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RELATIONSHIPS AMONG NURSES' EXERCISE BELIEFS,  
PERSONAL EXPERIENCE WITH EXERCISE,  
AND EXERCISE COUNSELING BEHAVIORS  
FOR WOMEN WITH BREAST CANCER  
EXPERIENCING TREATMENT-INDUCED CANCER-RELATED FATIGUE

By

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## ABSTRACT OF THE DISSERTATION

Relationships Among Nurses' Exercise Beliefs,

Personal Experience With Exercise,

And Exercise Counseling Behaviors

For Women With Breast Cancer

Experiencing Treatment-Induced Cancer-Related Fatigue

By DONNA HO-SHING

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This study examined the relationships among nurses' exercise beliefs, personal experience with exercise, and exercise counseling behaviors for women with breast cancer experiencing cancer related fatigue. The following hypotheses were formulated based on the theorized relationships of the Common Sense Model: 1) personal experience with exercise and exercise benefits beliefs are positively related to exercise counseling behaviors; 2) exercise barriers beliefs is negatively related to exercise counseling behaviors; 3) personal experience with exercise is positively related to exercise benefits beliefs and negatively related to exercise barriers beliefs; 4) exercise benefits beliefs and exercise barriers beliefs mediate the relationship between personal experience with exercise and exercise counseling behaviors. The Exercise Benefits Beliefs scale, the Exercise Barriers Beliefs scale, and the Exercise Counseling Behaviors scale were developed for this study. The Godin Leisure Time Exercise Scale was used to assess nurses' personal exercise behaviors. Data were collected from a convenience sample (N = 126) recruited through the use of an E-mail list of registered nurses enrolled in the Oncology Nursing Society (ONS) and working in oncology settings. A descriptive

correlational design was used. Only the relationship between exercise barriers beliefs and nurses' exercise counseling behaviors was supported,  $r = -.31, p < .01$ . However, ancillary analyses supported the relationships among contextual factors, treatment beliefs, and HCP illness management behaviors of the CSM. A nurse's current position (role),  $r = -.23, p < .05$ , and knowledge about NCCN guidelines for cancer treatment related fatigue,  $r = -.25, p < 0.05$ , were significantly related to exercise barriers beliefs. In addition, a nurse's current position,  $r = .209, p < 0.05$ , and knowledge about NCCN guidelines for cancer treatment related fatigue,  $r = .535, p < 0.01$ , were significantly related to exercise counseling behaviors. Exercise barriers beliefs, knowledge of the NCCN guidelines, and the current position of the nurse explained 36% of the variance in exercise counseling behaviors among nurses. Nurses' beliefs about exercise barriers of women with breast cancer and CRF are more important for the extent to which they counsel these women to exercise than their beliefs in the exercise benefits for these women.

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## CHAPTER 1

### Introduction: The Problem

Exercise counseling for women who are experiencing cancer-related fatigue (CRF) during breast cancer treatment is an important standard of care (National Comprehensive Cancer Network [NCCN], 2011). CRF is defined as a distressing, persistent, subjective sense of physical, emotional and cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning (NCCN, 2011). CRF is one of the most common long-term side effects of breast cancer treatment and can persist for up to ten years in one-third of women treated for this condition (Kirshbaum, 2006).

Research has shown that exercise appears to alleviate fatigue associated with breast cancer and its treatment (Courneya, Jones, Mackey, & Fairey, 2006; Courneya, Segal et al., 2007; Johnson- Koslow, Rock, Gilpin, Hollenbach, & Pierce, 2007; Kirshbaum, 2006; Nikander et al., 2007; Perna, Craft, Carver, & Antoni, 2008; Rogers et al., 2005; Schneider, Hsieh, Sprod, Carter, & Hayward, 2007; Thornton, Andersen, Crespin, & Carson, 2007). A recent meta-analysis of 17 randomized clinical trials revealed that among cancer patients exercise was most effective in women diagnosed with breast cancer (Kangas, Bovbjerg, & Montgomery, 2008), and was associated with reduction in fatigue, and improvements in vigor and vitality. Most importantly, exercise had a stronger effect when administered during chemotherapy (Kangas et al., 2008). Kirshbaum (2006) noted that nurses are advised to counsel cancer patients to engage in regular exercise, thus helping them to adhere to a prescribed exercise regime for cancer

treatment related fatigue. Thus, exercise counseling for women with breast cancer who are experiencing CRF is considered an important component of their care (NCCN, 2011).

Exercise counseling is defined as a multifaceted intervention that includes any discussion with a patient about the benefits of exercise, an assessment of a person's interest or disinterest in exercise, a discussion of the facilitators and barriers to exercise, and recommendations about the level of exercise in which a person should engage (Poskiparta, Kasila, & Kiuru, 2006). In addition, Mellen, Palla, Goff, Jr., and Bonds, (2004) stipulate that exercise counseling includes a discussion of a patient's conditioning or fitness as well as referrals to other professionals. National clinical practice guidelines regarding the management of cancer related fatigue for patients who are on active treatment include patient and family education about CRF, counseling about CRF strategies including exercise, possible referral to an exercise specialist, and an exercise prescription (American Cancer Society [ACS], 2011; NCCN, 2011).

Despite current national CRF guidelines that include recommendations for education and exercise counseling by healthcare professionals as a component of the treatment plan, the following research suggests that historically, many women undergoing treatment for breast cancer have not received exercise counseling. According to Buick (1997), cancer patients who lack information about their treatment tend to have less self-esteem and feelings of control; conversely feelings of control can be enhanced if patients are taught how to manage the treatment and the side effects of these treatments. Ashbury, Findlay, Reynolds and McKerracher (1998) noted that patients expressed difficulty finding answers about the causes and effects of cancer-related fatigue. The literature suggests that nurses do not regularly counsel breast cancer patients about the

benefits of exercise to combat CRF. Mills and Sullivan (1999) also noted that even though counseling about cancer and its treatment is an important aspect of nursing care for patients newly diagnosed with cancer, nurses do not consistently meet the counseling needs of patients. These researchers also noted nurses assumed that cancer patients want primarily emotional support when in fact patients express a desire for more information about their cancer and its treatment, including counseling about the management of treatment side effects. Rogers et al., (2006) conducted a study to measure the association between exercise and previous exercise counseling received by breast cancer patients. The study revealed that only 24% of the patients reported receiving exercise counseling by a physician or nurse (Rogers, et al., 2006). The correlation between prior exercise counseling and exercise activity of the patients was not significant. However, the authors noted that, for nonsignificant relationships in the study, there was a medium to large effect of the predictor variables on exercise behaviors. Of interest to this study, the effect of prior exercise counseling on exercise behaviors (number of steps) was moderate,  $r = .27$ . The lack of significance for many relationships tested in this study could have been due to a lack of statistical power since over twenty independent variables were tested in a small sample of 24 patients. Therefore, the study was likely underpowered to detect significant findings between counseling and exercise behaviors in this study. However, the magnitude of the correlation between exercise counseling and exercise behaviors in this study suggests that exercise counseling is likely important for increasing exercise behaviors of patients with breast cancer and CRF.

Research has also shown that health care professionals, including nurses, fail to counsel patients with gynecologic cancers and in areas about other important topics, such

as health promotion, lending support to the premise that nurses may not counsel patients with CRF about exercise. For example, Donovan and Ward (2005) reported that, for women diagnosed with gynecologic cancers, and receiving chemotherapy with resultant CRF, 56% of the women never received counseling for managing fatigue. A study of smoking cessation counseling activities in a sample of 168 nurses revealed that 15% of nurses did not engage in smoking cessation counseling at all, and only 35% stated that they counseled all who smoke (Goldstein, Hillier, Fitzgerald, Stegall, & Fischer, 1987). Likewise, Puffer and Rashidian (2004), in a study that examined nurses' intention to provide smoking cessation advice according to Congestive Heart Failure guidelines, revealed that 74% reported that they intended to provide this advice, even though historically as many as 42% of them had not done so. Similarly, Mellen et al. (2004) noted that despite national guidelines to counsel hypertensive patients regarding nutrition and exercise, less than 33% of patients received exercise counseling from physicians. In another study, despite the benefits of exercise in reducing the risk of physical disabilities in clients over 65years old, less than 30% of women in this age group received exercise counseling from physicians (Schonberg, Marcantonio, & Wee, 2006).

These findings suggest that there may be incongruence between exercise counseling recommendations for women undergoing treatment for breast cancer, the implementation of these guidelines by nurses, and the achievement of the benefits of these guidelines for women undergoing treatment for breast cancer. Thus, there is a need to gain a clear understanding of factors that affect the exercise counseling behaviors of nurses who care for cancer patients.

Theorists posit that a person's beliefs about treatment may affect their health behaviors (Leventhal, Brisette, & Leventhal, 2003). While much work has been done that supports the hypothesis that patients' beliefs about treatment, for example, medications, affect the extent to which they adhere to a particular treatment (Aikens, Nease, Jr, & Klinkman, 2008; Hirani, Patterson, & Newman, 2008; Horne, 2003; Horne & Weinman, 2002; Horne, Weinman & Hankins, 1999; Llewellyn, Miners, Lee, Harrington, & Weinman, 2003; Ross, Walker, & MacLeod, 2004), little work has been done that has examined the extent to which health professionals' beliefs about patients' treatment influences the extent to which they adhere to clinical practice treatment standards or guidelines. The importance of the relationship between nurses' beliefs about treatment and their subsequent illness management behaviors, is underscored by Byrne, Deane, and Coombs' study (2005), that found that nurses' negative attitudes and beliefs about the use of antipsychotic medications for the treatment of mental illness led to their difficulty in using cognitive techniques to enhance patient adherence to these medications. Also, in a study that examined health care workers' beliefs about preventive treatment for pressure ulcer formation, Buss, Halfens, Abu-Saad and Kok (2004) found that preventive interventions were utilized based on the nurses' belief that the intervention was effective; for example nurses implemented interventions that the guidelines stipulated were not effective because they still believed they were effective (Buss et al., 2004; Duimel-Peeters Hulsenboom, Berger, Snoeckx, & Halfens, 2006). These findings underscore the premise that nurses' treatment beliefs and subsequent clinical care behaviors may not be consistent with national treatment guidelines.

Theorists also posit that treatment beliefs and illness management behaviors are nested within a larger personal context that can include factors such as life experiences, institutional affiliations, and roles (Leventhal et al., 2003; Leventhal, Leventhal, & Cameron, 2005). For example, there are several studies that suggest personal factors among nurses such as personal experience with the treatment, may affect their beliefs about patient treatments and their illness management behaviors (Geffen et al., 2002; Kaewsarn, Moyle & Creedy, 2003). For example, health professionals who had personal experiences with breastfeeding and substance misuse tended to have more positive beliefs about infant breastfeeding and substance misuse treatment (Johnson, Booth, & Johnson, 2005; Kaewsarn et al., 2003). Similarly a group of researchers noted that medical students who were physically active believed exercise counseling was important (Frank, Tong, Lobelo, Carrera, & Duperly, 2008). Thus, it is plausible that nurses' personal experience with exercise may influence their beliefs about exercise as an appropriate treatment for CRF experienced by women receiving chemotherapy treatment for breast cancer.

Leventhal et al. (1997) also theorize that treatment beliefs mediate the relationship between contextual factors, such as one's personal experience with treatment, and illness management behaviors. For example, as mentioned above, medical students who were more physically active believed exercise counseling was important and, in turn, counseled their patients to exercise (Frank et al., 2008). This finding suggests the relationship between nurses' personal experience with exercise and their exercise counseling behaviors may be mediated by their beliefs about exercise as a treatment for patients' CRF.

Although exercise counseling is viewed as an important aspect of treatment for CRF in women with breast cancer receiving chemotherapy, there has been no empirical examination of factors that influence the exercise counseling behaviors of nurses who care for these women. Furthermore, as previously mentioned, breast cancer is the second most frequently occurring cancer in women, and exercise as an intervention for CRF has been shown to be most beneficial for breast cancer patients. Given that there is very little evidence of the extent to which nurses counsel breast cancer patients with cancer related fatigue, the purpose of this study is to address this gap by examining the relationship among nurses' personal experience with exercise, their beliefs about exercise as a treatment for CRF, and their exercise counseling behaviors.

### **Statement of the Problem**

What are the relationships among nurses' personal experience with exercise, their beliefs about exercise as a treatment for CRF, and their exercise counseling behaviors to women with breast cancer experiencing CRF?

### **Subproblems**

1. Is personal experience with exercise related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF?
2. Is personal experience with exercise related to the exercise benefits beliefs of nurses caring for women with breast cancer experiencing CRF?
3. Is personal experience with exercise related to the exercise barriers beliefs of nurses caring for women with breast cancer experiencing CRF?
4. Are exercise benefits beliefs related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF?

5. Are exercise barriers beliefs related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF?
6. Do exercise benefits beliefs mediate the relationship between personal experience with exercise and the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF?
7. Do exercise barriers beliefs mediate the relationship between personal experience with exercise and the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF?

### **Definition of Terms**

Exercise counseling is a multifaceted intervention that includes any discussion with a patient about the benefits of exercise, an assessment of a person's interest or disinterest in exercise, a discussion of the facilitators and barriers to exercise, and recommendations about the level of exercise in which a person should engage (Poskiparta et al., 2006). Exercise counseling is operationally defined as a subject's score on the Exercise Counseling Behaviors Scale that was developed for this study.

Personal experience with exercise is defined as a person's present exercise frequency and intensity behaviors. Personal experience with exercise is operationally defined as the subject's score on the Godin Leisure Time Exercise Questionnaire (Godin & Shephard, 1985).

Treatment beliefs are theoretically defined as the individual's beliefs about whether the illness warrants treatment and if so, if that treatment is appropriate (Horne, 1997; Horne, 2003; Horne et al., 1999). Treatment beliefs are operationally defined as the



subject's score on the Exercise Benefits Beliefs Scale and the Exercise Barriers Beliefs Scale developed for this study.

### **Delimitations**

Weinman, Heijmans and Figueiras (2003) postulate that for doctors, perceptions and ideas of a disease are static and based on medical knowledge, which also guides action. This might also be true for registered nurses working in oncology settings who care directly for adult females with breast cancer who are receiving chemotherapy, and who counsel these women about their treatment side effects. These nurses are also responsible for assessing CRF for patients receiving cancer treatment (Piper et al., 2008). Therefore, registered nurses who work in oncology settings and provide direct care to adult women receiving treatment for breast cancer will be the target population for this study. The subjects also will be delimited to those who can read and understand English, as the questionnaires will be printed in English.

### **Significance of the Study**

This study seeks to address a gap in the knowledge regarding factors that affect nurses' exercise counseling behaviors for breast cancer patients undergoing chemotherapy as a treatment for their cancer and who are experiencing CRF. According to data from the ACS (2011), breast cancer remains the leading type of cancer found in women of all races. The ACS (2011) estimates that 230,480 new cases of breast cancer will be diagnosed in women in 2011, an increase of over 25,000 from the previous year, with an estimated 39,520 deaths expected to occur. According to the Surveillance Epidemiology and End Results (SEER), the incidence rate for breast cancer during 2004-2008 was 124.0 per 100,000 women per year, and the death rate over the same period

was 24.0 per 100,000; and in January of 2008 over 2.6 million women were recorded as survivors of breast cancer (NCI, 2011). These statistics are current to date.

CRF is the most common side effect of cancer treatment across all cancer diagnoses, cancer stage, and treatment regimen, as reported by more than 90% of individuals on active treatment (Berger & Higginbotham, 2000; Donovan & Ward, 2005; Longman, Braden, & Mishel, 1999; Payne, 2002; Richardson & Ream, 1996). CRF can have profound effects on one's ability to function in usual roles and activities, may result in delay or termination of treatment, can linger for months or years, and may be predictive of shorter survival in certain populations with cancer (Donovan & Ward, 2005; Hartvig, Aulin, Hugerth, Wallenberg, & Wagenius, 2006; Holly, 2000). The focus of this study will be confined to nurses giving exercise counseling to women with breast cancer. Breast cancer is the most commonly occurring cancer in women, as previously noted (ACS, 2010; NCI, 2009) with an estimated 90% 5-year survival rate. For patients with breast cancer, Schwartz (2000) reported that fatigue levels rose sharply during the first 24 to 48 hours following chemotherapy, with women perceiving moderate to severe levels of fatigue (Bower et al., 2000).

Research has shown that moderate levels of exercise can be effective in reducing the fatigue that these women experience during chemotherapy treatment (Bush 2005; Courneya & Friedenreich, 1999; Mock, 2003; Stricker, Drake, Hoyer, & Mock, 2004). In particular, Stricker et al. (2004) in a meta-analysis of studies that used exercise as an intervention for cancer-related fatigue, noted that patients with cancer undergoing active treatment who exercised for at least 15 minutes three to five times weekly, either during

the entire hospitalization period or for a minimum of six weeks as outpatients, achieved a reduction or stabilization in fatigue levels.

Researchers (Barsevick et al., 2004; Barsevick, Whitmer, Sweeney, & Nail, 2002) have utilized energy conservation and activity management (ECAM) skills to prevent energy depletion, and determine whether proper use of these skills was able to reduce fatigue and improve the ability to perform usual activities. The researchers describe energy conservation as an individual deliberately planning the management of personal energy resources. It was found that the patients who were taught these skills were able to effectively reduce their cancer-related fatigue.

In an intervention study of 27 breast cancer patients who participated in an 8-week, home-based, low-to-moderate intensity aerobic exercise program that included rest periods and reduction in exercise duration, findings revealed that exercise reduced fatigue and increased functional ability and quality of life (Schwartz, 2000). A review of exercise trials noted that cancer patients who exercised had lower levels of fatigue (Mock, 2004).

Likewise, a meta-analysis of ten studies utilizing exercise interventions for the management of CRF revealed that the subjects in eight of the studies experienced a reduction in fatigue, while subjects in the other two studies had a slower onset of fatigue (Kuchinski, Reading, and Lash, 2009). Finally, in a critical review of 29 studies involving breast cancer patients, aerobic exercise appeared to reduce CRF for the majority of patients (Kirshbaum, 2006). The above findings indicate that exercise is a useful therapy in reducing cancer-related fatigue. However, research on the nurses' counseling role in the management of this distressing treatment side effect has been limited.

It is estimated that ten to nearly forty-five percent of patients with CRF do not exercise. A number of reasons are given for this lack of exercise engagement including comorbidity, lack of interest, failure to recognize fatigue symptoms, failure of exercise to meet their expectations, and difficulty coordinating their self-care activities based on their level of fatigue (Kuchinski et al., 2009; Pickett et al., 2002; Pinto, Rabin, & Dunsiger, 2009; Schwartz, 2000). These reasons for patient non-adherence to exercise as a treatment for CRF are important components of national clinical practice guidelines for exercise counseling behaviors by health professionals, and it is plausible that the patients with CRF could be motivated to exercise and, in turn reduce their CRF, through exercise education and counseling.

In a meta-analysis of studies that provided non-pharmacological interventions for CRF, education and counseling about exercise as a treatment for CRF was shown to be an effective strategy for reducing fatigue in breast cancer patients experiencing CRF (de Nijs, Ros, & Grijpdonck, 2008). However, research has revealed that few breast cancer patients may receive exercise counseling. As previously noted Rogers et al. (2006) conducted a study to measure the association between exercise and previous exercise counseling that breast cancer patients received. The study revealed that only 24% of the patients reported receiving exercise counseling by a physician or nurse. Although the correlation between prior exercise counseling and exercise activity of the patients was not significant, the authors noted that the effect of prior exercise counseling on exercise was moderate. Lastly, the national clinical practice guideline recommendation for the provision of exercise counseling to encourage exercise in patients with CRF provides an evidence-basis for a link between exercise counseling and exercise behaviors (NCCN,

2011). Thus, examining the factors that influence the exercise counseling behaviors of nurses who care for women with breast cancer and CRF could inform strategies to increase the exercise counseling behaviors of these nurses.

There has been no empirical examination of factors that influence the exercise counseling behaviors of nurses who care for women with breast cancer receiving chemotherapy, and experiencing CRF. The purpose of this study is to address this gap. This study will generate knowledge related to relationships among oncology nurses' beliefs about exercise as a treatment for CRF, prior related exercise behaviors, and their exercise counseling behaviors. This study will also provide data that can be used to test strategies designed to increase nurse CRF counseling behaviors and ultimately improve the health outcomes and quality of life of women who are being treated for breast cancer.

## CHAPTER 2

### Review of the Literature

The purpose of this research is to examine the relationships among nurses' exercise beliefs, personal experience with exercise, and exercise counseling behaviors for women with breast cancer and CRF. A discussion of the theoretical framework that guides the study, followed by a review of the literature that provides empirical support for the relationships that will be tested in the proposed study is presented in this chapter. Finally, the formulated hypotheses are listed.

#### **Theoretical Framework: The Common-Sense Model of Self-Regulation**

The Common Sense Model (CSM) of Self Regulation is an information-processing model built on the proposition that individuals generate their own “commonsense” interpretations of illness and its treatment to guide their coping efforts (Leventhal et al. 2003). According to the model, illness information processing occurs at the cognitive level in three stages: representations, procedures for coping, and appraisal. Cognitive representations of illness refer to the person's efforts to organize, analyze, and interpret diverse types of information about an illness and its symptoms. In the representation stage, the individual forms a mental prototype or representation of an illness, and five dimensions of illness representations have been identified: illness identity (one's interpretation of the nature of the illness or its symptoms), illness cause, timeline (beliefs that illness is acute, chronic, or intermittent), the anticipated or experienced illness consequences, and the anticipated or perceived responses of the illness to self-treatment or expert intervention (Leventhal et al., 2003). These dimensions form the basis of lay models of illness, and they guide the selection of coping procedures,

the second stage of information processing. Coping procedures are defined as the development and execution of strategies for self-managing or expert management of the illness and its symptoms and/or the emotional responses associated with it. The third stage is appraisal, defined as a person's evaluation of the effectiveness of coping efforts. The CSM is a parallel processing model that also describes emotional representations or reactions (e.g., fear, distress) to a health threat and a corresponding need for procedures to manage emotions

Leventhal and colleagues also describe treatment representations, as beliefs about illness treatment (Leventhal et al., 1997). A treatment belief can be multidimensional and, similar to an illness representation, has an identity (e.g. label, how to take or use it), timeline (when and how to take it), causal factors or route of action (e.g. works by removing pathogens), control (cure and control of symptoms and objective indicators of the disease), and consequences and cost (e.g. symptoms and side-effects, physical damage, addiction, financial costs) or benefits (e.g. life extension, improved quality of life).

Of relevance to the proposed study is the CSM's premise that self-regulation is a social process for adults, and the model underscores the complexity of social factors for the self-regulation of illness. According to the CSM, self-regulation of illness is nested within a larger context that includes personal, social, and cultural factors that can influence both treatment beliefs and procedures for coping, that is, illness management behaviors (Leventhal et al. 1997). The cultural context of illness self-regulation can include health care providers. Health care providers (HCPs) are conceptualized in the CSM as "expert others" with their own representations of illness and treatment that guide

their actions (Leventhal et al., 2003; Weinman et al., 2003), and the CSM suggests that the roles and relationships among practitioners and patients will affect the possibility of patients achieving expertise in illness management. These suppositions are based on the CSM assumption that practitioners and patients are striving to develop shared models of an illness threat and an agreed upon approach to threat reduction. The model stipulates that individuals turn to medical practitioners for diagnosis and treatment when they experience symptoms that are novel, vague, or of unexpected duration. Input from experts, that is, health professionals, is critical as the perceptual input provided by somatic sensations is often vague and diffuse. The expert other often provides a “context” for an individual’s somatic experience and its treatment by determining the nature of the dysfunction responsible for generating symptoms and suggesting appropriate treatment based on their “expert” illness models (Leventhal et al. 2003). Of theoretical relevance to this study is that HCPs treatment beliefs and illness management behaviors are also nested within a larger personal, social, and cultural context and are influenced and informed by these factors, such as one’s personal experience with an illness treatment (Horne, 2003).

According to Leventhal et al. (1997) contextual factors can have both direct and indirect effects on illness management behaviors and the effects of contextual factors on behavioral outcomes can be mediated by treatment beliefs (Leventhal et al., 2005). This study will examine the direct and indirect relationships among the specified contextual factor (personal experience with exercise), treatment beliefs (beliefs about the benefits and barriers of exercise as a treatment for CRF), and procedures for coping (exercise



counseling behaviors) among nurses who care for women with breast cancer who experience CRF.

## **Empirical Support**

### **Treatment beliefs and illness management behavior.**

Four studies were found that provide empirical support for the relationship between health care professionals' (HCPs) beliefs about treatment and their illness management behaviors. Hall and Marteau (2007) investigated the beliefs and predictors of smoking cessation counseling in a sample of 152 nurses during cervical cancer and cardiovascular screening and diabetes care. Nine beliefs about smoking cessation counseling were examined and included beliefs about the effectiveness of stopping smoking in reducing risk, the appropriateness of advising patients to stop, the practicality of advising patients to stop, the effectiveness in helping patients to stop, their confidence in their ability to advise them to stop, the potential for annoying patients if patients did not raise the subject, patients do not understand the importance of stopping, patients are less likely to attend for future appointments, and not enough time to advise patients to stop. Nurses were also asked the frequency with which they counseled patients within the three contexts of cervical cancer, cardiovascular screening, and diabetes care.

Multivariate linear regression and Pearson's product moment correlations were used to test treatment belief predictors of nurses' smoking cessation counseling behaviors. Within the context of cardiovascular screening, and diabetes care the researchers did not report associations between beliefs about giving smoking cessation advice to women and nurses' reports of smoking cessation counseling. Within the context of cervical cancer screening, seven of the beliefs were associated with the nurses' reports

of smoking cessation counseling, ranging from  $r = -.28$  to  $.63$ ,  $p < .001$ . The belief that the patient would be annoyed if they did not raise the subject was less significantly associated with the nurses' reports of smoking cessation counseling,  $r = -.25$ ,  $p < .01$ . The belief that "patients do not understand the importance of stopping" was not significantly associated. All the beliefs were entered simultaneously into a regression analysis, and they explained 51% of the variance in nurses' reports of giving smoking cessation advice. These findings support the theorized relationship between treatment beliefs and nurse' illness management behavior and suggest that oncology nurses' beliefs about exercise as a treatment for CRF may likely be an important antecedent to their exercise counseling behaviors.

Byrne et al. (2005) investigated the relationships between nurses' beliefs about anti-psychotic medications and their difficulty implementing medication adherence strategies in a sample of 64 mental health nurses. Beliefs and attitudes about medicines were measured by the Beliefs about Medicines Questionnaire (BMQ). The Difficulty Implementing Adherence Strategies (DIAS) scale was used to elicit how often nurses had difficulties using adherence strategies with patients who were nonadherent. The DIAS has three subscales: Information/Educational strategies (8 items),  $\alpha = 0.91$ ; Behavioral strategies (10 items),  $\alpha = 0.82$ ; and Cognitive/Motivational strategies (15 items),  $\alpha = 0.93$ . Study findings revealed that nurses' negative beliefs about antipsychotic medicines were associated with their self-reported difficulties using cognitive/motivational adherence strategies with patients,  $r = -0.23$ ,  $p = .03$ . This finding lends support for the theorized relationship between nurses' treatment beliefs and illness management behavior. However, the lack of multivariate analysis underscores a

methodological weakness in this study, since the independent effects of nurses' beliefs on their reported difficulties using medication adherence strategies was not determined.

Bell et al. (2006) explored the relationship between physicians' beliefs about the net benefits of prostate cancer screening (i.e., prostate specific antigen [PSA] testing and digital rectal exam [DRE]) and their prostate cancer screening behaviors in a sample of 70 physicians. The participants completed a survey to assess their attitudes and practices related to prostate cancer screening. Mean physician beliefs scores were reported about a net mortality benefit from PSA and DRE. Mean belief scores of physicians who were high users of PSA and DRE screening were significantly higher PSA, 2.40 (0.71),  $p < .001$ , and DRE, 2.26 (0.82),  $p < .001$ , compared with mean belief scores of PSA, 0.22 (0.97),  $p < .001$ , and DRE, 0.89 (0.93),  $p < .001$ , among physicians who were low users of PSA and DRE screening. Even though the researchers intimated an association between physician beliefs and behaviors in this study, there were no bivariate or multivariate statistics reported for the variables of interest. According to the researchers, the small sample size prevented them from conducting multivariate analyses. While physicians with greater beliefs in the benefits of prostate cancer screening reported higher levels of actual screening behaviors compared to physicians who believed less in the benefits of prostate cancer screening, the independent effects of their beliefs on their cancer screening behaviors in this study were not examined.

McIntosh, Swanson, and Howell (2001) conducted a study to investigate the beliefs of health professionals about treatment of acute diarrhea, and recommendations for antidiarrheal treatment in a sample of 474 doctors, pharmacists, and nurses. A questionnaire was used to collect data aimed at assessing health professionals' current

practice in the treatment and management of diarrhea in healthy adults and their beliefs about prescribing antidiarrheal medication. Findings revealed that those who would recommend prescribing antidiarrheal medication were more likely to disagree that antidiarrheals lead to more damage to the gut,  $X^2 = 40.6, p < .001$ , and also more likely to disagree that antidiarrheals prolong illness by delaying excretion of pathogens,  $X^2 = 56.7, p < .001$  than those who did not recommend prescribing antidiarrheals. While these findings suggest that health care professionals' beliefs about treatment influence their illness management behaviors, a weakness of the study is that only parametric and non-parametric independent or matched sample t-tests or chi-squared analyses were conducted, and the independent relationships between health care professionals' treatment beliefs and behaviors were not examined.

In summary, the above studies support the theorized relationship between healthcare professionals' treatment beliefs and illness management behaviors. However, of the four studies, only two reported the use of multivariate analyses to determine independent effects of beliefs on illness management behaviors. While no studies examined relationships between beliefs about exercise as a patient treatment and exercise counseling behaviors, the findings from these studies suggest that nurses' beliefs about the benefits and barriers of exercise as a treatment for CRF in women with breast cancer may have an important influence on their exercise counseling behaviors.

### **Contextual factor and illness management behaviors.**

Four studies were found that examined HCPs' personal experience with the treatment and their illness management behaviors. Kaewsarn et al. (2003) conducted a study to identify antecedents to postpartum care in a sample of 372 nurses working in

hospitals and health service offices. Nurses' personal breastfeeding experience was one variable examined in relationship to their postpartum care practices. Study findings revealed that there was a significant relationship between nurses' personal experience with breastfeeding and their approval and recommendation of sexual abstinence during the postpartum period,  $X^2 = 12.89, p = .002$ . This finding supports the theorized association between personal experience and behavior. However, only descriptive and bivariate analyses were reported. Use of multivariate analyses may have strengthened the internal validity of the study, as the independent effects of the personal breastfeeding experience of the nurses on their postpartum practices could have been discerned.

In a study that included a sample of 648 primary physicians, Johnson et al. (2005) examined correlates of physician substance misuse counseling behavior. A personal experience with substance misuse among family members and friends was one predictor among several that were examined. Personal experience with family and friend substance misuse was found to be a significant predictor of physicians' reports of having less difficulty discussing the topic of substance misuse with their patients,  $\beta = -.32, p < .001$ . This finding supports the theorized association between health care provider personal experience and illness management behaviors.

Burns, Camaione, and Chatterton (2000) examined predictors of 396 adult nurse practitioners' (ANP) exercise counseling behaviors as recommended by the American College of Sports Medicine (ACSM) and the Centers for Disease Control (CDC). Regression analysis revealed that nurses' engagement in moderate physical activity on most days of the week was a predictor of their routine counseling of patients regarding the ACSM and the CDC recommendation for physical activity,  $\beta = 0.82, p < .05$ . This

finding supports the theorized association between personal experience and counseling behavior.

In a study that included a sample of 2316 medical students, Frank et al. (2008) examined factors that predicted exercise levels and exercise counseling. The mean exercise scores for medical students who counseled patients to exercise was higher compared to those who did not, 47.4,  $p = .008$  and 42.3,  $p = .008$  respectively. Even though the researchers reported an OR of 1.01, 95% CI [1, 1.01], they noted that there was a significant relationship between engaging in exercise and counseling patients to exercise. This finding supports the theorized association between health care provider personal experience and illness management behaviors.

In summary, these four studies support a relationship between personal experience and behavior among nurses and physicians. However, no research that examines the relationship between personal experience with exercise and exercise counseling behaviors of nurses who care for patients with breast cancer and CRF has been identified.

### **Contextual factor and treatment beliefs.**

Two studies were found that examined the relationship between HCPs' personal experiences and treatment beliefs. Johnson et al. (2005) conducted a study to assess physicians' beliefs regarding the effectiveness of substance misuse treatments in a sample of 648 primary care physicians. Personal experience with a family member who misused substances was one predictor that was examined in this study. The results revealed an inverse and independent association between personal experiences with a family member who misused substances and beliefs about the effectiveness of substance misuse

treatments,  $\beta = -0.14$ ,  $p < 0.05$ , indicating that physicians who had a personal experience with a family member who misused substances had less confidence in the belief that substance misuse treatments were effective. This finding supports the theorized relationship between personal experience and treatment beliefs.

Similarly, in a study that included a sample of 2316 medical students, Frank et al. (2008) examined factors that predicted exercise levels and exercise counseling. The medical students who were compliant with the CDC exercise recommendation were more likely to believe that exercise counseling was important, OR 1.32, 95% CI [4.06, 1.65]. This finding supports the theorized association between health care provider personal experience and treatment beliefs.

In summary, two studies were found that examined the association between personal experience and treatment beliefs in non-nursing populations, and these studies support the examination of this relationship in nurses who care for patients with breast cancer experiencing CRF in the proposed study.

### **Treatment belief as a Mediator of Contextual factor and Illness Management Behavior.**

A review of the literature found no studies that tested treatment belief as a mediator of the relationship between contextual factors and behavior. However, the literature review supports the relationship between HCP contextual factors and illness management behaviors, between treatment beliefs and illness management behavior, and between HCP contextual factors and treatment beliefs as theorized by the CSM. Baron and Kenny (1986) suggest that when strong correlations are found between variables, theoretically derived mediators of the relationship should be identified and examined.

The empirical literature suggests that HCP treatment beliefs may mediate the relationship between contextual factors (personal experience with exercise) and procedures for coping (exercise counseling) in nurses who care for women with breast cancer and cancer related fatigue since contextual factors are related to both treatment beliefs and illness management behaviors. Specifically, the literature review reveals a relationship between personal experience with treatment and treatment beliefs as well as a relationship between treatment beliefs and illness management behaviors. These relationships suggest that treatment beliefs may mediate the relationship between personal experience with treatment and illness management behaviors. An examination of the role of treatment beliefs as a mediator in this study will help to elucidate an important mechanism for the relationship between nurses' personal experience with exercise and their exercise counseling behaviors.

### **Theoretical rationale**

The CSM stipulates that contextual factors influence health professional's treatment beliefs and procedures for coping (i.e., illness management behaviors) (Horne, 2003, Leventhal et al., 1997). According to Leventhal et al. (1997) contextual factors can have both direct and indirect effects on behavior. The CSM postulates that the relationship between contextual factors and procedures for coping (e.g. behavior) can be mediated by treatment beliefs (Horne, 2003, Leventhal et al., 2003). Based on these theoretical propositions, the following hypotheses are derived and will be tested:

1. Personal experience with exercise is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.



2. Exercise benefit belief is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.
3. Exercise barriers belief is negatively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.
4. Personal experience with exercise is positively related to the exercise benefits beliefs of nurses who care for women with breast cancer experiencing CRF.
5. Personal experience with exercise is negatively related to exercise barriers beliefs of nurses who care for women with breast cancer experiencing CRF.
6. When exercise benefits beliefs are controlled for, the magnitude and significance of the relationship between personal experience with exercise and exercise counseling behaviors will diminish in nurses caring for women with breast cancer experiencing CRF.
7. When exercise barriers beliefs are controlled for, the magnitude and significance of the relationship between personal experience with exercise and exercise counseling behaviors will increase in nurses caring for women with breast cancer experiencing CRF.

**Diagram of propositions to be tested**

***Proposition A***

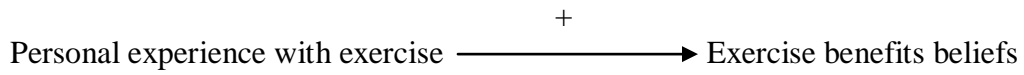
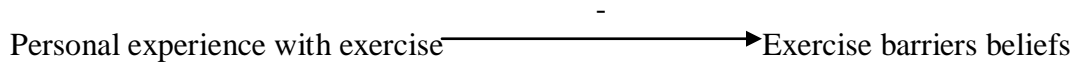
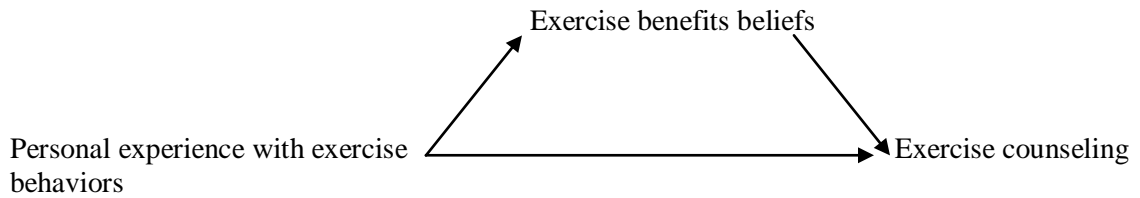
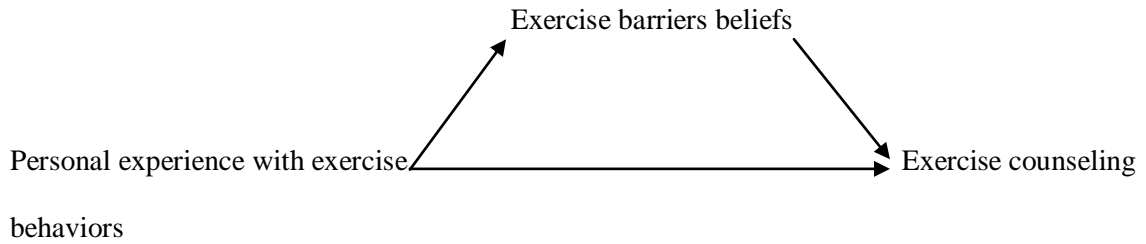
Personal experience with exercise  $\xrightarrow{+}$  Exercise counseling behaviors

***Proposition B***

Exercise benefits beliefs  $\xrightarrow{+}$  Exercise counseling behaviors

***Proposition C***

Exercise barriers beliefs  $\xrightarrow{-}$  Exercise counseling behaviors

***Proposition D******Proposition E******Mediation Model (A)******Mediation Model (B)***

## **CHAPTER 3**

### **Methodology**

This chapter will describe the research design for this study including the research setting, sampling methods, sample, the instruments, the procedure for data collection, and data analysis. To examine the relationships among nurses' knowledge of CRF treatment guidelines, personal experience with exercise, treatment beliefs, and exercise counseling behaviors, the study used a descriptive, correlational research design.

#### **Research Setting**

The subjects were recruited through the use of an E-mail list of registered nurses currently enrolled in the Oncology Nursing Society (ONS). This professional organization is comprised of registered nurses and other healthcare providers. These professionals are diverse in their professional roles and practice settings, and benefit from information, education, and opportunities provided by the Society. A list of E-mail addresses of nurses meeting the inclusion criteria who are members of ONS was rented from the ONS.

#### **Sampling Methods**

The ONS maintains an E-mail list of approximately 20,000 members of the society. A minimum required E-mail list of 2,000 addresses of nurses who work in oncology settings and provide direct care to adult women receiving treatment for breast cancer was ordered as well as other data that were relevant to this study including, primary work setting and employment status. The ONS List Manager selected the E-mail addresses of a convenience sample of 2000 registered nurses according to the stipulated inclusion criteria, which is included in the membership information that nurses provide to

ONS. The subjects for this study were delimited to include only nurses who work in oncology settings and provide direct care to adult women receiving treatment for breast cancer. The subjects also were delimited to those who can read and understand English, as the questionnaires were printed in English.

An invitational letter (Appendix A) was sent via E-mail to the participants with information that includes: a) an explanation of the study purpose and invitation to participate, b) an assurance of anonymity and explanation of the participant's rights as a research subject, c) a summary of risks and benefits, d) contact information for the Principal Investigator, Rutgers University IRB, and e) the instructions for completion of the survey. This letter also indicated that completion of the questionnaire would serve as the individual's consent to participate in the study. All participants willing to complete the survey were asked to complete the Demographic questionnaire, the Godin Leisure Time Exercise Questionnaire, the Exercise Benefits Beliefs Scale, the Exercise Barriers Beliefs scale, and the Exercise Counseling Behaviors Scale.

A response rate of 6% was expected to yield 120 respondents; this expected response rate was based on the response rate of the pilot study. According to Dillman, Smyth and Christian, (2009) the response rates for online surveys typically range between 5-10% because of a multiplicity of issues endemic to online surveys including the fact that E-mails are more quickly dismissed and forgotten than mailed pencil and paper surveys; therefore one of the methods for yielding the desired response rate would be to send multiple contacts (Dillman et al., 2009). The initial email transmission was sent to only 1822 nurses. Three contacts were sent which resulted in a final response rate of 7% yielding 128 respondents. Buchholz and Purath (2007) in a web-based survey of

1500 adult nurse practitioners had only 148 respondents, yielding a response rate of <10%. For the current study, the first follow-up letter was sent to the nonresponders two weeks after the initial contact, and the second was sent 3 weeks after the initial contact. The follow-up letters included a) a reminder to all the respondents, to complete the survey that was previously sent, b) usefulness of the survey and the importance of responding, c) the instructions for completing the survey, and d) a request to complete the survey which included the Demographic questionnaire, the Godin Leisure Time Exercise Questionnaire, the Exercise Beliefs Scales, and the Exercise Counseling Behaviors Scale.

Power analysis for correlational and regression analysis was used to determine the sample size. For correlational analysis, using moderate effect size,  $r = .30$ , based on the literature for personal experience with a treatment, treatment beliefs and illness management behaviors that yielded correlations of -0.23 to 0.63 as noted above (Byrne et al., 2005; Hall & Marteau, 2007), a sample size of 85 was needed to obtain a power of .80, and an alpha level of .05 with three predictor variables (Polit, 2010). For regression analysis a medium effect size,  $r^2 = 0.13$ , was estimated based on reported betas of previous studies (-0.14, -0.32, and 0.82), with an average beta of 0.32 (Johnson et al., 2005; Burns et al., 2000). Based on three predictor variables, a sample size of 88 was needed for regression analysis. Thus a minimum sample size of 88 was needed to achieve sufficient statistical power for correlational and regression analyses. With a response rate of 7%, a minimum sample size of 128 nurses was more than sufficient power for statistical analyses.

## **Instruments**

### **Demographics Questionnaire.**

The following demographic data and participant characteristics were collected to describe the study sample: age, gender, marital status, current position, length of time working in that position, work status, highest degree earned, background, knowledge level of National Comprehensive Cancer Network (NCCN) clinical practice guidelines for cancer-related fatigue, length of time licensed as a registered nurse, length of time worked in an oncology setting, and certification in oncology nursing (Appendix B).

### **Godin Leisure Time Exercise Questionnaire.**

The Godin Leisure Time Questionnaire is a self-report instrument designed to measure the usual leisure time exercise behaviors of the respondents (Godin & Shephard, 1985). The instrument assesses two types of physical activity: exercise and leisure activities. The three exercise items elicit the frequency (minutes per week) of three levels of (strenuous, moderate, mild) exercise in a 7-day period. Responses on the questionnaire allow the calculation of the total time spent per week (minutes) in strenuous, moderate, and mild exercise. In addition, a total weekly energy expenditure in kilocalories per week score is calculated by multiplying the total weekly minutes spent in strenuous activity by 9 kilocalories per minute, total weekly minutes spent in moderate level exercise by 5 kilocalories per minute, and total weekly minutes spent in mild exercise by 3 kilocalories per minute. These products are summed to yield a score that represents the total weekly exercise kilocalorie expenditure (MET).

The second type of activity assessed is one's self-reported frequency in the engagement of weekly leisure activities that last "long enough to work up a sweat". This

item is assessed on a 3-point Likert scale ranging from often to never/rarely. For this study, only the items that pertain to the time spent in and intensity of weekly exercise were used. To assess participants' current level of exercise, they were asked to respond to these items by reporting their level of exercise over a 7-day period that represents a typical exercise week for them in the past month. Participants who were not currently exercising were instructed to respond with a time spent frequency of zero for each level of exercise intensity (Appendix C).

Since the Godin Leisure Activity exercise construct is a composite measure of the linear combination of time spent in exercise, exercise intensity, and kilocalorie expenditure, internal consistency reliability is not an appropriate measure of the instrument's reliability (Nunnally & Bernstein, 1994). Test-retest reliability is an appropriate alternative measure of reliability for linear combinations (Nunnally & Bernstein, 1994) and has been well established for this instrument. Test-retest reliability coefficients for the strenuous, 0.98,  $p < 0.05$ , moderate, 0.46,  $p < 0.05$ , and light, 0.48,  $p < 0.05$ , intensity exercise levels, and the total weekly score, 0.74,  $p < 0.05$ , and the sweat, 0.80,  $p < 0.05$ , constructs were initially established in a sample of 53 healthy adults (Godin & Shephard, 1985). Subsequent studies have established test-retest reliability for the total weekly score, 0.81,  $p < 0.05$ , in a sample of 319 male and female adolescents; for time spent in strenuous, 0.84,  $p < 0.05$ , moderate, 0.36,  $p < 0.05$ , and light, 0.24,  $p < 0.05$ , intensity exercise, the total weekly kilocalorie expenditure score, 0.62,  $p < 0.05$ , and the leisure activity sweat scale score, 0.69,  $p < 0.05$ , in a sample of 28 healthy males and 50 healthy females has been reported (Jacobs, Ainsworth, Hartman, & Leon, 1993; Sallis, Buono, Robis, Micale, & Nelson, 1993).

Criterion-related validity was established with the original scale by correlating all the Godin item scores with maximal oxygen intake ( $VO_2$  max) and body fat (BF). There were significant correlations for strenuous exercise, .38 and .21, respectively,  $p < .05$ , and the total weekly kilocalorie score, .24 and .21 respectively,  $p < .05$ , and the leisure activity subscale, .26 and .21 respectively,  $p < .05$ , in a sample of 306 healthy individuals. Subsequent studies have established validity of the Godin total weekly kilocalorie score and the leisure activity sweat scale with other exercise criterion measures such as  $VO_2$  max, BF, Caltrac, treadmill time, forced expiratory volume (FEV), activity rating scales and questionnaires such as the National Aeronautics and Space Administration (NASA) physical activity status scale and the Baecke (Jacobs et al., 1993; Miller, Freedson, & Kline, 1994; Sallis et al., 1993). Correlation coefficients were acceptable and ranged from -.43 to .57,  $p < .05$ , for the total weekly kilocalorie score and -0.40 to .61,  $p < .05$ , for the leisure activity sweat scale (Tabachnick & Fidell, 2007).

In summary, this scale has been widely used to measure individuals' frequency and intensity of exercise. Reliability and validity for this instrument have been established, and it has been tested in persons in the general population and is therefore suitable for measuring nurses' personal experience with exercise in this study.

### **Exercise Beliefs Scale.**

No instrument measuring the exercise beliefs that nurses have for women with breast cancer experiencing CRF was found; therefore an instrument was developed to measure the construct.



***Item selection.***

Items for this instrument were initially selected based on a literature review of exercise studies that examined the exercise beliefs of study participants; that is, reasons why they did or did not engage in regular exercise. Participants in these studies included nurses, healthy persons in the general population, and persons who were chronically ill (Blaney et al., 2010; Brown, 2005; Grubbs & Carter, 2002; Kirshbaum, 2006; Lee, Huang, and Kao, 2005; Loumidis and Wells, 1998; Lowe-Strong, Rankin, Campbell, Allen, & Gracey, 2010; Mock et al., 2005; Pickett et al., 2002; Robbins, 2004; Stutts, 2002). Items generated from these studies focused on barriers to or facilitators of exercise. Items were also gleaned from the 2011 National Comprehensive Cancer Network (NCCN) guidelines on managing CRF; items generated from this aspect of the literature review focused on the benefits of exercise for the management of CRF (NCCN, 2011).

Twenty items were developed for the exercise beliefs scale based on the literature review. A Likert type response scale was selected for this instrument because it distinguishes among each nurse's degree of belief toward each item (Nunnally & Bernstein, 1994). This type of response rating is based on numerical scales corresponding with specific ratings. According to Nunnally and Bernstein (1994), scoring based on Likert scale rating is superior to dichotomous ratings because it yields a wider range of information about a construct based on statistical analysis compared to dichotomous rating scores. Nurses are asked to rate each item on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

***Content Validity.****Item judgment.*

The process of content validation is necessary to ensure that the instrument measures what it is supposed to measure (Nunnally & Bernstein, 1994; Polit & Beck, 2006). Content validity begins with item judgments where experts in the content area are asked to evaluate the adequacy, quality, format, and content of the item to represent the content domain (Waltz, Strickland, & Lenz, 2010). Item judgment was performed by a panel of seven oncology nurse experts including one nurse researcher, two oncology nurse practitioners, two outpatient oncology nurses, and two inpatient oncology nurses, all certified in oncology nursing. The number of experts selected was based on the recommendation of a range of 5 to 10 experts to control for chance agreement among the judges (Lynn, 1986; Waltz et al., 2010).

Content validity at the item level is based on item objective congruence; the experts are given the definition of the domain or the variable to be measured, along with the items in the scale, they then rate the relevance of each item (Waltz et al. 2010). For this scale, the judges were asked to rate how relevant they believed each item to be for the domain of nurses' beliefs about exercise for patients with CRF. Item relevance was conducted by the experts who reviewed the items of the Exercise Beliefs Scale for accuracy, appropriateness, and representativeness on a 4-point scale ranging from (1) not relevant to (4) very relevant. The judges were also asked to give suggestions on item modification, deletion, or additions. In addition, their opinions about the wording of the stem questions and the scaling responses were sought.

Interrater agreement was determined by identifying the consistency of the judges' agreement of the relevancy of the items to the content domain. For an item to be content valid Lynn (1986) noted that if there are seven judges at least five of them need to judge the item as somewhat or extremely relevant. Seventeen items were deemed content valid or congruent.

Next, a content validity index (CVI) was computed for the 20 items to ascertain content validity of the entire instrument by measuring the proportion of homogeneous items. This is determined by the number of items deemed congruent (rated as 3 or 4) divided by the total number of items in the measure (Waltz et al., 2010). The CVI for this instrument was .85, which is acceptable; an instrument is deemed content valid with a CVI of .8 and above (Waltz et al., 2010). Based on suggestions by the expert judges, the domain stem and items with the word "they" were changed to "the patients" to achieve clarity of the items. Item judgment and content validity process yielded an item pool of 20 items for this scale.

### **Exercise Counseling Behaviors Scale.**

No instrument measuring exercise counseling behaviors of oncology nurses caring for women with breast cancer experiencing cancer treatment related fatigue was found, therefore an instrument was developed by the principal investigator (PI) to measure the construct.

#### ***Item selection.***

The Exercise Counseling Behaviors Scale was developed to assess the domain of nurse exercise counseling behaviors based on the NCCN Clinical Practice Guideline counseling recommendations for CRF. The six items for this instrument were derived

from these guidelines related to fatigue, energy conservation, and activity enhancement counseling strategies (NCCN, 2011). A Likert type response scale was developed for this instrument distinguishing among each nurse's degree of behavior for each item in the counseling behaviors over the past 12 months (Nunnally & Bernstein, 1994). Response ratings included the following: 1 (Never), 2 (Seldom), 3 (About half the time), 4 (Usually), and 5 (Always). As previously noted, this type of scoring exceeds one that is dichotomous because of the increased information it yields based on statistical analysis (Nunnally & Bernstein, 1994).

***Content validity.***

***Item judgment.***

Item judgment experts and procedures were the same as previously described. Content validity testing and procedures were also conducted as previously described for the Exercise Beliefs Scale. Six or more of the seven experts deemed all the items content valid i.e. rated as 3 or 4 on the relevancy scale, The CVI for this instrument was 1.00, which is acceptable (Waltz et al., 2010). Three of the experts gave suggestions regarding the wording and clarification of the items and the wording of four items was modified based on their suggestions.

### **Psychometric Testing Pilot Study**

#### **Sample**

A pilot study was conducted to evaluate the psychometric properties of the 20-item Exercise Beliefs Scale and the six-item Exercise Counseling Behaviors Scale. A convenience sample of 2000 registered ONS members who worked in oncology settings and provided direct care to adult women receiving treatment for breast cancer and who

could read and understand English, was used. Based on the sample size recommendation of 10 subjects per item for internal consistency reliability and factor analysis (Polit, 2010), a sample size of at least 260 was needed to evaluate the scales. Since response rates via E-mail survey are very variable, several methods to increase response rates were utilized (Dillman et al., 2009). Potential participants were contacted via E-mail by ONS with an informational letter explaining the purpose of the study and their rights as research participants and informed that completion of the questionnaire would serve as their consent to participate in the study. Each participant was instructed to simply access the web link provided in the email to complete an online survey, which consisted of three questionnaires. Each participant was asked to respond to items on a demographic form, the Exercise Beliefs Scale, and the Exercise Counseling Behaviors Questionnaires. The subject's responses were entered directly into a SurveyMonkey file that could be accessed only by the PI. Due to the initial low response rate (3%) of the initial email dispersion, 5,400 additional respondents were sent an initial and follow-up email invitation. The total number of emails delivered was 7380 with a 6.1% response rate (n = 447) across the three mailings. Of these responses only 5.3% (n = 387) respondents' data were usable based on inclusion criteria and missing data.

The pilot study sample for psychometric evaluation consisted of a convenience sample of 387 nurses who met the inclusion criteria. The demographic characteristics of the sample are given in Table 1.

**Table 1**  
*Characteristics of the Pilot Study Sample*

<i>Variable</i>	<i>N</i>	<i>%</i>
<b>Age</b>		
21-30	24	6.2
31-40	28	7.2
41-50	123	31.8

51-60	180	46.5
61-70	32	8.3
<b>Gender</b>		
Male	380	98.2
Female	7	1.8
<b>Marital Status</b>		
Never been married	35	9.0
Married	273	70.5
Divorced	57	14.7
Widowed	4	1.0
Separated	4	1.0
A member of an unmarried couple	14	3.6
<b>Background</b>		
African-American	14	3.6
Alaskan or Native American	2	0.5
Asian	20	5.2
Hispanic	7	1.8
Filipino	7	1.8
Pacific Islander	1	0.3
White	326	84.2
Mixed Race	6	1.6
<b>Work status</b>		
Full time	361	93.3
Part time	22	5.7
Per diem	4	1.0
<b>Current position</b>		
Staff nurse	233	60.2
Charge nurse	25	6.5
Nurse manager	19	4.9
Nurse educator	10	2.6
Nurse practitioner	62	16
Other	38	9.8
<b>Experience in current position</b>		
Less than 1 year	22	5.7
1-5 years	132	34.1
6-10 years	79	20.4
11-15 years	76	19.6
16-20 years	32	8.3
Over 20 years	46	11.9
<b>Highest nursing degree</b>		
Diploma	36	9.3
Associate degree	106	27.4
Baccalaureate degree	138	35.7
Masters degree	99	25.6
Doctorate	8	2.1
<b>Time licensed as a registered nurse</b>		
Less than 1 year	5	1.3
1-5 years	40	10.3
6-10 years	18	4.7
11-15 years	30	7.8
16-20 years	59	15.2
Over 20 years	235	60.7
<b>Time worked in an Oncology setting</b>		
Less than 1 year	8	2.1
1-5 years	62	16
6-10 years	49	12.7
11-15 years	43	11.1
16-20 years	86	22.2
Over 20 years	139	35.9

<b>Board certified in Oncology nursing (OCN/AOCN)</b>		
Yes	289	74.7
No	98	25.3

### **Data Analysis**

Item analysis was conducted to determine the “best” items to use on the final version of each scale, i.e., Exercise Beliefs, and the Exercise Counseling behaviors (Nunnally & Bernstein, 1994). The discrimination index, that is, corrected item-to-total correlations, was used for item analysis and selection. Items that did not correlate, that is, their item-to-total correlation was  $r < .30$ , were further examined to ascertain if deleting them would have made a significant difference to the reliability of the instrument (Nunnally & Bernstein, 1994). Cronbach’s alpha was used to assess internal consistency reliability for each scale, and factor analysis was used to assess the scales’ construct validity.

#### **Item analysis**

An examination of item-to-total correlations for the 20-item Exercise Beliefs Scale revealed seven items with item-to-total correlations less than 0.30, ranging from 0.06 to 0.29. These items pertained to beliefs about the patients’ physical condition for exercising, the priority of exercise, the possibility of the patient not following the recommendation to exercise, and neighborhood safety. Since deleting these items would not significantly change the reliability of the instrument, the items were retained because they were deemed important beliefs based on item selection and judgment. All item-to-total correlations for the Exercise Counseling Behaviors scale were above 0.30, and all six items on this scale were retained.

### **Reliability Analysis**

Cronbach's alpha was used to assess the internal consistency reliability for the Exercise Beliefs, and Exercise Counseling Scales. The alpha coefficient for the 20-item Exercise Beliefs Scale was .73, and the alpha coefficient for the 6-item Exercise Counseling Behaviors Scale was .78. These reliability coefficients are acceptable for newly developed scales (Nunnally and Bernstein, 1994).

### **Factor Analysis**

Principal Components factor analysis was used to evaluate the initial construct validity of each scale. The dimensionality of items in each of the two scales was analyzed by examining the scree plot and the number of components with Eigenvalues greater than one (Polit, 2010). The scree plot indicated that the Exercise Counseling Behavior Scale (Appendix D) was unidimensional and accounted for 48% of the variance in exercise counseling behaviors. The Exercise Counseling Behaviors Scale is summed with a possible range from 6 to 30; higher scores represent a high level of exercise counseling behaviors.

The scree plot for the 20-item Beliefs Scale indicated that the scale was multidimensional and was comprised of four dimensions. A four-factor solution emerged using the Varimax rotation procedure (Table 2). The rotated solution yielded four factors with Eigenvalues greater than one and explained 63% of the variance in exercise beliefs.

The first factor was conceptually distinct and consisted of eight items with excellent loadings, i.e., greater than .70, (Polit, 2010) and pertained to beliefs about exercise benefits. The second factor was also conceptually distinct, consisted of 7 items with loadings ranging from .52 to .78 and pertained to beliefs about exercise barriers.



Factor three had 3 items with loadings of .55, .63, and .80. These items included “Counseling about exercise is useless because they will not follow the recommendations,” “Exercise is not a priority for them,” and “They will not be motivated to exercise.” Factor 4 was comprised of 2 items with loadings of .63 and .77, and the items were “They have other concerns (caring for children, working, being treated for other medical illnesses) that are more important” and “If walking in the neighborhood is their only means of exercising, they will not exercise if their neighborhood is unsafe.” There was difficulty in identifying a distinct conceptual basis for these items. Although the items in Factors 3 and 4 did not load unambiguously onto Factor 2 (the items deemed as exercise barriers beliefs), conceptually these items that loaded onto factors 3 and 4 were deemed consistent with exercise barriers beliefs.

**Table 2**

***Factor Loadings for Exploratory Factor Analysis With Varimax Rotation of Exercise Beliefs Scales: 2-factor solution***

Scale	Component			
	1	2	3	4
They are physically able to exercise	<b>.670</b>	-.325	-.115	.057
Exercise can be safely recommended	<b>.841</b>	-.183	-.088	.027
Exercise will improve their vigor/vitality	<b>.909</b>	-.084	-.061	-.016
Exercise will improve their cardiorespiratory fitness	<b>.872</b>	-.041	-.016	-.002
Exercise will improve their quality of life	<b>.906</b>	-.088	-.058	-.020
Exercise will improve their sleep	<b>.911</b>	-.068	-.027	.013
Exercise will reduce their fatigue	<b>.833</b>	-.143	-.063	.011
Exercise will reduce their anxiety	<b>.788</b>	-.087	.072	-.077
They are too tired to exercise	-.113	<b>.633</b>	.297	.080
They will not be motivated to exercise	.032	.164	<b>.804</b>	.033
Counseling about exercise is useless because they will not follow the recommendations	-.104	.334	<b>.554</b>	-.040
Exercise will increase their level of fatigue	-.249	<b>.516</b>	.185	-.285
They feel too sick to exercise	-.115	<b>.652</b>	.326	.108

Some have too many medical complications to exercise	-.186	<b>.619</b>	-.104	.212
Their blood counts are too low to exercise	-.089	<b>.781</b>	.015	-.057
Nausea and vomiting will prevent them from exercising	-.011	<b>.661</b>	-.016	.259
Exercise is not a priority for them	-.103	-.029	<b>.628</b>	.508
They are too weak to exercise	-.125	<b>.710</b>	.241	.085
They have other concerns (caring for children, working, being treated for other medical illnesses) that are more important	-.087	.346	.246	<b>.629</b>
If walking in the neighborhood is their only means of exercising, they will not exercise if their neighborhood is unsafe	.066	.102	-.024	<b>.768</b>

A 2-factor solution was examined utilizing Principal Components analysis with Varimax rotation (Table 3). The 2-factor solution yielded Eigenvalues greater than 1 and explained 50% of the variance, which is more than the cumulative variance for the first 2 factors in the 4-factor solution of 46.9%. Each factor was conceptually distinct, and consisted of 8 and 12 items respectively. The first factor consisted of 8 items with loadings ranging from .69 to .91 and pertained to beliefs about exercise benefits. The second factor consisted of 12 items with loadings ranging from .30 to .73 and pertained to beliefs about exercise barriers. All the items in factors 3 and 4 from the 4-factor solution loaded satisfactorily on the second factor in the 2-factor solution. Thus Exercise Beliefs consisted of 2 distinct dimensions: benefits beliefs and barriers beliefs.

Internal consistency reliability for each of these scales was examined and revealed an alpha coefficient of .94 for the 8-item Exercise Benefits Beliefs Scale (Appendix E) and .81 for the 12-item Exercise Barriers Beliefs Scale (Appendix F). For the Exercise Benefits Beliefs scale, item ratings were summed with a possible range of 8 to 40; higher scores indicate a favorable belief in the benefits of exercise. Similarly, for the Exercise

Barriers Beliefs scale, item ratings were summed with a possible range of 12 to 60; higher scores indicate a greater belief in the barriers to exercise. For the proposed study, the 3-item Godin Leisure Time Questionnaire, 8-item Exercise Benefits Beliefs Scale, 12-item Exercise Barriers Beliefs Scale, and the 6-item Exercise Counseling Behaviors Scale were used to measure personal experience with exercise, exercise beliefs, and exercise counseling behaviors respectively.

**Table 3**

***Factor Loadings for Exploratory Factor Analysis With Varimax Rotation of Exercise Beliefs Scales: 2-factor solution***

Scale	Benefits	Barriers
They are physically able to exercise	<b>.688</b>	-.295
Exercise can be safely recommended	<b>.848</b>	-.169
Exercise will improve their vigor/vitality	<b>.908</b>	-.085
Exercise will improve their cardiorespiratory fitness	<b>.870</b>	-.025
Exercise will improve their quality of life	<b>.905</b>	-.088
Exercise will improve their sleep	<b>.912</b>	-.047
Exercise will reduce their fatigue	<b>.837</b>	-.129
Exercise will reduce their anxiety	<b>.785</b>	-.048
They are too tired to exercise	-.139	<b>.689</b>
They will not be motivated to exercise	.037	<b>.504</b>
Counseling about exercise is useless because they will not follow the recommendations	-.117	<b>.514</b>
Exercise will increase their level of fatigue	-.296	<b>.431</b>
They feel too sick to exercise	-.139	<b>.726</b>
Some have too many medical complications to exercise	-.206	<b>.537</b>
Their blood counts are too low to exercise	-.138	<b>.650</b>
Nausea and vomiting will prevent them from exercising	-.030	<b>.629</b>
Exercise is not a priority for them	-.054	<b>.400</b>
They are too weak to exercise	-.156	<b>.731</b>
They have other concerns (caring for children, working, being treated for other medical illnesses) that are more important	-.057	<b>.585</b>
If walking in the neighborhood is their only means of exercising, they will not exercise if their neighborhood is unsafe	.116	<b>.303</b>

### **Data Collection Procedures**

Prior to data collection, this study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey to protect the rights of human subjects participating in the study. Data were collected electronically through the use of an E-mailing list from a convenience sample of registered nurses currently enrolled in the Oncology Nursing Society (ONS). The participants were sent an informational letter that explained the purpose of the study, an assurance of anonymity and the participant's right to choose not to participate or to terminate participation at any time. This letter also indicated that completion of the questionnaire would serve as the individual's consent to participate in the study, and was not expected to take more than 15 minutes to complete. All participants willing to complete the survey were instructed to access the web link provided in the email to complete the Demographic questionnaire, the Godin Leisure Time Exercise Questionnaire, the Exercise Benefits, and Exercise Barriers Beliefs Scales, and the Exercise Counseling Behaviors Scale.

### **Data Analysis Plan**

The PI created a statistical database using the Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows (IBM SPSS Statistics, 2010) into which demographic, personal exercise experience, exercise beliefs, and exercise counseling behaviors data from the SurveyMonkey database were imported. A descriptive analysis of the demographic data including means and standard deviations was conducted to describe the sample characteristics. Frequency tables, histograms, and scatterplots were used to assess distribution of study variables for normality. Tests for skewness and

kurtosis were conducted and data were inspected for inconsistencies, outliers, and wild data entry codes.

Correlational analysis of the study variables was conducted using both Pearson Product Moment Correlation and chi-square for nominal level data. A two-tailed test of significance set at .05 level was used, even if the hypothesized relationship was directional, reducing the risk of committing a Type I error i.e. reducing the likelihood of gaining a false positive result (Polit, 2010). The correlation matrix was examined to determine if there were any demographic variables that were significantly correlated with the dependent variable and that needed to be controlled in subsequent analyses. In addition, the correlation matrix was examined to determine if personal exercise experience and exercise beliefs scores were significantly related to exercise counseling behaviors scores, and if personal experience with exercise scores were significantly related to exercise beliefs scores. Regression analyses were conducted to test hypotheses 1 through 5 to determine which of the three predictors independently predicted counseling behaviors.

To test hypothesis six and seven, Baron and Kenny's test for mediation was used (Baron & Kenny, 1986). According to Baron and Kenny (1986) a mediator is a variable that specifies how the association occurs between an independent variable (IV) and an outcome variable. Baron and Kenny (1986) state that the following conditions must be present to establish mediation, 1) the independent variable (personal exercise experience) must be significantly related to the mediator (exercise benefits beliefs/exercise barriers beliefs), 2) the independent variable (personal exercise experience) must be significantly related to the dependent variable (exercise counseling behaviors), and 3) the mediator

(exercise benefits beliefs/exercise barriers beliefs) must be significantly related to the dependent variable (exercise counseling behaviors).

### Sample Description

Data were collected from a sample of 128 nurses; data from two of the respondents were eliminated as one nurse identified herself as a nursing instructor in a school of nursing, and the second respondent had too many missing data to be included in the sample. Therefore data analysis was completed for a sample of 126 nurses. The demographic characteristics of the sample are given in Table 4.

Table 4

#### *Characteristics of the Sample*

<i>Variable</i>	<i>N</i>	<i>%</i>
<b>Age</b>		
21-30	10	8.7
31-40	7	6.1
41-50	31	27
51-60	56	48.7
61-70	11	9.6
<b>Gender</b>		
Female	112	97.4
Male	3	2.6
<b>Marital Status</b>		
Never been married	15	13.3
Married	77	68.1
Divorced	7	6.2
Widowed	5	4.4
Separated	1	.9
A member of an unmarried couple	8	7.1
<b>Background</b>		
African-American	1	.9
Asian	2	1.7
Caucasian	107	93
Filipino	2	1.7
Hispanic	2	1.7
Mixed Race	1	.9
<b>Work status</b>		
Full time	111	96.5
Part time	3	2.6
Per Diem	1	.9
<b>Current position</b>		
Staff nurse	53	54.1
Charge nurse	5	5.1
Nurse manager	13	13.3
Nurse educator	11	11.2
Nurse practitioner	16	16.3

<b>Experience in current position</b>		
Less than 1 year	9	7.8
1-5 years	47	40.5
6-10 years	28	24.1
11-15 years	14	12.1
16-20 years	8	6.9
Over 20 years	10	8.6
<b>Highest nursing degree</b>		
Diploma	10	8.6
Associate degree	23	19.8
Baccalaureate degree	50	43.1
Masters degree	33	28.4
<b>Time licensed as a registered nurse</b>		
1-5 years	13	11.3
6-10 years	10	8.7
11-15 years	10	8.7
16-20 years	15	13
Over 20 years	67	58.3
<b>Time worked in an Oncology setting</b>		
Less than 1 year	1	.9
1-5 years	17	14.9
6-10 years	21	18.4
11-15 years	17	14.9
16-20 years	17	14.9
Over 20 years	41	36
<b>Board certified in Oncology nursing (OCN/AOCN)</b>		
Yes	85	73.9
No	30	26.1
<b>Knowledge about the NCCN guidelines for cancer treatment related fatigue</b>		
0 (No Knowledge)	3	2.6
1	3	2.6
2	4	3.5
3	11	9.6
4	5	4.3
5	19	16.5
6	21	18.3
7	19	16.5
8	15	13
9	8	7
10 (Very Knowledgeable)	7	6.1

### Human Subjects Protection

This study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey to protect the rights of human subjects participating in the study. There were no anticipated risks to subjects participating in the study. An exempt IRB review was requested as participation in the study only required the completion of questionnaires. Participants' responses to questionnaire items were anonymous in that there were no documents or identifiers linking participants' email addresses or identities

to their responses. Thus, participants' survey responses entered into the SurveyMonkey file and imported into the SPSS data were de-identified. The PI maintained completed questionnaires in computer files that were password protected and only the PI had access to the password. Computer files were backed up onto a flash drive and the flash drive was maintained in a locked cabinet.

Data collected from this study that will be published or presented, will be reported only as grouped data, and no participants will be identified by name. The flash drive will be destroyed three years after completion of the research study.



## Chapter 4

### Analysis of the Data

The purpose of this study was to determine the relationship among nurses' exercise beliefs, their personal experience with exercise, and their exercise counseling behaviors for women with breast cancer and CRF. Data were collected from a sample of 126 nurses who identified themselves as staff nurses, managers, educators, and advanced practice nurses working in oncology settings and caring for women with breast cancer. The following instruments were used in this study: a) a demographic questionnaire, developed by the investigator, was used to collect information on age, gender, marital status, current position, length of time in position, work status, highest degree earned, background, knowledge of National Comprehensive Cancer Network (NCCN) guidelines, years licensed as a registered nurse, length of time in an oncology setting, and Oncology certification status; b) the Godin Leisure Time Exercise Questionnaire was used to measure the length (minutes) and intensity (strenuous, moderate, mild) of weekly exercise (Godin & Shephard, 1985); c) the Exercise Benefits scale was developed by the investigator to measure the beliefs that nurses have of the benefits of exercise for women with breast cancer experiencing CRF; d) the Exercise Barriers Beliefs scale was developed by the investigator to measure the beliefs that nurses have of the barriers to exercise for women with breast cancer experiencing CRF , and e) the Exercise Counseling Behaviors Scale was developed by the investigator to assess the exercise counseling behaviors of the nurses based on the NCCN Clinical Practice Guideline counseling recommendations for CRF. Data analysis findings are presented in this chapter.

### **Instrument Reliability**

For this sample, the alpha coefficient for the 8-item Exercise Benefits scale was .95, the alpha coefficient for the 12-item Exercise Barriers scale was .82 and the alpha coefficient for the 6-item Exercise Counseling Scale was .79.

### **Statistical Description of the Variables**

Electronically collected data were imported from the SurveyMonkey database into the Statistical Package for the Social Sciences (SPSS). A codebook containing both the raw data and clean data was maintained and copies of all output and syntax were maintained in computer files. The data were cleaned by examining them for outliers, wild entries, and other keypunch errors (Tabachnick & Fidell, 2007). The data quality was evaluated by assessing study variable scores for normality, extreme skewness and kurtosis (see Table 5) using frequency tables, histograms and scatterplots (Tabachnick & Fidell, 2007). Normal distribution of the variables can be assessed by evaluating the degree of skewness ( $z$ -score), i.e., dividing the skewness statistic by the corresponding standard error of skewness. Variable scores are said to be normally distributed if the  $z$ -score falls in the range of  $-1.96$  to  $1.96$  (Tabachnick & Fidell, 2007).

The distribution of scores for the main study variables are summarized in Table 5 and the number of participants varies across variables because of missing data. Scores for exercise barriers beliefs and exercise counseling behaviors were normally distributed. Scores for exercise benefits beliefs were mildly skewed and not transformed (Tabachnick & Fidell, 2007). The scores for total time spent in exercise revealed a positive and severely skewed distribution ( $z$ -score for skewness = 12.9). Further inspection of descriptive statistics for this variable revealed nine outliers with a score range of 900 to

2360 total time spent in exercise in minutes. A deletion of these outliers resulted in a reduction of distribution of scores for this variable from severe skewness to mild skewness, and this variable was not transformed. The sample of 105 participants with outliers deleted was used for data analysis and hypothesis testing that included this variable (Tabachnick & Fidell, 2007).

**Table 5**

*Summary of Distribution of Variables*

	Exercise Benefits Beliefs	Exercise Barriers Beliefs	Exercise Counseling Behaviors	Total time spent in exercise with outliers included	Total time spent in exercise with outliers excluded
Skewness	-1.271	-.460	-.054	2.917	.867
SE	.222	.228	.227	.226	.236
Kurtosis	5.705	.633	-.939	11.655	.061
SE	.440	.453	.451	.449	.131
Z-score	-5.72	-2.01	-.237	12.9	3.67

**Dependent Variable**

**Exercise Counseling Behavior.**

Scores were summed for the Exercise Counseling Behavior scale, and a mean score was computed. Of the 126 nurses in the sample, scores ranged from 12 to 30, and the sample mean score was 21.46 ( $SD = 4.71$ ) (see Table 6). For this scale, higher scores represent a high level of exercise counseling behaviors. This indicates that there was moderate engagement in counseling behaviors, on average, among study participants.

**Independent Variables**

**Exercise benefits beliefs.**

Scores for the Exercise Benefits Beliefs Scale were summed, and a mean score was computed. Scores ranged from 8 to 40, and the sample mean score was 33.25 ( $SD =$

4.83), (see Table 6). Higher scores on this scale reflect a positive belief in the benefits of exercise, and the sample mean score for exercise benefits beliefs indicates that a majority of the nurses, on average, agreed or strongly agreed that there were benefits of exercise for women with breast cancer experiencing CRF.

#### **Exercise barriers beliefs.**

Scores for the Barriers Beliefs Scale were summed, and a mean score was computed. For this scale, higher scores indicate a greater belief in the barriers to exercise for women with breast cancer and CRF. Scores ranged from 14 to 44, and the sample mean score was 34.32 ( $SD = 5.5$ ) (see Table 6). This indicates that there was a moderate belief among study participants, on average, regarding the barriers to exercise for women with breast cancer and CRF.

#### **Personal Experience with Exercise**

Scores for the Godin Leisure Time Exercise Questionnaire are described for the sample ( $n = 105$ ) with outliers excluded. Scores for the number of minutes spent in a typical week in all levels of exercise (strenuous, moderate, and mild) and total overall time spent were computed and sample mean scores are listed in Table 6. Only 8% of participants reported no level of engagement in exercise. A majority of participants (81%) reported engagement in mild exercise during the week with an average time spent of 102 minutes (1.7 hours). Eighty-two percent of participants reported engagement in moderate intensity exercise with an average time spent of 96 minutes (1.6 hrs). Forty-seven percent of participants reported engagement in strenuous exercise with an average time spent of 42 minutes (0.7 hours). Scores for total time spent in exercise in a week, across all levels of intensity, ranged from 0 to 720 minutes ( $M = 240.3$ ,  $SD = 192.3$ ),

reflecting an average level of four hours of exercise per week (across the intensity levels) for the sample.

**Table 6**

*Descriptive Statistics of the Study Variables*

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>
Exercise Counseling Behaviors	21.46	4.7	12-30
Exercise Benefits Beliefs	33.25	4.8	8-40
Exercise Barriers Beliefs	34.32	5.5	14-44
Total time spent in mild exercise	101.2	115.3	0-500
Total time spent in moderate exercise	96.5	94	0-420
Total time spent in strenuous exercise	42.5	67.5	0-420
Total time spent in exercise	240.3	192.3	0-720

**Demographic Variables.**

To determine if any demographic variable was a covariate that should be controlled for in multivariate analysis, correlational analysis was conducted to examine significant relationships, if any, between demographic variables and exercise counseling behaviors. Current position ( $r = .209, p < 0.05$ ) and knowledge about NCCN guidelines for cancer treatment related fatigue ( $r = .535, p < 0.01$ ) were significantly related to exercise counseling behaviors. These demographic variables were controlled for in multivariate regression analyses.

**Hypothesis Testing**

Hypotheses 1 through 5 were tested using correlational analysis (see Table 7). Two tailed tests of significance set at the .05 level were used to test the hypothesized relationships (Tabachnick & Fidell, 2007). Hypotheses 6 and 7 were tested using multiple regression analyses as specified by Baron and Kenny (1986) for testing a mediation model.

**Hypothesis 1**

Hypothesis 1 was derived from the theoretical proposition that personal experience with exercise is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF. Correlational analysis revealed no relationship between personal experience with exercise and exercise counseling behaviors,  $r = .11$ ,  $p = .278$ . Hypothesis 1 was not supported.

**Hypothesis 2**

Hypothesis 2 was derived from the theoretical proposition that exercise benefit beliefs are positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF. Correlational analysis revealed that exercise benefit beliefs were not related to exercise counseling behaviors,  $r = .008$ ,  $p = .936$ . Hypothesis 2 was not supported.

**Hypothesis 3**

Hypothesis 3 was derived from the theoretical proposition that exercise barriers beliefs are negatively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF. Correlational analysis revealed a significant and inverse relationship between exercise barriers beliefs and exercise counseling behaviors,  $r = -.311$   $p = .001$ . Hypothesis 3 was supported.

**Hypothesis 4**

Hypothesis 4 is derived from the theoretical proposition that personal experience with exercise is positively related to the exercise benefits beliefs of nurses who care for women with breast cancer experiencing CRF. Correlational analysis revealed no

relationship between personal experience with exercise and exercise benefits beliefs,  $r = .05$ ,  $p = .631$ . Hypothesis 4 was not supported.

### Hypothesis 5

Hypothesis 5 was derived from the theoretical proposition that personal experience with exercise is negatively related to exercise barriers beliefs of nurses who care for women with breast cancer experiencing CRF. Correlational analysis revealed that personal experience with exercise was not related to exercise barriers beliefs,  $r = -.01$ ,  $p = .929$ . Hypothesis 5 was not supported.

**Table 7**

*Summary of Intercorrelations of Variables for Testing Hypotheses 1 through 5*

Variables	1	2	3	4
1. Exercise Counseling Behaviors	1	.01 <sup>ns</sup>	-.31 <sup>**</sup>	.11 <sup>ns</sup>
2. Exercise Benefits beliefs	.01 <sup>ns</sup>	1	-.34 <sup>**</sup>	-.05 <sup>ns</sup>
3. Exercise Barriers beliefs	-.31 <sup>**</sup>	-.34 <sup>**</sup>	1	-.01 <sup>ns</sup>
4. Total time spent in exercise	.11 <sup>ns</sup>	-.05 <sup>ns</sup>	-.01 <sup>ns</sup>	1

\*\* $p < .01$ ; <sup>ns</sup> non-significant

### Hypothesis 6

Hypothesis 6 was derived from the theoretical proposition that indicates exercise benefit beliefs mediates the relationship between personal experience with exercise and exercise counseling behaviors in nurses caring for women with breast cancer experiencing CRF. In order to test the mediation model, 1) personal exercise experience must be significantly related to the mediator exercise benefits beliefs, 2) personal exercise experience must be significantly related to exercise counseling behaviors, and 3) exercise benefits beliefs must be significantly related to exercise counseling behaviors

(Baron and Kenny, 1986). As these variables were not related, a mediation model could not be tested. Hypothesis 6 was not supported.

### **Hypothesis 7**

Hypothesis 7 was derived from the theoretical proposition and states that exercise barriers beliefs mediates the relationship between personal experience with exercise and exercise counseling behaviors in nurses caring for women with breast cancer experiencing CRF. In order to test the mediation model, 1) personal exercise experience must be significantly related to exercise barriers beliefs, 2) personal exercise experience must be significantly related to exercise counseling behaviors, and 3) exercise barriers beliefs must be significantly related to exercise counseling behaviors. There was a significant inverse relationship between exercise barriers beliefs and exercise counseling behaviors, and exercise barriers beliefs was found to be a significant predictor of exercise counseling behaviors,  $\beta = -.311, p = .000$ . However, the independent variable, exercise benefits beliefs, was not significantly related to the dependent variable, exercise counseling behaviors, and a test of mediation could not be conducted. Therefore, hypothesis 7 was not supported.

### **Ancillary Findings**

Further tests were conducted to examine the predictive ability of demographic variables that were significantly related to exercise counseling behavior in the study sample. Correlational analysis revealed that the current position of the nurse (Staff nurse, Charge nurse, Nurse manager, Nurse educator, Nurse practitioner) was inversely related to exercise barriers beliefs,  $r = -.233, p = .028$ , and positively related to exercise counseling behavior,  $r = .209, p = .044$ , suggesting that nurses in leadership roles



(educator, advanced practice nurse) perceived less barriers to exercise in women receiving treatment for breast cancer. Since hypothesis testing revealed a significant inverse relationship between exercise barriers beliefs and exercise counseling behaviors,  $r = -.311$ ,  $p = .001$ , mediation analyses was conducted to further understand the nature of the relationship among these variables. A series of regression analyses were conducted to determine: 1) if current position of the nurse predicted exercise counseling behavior; 2) if current position of the nurse predicted exercise barriers beliefs; and 3) if exercise barriers beliefs mediated the relationship between a nurses' role and exercise counseling behaviors.

Findings revealed that participants' current position (i.e., role) predicted exercise counseling behavior,  $\beta = .209$ ,  $p = .044$ , and exercise barriers beliefs,  $\beta = -.233$ ,  $p = .028$ ; and that exercise barriers beliefs completely mediated the relationship between current position and exercise counseling behaviors,  $\beta = .134$ ,  $p = .201$ .

On the demographic questionnaire, participants were asked to rate the extent to which they were knowledgeable about the National Comprehensive Cancer Network (NCCN) guidelines for cancer treatment-related fatigue on a scale of zero to ten (0 = not knowledgeable to 10 = extremely knowledgeable). Approximately 31% of nurses reported that they were not knowledgeable about NCCN guidelines for management of CRF, and a majority of nurses (69%) reported that they were knowledgeable about these guidelines. Correlational analysis revealed that participant responses to this single item question were positively related to exercise counseling behaviors,  $r = .53$ ,  $p = .000$ , and inversely related to exercise barriers beliefs,  $r = -.248$ ,  $p = .011$ . A series of regression analyses (Baron & Kenny, 1986) were done to determine if exercise barriers beliefs

mediated the relationship between nurses' knowledge of NCCN guidelines and their exercise counseling behaviors. Findings revealed that knowledge of the NCCN guidelines predicted exercise counseling behavior,  $\beta = .535$ ,  $p = .000$ , that knowledge of the NCCN guidelines predicted exercise barriers beliefs,  $\beta = -.248$ ,  $p = .011$ , and that exercise barriers beliefs partially mediated the relationship between knowledge of the NCCN guidelines and exercise counseling behaviors,  $\beta = .472$ ,  $p = .000$ .

Finally, multivariate regression analysis was conducted to determine the variance accounted for in exercise counseling behaviors by exercise barriers beliefs, knowledge of the NCCN guidelines, and the current position of the nurse. Together, these three predictors explained 36% of the variance in exercise counseling behaviors among nurses working with women being treated for breast cancer experiencing cancer treatment related fatigue.

## CHAPTER 5

### Discussion of the Findings

The purpose of this study was to determine the relationship among nurses' exercise beliefs, their personal experience with exercise, and their exercise counseling behaviors for women with breast cancer and CRF. This chapter includes an interpretation of the findings of the hypothesized relationships based on the theoretical propositions of the Common Sense Model (Horne, 2003, Leventhal et al, 1997).

#### Exercise counseling behaviors

The sample mean score for exercise counseling behaviors was 21.46 ( $SD = 4.71$ ) out of a possible range of 12 to 30, indicating that study participants' level of engagement in counseling behaviors was moderate. An examination of response frequencies to exercise counseling scale items revealed that, for three items, a majority of participants reported that they 1) usually or always provided education to women with CRF about fatigue before they experienced it, 2) taught these patients to use energy conservation strategies, and 3) counseled them about exercise goals. On the other hand, for the three remaining items, less than one-half of participants reported that they usually or always: 1) taught women with CRF about how to monitor fatigue, 2) encouraged them to consider initiation of endurance and resistance exercise, and 3) discussed referral to an exercise specialist with a nurse practitioner or physician. The level of exercise counseling reported in this study is consistent with findings from Donovan and Ward's study (2005) that revealed that, for women receiving chemotherapy for gynecologic cancers and CRF, only 35% received counseling for managing fatigue. Likewise, in a study by Tompkins, Belza, and Brown (2009), findings revealed that only about one-half of the participants who

were deemed in need of exercise counseling were actually provided exercise counseling by nurse practitioners. Lastly, Rogers et al. (2006) noted that only 24% of the breast cancer patients in their study reported receiving exercise counseling by a physician or nurse. The variability in the exercise counseling behaviors in this study underscores the need to gain an understanding of additional factors that explain nurse counseling behaviors and to test strategies designed to increase the level of exercise counseling among nurses who care for women with breast cancer who experience CRF.

### **Contextual factor and illness management behaviors**

Theorists posit that illness management behaviors are nested within a larger personal context that can include factors such as life experiences, institutional affiliations, personal experiences, and roles (Leventhal et al. 2003; Leventhal et al. 2005). Empirical evidence indicates that when healthcare professionals have experience with a certain behavior, they tend to counsel patients to engage in that behavior (Burns et al., 2000; Kaewsarn et al., 2003; Johnson et al., 2005; Frank et al., 2008). Therefore, based on the theoretical and empirical literature, a relationship between personal experience with exercise and exercise counseling behaviors was hypothesized.

There was tremendous variability in self-reported exercise behaviors in the sample. The mean time spent in exercise was 240 minutes ( $SD = 192.3$ ) and ranged from zero minutes per week to 720 minutes per week. Even though the mean time spent in exercise per week was 240 minutes, the sample, in general, did not exercise at the level recommended by the CDC (i.e., 150 minutes [2.5 hours] of moderate intensity exercise per week or at least 75 minutes [1.25 hours] of vigorous intensity exercise per week). Only 19% of the sample exercised at a moderate intensity, that is, 150 minutes or more

per week, and only 8% of the sample exercised strenuously for 75 minutes or more per week. However, a majority of the sample reported some level of engagement in exercise. At least 88% of women reported that they participated in both mild and moderate exercise during the week, and 47% reported that they engaged in strenuous exercise during the week. Only 8% of sample reported no engagement in exercise at all. Self-reporting of behaviors is often associated with social desirability (Frank et al., 2008), which may explain the wide range of time spent, i.e., likely over-reporting, in personal exercise behaviors reported by the study participants.

Future research that examines the influence of time spent in weekly exercise on exercise counseling behaviors should include objective measures of this variable. The utility of direct observation of exercise, pedometers or accelerometers has been shown to be more objective measures of exercise than the use of a questionnaire that is more prone to errors with regard to memory recall and overinflation (Cassetta, Boden-Albala, Sciacca, & Giardina, 2007; Perna, Craft, Carver, & Antoni, 2008).

Hypothesis 1 stated that personal experience with exercise is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF. Hypothesis testing revealed no significant relationship between personal experience with exercise and exercise counseling behaviors. This finding was inconsistent with findings reported by Burns et al. (2000) that revealed that adult nurse practitioners' engagement in moderate physical activity on most days of the week was a strong predictor of routine counseling of patients,  $\beta = 0.82$ ,  $p < .05$ . Similarly, Frank et al. (2008) found a significant relationship between medical students' physical activity behaviors and their level of exercise counseling, 1.01, 95% CI [1, 1.01]. Mean exercise

scores for medical students who counseled patients to exercise was higher compared to those who did not,  $M = 47.4, p = .008$  and  $M = 42.3, p = .008$  respectively. For this study, it is plausible that, even though nurses in the sample, on average, engaged in some level of exercise, their level of personal exercise is simply not an important factor that explains their counseling behaviors for women who are receiving breast cancer treatment and are experiencing CRF. However, consideration should be given to the use of more objective measures of personal exercise behaviors in future studies.

### **Treatment beliefs and illness management behavior**

#### **Exercise benefit beliefs and exercise counseling behaviors.**

Empirical evidence has shown that nurses tend to endorse the benefits of exercise for their patients. The sample mean exercise benefits beliefs score was 33.25 (possible range = 8 to 40) indicating that, on average, participants in this study held positive beliefs about the benefits of exercise for women with breast cancer and experiencing CRF. At least 80% of the sample responded that they agreed or strongly agreed with each item on the exercise benefits belief scale. These findings are consistent with a study by Lee et al. (2005) who found a 95% congruence rate among clinical nurses in their belief regarding personal benefits of exercise.

Theorists posit that a person's beliefs about treatment may also affect their health behaviors (Leventhal et al., 2003), and empirical evidence has supported a relationship between the beliefs of a treatment and treatment behaviors (Bell et al., 2006; Hall & Marteau, 2007). Hence a positive relationship between exercise benefits beliefs and exercise counseling behaviors was hypothesized. Hypothesis testing in this study revealed no significant relationship between exercise benefits beliefs and exercise

counseling behaviors. Exercise beliefs scores were high in this study, and the lack of variability in exercise benefits beliefs scores may explain the insignificant relationship between nurses' exercise benefits beliefs and exercise counseling behaviors.

**Exercise barriers beliefs and exercise counseling behaviors.**

The sample mean exercise barriers belief score was 34.32, and scores ranged from 14 to 44, indicating that there was a moderate level of belief among participants, on average, that there were barriers to exercise for women with breast cancer and CRF. Empirical evidence has supported a theorized relationship between beliefs and treatment behaviors (Hall & Marteau, 2007). Therefore, based on the theoretical and empirical literature, it was hypothesized that exercise barriers belief is negatively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.

Correlational analysis revealed a significant relationship between exercise barriers beliefs and exercise counseling behaviors in the theorized direction. That is, there was an inverse relationship between participants' barriers beliefs and their exercise counseling behaviors, indicating that nurses who held strong beliefs that women with CRF had many barriers to exercise tended to also report lower levels of exercise counseling behaviors. Importantly, even though a majority of nurses believed in the benefits of exercise for women with breast cancer and CRF, their exercise benefit beliefs had no effect on their counseling behaviors. On the other hand, nurses' beliefs about barriers to exercise for women with breast cancer and CRF appear to be an important antecedent to their exercise counseling behaviors. That is, the effect of negative exercise barriers beliefs on nurses' exercise counseling behavior appear to outweigh the effect of positive exercise benefits

on the extent to which nurses engage in exercise counseling behaviors. These findings point to the need for nurses to develop strategies to explore potential exercise barriers with their patients and assist them in overcoming barriers and promoting exercise behaviors. Also there is a need for nurses to explore and reshape their personal beliefs about barriers in order to increase their exercise counseling behaviors to women with breast cancer experiencing CRF.

### **Contextual factor and treatment beliefs**

Theorists also posit that HCPs treatment beliefs and illness management behaviors are nested within a larger personal, social, and cultural context that can include and are informed by these factors such as life experiences, institutional affiliations, roles, and knowledge (Horne, 2003; Leventhal et al., 2003; Leventhal et al., 2005). Empirical studies lend support to these theoretical propositions and suggest that nurses' personal experience with exercise may affect their beliefs about patient exercise and their exercise counseling behavior (Frank et al., 2008; Johnson et al., 2005).

### **Personal experience and treatment beliefs**

Based on the theoretical propositions and empirical support, it was hypothesized that personal experience with exercise is positively related to the exercise benefits beliefs of nurses who care for women with breast cancer experiencing CRF. The hypothesis was not supported. This negative finding is inconsistent with previous research (Kaewsarn et al., 2003) that revealed that nurses' personal experiences with breastfeeding was significantly related to their positive beliefs about infant breastfeeding. In this dissertation study, the sample's relatively homogenous exercise benefits beliefs may explain the negative relationship between personal experience with exercise and exercise benefits



beliefs. It was also hypothesized that nurses' personal experience with exercise is negatively related to their beliefs about the barriers to exercise for women with breast cancer experiencing CRF. This hypothesis was not supported. Thus, the theorized relationship between personal experience as a contextual factor and treatment beliefs was not supported in this study. However, ancillary findings did support the theorized relationships among contextual factors, treatment beliefs, and exercise counseling behaviors, suggesting that personal experience with exercise may not be an important contextual factor that affects nurses' exercise treatment beliefs for women with breast cancer experiencing CRF.

### **Ancillary Findings**

Contextual factors extraneous to the main analyses were examined to determine their effects on exercise beliefs and counseling behaviors. Ancillary analyses revealed a significant and positive relationship between a nurses' current position (i.e., role) and exercise counseling behaviors, indicating that nurses who had leadership positions in nursing (nurse manager, nurse educator, nurse practitioner) tended to counsel patients to exercise.

The position or role of the nurse was also significantly and inversely related to exercise barriers beliefs in this study, suggesting that nurses in leadership roles may not perceive many barriers to exercise for women with breast cancer and CRF. Since there were significant relationships among current position of the nurse, their exercise barriers beliefs, and their counseling behaviors, the mediating effect of exercise barriers on the relationship between current position of the nurse and exercise counseling behaviors was examined. Exercise barriers beliefs completely mediated the relationship between a

nurses' current position, i.e., their role, and their exercise counseling behavior, suggesting that beliefs about barriers to exercise may be an important operant mechanism for the extent to which nurses in particular roles counsel women with breast cancer and CRF about exercise. These findings support the theorized direct and indirect influence of contextual factors on the illness management behaviors of health care providers (Leventhal et al. 2005). These findings also indicate a need for in-depth qualitative explorations of the exercise treatment beliefs across roles of nurses who care for women with breast cancer and CRF to gain a better understanding of commonalities and differences in nurses' exercise barriers beliefs. Moreover, comparison studies that examine the effects of differences in barriers beliefs among nurses in different roles on their counseling behaviors are warranted.

Ancillary analyses also revealed a moderate and significant relationship between knowledge of NCCN guidelines and exercise counseling behavior,  $r = .535$ ,  $p = .000$ , suggesting that nurses who are knowledgeable about NCCN guidelines for CRF management may be more likely to engage in exercise counseling behaviors. This finding is consistent with Rogers et al. (2006) who investigated the associations between self-reported physical activity, knowledge, and physical activity counseling behavior in a sample of 51 internal medicine resident physicians. Correlational and multivariate regression analyses revealed that resident physicians' level of confidence in the knowledge of the American College of Sports Medicine (ACSM) guidelines was significantly associated with more frequent self-reported counseling behaviors,  $r = 0.3$ ,  $p = .03$ .

Knowledge about NCCN guideline for CRF was also significantly and inversely related to exercise barriers beliefs, suggesting that nurses who are knowledgeable about NCCN guidelines for CRF may not believe that women with breast cancer and CRF have many barriers that impede their engagement in exercise. In addition, ancillary findings also revealed that exercise barriers beliefs partially mediated the relationship between NCCN CRF guideline knowledge and exercise counseling behaviors. These ancillary findings underscore the importance of exercise barriers beliefs as an operant mechanism for the effect of knowledge on the extent to which nurses' engage in exercise counseling behaviors. The findings also underscore the need to target negative exercise barriers beliefs in interventions designed to improve nurses' exercise counseling behaviors for women with breast cancer and CRF.

In summary, hypothesis testing in this study only supported the theorized relationship between treatment beliefs, operationalized as beliefs about barriers to exercise, and nurses' exercise counseling behaviors. However, ancillary analyses support the complex relationships among contextual factors, treatment beliefs, and HCP illness management behaviors that the CSM proposes. Findings from this study suggest that exercise barriers beliefs may be an important operant mechanism for the relationship between particular contextual factors (role of nurse and knowledge of CRF national guidelines) and nurses' exercise counseling behaviors for women with breast cancer and CRF. The findings also suggest that interventions designed to increase nurses' exercise counseling behaviors should include strategies that reshape their negative barriers beliefs.

## CHAPTER 6

### Summary, Conclusions, Implications, and Recommendations

#### Summary

The purpose of this research was to examine the relationships among nurses' exercise beliefs, personal experience with exercise, and exercise counseling behaviors for women with breast cancer experiencing cancer related fatigue in a sample of registered nurses working in oncology settings and who provide direct care to these women. Theoretical propositions derived from the Common Sense Model (Horne, 2003; Leventhal et al. 2003; Leventhal et al. 2005) were tested.

Exercise counseling is a multifaceted intervention that includes any discussion with a patient about the benefits of exercise, an assessment of a person's interest or disinterest in exercise, a discussion of the facilitators and barriers to exercise, and recommendations about the level of exercise in which a person should engage (Poskiparta et al. 2006). Personal experience with exercise is defined as a person's present exercise frequency and intensity behaviors (Godin and Shephard, 1985). Treatment beliefs are theoretically defined as the individual's beliefs about whether the illness warrants treatment and if so, if that treatment is appropriate (Horne, 1997; Horne, 2003; Horne et al. 1999).

Theorists posit that a person's beliefs about treatment may affect their health behaviors (Leventhal et al. 2003). This relationship is supported by empirical literature (Bell et al., 2006; Byrne et al., 2005; Hall & Marteau, 2007; McIntosh et al., 2001).

Theorists also posit that treatment beliefs and illness management behaviors are nested within a larger personal context that can include factors such as life experiences,

institutional affiliations, and roles (Leventhal et al. 2003; Leventhal et al. 2005), and these contextual factors are theorized to directly affect illness management behaviors and treatment beliefs. These relationships are supported by empirical literature (Burns et al., 2000; Frank et al. 2008; Johnson et al. 2005; Kaewsarn et al., 2003).

Theorists posit that contextual factors may also indirectly affect illness management behavior through their treatment beliefs (Leventhal et al., 2005). The empirical literature suggests that HCP treatment beliefs may mediate the relationship between contextual factors (personal experience with exercise) and procedures for coping (exercise counseling) in nurses who care for women with breast cancer and cancer related fatigue since contextual factors are related to both treatment beliefs and illness management behaviors. Specifically, the literature review reveals a relationship between personal experience with treatment and treatment beliefs as well as a relationship between treatment beliefs and illness management behaviors.

Based on the theorized relationships among contextual factors, treatment beliefs, and illness management behaviors, the following hypotheses were derived for this study:

1. Personal experience with exercise is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.
2. Exercise benefit belief is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.
3. Exercise barriers belief is negatively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF.

4. Personal experience with exercise is positively related to the exercise benefits beliefs of nurses who care for women with breast cancer experiencing CRF.
5. Personal experience with exercise is negatively related to exercise barriers beliefs of nurses who care for women with breast cancer experiencing CRF.
6. When exercise benefits beliefs are controlled for, the magnitude and significance of the relationship between personal experience with exercise and exercise counseling behaviors will diminish in nurses caring for women with breast cancer experiencing CRF.
7. When exercise barriers beliefs are controlled for, the magnitude and significance of the relationship between personal experience with exercise and exercise counseling behaviors will increase in nurses caring for women with breast cancer experiencing CRF.

The subjects in this study were recruited through the use of an E-mail list of registered nurses currently enrolled in the Oncology Nursing Society (ONS). The list consisted of registered nurses working in oncology settings. The convenience sample consisting of 126 nurses identified themselves as staff nurses, managers, educators, and advanced practice nurses working in oncology settings and caring for women with breast cancer. The majority of the respondents were Caucasian females, over 40 years old, licensed and working in oncology for over ten years.

Data were collected using the following instruments: a Demographic questionnaire; the Godin Leisure Time Exercise Questionnaire; the Exercise Benefits Scale; the Exercise Barriers Beliefs Scale; and the Exercise Counseling Behaviors Scale.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows (IBM SPSS Statistics, 2010). Alpha coefficients were calculated for the Exercise Benefits Scale, the Exercise Barriers Beliefs Scale, and the Exercise Counseling Behaviors Scale. Alpha coefficients ranged from 0.79 to 0.95. Descriptive statistics were used to analyze sample characteristics. Pearson's Product Moment correlation analysis was used to examine the relationships between the study variables, and multiple regression was used to test hypothesis one through four. The level of significance used for hypothesis testing was .05.

The first hypothesis, which stated that personal experience with exercise is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF, was not supported. The second hypothesis, which stated that exercise benefit beliefs is positively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF, was not supported. The third hypothesis, which stated that exercise barriers belief is negatively related to the exercise counseling behaviors of nurses caring for women with breast cancer experiencing CRF, was supported. The fourth hypothesis, which stated that personal experience with exercise is positively related to the exercise benefits beliefs of nurses who care for women with breast cancer experiencing CRF, was not supported. The fifth hypothesis, which stated that personal experience with exercise is negatively related to exercise barriers beliefs of nurses who care for women with breast cancer experiencing CRF, was not supported. The sixth hypothesis, which stated that exercise benefits beliefs mediates the relationship between personal experience with exercise and exercise counseling behaviors in nurses caring for women with breast cancer experiencing CRF,

was not supported. The seventh hypothesis, which stated that exercise barriers beliefs mediates the relationship between personal experience with exercise and exercise counseling behaviors in nurses caring for women with breast cancer experiencing CRF, was not supported.

In summary, theoretical propositions were tested to explain the relationships among, nurses' exercise beliefs, personal experience with exercise, and exercise counseling behaviors for women with breast cancer experiencing cancer related fatigue in a sample of registered nurses working in oncology settings.

### **Limitations**

The major limitation of this study was the sampling frame. All of the study participants were members of a professional organization and most were Caucasian. Therefore, it is difficult to generalize the findings of this study to the entire population of nurses who work in oncology settings and to nurses with more diverse backgrounds. The study sample is not likely representative of nurses who are not members of ONS since nurses who are not members of a professional organization may be uniquely different on study variables and demographic characteristics compared to nurses who belong to professional organizations. The second limitation of this study was the low response rate (7%) to the electronic survey. Since participants were anonymous, and the stipulation of ONS that participants be contacted by the organization, the PI was unable to track nonresponders, send individualized reminder notices, nor provide incentives or compensation, as recommended by Dillman et al. (2009). Therefore a modified methodology was used in contacting subjects. These methodological issues may have contributed to the low response rate.



Another limitation was the use of a self-report exercise behavior scale. It is highly plausible that nurses' responses to the Godin Leisure Time questionnaire were socially desirable responses and reflected an over-reporting of their exercise behaviors. The utility of direct observation of exercise, pedometers, or accelerometers has been shown to be more objective measures of exercise than the use of a questionnaire that is more prone to errors with regard to memory recall and overinflation (Cassetta, Boden-Albala, Sciacca, & Giardina, 2007; Perna, Craft, Carver, & Antoni, 2008).

### **Conclusions**

The main findings of this study support, as theorized, the relationship between nurses' exercise barriers beliefs and exercise counseling behaviors for women with breast cancer experiencing CRF. Exercise barriers beliefs were found to be an independent predictor of exercise counseling behaviors. On the other hand, the theorized relationship between nurses' exercise benefits beliefs and exercise counseling behaviors was not supported. Importantly, these conflicting findings suggest that nurses' beliefs about barriers that likely impede women with breast cancer and CRF from exercising are more important for the extent to which nurses counsel these women to exercise than their beliefs in the benefits of exercise for them. Moreover, nurses' personal experience with exercise was not found to be an independent predictor of exercise benefits beliefs, exercise barriers beliefs, or exercise counseling behaviors as theorized. In addition, the theorized role of nurses' exercise benefits and exercise barriers beliefs as mediators of the relationship between personal experience with exercise and exercise counseling behaviors was not supported. Ancillary findings, on the other hand, revealed complex relationships among contextual factors (nurse's position and knowledge of national CRF

guidelines), treatment beliefs, and exercise counseling behaviors. Thus, the Common Sense Model propositions tested in this study appear empirically adequate and appropriate for examining relationships among health care provider characteristics, beliefs, and illness management behaviors.

### **Implications for Practice**

Findings from this study suggest that the level of exercise counseling varies among nurses who care for women with breast cancer and CRF. That is, nurses' exercise counseling behaviors, on average, do not meet national standards of care. This indicates a need for education that is targeted to nurses who care for women with CRF. Interventions are also needed that will reshape and reduce the negative beliefs the nurses have about barriers to exercise in women with breast cancer and CRF. Nurses in leadership roles, i.e., nurse educators and APNs, could be used to alter staff nurse negative exercise barriers beliefs in oncology settings. Furthermore, educational programs in the workplace and at professional meetings are needed to increase oncology nurses' knowledge about the NCCN standards of care for the treatment of CRF.

### **Recommendations**

Based on the findings of this study and the study limitations it would be prudent to replicate this study in a sample of nurses that are representative of the true population of nurses who care for women with breast cancer and CRF. In addition, the use of subject incentives could improve the response rate in future studies (Dillman et al., 2009). To reduce the possibility of social desirability response set bias and over-reporting of self-reported exercise behaviors, future studies should include objective measures of exercise.

Specific areas for future research may address the following research questions:

1. What is the nature of exercise barriers beliefs across nurses' roles in oncology settings?
2. What are the relationships among personal experience with exercise, treatment beliefs, and exercise counseling behaviors in a sample of nurses who are representative of the population of nurses who care for women with breast cancer and CRF?
3. Is personal experience with exercise, when measured objectively, a predictor of exercise beliefs and exercise counseling behaviors in nurses who care for women with breast cancer experiencing CRF.
4. What is the effect of a tailored education intervention designed to increase nurses' knowledge of NCCN guidelines for cancer related fatigue on their and exercise counseling behaviors?
5. Does a tailored intervention designed to reshape nurses' exercise barriers beliefs improve the level of their exercise counseling behaviors?

## References

1. Aikens, J. E., Nease, Jr, D. E. & Klinkman, M. S. (2008). Explaining patients' beliefs about the necessity and harmfulness of antidepressants. *Annals of Family Medicine*, 6, 23-29. doi: 10.1370/afm.759
2. American Cancer Society. (2011). *Cancer Facts & Figures 2011*. Atlanta, GA: American Cancer Society.
3. American Cancer Society. (2011). *Fatigue in patients with cancer*. Atlanta, GA: American Cancer Society.
4. Ashbury, F.D., Findlay, H., Reynolds, B., & McKerracher, K. (1998). A Canadian survey of cancer patients' experiences: Are their needs being met? *Journal of Pain and Symptom Management*, 16(5), 298-306.
5. Baron, R. M. and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
6. Barsevick, A. M., Dudley, W., Beck, S., Sweeney, C., Whitmer, K. & Nail, L. (2004). A randomized clinical trial of energy conservation for patients with cancer-related fatigue *Cancer*, 100, 1302-1310. doi: 10.1002/cncr.20111
7. Barsevick, A. M., Whitmer, K., Sweeney, C. & Nail, L. (2002). A pilot study examining energy conservation for cancer treatment-related fatigue. *Cancer Nursing*, 25(5), 333-341.
8. Bell, D. S., Hays, R. D., Hoffman, J. R., Day, F. C., Higa, J. K., & Wilkes M. S. (2006). A test of knowledge about prostate cancer screening: Online pilot evaluation among southern California physicians. *Journal of General Internal Medicine*, 21, 310-314. doi: 10.1111 /J.1525-14g7.2006.00337.x
9. Berger, A. M. and Higginbotham, P. (2000). Correlates of Fatigue During and Following Adjuvant Breast Cancer Chemotherapy: A Pilot Study. *Oncology Nursing Forum*, 27(9), 1443-1448.
10. Blaney, J., Lowe-Strong A., Rankin J., Campbell, A., Allen, J., Gracey, J. (2010). The cancer rehabilitation journey: barriers to and facilitators of exercise among patients with cancer-related fatigue. *Physical Therapy*, 90, 1135-1147. doi: 10.2522/ptj.20090278
11. Bower, J. E., Ganz, P.A., Desmond, K. A., Rowland, J. H., Meyerowitz, B. E. & Belin, T. R. (2000). Fatigue in breast cancer survivors: Occurrence, correlates, and impact on quality of life. *Journal of Clinical Oncology*, 18(4), 743-753.

12. Brown, S. A. (2005). Measuring Perceived Benefits and Perceived Barriers for Physical Activity. *American Journal of Health Behavior*, 29(2), 107-116.
13. Buchholz, S. W. & Purath, J. (2007). Physical activity and physical fitness counseling patterns of adult nurse practitioners *Journal of the American Academy of Nurse Practitioners* 19, 86-92. doi: 10.1111/j.1745-7599.2006.00197.x
14. Buick, D. L. (1997). Illness representations and breast cancer: Coping with radiation and chemotherapy. In K. J. Petrie & J. Weinman (Eds.). *Perceptions of Health and Illness* (pp. 379-410). Amsterdam, Harwood Academic.
15. Burns, K. J., Camaione, D. N., & Chatterton, C. T. (2000). Prescription of Physical Activity by Adult Nurse Practitioners: A National Survey. *Nursing Outlook*, 48, 28-33. doi:10.1067/mno.2000.99101
16. Bush, N. J. (2005). Biobehavioral and Sociocultural Dimensions of Cancer-Related Fatigue. *Oncology Nursing Forum*, 32, 237-240. doi: 10.1188/05.ONF.237-240
17. Buss, I. C., Halfens, R. J., Abu-Saad, H. H. & Kok, G. (2004). Pressure ulcer prevention in nursing homes: views and beliefs of enrolled nurses and other health care workers. *Journal of Clinical Nursing*, 13, 668–676. Retrieved from [http://www.unimaas.nl/hcns/websiteVW/publications/Publication\\_scans/Buss.Pressure ulcer prevention in nursing homes.pdf](http://www.unimaas.nl/hcns/websiteVW/publications/Publication_scans/Buss.Pressure%20ulcer%20prevention%20in%20nursing%20homes.pdf)
18. Byrne, M. K., Deane, F. P. & Coombs, T. (2005). Nurse's beliefs and knowledge about medications are associated with their difficulties using patient treatment adherence strategies. *Journal of Mental Health*, 14, 513-521. doi: 10.1080/09638230500271378
19. Cassetta, J. A., Boden-Albala, B., Sciacca, R. R., & Giardina, E. V. (2007). Association of education and race/ethnicity with physical activity in insured urban women. *Journal of Women's Health*, 16, 902-908. doi: 10.1089/jwh.2006.0141
20. Centers for Disease Control and Prevention (2011). Physical Activity Resources for Health Professionals: Physical Activity Guidelines for Adults. Retrieved from <http://www.cdc.gov/physicalactivity/professionals/index.html>
21. Courneya, K. S., & Friedenreich, C. M. (1999). Utility of the Theory of Planned Behavior for understanding exercise during breast cancer treatment. *Psycho-Oncology*, 8(2), 112-122.
22. Courneya, K. S., Jones, L. W., Mackey, J. R. & Fairey, A.S. (2006). Exercise beliefs of breast cancer survivors before and after participation in a randomized controlled trial. *International Journal of Behavioral Medicine*, 13, 259–264. doi: 10.1207/s15327558ijbm1303\_10

23. Courneya, K. S., Segal, R. J., Gelmon, K., Reid, R. D., Mackey, J. R., Friedenreich, C. M., et al. (2007). Six-month follow-up of patient-rated outcomes in a randomized controlled trial of exercise training during breast cancer chemotherapy. *Cancer Epidemiology Biomarkers Preview*, *16*, 2572–2578. doi: 10.1158/1055-9965.EPI-07-0413
24. De Nijs, E. J. M., Ros, W., & Grijpdonck, M. H. (2008). Nursing intervention for fatigue during the treatment for cancer. *Cancer Nursing*, *31*, 191-206. doi: 10.1097/01.NCC.0000305716.45153.73
25. Dillman, D. A., Smyth, J. D., & Christian, L. M. (Eds.). (2009). *Internet, mail, and Mixed-Mode Surveys: The Tailored Design Method*. Hoboken, NJ: John Wiley & Sons, Inc.
26. Donovan, H. S. & Ward, S. (2005). Representations of Fatigue in Women Receiving Chemotherapy for Gynecologic Cancers. *Oncology Nursing Forum*, *32*, 113-116. doi: 10.1188/05.ONF.113-116
27. Duimel-Peeters, I. G. P., Hulsboom, M. A., Berger, M. P. F., Snoeckx, L. H. E. H., & Halfens, R. J. G. (2006). Massage to prevent pressure ulcers: knowledge, beliefs and practice. A cross-sectional study among nurses in the Netherlands in 1991 and 2003. *Journal of Clinical Nursing*, *15*, 428–435. doi:10.1186/1472-6955-6-2
28. Frank, E., Tong, E., Lobelo, F., Carrera, J., & Duperly, J. (2008). Physical activity levels and counseling practices of U. S. medical students. *Medicine and Science in Sports Exercise*, *40*, 413-421. doi: 10.1249/MSS.0b013e31815ff399
29. Geffen, J., Cameron, A., Sorensen, L., Stokes, J., Roberts, M. S. & Geffen L. (2002). Pro re nata medication for psychoses: the knowledge and beliefs of doctors and nurses. *Australian and New Zealand Journal of Psychiatry*, *36*, 642–648. doi: 10.1046/j.1440-1614.2002.01068.x
30. Godin, G., & Shepard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Science*, *10*(3), 141-146.
31. Goldstein, A. O., Hillier, A., Fitzgerald, S., Stegall, T. S. & Fischer, P. M. (1987). Hospital nurse counseling of patients who smoke. *American Journal of Public Health*, *77*, 1333-1334. doi: 10.2105/AJPH.77.10.1333
32. Grubbs, L. & Carter, J. C. (2002). The Relationship of Perceived Benefits and Barriers to Reported Exercise Behaviors in College Undergraduates. *Family Community Health*, *25*(2), 76–84.
33. Hall, S. & Marteau, T. M. (2007). Practice nurses' self-reported opportunistic

- smoking cessation advice in three contexts. *Nicotine & Tobacco Research*, 9, 941–945. doi: 10.1080/14622200701488434
34. Hartvig, P., Aulin, J., Hugerth, M., Wallenberg, S. & Wagenius, G. (2006). Fatigue in cancer patients treated with cytotoxic drugs. *Journal of Oncology Pharmacy Practice*, 12, 155-164. doi: 10.1177/1078155206070774
35. Hirani, S. P., Patterson, D. L. H. and Newman, S. P. (2008). What do coronary artery disease patients think about their treatments? An assessment of patients' treatment representations. *Journal of Health Psychology*, 13, 311–322. doi: 10.1177/1359105307088133
36. Holly, S. (2000). Cancer-related fatigue: Suffering a different fatigue. *Cancer Practice*, 8(2), 87-95.
37. Horne, R. (1997). Representations of medication and treatment: Advances in theory and measurement. In K. J. Petrie & J. A. Weinman (Eds.). *Perceptions of Health and Illness* (pp. 155-188). Amsterdam, The Netherlands: Harwood Academic Publishers.
38. Horne, R. (2003). Treatment perceptions and self-regulation. In L. D. Cameron & H. Leventhal (Eds.). *The Self-Regulation of Health and Illness Behavior* (pp. 138-153). New York, NY: Routledge.
39. Horne, R. & Weinman, J. (2002). Self-regulation and self-management in asthma: Exploring the role of illness perceptions and treatment beliefs in explaining non-adherence in preventer medication. *Psychology and Health*, 17, 17-32. doi: 10.1080/08870440290001502
40. Horne, R., Weinman, J., & Hankins, M. (1999). The beliefs about medicines questionnaire: The development and evaluation of a new method for assessing the cognitive representation of medication. *Psychology and Health*, 14, 1-24. doi: 10.1080/08870449908407311
41. Jacobs, D. R. Jr., Ainsworth, B. E., Hartman, T. J. & Leon, A. S. (1993). A simultaneous evaluation of 10 commonly used physical activity questionnaires. *Medicine and Science in Sports Exercise*, 25(1), 81-91.
42. Johnson, T. P., Booth, A. L., & Johnson, P. (2005). Physician beliefs about substance misuse and its treatment: Findings from a U.S. survey of primary care practitioners. *Substance Use & Misuse*, 40, 1071-1084. doi: 10.1081/JA-200030800
43. Johnson-Kozlow, M., Rock, C. L., Gilpin, E. A., Hollenbach, K. A., & Pierce, J. P.

- (2007). Validation of the WHI brief physical activity questionnaire among women diagnosed with breast cancer. *American Journal of Health Behavior*, 31(2), 193-202.
44. Kaewsarn, P., Moyle, W. & Creedy, D. (2003). Thai nurses' beliefs about breastfeeding and postpartum practices. *Journal of Clinical Nursing*, 12(2), 467–475.
  45. Kangas, M., Bovbjerg, D. H., & Montgomery, G. H. (2008). Cancer-related fatigue: a systematic and meta-analytic review of nonpharmacological therapies for cancer patients. *Psychological Bulletin*, 134, 700-741. doi: 10.1037/a0012825
  46. Kirshbaum, M. N. (2006). A review of the benefits of whole body exercise during and after treatment for breast cancer. *Journal of Clinical Nursing*, 16, 104–121. doi: 10.1111/j.1365-2702.2006.01638.x
  47. Kuchinski, A., Reading, M. & Lash, A. A. (2009). Treatment-related fatigue and exercise in patients with cancer: A systematic review. *MedSurg Nursing*, 18(3), 174-180.
  48. Lee, Y., Huang, Y., & Kao, Y. (2005). Physical Activities and Correlates of Clinical Nurses in Taipei Municipal Hospitals. *Journal of Nursing Research*, 13, 281-292. doi: 10.1097/01.JNR.0000387551.50458.f5
  49. Leventhal, H., Benyamini, Y., Brownlee, S., Diefenbach, M., Leventhal, E. A., Patrick-Miller, L., and Robitaille, C. (1997). Illness representations: Theoretical foundations. In K. J. Petrie & J. A. Weinman (Eds.), *Perceptions of health and illness* (pp. 19–45). The Netherlands, Amsterdam: Harwood Academic Publishers.
  50. Leventhal, H., Brisette, I. & Leventhal, E. A. (2003). The common-sense model of Self-regulation of Health and Illness. In L. D. Cameron & H. Leventhal (Eds.). *The Self-Regulation of Health and Illness Behavior* (pp. 42-65). New York, NY: Routledge.
  51. Leventhal, H., Leventhal, E. A., & Cameron, L. (2005). Representations, procedures, and affect in illness self-regulation: A perceptual-cognitive model. In J. A. Revensom, J. E. Singer & A. Baum (Eds.). *Handbook of Health Psychology* (pp. 19-47). Mahwah, N.J.: Lawrence Erlbaum Associates.
  52. Llewellyn, C. D., Miners, A. H., Lee, C. A., Harrington, C., & Weinman, J. (2003). The illness perceptions and treatment beliefs of individuals with severe hemophilia and their role in adherence to home treatment. *Psychology and Health*, 18, 185–200. doi: 10.1080/0887044031000098198
  53. Longman, A. L., Braden, C. J., & Mishel, M. H. (1996). Side effects of burden in women with breast cancer. *Cancer Practice*, 4(5), 274–280.



54. Loumidis, K. S. and Wells, A. (1998). Assessment of beliefs in exercise dependence: The development and preliminary validation of the exercise beliefs questionnaire. *Personality and Individual Differences*, 25, 553-567. doi:10.1016/S0191-8869(98)00103-2
55. Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research*, 35, 382-386. doi: 10.1097/00006199-198611000-00017
56. McIntosh, I. B., Swanson, V., & Howell, K. (2001). Health professionals' attitudes toward acute diarrhea management. *Journal Of Travel Medicine*, 8, 60-65. doi: 10.2310/7060.2001.24334
57. Mellen, P. B. Palla, S. L., Goff, Jr., D. C., Bonds, D. E. (2004). Prevalence of Nutrition and Exercise Counseling for Patients with Hypertension: United States, 1999 to 2000. *Journal of General Internal Medicine*, 19, 917-924. doi: 10.1111/j.1525-1497.2004.30355.x
58. Mills, M. E. & Sullivan, K. (1999). The importance of information giving for patients newly diagnosed with cancer: a review of the literature. *Journal of Clinical Nursing*, 8, 631-642. doi: 10.1046/j.1365-2702.1999.00296.x
59. Miller, D. J., Freedson, P. S., & Kline, G. M. (1994). Comparison of activity levels using Caltrac accelerometer and five questionnaires. *Medicine and Science in Sports Exercise*, 26(3), 376-382.
60. Mock V. 2003. Clinical excellence through evidenced based practice: Fatigue management as a model. *Oncology Nursing Forum* 30, 787-796. doi: 10.1188/03.ONF.787-795
61. Mock V. (2004). Evidence-based treatment for cancer-related fatigue. *Journal of National Cancer Institute Monographs* 32, 112-8. doi: 10.1093/jncimonographs/lgh025
62. Mock, V., Frangakis, C., Davidson, N. E., Ropka, M. E., Pickett, M., Poniowski, B., et al. (2005). Exercise manages fatigue during breast cancer treatment: A randomized control trial. *Psycho-Oncology*, 14, 464-477. doi: 10.1002/pon.863
63. National Cancer Institute (2009). *Breast Cancer*. Retrieved May 16, 2010, from <http://www.cancer.gov/cancertopics/types/breast>
64. National Cancer Institute. (2011). *Surveillance Epidemiology and End Results*. Retrieved June 22, 2011, from <http://seer.cancer.gov/statfacts/html/breast.html>
65. National Comprehensive Cancer Network. (2011). Cancer-Related Fatigue, v.1.2011. *NCCN Clinical Practice Guidelines in Oncology*. Retrieved February 2, 2010 from: [www.nccn.org](http://www.nccn.org)

66. Nikander, R., Seivanen, H., Ojala, K., Oivanen, T., Kellokumpu-Lehtinen, P., & Saarto, T. (2007). Effect of a vigorous aerobic regimen on physical performance in breast cancer patients: a randomized controlled pilot trial. *Acta Oncologica*, *46*, 181-186. doi: 10.1080/02841860600833145
67. Nunnally, J. C. & Bernstein, I. H. (1994). Validity. In J. C. Nunnally & I. H. Bernstein (Eds.), *Psychometric theory* (pp. 83-113). San Francisco, CA: McGraw-Hill, Inc.
68. Payne, J. K. (2002). The Trajectory of Fatigue in Adult Patients With Breast and Ovarian Cancer Receiving Chemotherapy. *Oncology Nursing Forum*, *29*, 1334-1340. doi: 10.1188/02.ONF.1334-1340
69. Perna, F. M., Craft, L., Carver, C. S., & Antoni, M. H. (2008). Negative affect and barriers to exercise among early stage breast cancer patients. *Health Psychology*, *27*, 275-279. doi: 10.1037/0278-6133.27.2.275
70. Pickett, M., Mock, V., Ropka, M. E., Cameron, L., Coleman, M., & Podewils, L. (2002). Adherence to moderate-intensity exercise during breast cancer therapy. *Cancer Practice*, *10*, 284-292. doi: 10.1046/j.1523-5394.2002.106006.x
71. Pinto, B. M., Rabin, C. & Dunsiger, S. (2009). Home-based exercise among cancer survivors: Adherence and its predictors. *Psycho-Oncology*, *18*, 369-376. doi: 10.1002/pon.1465
72. Piper, B. F., Borneman, T., Sun, V. C-Y., Koczywas, M., Uman, G., and Ferrell, B., & James, R. L. (2008). Cancer-related fatigue: Role of oncology nurses in translating National Comprehensive Cancer Network assessment guidelines into practice. *Clinical Journal of Oncology Nursing*, *12*, Supplement, 37-47. doi: 10.1188/08.CJON.S2.37-47
73. Polit, D. F. (2010). *Statistics and Data Analysis for Nursing Research*, (2<sup>nd</sup> ed.). Upper Saddle River, NJ: Pearson Education, Inc.
74. Polit, D., & Beck, C. T. (Eds.). (2006). *Nursing Research: Principals and Methods*, (6<sup>th</sup> ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
75. Poskiparta, M., Kasila, K., and Kiuru, P. (2006). Dietary and physical activity counseling on Type 2 diabetes and impaired glucose tolerance by physicians and nurses in primary healthcare in Finland. *Scandinavian Journal of Primary Health Care*, *24*, 206-210. doi:10.1080/02813430600866463
76. Puffer, S. & Rashidian, A. (2004). Practice nurses' intentions to use clinical guidelines. *Journal of Advanced Nursing*, *47*, 500-509. doi: 10.1111/j.1365-2648.2004.03129.x

77. Richardson, A. and Ream, E. (1996). The experience of fatigue and other symptoms in patients receiving chemotherapy. *European Journal of Cancer Care*, 5 (Supplemental 2), 24-30. doi: 10.1111/j.1365-2354.1996.tb00248.x
78. Robbins, L. (2004). Physical Activity Practice Patterns in Nurse Practitioners. *Clinical Excellence for Nurse Practitioners*, 8(4), 189-193.
79. Rogers, L. Q., Gutin, B., Humphries, M. C., Lemmon, C. R., Waller, J. L., Baranowski, T. and Saunders, R. (2006). Evaluation of internal medicine residents as exercise role models and associations with self-reported counseling behavior, confidence, and perceived success. *Teaching and Learning in Medicine*, 18(3), 215–221.
80. Rogers, L. Q., Shah, P., Dunnington, G., Greive, A., Shanmugham, A., Dawson, B., and Courneya, K. S. (2005). Social Cognitive Theory and physical activity during breast cancer treatment. *Oncology Nursing Forum*, 32, 807-815. doi: 10.1188/05.ONF.807-815
81. Ross, S., Walker, A., and MacLeod, M. J. (2004). Patient compliance in hypertension: Role of illness perceptions and treatment beliefs. *Journal of Human Hypertension*, 18, 607–613. doi: 10.1038/sj.jhh.1001721
82. Sallis, J. F., Buono, M. J., Robis, J. J., Micale, F. G., & Nelson, J. A. (1993). Seven-day recall and other physical activity self-reports in children and adolescents. *Medicine and Science in Sports Exercise*, 25(1), 99-108.
83. Schneider, C. M., Hsieh, C. C., Sprod, L. K., Carter, S. D. & Hayward, R. (2007). Effects of supervised exercise training on cardiopulmonary function and fatigue in breast cancer survivors during and after treatment. *Cancer*, 110, 918-925. doi: 10.1002/cncr.22862
85. Schonberg, M. A., Marcantonio, E. R., and Wee, C. C. (2006). Receipt of exercise counseling by older women. *Journal of the American Geriatrics Society*, 54, 619–626. doi: 10.1111/j.1532-5415.2006.00679.x
86. Schwartz, A. L. (2000). Daily fatigue patterns and effect of exercise in women with breast cancer. *Cancer Practice*, 8, 16-24. doi: 10.1046/j.1523-5394.2000.81003.x
87. Stricker, C. T., Drake, D., Hoyer, K., & Mock, V. (2004). Evidence-Based Practice for Fatigue Management in Adults With Cancer: Exercise as an Intervention. *Oncology Nursing Forum*, 31, 963-976. doi: 10.1188/04.ONF.963-976
88. Stutts, W. C. (2002). Physical Activity determinants in adults: Perceived benefits, barriers, and self-efficacy. *American Association of Occupational Health Nurses Journal*, 50(11), 499-507.

89. Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston, MA: Pearson Education, Inc.
90. Thornton, L. M., Andersen, B. L., Crespin, T. R. & Carson, W. E. (2007). Individual trajectories in stress covary with immunity during recovery from cancer diagnosis and treatments. *Brain, Behavior & Immunity*, 21, 185-194.  
doi:10.1016/j.bbi.2006.06.007
91. Tompkins, T. H., Belza, B., & Brown, M. (2008). Nurse practitioner practice patterns for exercise counseling. *Journal of the American Academy of Nurse Practitioners*, 2, 79–86. doi: 10.1111/j.1745-7599.2008.00388.x
92. Waltz, C. F., Strickland, O., & Lenz, E. R. (2010). *Measurement in Nursing and Health Research*. New York, NY: Springer Publishing Company, L.L.C.
93. Weinman, J., Heijmans, M. & Figueiras, M. J. (2003). Carer perceptions of chronic illness. In L. D. Cameron & H. Leventhal (Eds.). *The Self-Regulation of Health and Illness Behavior*, (pp. 207-219). New York, NY: Routledge.

## Appendix A

### Recruitment Letter

From: Donna Ho-Shing ([shingyd@comcast.net](mailto:shingyd@comcast.net))

Subject: Research survey of Rutgers University PhD Candidate

Dear Nurse Colleague,

You are being invited to participate in an important survey that is critical to gaining an understanding of the factors that affect nurse exercise counseling behaviors to women with breast cancer who are experiencing cancer treatment-related fatigue. I am asking nurses like you to reflect on your experience as a nurse who works in an oncology setting. Your participation in this survey and your honest response to the survey questionnaire will help in guiding the efforts to improve the health outcomes of women who are being treated for breast cancer.

In order to participate in this study, you must be a registered nurse (staff nurse, nurse practitioner, clinical nurse specialist) who provides direct care to women with breast cancer in an in-patient oncology unit and/or outpatient oncology clinic and be able to read and understand English. There is no cost to you for participating in this study. Your alternative is to not participate. Responding to this survey indicates that you are willing to participate in the study. Although your responses are very important to me, your participation is voluntary.

This short, confidential online survey should take no more than 15 minutes to complete. You will respond to the survey via a web link to SurveyMonkey. There are no anticipated risks to you in participating in this survey. If you desire to participate, please access the link below:

<https://www.surveymonkey.com/s/7KTZNTJ>

This research is anonymous; meaning that I have no information about you that could identify you. To ensure your anonymity, your name does not appear anywhere on the survey and your E-Mail address is completely anonymous to me, although you have been contacted via E-Mail.

Only your responses will be captured on the SurveyMonkey website, and neither you nor your Email address will be identified. The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see your survey responses, except as may be required by law. If a report of this study is published or the results are presented at a professional conference, only group results will be stated.

If you have any questions about this survey please contact the Principal Investigator, Donna Ho-Shing, MSN, RN by email at [shingyd@comcast.net](mailto:shingyd@comcast.net) or by telephone at 908-810-1557. If you have any questions or concerns about your rights as a survey participant, please contact *the IRB Administrator at Rutgers University at:*

Rutgers University Institutional Review Board for the Protection of Human Subjects  
Office of Research and Sponsored Programs, 3 Rutgers Plaza

New Brunswick, NJ 08901-8559  
*Tel: 732-932-0150 x 2104;*  
Email: *humansubjects@orsp.rutgers.edu*

Thank you so much for your time.

Sincerely,  
*Donna Ho-Shing*

Donna Ho-Shing, MSN, RN  
Doctoral Candidate  
Rutgers University College of Nursing

<p>This informed consent form was approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects on 6/14/11.</p>
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## Appendix B

### Demographic Questionnaire

This section asks general questions about your background. Please check the appropriate response or fill in the blank.

- 1. What is your age?** \_\_\_\_\_
  - Under 21
  - 21-30
  - 31-40
  - 41-50
  - 51-60
  - 61-70
  - Over 70
  
- 2. What is your gender?**
  - Female
  - Male
  
- 3. Which of the following best describes your marital status? Please check one**
  - Never been married
  - Married
  - Divorced
  - Widowed
  - Separated
  - A member of an unmarried couple
  
- 4. Which of the following best describes your current position? Please check one**
  - Staff nurse
  - Charge nurse
  - Nurse manager
  - Nurse educator

- Nurse practitioner
- Other \_\_\_\_\_

**5. How long have you worked in your current position? \_\_\_\_\_**

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Over 20 years

**6. What is your work status?**

- Full time
- Part time
- Per diem
- Not working at the present or retired

**7. What is the highest nursing degree that you have earned?**

- Diploma
- Associate degree
- Baccalaureate degree
- Masters degree
- Doctorate

**8. Please indicate your background:**

- African-American
- Alaskan or Native American
- Asian
- Caucasian
- Filipino
- Hispanic



- Pacific Islander
- Mixed Race
- Other: Describe \_\_\_\_\_

**9. On the scale below, please rate the extent to which you feel that you are knowledgeable about the National Comprehensive Cancer Network (NCCN) guidelines for cancer treatment-related fatigue**

0	1	2	3	4	5	6	7	8	9	10
<b>No</b>										<b>Very</b>
<b>Knowledge</b>										<b>Knowledgeable</b>

**10. How long have you been licensed as a registered nurse?**

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Over 20 years

**11. How long have you worked in an Oncology setting?**

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Over 20 years

**12. Are you currently board certified in Oncology nursing (OCN/AOCN)?**

- Yes
- No

**THANK YOU FOR YOUR TIME IN TAKING THIS SURVEY**

## Appendix C

### Modified Godin Leisure-Time Exercise Questionnaire

1. During a typical **7-day period** of exercise for you, in **the past month** how many **minutes** per week did you engage in the following kinds of exercise during your free time (write on each line the appropriate number)? If you are not currently exercising respond on each line with a zero

**Minutes Per Week**

**a) STRENUOUS EXERCISE**

(Breathing hard and fast and your heart rate has increased quite a bit; e.g. jogging or running, swimming laps, riding a bike fast or on a hill, playing tennis or basketball)

\_\_\_\_\_

**b) MODERATE EXERCISE**

(You are working hard enough to raise your heart rate and break a sweat; e.g. fast walking, easy bicycling, water aerobics, and dancing)

\_\_\_\_\_

**c) MILD EXERCISE**

(Your heart rate does not increase, you do not sweat or breathe hard; e.g., fishing, bowling, golf, easy walking)

\_\_\_\_\_

Adapted from Godin, G., & Shepard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Science*, 10, 141-146

## Appendix D

### Exercise Counseling Behaviors Scale

**Think about the women that you cared for in the past year with breast cancer and who were experiencing cancer-treatment related fatigue. For each statement listed below, rate how often you engaged in the activity for these women by checking the appropriate box next to each statement.**

	Never	Seldom	About half the time	Usually	Always
1. I provided education to these patients about fatigue as a complication of cancer treatment before they experienced it.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. I taught these patients how to monitor fatigue levels (e.g. log or diary).	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. I taught these patients to utilize energy conservation strategies (e.g., pace activities and schedule at time of peak energy; limit naps to less than one hour).	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
4. I encouraged these patients to consider initiation of both endurance and resistance exercises.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. I counseled these patients that the exercise goal is to progress to moderate levels of exercise (not exhausting e.g. fast walking, tennis, easy bicycling, easy swimming, dancing), during active cancer treatment and after treatment is completed.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

	Never	Seldom	About half the time	Usually	Always
6. I discussed with the physician or nurse practitioner the need for patients with moderate to severe fatigue and/or certain conditions (cardiovascular disease, recent surgery, severe deconditioning) to be referred to an exercise specialist (e.g. physical medicine, physical therapy or rehabilitation) for an exercise evaluation and prescription.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

## Appendix E

### Exercise Benefits Beliefs Scale

Exercise is planned, structured, and repetitive bodily movement (e.g., fast walking, tennis, easy bicycling, volleyball, easy swimming, dancing) performed with the intent of improving or maintaining one or more components of physical fitness.

We are interested in your beliefs about the benefits of exercise **for women with breast cancer who are experiencing cancer treatment-related fatigue (CRF) during cancer treatment (chemotherapy, radiation therapy, biotherapy)**. For each statement below, please rate the extent to which you agree or disagree with the item.

*For women with breast cancer who are experiencing CRF, I believe:*

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. They are physically able to exercise	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. Exercise can be safely recommended.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. Exercise will improve their vigor/vitality.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
4. Exercise will improve their cardiorespiratory fitness.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. Exercise will improve their quality of life.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
6. Exercise will improve their sleep.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
7. Exercise will reduce their fatigue.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
8. Exercise will reduce their anxiety.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

## Appendix F

### Exercise Barriers Beliefs Scale

Exercise is planned, structured, and repetitive bodily movement (e.g., fast walking, tennis, easy bicycling, volleyball, easy swimming, dancing) performed with the intent of improving or maintaining one or more components of physical fitness.

We are interested in your beliefs about the **barriers** of exercise **for women with breast cancer who are experiencing cancer treatment-related fatigue (CRF) during cancer treatment (chemotherapy, radiation therapy, biotherapy)**. For each statement below, please rate the extent to which you agree or disagree with the item.

*For women with breast cancer who are experiencing CRF, I believe:*

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. They are too tired to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
2. They will not be motivated to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
3. Counseling about exercise is useless because they will not follow the recommendations.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
4. Exercise will increase their level of fatigue.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
5. They feel too sick to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
6. Some have too many medical complications to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
7. Their blood counts are too low to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
8. Nausea and vomiting will prevent them from exercising.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
9. Exercise is not a priority for them.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
10. They are too weak to exercise.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
11. They have other concerns (caring for children, working, being treated for other medical illnesses) that are more important.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>
12. If walking in the neighborhood is their only means of exercising, they will not exercise if their neighborhood is unsafe.	1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>	4. <input type="checkbox"/>	5. <input type="checkbox"/>

## Curriculum Vitae

Donna Ho-Shing  
December 16, 1963  
Kingston, Jamaica, W. I.

### Education

- 1985 Diploma, University Hosp. School of Nursing, Jamaica, WI  
1997 Bachelor of Science, Nursing, Jersey City State College (New Jersey City University), Jersey City, NJ  
2004 Master of Science, Nursing, William Paterson University, Wayne, NJ

### Employment

- |                     |  |
|---------------------|--|
| Mar 1994-March 2000 | Staff CL II RN, East Orange General Hospital, NJ   |
| Mar 2000 – Mar 2002 | Nurse Educator, East Orange General Hospital, NJ   |
| Mar 2002 – Feb 2004 | Nursing Director, East Orange General Hospital, NJ |
| Mar 2004 – Jul 2005 | Nurse Educator, Overlook Hospital, NJ              |
| Jul 2005 – May 2006 | Instructor, Essex County College, NJ               |
| Jan 2006 – Aug 2007 | Instructor, Trinitas School of Nursing, NJ         |
| Sep 2007 – Present  | Instructor, Seton Hall University, NJ              |

### Publications

- Ho-Shing, D. (2000). Treating Glaucoma with Drainage Devices and Pericardial Grafts. *AORN*, 71(6), 1237-1251. (Home Study program for CNOR and CRNFA recertification).
- Ho-Shing, D. (2005, April). Cervical Cancer Among African Americans. Paper presented at the Eastern Nursing Research Society 17<sup>th</sup> Annual Scientific Session, New York City, NY.
- Ho-Shing, D. (2005, April). Impact of Insurance on Breast Cancer Screening Activities. Paper presented at the Eastern Nursing Research Society 17<sup>th</sup> Annual Scientific Session, New York City, NY.