I feel I would benefit from a training program in proper breast self-examination.

Strongly Agree				Strongly Disagree
1	2	3	4	5

Have you ever detected an abnormality in your breast? Yes No

If yes, what? _____

Have you ever had a clinical breast examination (a breast examination conducted by a physician or nurse)? Yes No

Have you ever been diagnosed with a breast health issue? Yes No

If yes, what?_____

How many times in the past 3 months have you completed a breast self-exam?

None 1-2 3-4 5-6 7+

Have you ever been diagnosed with breast cancer? Yes No

How likely would you be to participate in a research study that was located at the Institute for Health and Human Services (located in Boone near Staples on Highway 321)?

Very Likely				Not at all likely
1	2	3	4	5

Appendix C

HBM/BSE Questionnaire

Please answer all of the following questions about breast cancer and breast self-

1) If I had breast cancer my career would be endangered.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

2) Breast cancer would endanger a significant romantic relationship.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

3) If I had breast cancer I would feel like less of a woman.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

4) My financial security would be endangered if I got breast cancer.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

5) If I got breast cancer, it would be more serious than other diseases.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

6) Treatments for breast cancer have severe side effects.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

7) In spite of advances in modern medicine, breast cancer is a serious and dangerous disease.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

8) Problems I would experience from breast cancer would last a long time.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

9) If I had breast cancer, my whole life would change.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

10) Breast cancer is a hopeless disease.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

11) My chances of getting breast cancer are great.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

12) My physical health makes it more likely that I will get breast cancer.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

13) I feel that I am likely to get breast cancer in the future.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

14) There is a good possibility that I will get breast cancer.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

15) I am no more vulnerable to breast cancer than anyone else.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

16) My chances of developing breast cancer are small.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

17) There is a high probability that a cancerous lump may now be developing in my breast.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

18) I am more likely than the average woman my age to get breast cancer.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

19) I believe I will be diagnosed with breast cancer at some time in my life.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

20) Doing breast self-exams prevents future problems for me.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

21) I have a lot to gain by doing breast self-exams.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

22) I would not be so anxious about breast cancer if I did monthly exams.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

23) By detecting breast cancer myself through breast self-examination, I greatly improve my chances of survival.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

24) Completely monthly breast self exams could save my life.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

25) I believe it is wise to examine my breasts regularly.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

26) I feel it is very useful to examine my breasts regularly.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

27) Breast self-exams can help me find lumps in my breast.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

28) Doing breast self-exams have many benefits.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

29) Breast self-examination is a low cost method of detecting breast cancer early.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

30) It is embarrassing for me to do monthly breast exams.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

31) Breast self-exams can be painful.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

32) Breast self-exams are time consuming.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

33) It is too difficult for me to remember to do regular breast self-exams every month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

34) Performing regular breast self-exams each month requires too much effort.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

35) Developing the habit of breast self-exams is difficult

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

36) I simply forget to complete breast self-examinations each month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

37) Completing breast self-exams makes me nervous.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

38) Completing a breast self-examination once per month would be inconvenient.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

39) I am uncomfortable touching my body while completing a breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

40) I think it's too much trouble to complete a breast self-exam once per month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

41) I am not sure I could do a breast self-exam properly.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

42) I am able to conduct a proper breast self-exam.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

43) I feel confident that I could accurately perform a breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

44) I feel I could accurately detect any abnormalities in my breasts.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

45) Even if I do examine my breasts regularly, I often don't know if I am doing it correctly.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

46) I believe I can effectively examine my breasts for abnormalities.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

47) I am very certain that I could complete a breast self-examination the recommended once per month.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

48) I feel confident that I could teach a family member or friend the accurate method of breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

49) I think breast self-examinations are relatively easy to perform.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

50) I have been taught how to accurately perform a breast self-exam.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

51) I have spoken with a family member about breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

52) I have spoken with my doctor about breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

53) I have spoken with a friend about breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

54) If I had way of reminding me monthly, I would engage in breast self-examination.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

55) I record when I do breast self-examinations.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

56) I have a certain date each month when I do breast self-examinations.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

57) I have a shower placard to remind me to complete breast self-examinations once a month

1	2	3	4	5	6	7
strongly disagree	moderately disagree	mildly disagree	neither agree nor disagree	mildly agree	moderately agree	strongly agree

Appendix D

BSE Intentions Questionnaire

1. How likely are you to conduct a breast self-examination in the next month?

Not at all Likely			Neither Likely nor Unlikely			Very Likely
1	2	3	4	5	6	7

2. How likely are you to complete a breast self-examination using the three-step method?

Not at all Likely			Neither Likely nor Unlikely			Very Likely
1	2	3	4	5	6	7

3. How likely are you to complete breast self-examinations once a month for the next six months?

Not at all Likely			Neither Likely nor Unlikely			Very Likely
1	2	3	4	5	6	7

4. How likely are you to conduct a breast self-examination the day after the last day of your next menstrual cycle?

Not at all Likely			Neither Likely nor Unlikely			Very Likely
1	2	3	4	5	6	7

5. How likely are you to forget to conduct a breast self-examination in the next month?

Not at all Likely			Neither Likely nor Unlikely			Very Likely
1	2	3	4	5	6	7

Appendix E

Phase I Consent Form

Appalachian STATE UNIVERSITY **Consent to Participate in Research**

Information to Consider About this Research

Breast Self-Examination Behaviors Among College-Aged Females

Principal Investigator: Kelsey Toomey
Department: Psychology
Contact Information: Courtney Rocheleau, Ph.D.
308 Smith Wright Hall
Boone, NC 28608
(828) 262-2732

What is the purpose of this research?

You are being invited to take part in a research study about breast self-examination behaviors in college aged-women. If you take part in this study, you will be one of about 200 people to do so. By doing this study we hope to learn more about current health behaviors in young women, such as breast self-examination.

What will I be asked to do?

The research procedures will be conducted at Appalachian State University. You will be asked to complete several measures online. These measures seek to assess health behaviors, and mental health. You may be asked to attend up to two additional sessions based on the results of the questionnaires. If you are invited and agree to participate in these additional research sessions, you will be provided with additional information about those sessions at that time.

Most participants will be able to complete this study in approximately 30 minutes. Participants who complete this study are eligible to receive one Experiential Learning Credit (ELC) as compensation for their time.

You should not volunteer for this study if you are not a female and if you are under 18 years of age.

What are possible harms or discomforts that I might experience during the research?

To the best of our knowledge, the risk of harm for participating in this research study is no more than you would experience in everyday life. We know about the following risks or discomforts that you may experience if you choose to volunteer for this study:

- You may find some of the questions we ask (or some procedures we ask you to do) to be upsetting or stressful. If so, we can tell you about some people who may be able to help you with these feelings.
- Some of the answers you provide may be very personal or indicate behavior which you do not want made public. Though online communication is not perfectly secure, the

research team will do its best to ensure that the information you provide will be kept private and confidential.

In addition to the risks listed above, you may experience a risk or negative effect that we cannot predict. During the course of this research, if we find out any new reason why you may no longer wish to participate, we will provide you with that information.

What are the possible benefits of this research?

There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

This study should help us learn more about preventative measures taken by college-aged females.

Will I be paid for taking part in the research?

You will receive one Experiential Learning Credit (ELC) for completing this on-line survey. If you qualify for additional studies based upon your responses to this survey, you will have the opportunity to earn additional ELCs in those studies.

How will you keep my private information confidential?

Your information will be combined with information from other people taking part in the study. When we write up the study to share it with other researchers, we will write about the combined information. You will not be individually identified in any published or presented materials.

We will make every effort to prevent anyone who is not on the research team from knowing what information you gave us.

Your name will be kept separate from the information you provide, and you will be assigned a number in place of your email address during data entry to ensure that your identity will not be connected to your responses.

Data will be kept indefinitely, and information you provide may be stripped of identifiers and used in future research without anyone knowing it is information that you have provided.

Who can I contact if I have questions?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Kelsey Toomey, at 704-307-0272 or kt71579@appstate.edu or Dr. Rocheleau at 828-262-2732 or rocheleauca@appstate.edu. If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2130 (days), through email at irb@appstate.edu or at Appalachian State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

Do I have to participate? What else should I know?

In order to receive your ELC, you will need to click on a link on the last page of the on-line survey. This will take you to another survey in which you'll be asked to provide your full name and Banner ID number. These identifying data will be kept confidential. If you do not complete this information on the second survey, you will not receive your ELC.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to answer any survey question for any reason. If you decide to withdraw your consent, you may still earn the ELC associated with the study. You should simply click through the survey by using the "Next" button at the end of each page. At the end of the survey, follow the instructions for getting your credit. There will be no penalty and no loss of benefits or rights if you decide at any time to stop participating in the study.

This research project has been approved, as required, by the Institutional Review Board of Appalachian State University This study was approved on [approval pending]. This approval will expire on [approval pending] unless the IRB renews the approval of this research.

I have decided I want to take part in this research. What should I do now?

By checking on the boxes below, you are stating that you agree with the following information:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- I understand I am not giving up any of my rights.
- I agree not to discuss this study with any other students who may serve as participants, in order to maintain the integrity of the research study.
- I am 18 years of age or older.

Participants will check a box indicating either that (1) they have read and understood this information and consent to the use of their data in this study, or (2) they decline consent to use their data in this study, and are completing the study only to receive the Experiential Learning Credit. If participants decline consent, their data record will be deleted, but they will still receive the ELC compensation.

Appendix F

Phase II Consent Form

Appalachian STATE UNIVERSITY

Consent to Participate in Research
Information to Consider About this Research

Breast Self-Examination Behaviors Among College-Aged Females

Principal Investigator: Kelsey Toomey
Department: Psychology
Contact Information: Courtney Rocheleau, Ph.D.
308 Smith Wright Hall
Boone, NC 28608
(828) 262-2732

What is the purpose of this research?

You are being invited to take part in a research study about breast self-examination behaviors in college aged-women. If you take part in this study, you will be one of about 200 people to do so. By doing this study we hope to learn more about current health behaviors in young women, such as breast self-examination.

What will I be asked to do?
The research procedures will be conducted at Appalachian State University and at The Institute for Health and Human Services. You will be asked to complete several measures online. These measures seek to assess health behaviors, and mental health. You may be asked to come to the lab to discuss breast health behaviors.

In this study there are different groups, each requiring different amounts of time. This study may take between one and two hours. Participants who complete this study are eligible to receive between two and four Experiential Learning Credit (ELC) as compensation for their time.

You should not volunteer for this study if you are not a female and if you are under 18 years of age.

What are possible harms or discomforts that I might experience during the research?

To the best of our knowledge, the risk of harm for participating in this research study is no more than you would experience in everyday life. We know about the following risks or discomforts that you may experience if you choose to volunteer for this study:

- You may find some of the questions we ask (or some procedures we ask you to do) to be upsetting or stressful. If so, we can tell you about some people who may be able to help you with these feelings.
- Some of the answers you provide may be very personal or indicate behavior, which you do not want made public. Though online communication is not perfectly secure, the research team will do its best to ensure that the information you provide will be kept private and confidential.

In addition to the risks listed above, you may experience a risk or negative effect that we cannot predict. During the course of this research, if we find out any new reason why you may no longer wish to participate, we will provide you with that information.

What are the possible benefits of this research?

There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

This study should help us learn more about preventative measures taken by college-aged females.

Will I be paid for taking part in the research?

You will receive between two and four Experiential Learning Credits (ELCs) for completing this research study. You will need to take part in all components of the study to receive full credit for this study.

How will you keep my private information confidential?

Your information will be combined with information from other people taking part in the study. When we write up the study to share it with other researchers, we will write about the combined information. You will not be individually identified in any published or presented materials.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information or what that information is.

Your name will be kept separate from the information you provide, and you will be assigned a number in place of your email address during data entry to ensure that your identity will not be connected to your responses.

Data will be kept indefinitely, and information you provide may be stripped of identifiers and used in future research without anyone knowing it is information that you have provided.

Who can I contact if I have questions?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Kelsey Toomey, at 704-307-0272 or kt71579@appstate.edu or Dr. Rocheleau at 828-262-2732 or rocheleauca@appstate.edu. If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2130 (days), through email at irb@appstate.edu or at Appalachian State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

Do I have to participate? What else should I know?

Your participation in this research is completely voluntary. If you choose not to volunteer, there will be no penalty and you will not lose any benefits or rights you would normally have. If you decide to take part in the study you still have the right to decide at any time that you

no longer want to continue. There will be no penalty and no loss of benefits or rights if you decide at any time to stop participating in the study.

This research project has been approved, as required, by the Institutional Review Board of Appalachian State University This study was approved on [approval pending]. This approval will expire on [approval pending] unless the IRB renews the approval of this research.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should indicate your agreement:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- I understand I am not giving up any of my rights.
- I agree not to discuss this study with any other students who may serve as participants, in order to maintain the integrity of the research study.
- I am 18 years of age or older.

_____ _____

Signature Date

_____ _____

Witness Date

Appendix G

Psychoeducation Session Outline

1. _____ Set up video in classroom prior to participants arrival:
   Breast Self-Awareness (BSA) Interactive Tool on CD-ROM

2. _____ As participants arrive, give Informed Consent to each participant

Read: "You are being invited to take part in a research study about breast self-examination behaviors in college aged-women. If you take part in this study, you will be one of about 100 people to do so. By doing this study we hope to learn more about current health behaviors in young women, such as breast self-examination. Please read over this form, and sign it if you agree to participate in this research study."

3. _____ Begin video (10 minutes)

Read: "This video discusses breast health, breast cancer and provides step by step instruction for proper breast self examination behavior."

4. _____ Researcher provides hands on instruction using breast models (15 minutes)

Make sure that each participant is instructed and conducting proper BSE behavior.

Read: "We are now going to practice breast self-examination on silicone breast models. We have three different size breasts. It is encouraged that you choose the breast that you think is closest to your breast size.

Use the finger pads of the three middle fingers on your hand to feel for lumps. Use overlapping dime-sized circular motions of the finger pads to feel the breast tissue.

Use three different levels of pressure to feel all of the breast tissue. Light pressure is needed to feel the tissue closest to the skin; medium pressure to feel a little deeper; and firm pressure to feel the tissue closest to the chest and ribs. Use each pressure level to feel the breast tissue before moving on to the next spot.

When conducting the exam, you may examine the breast in a vertical pattern, if this feels most comfortable, you would move the fingers in an up-and-down pattern from the collarbone to the ribs, continuing the up-and-down pattern across the breast to the middle of the chest bone.

Or, you may conduct the exam in a circular pattern, where you start at the top of the breast, and circle in toward the nipple, using small circular motions to examine your entire breast. Choose what feels most comfortable for you.
There are several lumps of different sizes in different locations of these breasts. See if you can find where they are all located."

5. _____ Encourage participants to practice one at a time with the breast models

_____Provide sanitizer to participants prior to touching the breast models!

6. _____ Ask the participants if they have any questions about the procedure to complete breast self-examinations, or the importance of conducting breast self-exams.
   Suggest performing BSEs in the shower, as opposed to lying down, as shown in the video

7. _____ **Read**: “To receive full credit for this study, as noted in the Informed Consent, you must follow the instructions on the slip provided and complete the follow-up portion of this study. A note card will be provided to you with instructions to complete this portion of the study. On this card is a link to the survey, your participant number, and directions to email the researcher when you are finished with the survey. This survey must be completed within the next 24 hours for you to receive full credit.”

8. _____ Thank participants for completion of the study and distribute BSE Cards and Young Women Taking Care Booklet to each participant.
   Read: “Thank you for your time and cooperation, we will be distributing materials regarding breast self-examination that you may find helpful. These materials include stickers to place on your personal calendar to serve as a reminder to complete breast self-exams once a month, a shower placard describing proper breast self-exams, and a booklet on breast cancer in young women.”

Appendix H

Motivational Interviewing Session Outline

1. ____If not from PE group—Informed Consent.
   READ: "You are being invited to take part in a research study about breast self-examination behaviors in college aged-women. If you take part in this study, you will be one of about 100 people to do so. By doing this study we hope to learn more about current health behaviors in young women, such as breast self-examination. Please read over this form, and sign it if you agree to participate in this research study."

2. ____ Rationale (2 minutes)
   "We're here to discuss your thoughts and feelings about breast self-examinations. It is not my intent to persuade you in anyway today. "
   "Do you currently perform breast self-exams?"

3. ____Decisional Balance (about 8 minutes)
   Worksheet:
   "In thinking about breast self-exams, let's take a look at this worksheet…"
   Inform participant that they can keep the worksheet if they would like
   Highlight ambivalence (reflect)

4. ____Future plans regarding the participant's BSE behavior (5 minutes)
   Have the participant summarize: "Looking at this worksheet, tell me what you see here"

   Questions about future plans:
   1. On a scale from 1-10, with 1 being not important at all, and 10 being extremely important, how important is it for you to engage in regular BSE behavior?
      ANSWER—
   2. Using that same scale, how confident are you that you could engage in regular BSE behavior?
      ANSWER—
   3. What would it take for you to move up on your confidence rating?
      ANSWER—

   Develop a plan (to change or not)—set goals, discuss how to reach goals, etc.

Appendix I

When we think about making changes, most of us don't really consider all "sides" in a complete way. Instead, we often do what we think we "should" do, avoid doing things we don't feel like doing, or just feel confused or overwhelmed and give up and thinking about it all. Thinking through the pros and cons of both changing and not making a change is one way to help us make sure we have fully considered a possible change. Below, write the reasons that you can think of in each of the boxes.

	Benefits/Pros	Costs/Cons
Making a change		
Not Changing		

Appendix J

Schedule of Measures Completed

	Measures
Pre-Test: All Participants	Demographic Questionnaire HBM/BSE Questionnaire
Post-Test: Control Group; MI Group	Demographic Questionnaire HBM/BSE Questionnaire BSE Measure of Intent

Vita

Kelsey J. Toomey graduated from Appalachian State University (ASU) with a Bachelor of Science Degree in Psychology, Summa Cum Laude, in May of 2009. During her final year of her undergraduate studies, Ms. Toomey became involved as an undergraduate intern at the ASU Psychology Clinic. This experience, as well as her interest in psychological research, inspired her to enroll in post-graduate studies in psychology. In the fall of 2009, Ms. Toomey began working towards a Master of Arts degree in Clinical Health Psychology at ASU. In addition to the two years of coursework required by her program, she had the opportunity to complete a research assistantship with a faculty member, work as the Clinic Coordinator at the ASU Psychology Clinic, and engage in practicum experiences at Cannon Memorial Hospital and at the ASU Psychology Clinic. Ms. Toomey completed her internship at Mélange Health Solutions in Charlotte, North Carolina after completing her coursework. She graduated with her Master's degree from ASU in the fall of 2011. In January 2012, Ms. Toomey will commence work towards obtaining licensure to practice as a clinical psychologist in Charlotte, North Carolina. Ms. Toomey was a student member of the Association for Behavioral and Cognitive Therapies, the Society for Personality and Social Psychology, and the American Psychological Association.