COPING WITH APPRAISED THREAT OF BREAST CANCER: PRIMARY PREVENTION COPING BEHAVIORS UTILIZED BY WOMEN AT INCREASED RISK

by

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DISSERTATION

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MAJOR: NURSING Approved by: 
Advisor Date 11/5/91

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DEDICATION

This work, and all good that may come from it in the future, is dedicated to the memory of my mom:

Charlotte Veronica Kampe Novotny
July 31, 1934 – February 6, 1990

During the time we had together, she taught me much about the value of life and the importance of family. Her courage, determination, wisdom, and strength established a standard of excellence for all to emulate. Although her battle with breast cancer is over, the bond which unites our souls can never be severed. I shall never forget her most important lesson ... "if I cannot do great things, I will do small things in a great way".

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things we thought we could never do.

Very special thanks are extended to my family, particularly my mother, whose support, tolerance, and love helped me to begin this journey, and was vital in helping me to complete it. But most of all, I wish to acknowledge my husband, George, who lived this experience with me on a daily basis. I could never adequately thank him for the depth of his patience or love -- he is truly the wind beneath my wings.
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CHAPTER 1

Introduction

Among American women, breast cancer is the most common malignancy. It affects nearly one in nine women and is a leading cause of cancer related deaths among this group (Boring, Squires & Tong, 1991). In 1991, an estimated 175,000 American women will be diagnosed with breast cancer and approximately 44,500 will die from it (Boring, Squires, & Tong, 1991).

Nursing is concerned with helping clients retain, attain, and maintain optimal levels of health (Neuman, 1982; 1989). Learning more about the meaning women ascribe to breast cancer risk can assist nurses to identify and understand the primary prevention coping behaviors of clients who are at increased risk for breast cancer. Such information can be incorporated into primary prevention programs and thus, may ultimately result in the reduction of the incidence, suffering, and mortality associated with the diagnosis and treatment of breast cancer.

In addition to the human costs of suffering and loss of life, there are significant economic burdens. The overall medical costs for cancer were estimated to be over 70 billion dollars for 1985 (American Cancer Society, 1988). Thus, reduction in breast cancer incidence and mortality through programs of primary prevention can have a significant social, as well as economic, impact.

This research is consistent with the U.S. Department of
Health and Human Services' priority to reduce cancer through actions individuals can take themselves (Mason & McGinnis, 1990). Although little can be done to influence a woman's genetic predisposition to breast cancer, it is possible to change individual behaviors that otherwise could contribute to the development of the disease. To do so, however, requires scientific knowledge of how women at risk for breast cancer appraise and cope with such a health threat.

Throughout the past two decades, research related to women with breast cancer has had a rather narrow focus. Most of the early research focused on the difficulties of women as they coped with the illness. More recently, the research focus has widened to include the breast cancer patient's partner who is also intricately enmeshed in the coping process (Baider & DeNour, 1988; Northouse, 1988; Northouse & Swain, 1987).

While early research was focused on the patient and her spouse, many studies have demonstrated that women who have a family history of breast cancer have a significantly increased risk of developing the disease during their lifetime. Generally, women who have an affected mother or sister have a two-fold increase in their risk of developing breast cancer (Lubin et al., 1982; Sattin et al., 1985; Spratt, Donegan, & Greenberg, 1988). In addition to mothers and sisters, grandmothers, aunts, and female cousins of breast cancer patients also manifest
significantly increased risk (relative risk = 1.5) 
(Anderson, 1975; Sattin et al., 1985; Choi et al., 1978).

Despite the identification of this high risk group, 
research pertinent to this population has focused primarily 
on the practice of self-breast exam (Calnan, 1984; Calnan & 
Moss, 1984; Calnan & Rutter, 1986; Glasel, 1985; Hallal, 
1982; Howe, 1981; Lashley, 1987; Massey, 1986; Rutledge & 
Davis, 1988; Schleuter, 1982; Stillman, 1977; Turnbull, 
1978; Champion, 1991). However, there are other specific 
primary prevention coping behaviors such as alterations in 
dietary habits, decreasing alcohol intake, weight 
reduction, change in contraceptive method, etc., that have 
received little or no attention.

Thus, the breast cancer threat appraisal pattern and 
the primary prevention coping behaviors used by women with 
family histories of breast cancer is not known. Therefore, 
the purpose of this study is to examine how women with 
family histories of breast cancer appraise and cope with 
their increased risk for developing the disease. Specific 
aims of the study include the following:

1) to describe how women with family histories of 
  breast cancer appraise this health threat;

2) to identify the primary prevention coping behaviors 
  used by women with family histories of breast 
  cancer;

3) to examine the relationship between a woman's degree 
  of breast cancer threat appraisal and the number of
primary prevention coping behaviors used;

4) to determine the percent of variation in primary prevention coping behaviors that is accounted for by both the degree of actual breast cancer risk and the degree of breast cancer threat appraisal reported by women with family histories of breast cancer;

5) to examine the relationship between a woman's pattern of breast cancer threat appraisal and the types of coping behaviors used; and

6) to determine if a positive relationship exists between actual breast cancer risk and breast cancer threat appraisal among women with family histories of breast cancer.
CHAPTER 2
Conceptual Framework

The Neuman Health Care Systems Model (1982; 1989) has been selected as the nursing conceptual model to guide this research. The rationale for selection of the Neuman model relates to the model's concern with the concept of stress and the client's response to it. More importantly, the model directly addresses the major phenomena of interest -- stressor appraisal and primary prevention coping behaviors. The overview of the Neuman model is followed by the formulation of assumptions derived from the model.

The Neuman Systems Model

The basic phenomena of interest in the Neuman (1982; 1989) model are the client or client system and their environment. Within this model, a client reacts to various stressors based on the meaning of the stressor to the client, i.e., stressor appraisal. Neuman views the presence of stressors as highly individualized experiences which are essentially wellness oriented and require adjustment or change within an individual. Thus, Neuman implies that stressor appraisal, i.e., the evaluative process that give a situation meaning, is very important and requires the individual to evaluate and implement available coping options. The client, therefore, is viewed as being engaged in varying amounts of activity with regard to stressors.

A stressor is defined as a tension-producing stimuli
that has potential to disrupt an individual's equilibrium (Neuman, 1982; 1989). Neuman further stipulates that stressors can be viewed as intrapersonal, interpersonal, and/or extrapersonal in nature. Those that would be of concern in relation to this research are the intrapersonal and extrapersonal stressors.

Intrapersonal stressors are "internal environmental interaction forces occurring within the boundary of the client" (Neuman, 1989, p. 24). An example of an intrapersonal stressor for this research is the genetic factors that may be present within an individual that predisposes them to developing breast cancer. Such stressors are not usually within the control of the individual.

Extrapersonal stressors are "external environmental forces occurring outside the boundaries of the client" (Neuman, 1989; p. 24). Individuals are usually able to exert some control over extrapersonal stressors. An example of an extrapersonal stressor specific to this research is that of excessive alcohol intake that could serve to increase the client's risk for breast cancer.

Stressors can be appraised by the client as resulting in either a positive or negative outcome (Neuman, 1989). If a stressor is appraised by the client as leading to a positive outcome, then the stressor is considered to be a motivating or strengthening factor for that individual. Positive outcome stressors serve to increase one's
self-awareness and assist an individual to experience continued personal growth and development (B. Neuman, personal communication, February 26, 1987).

Stressors that are appraised as resulting in negative outcomes are noxious events that are to be avoided or mitigated so that a state of stability may be maintained. Thus, the threat of developing breast cancer due to the presence of actual breast cancer risk factors would most likely be appraised as having a potentially negative outcome.

Neuman (1982; 1989) defines the flexible line of defense as a protective buffer that prevents stressors from breaking through one's normal line of defense or usual state of wellness. The flexible line of defense is dynamic and can be rapidly altered over a short period of time. The degree to which one can use one's flexible line of defense against a stressor is affected by the interrelationship of the five client variables, i.e., the physiological, psychological, sociocultural, developmental, and spiritual components that comprise the whole person. Neuman states that the variables that compose the flexible line of defense are contained within the process of interacting and adjusting to one's environment, and the process of adjusting the environment to the client, i.e., the coping process. Factors which influence the coping process include the client's basic physiologic and psychologic structure and condition, sociocultural
background, developmental state, spiritual beliefs, cognitive skills, age, and sex (Dunbar, 1982; Hoch, 1987; Neuman, 1982; 1989).

Upon encounter with a stressor, it is the strength of the flexible line of defense that determines whether or not a stressor reaction will occur (Neuman, 1982; 1989). The further away the flexible line of defense is from the normal line of defense, the greater the degree of available protection (Neuman, 1982; 1989). The presence of any stressor may narrow the space between the flexible line of defense and the normal line of defense. The flexible line of defense is particularly susceptible to risk factors such as family history of breast cancer, obesity, or excessive intake of alcohol. All of these factors can decrease the effectiveness of this buffer system.

If the flexible line of defense is adequate, a stressor reaction is prevented and a dynamic equilibrium, i.e., the absence of symptomatology and/or maintenance of the client's usual state of health, should exist. However, if the flexible line of defense is inadequate, the stressor breaks through the normal line of defense and the nature and degree of the stressor reaction is determined by the interrelationship of the client's physiologic, psychologic, sociocultural, developmental, and spiritual variables (Neuman, 1982; 1989). Thus, there is no absolute boundary for the flexible line of defense. It is different for every person and is relative to the normal line of defense.
(Thibodeau, 1983).

Because the flexible line of defense functions to protect an individual from stressors, a concept that is closely tied to it is that of primary prevention. The goal of primary prevention is to strengthen the flexible line of defense and thus maintain the client's current level of wellness by reducing the possibility of encountering stressors that could affect client homeostasis (Capers & Kelly, 1987; Neuman, 1982; 1989). Homeostasis is a state of balance requiring energy exchanges whereby the client is able to adequately cope with stressors as evidenced by the maintenance of an optimal state of health.

This level of prevention is only implemented prior to the occurrence of a stressor reaction when the degree of threat or hazard is known. Primary prevention coping behaviors focus on identifying and reducing known health risk factors (Mirenda, 1986) and result in a stronger flexible line of defense. Therefore, one's flexible line of defense can be strengthened by learning and initiating specific primary prevention coping behaviors to cope with the threat of illness (Benedict & Sproles, 1982; Buchanan, 1987; Ross & Helmer, 1988; Thibodeau, 1983).

The process of coping is dependent on the client's stressor appraisal (Neuman, 1982; 1989; Lazarus & Folkman, 1984). While Neuman, like Lazarus, has addressed the importance of assessing the client's appraisal of stressors, Neuman's ideas surrounding the client's coping
process need elaboration. In order to expand the coping aspect of the Neuman model, and in an effort to incorporate a more dynamic view of coping, this author will integrate Lazarus' conceptualization of the coping process into Neuman's work.

Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Coping efforts arise from cognitive appraisal and have two major functions: (1) altering the stressful person-environment relationship (problem focused) or (2) regulating the emotional reaction from that relationship (emotion focused).

Stressful situations which are appraised as requiring acceptance are associated with greater emotion focused coping behaviors. Problem focused coping behaviors are more predominant in situations in which the person believes are amenable to change. It is not unusual for both modes of coping to be utilized to deal with a particular stressor (Lazarus & Folkman, 1984).

Within each of the two major coping types are four additional modes of coping: (1) information seeking, (2) direct action, (3) inhibition of action, and (4) intrapsychic. Each of these modes serves both the problem and emotion focused functions in situations appraised as harm/loss, threat, or challenge (Lazarus & Launier, 1978).
The information seeking mode of coping involves attempts to learn more about the stressor in the situation. Direct action is defined as any concrete act one carries out to handle stressful situations. For a woman faced with the stressor of increased breast cancer risk, the direct action mode of coping may include activities such as increasing her dietary fiber intake and/or consistent performance of monthly self breast exams, or annual mammography.

The opposite of direct action is inhibition of action. This mode of coping implies refraining from action altogether or holding back action that would do harm. For the woman at increased risk for breast cancer, it could involve the avoidance of alcohol consumption. The intrapsychic mode of coping includes all cognitive processes designed to regulate emotions by making the person feel better. It only changes the state of mind of the individual, no actual change in the situation occurs. Traditionally, it includes processes viewed as defenses such as denial, repression, and/or avoidance, and includes displays of emotion such as anger or crying.

Individuals from breast cancer prone families are susceptible to this potentially fatal malignancy and may appraise such a stressor as threatening to their flexible and normal lines of defense. Therefore, it is logical that such persons would initiate primary prevention coping behaviors to manage the perceived threat of developing
breast cancer. Conceptually, initiation of such behaviors should strengthen their flexible line of defense and thus prevent disruption of their normal line of defense. Because the Neuman Systems Model (1982; 1989) addresses these issues, it is an appropriate framework to guide the aspects of this study.

However, such a grand theory of stress and coping, by virtue of its generality and abstractness, has to date remained untestable (Fawcett, 1989). While grand theories may be useful in distinguishing the domain of nursing from those of medicine and other disciplines, theories of more limited scope are better aimed at addressing practice concerns in nursing (Hoeffer & Murphy, 1984). Therefore, this author has refocused Neuman's grand theory to a mid-range level that involves a limited number of concepts that are more precisely defined and operationalized (Walker & Avant, 1983).

The theoretical level concepts of interest that were derived from the integration of the Neuman and Lazarus models, and which comprise the proposed theory of breast cancer primary prevention include and are defined as follows:

Actual Breast Cancer Risk - any genetic/biological characteristics, personal health habits, lifestyle, and/or environmental factors that are present prior to the development of signs and symptoms and which predispose women to the development of breast cancer.
Breast Cancer Threat Appraisal – the process involved in evaluating one's perceived susceptibility to breast cancer, involvement of personal stakes, projected outcome expectancy, and control over the situation.

Primary Prevention Coping Behaviors – problem and emotion focused modes of coping that are initiated before breast cancer develops in an effort to manage the appraised health threat by preventing development of disease or detecting symptoms of it at an early stage.

Presentation of Assumptions

The underlying assumptions for the theory of primary prevention derived from the integration of the Neuman and Lazarus models are as follows:

1. Clients are unique physiological, psychological, cultural, developmental, social, and spiritual beings.

   Neuman – People are a dynamic composite of the interrelationship between physiologic, psychologic, sociocultural, spiritual, and developmental variables.

   Lazarus – Persons are physiological, psychological, and social beings.

2. The environment consists of all internal and external factors that clients appraise and respond to.

   Neuman – People affect and react to the perceived internal and external forces in the environment that surrounds them.
Lazarus - The environment consists of internal and external situations and events that create a demand for a response because of harm/loss, threat, or challenge relevant to the person's well-being.

3. Stress arises from potentially disruptive internal and external forces that clients appraise as potentially disruptive to their normal line of defense.

Neuman - Stress is that which is produced by a stressor, i.e., the intrapersonal, interpersonal, and extrapersonal forces capable of causing instability of the client system by weakening the flexible line of defense and thus resulting in penetration of the normal line of defense.

Lazarus - Stress is an inevitable aspect of life; it is a relationship between the person and the environment that is appraised by the person as taxing or exceeding his/her resources and endangering his/her well-being.

4. Coping behaviors are problem and/or emotion focused actions initiated by and based upon the client's appraisal of the stressor.

Neuman - Coping is the process of interacting with the environment by adjusting oneself to it or by adjusting the environment to the person based upon the person's appraisal of the stressor.
Lazarus - Coping is a subset of problem and emotion focused adaptational activities that involves effort and is governed by cognitive appraisal.

5. When the degree of threat is appraised, primary prevention coping behaviors are initiated by the client prior to a stressor reaction in an effort to strengthen the flexible line of defense and thereby maintain optimal client system stability.

Neuman - Primary prevention coping occurs when the degree of threat is known but a stressor reaction has yet to occur. Its goal is to maintain or promote optimal client stability by strengthening the client's flexible line of defense through stress prevention and threat reduction.

Lazarus - Anticipatory coping, i.e., a situation in which the person anticipates the stressor, plans for it, and works through some of its problems in advance, is initiated by a threat appraisal.

Presentation of Propositions:

The following propositions are based on the assumptions presented, address each of the major concepts within the proposed middle range theory of primary prevention, and thus form the basis for this research.

1. The greater the degree of actual breast cancer risk
present, the higher the degree of breast cancer threat appraised.

(Breast Cancer Risk Factors --> Breast Cancer Threat Appraisal)

2. The client's degree of breast cancer threat appraisal determines the client's predominant mode of primary prevention coping behaviors.

(Breast Cancer Threat Appraisal --> Primary Prevention Coping Behaviors)

Problem Emotion
Focused Focused

3. Primary prevention coping behaviors assist the client to maintain an optimal state of health.

(Primary Prevention Coping --> + Health)

This proposition was derived from the theory but was not tested in this research. The theoretical model guiding this research is presented in Figure 1.

The following chapter examines the available research pertinent to these concepts and the proposed relationships among them, and identifies the research questions and hypotheses for this study.
(Stressors) --> (Stressor Appraisal) --> (Flexible Line of Defense)
Breast Cancer Risk Factors --> Breast Cancer Threat Appraisal --> Primary Prevention Coping Behaviors

- Age
- Income
- Biopsy Hx
- Family Hx
- Age @ Menarche
- Age @ 1st Birth
- Susceptibility
- Outcome Expectancy
- Stakes
- Control
- Problem & Emotion
- Focused Modes
- Information
- Seeking
- Direct Action
- Inhibition of Action
- Intrapsychic

**Figure 1.** Theory of Primary Prevention for Breast Cancer.
CHAPTER 3

Review of the Literature

A review of the literature and research significant to
the major concepts and relationships identified in the
middle range theory being tested in this project will be
presented. The review begins with literature related to
the concept of breast cancer risk factors. This section
will examine the research pertinent to the risk factors
that will be used to measure actual breast cancer risk.
These included the demographic variables of age, race, and
socioeconomic status, the reproductive factors of age at
menarche and age at first birth, the genetic factors
surrounding family history of breast cancer, and finally
history of prior breast biopsy. The second major component
of the literature review examines the concept of health
threat appraisal and reviews the research surrounding the
psychological and environmental factors that are important
determinants of threat appraisal. The final section
discusses the concept of primary prevention coping
behaviors and presents research which supports the
theoretical notions about the use of problem and emotion
focused behaviors among women at risk for breast cancer.

Breast Cancer Risk Factors

As the most common type of cancer among American
women, breast cancer has been studied intensely by
epidemiologists. Such studies have attempted to define the
magnitude of the problem, and to identify the variety of
characteristics associated with an increased risk of breast cancer. A review of the literature revealed 11 major breast cancer risk factors, each of which contains numerous other sub-factors within it.

The etiology of breast cancer is exceptionally complex and represents a poorly understood interaction between reproductive, hormonal, genetic, and environmental factors. Most breast cancer risk factors have only a modest etiologic impact and thus, it is their combination that determines a woman's overall risk. Unlike the relationship between cigarette smoking and lung cancer, there is no single breast cancer risk factor that is so highly implicated (Schechter, 1985).

The major breast cancer risk factors that have been studied include the demographic variables, reproductive factors, menopausal status, estrogen replacement therapy, oral contraceptive use, benign breast disease, body weight/build, smoking history, family history of breast cancer, alcohol use history, and consumption of dietary fat. A thorough review of the literature on each of these factors and its corresponding subfactors is beyond the scope of this project. In addition, the research related to many of the 11 identified risk factors remains contradictory. Only those risk factors which have yielded consistent results in the literature have been reviewed.

Age

Because the risk of breast cancer steadily increases
as a woman grows older, age is the most important breast cancer risk factor (Kalache, McPhearson, Bartrop, & Vessey, 1983; Kelly, 1988). Evidence that the risk for the disease is strongly age related is reflected in age specific incidence curves. The number of breast cancer cases per year per 100,000 women in specified age groups reveals a progressive rise with increasing age (Spratt, Donegan, & Greenberg, 1988). The age specific incidence curve characteristically climbs rapidly during reproductive years and through age 50 (menopause). Then the curve temporarily levels off or slightly declines in the 50-54 year age group, and finally proceeds to consistently rise, but at a slower rate, during the postmenopausal years (Spratt et al., 1988; MacMahon, Cole, & Brown, 1973; Kelsey & Gammon, 1991).

DeWaard (1969) hypothesized that the temporary decrease in age specific incidence rates at middle age was reflective of two specific types of breast cancer. One was found primarily among young women and is ovary related, while the second was primarily postmenopausal and related chiefly to adrenal hormonal predominance at menopause. Moolgavkar, Stevens, and Lee (1979) extracted complete age curves for female breast cancer incidence in various geographic locations. After adjustment for birth cohort and year of incidence, the shapes of all the extracted age incidence curves were very similar in shape to those found by DeWaard (1969) and Spratt et al. (1988) and thus,
support their findings.

According to Haagensen, Bodian, and Haagensen (1981), the risk of developing breast cancer below the age of 25 is negligible (0.2%). The average woman's risk of developing breast cancer before the age of 50 is about 1.5% (Kelly, 1988). Two thirds of all breast cancer cases that occur, occur in women over the age of 50 (Lake, 1989). These observations are consistent with the progressive increased incidence of breast cancer throughout a woman's lifespan. A woman's breast cancer risk is more than three times greater at the age of 75 years than one's risk at age 35 (Vogel, 1991).

Race

Breast cancer incidence also varies among races. In the United States, the highest incidence occurs among white women (81%) while oriental women experience the lowest (29%) rate of breast cancer (White & Faulkenberry, 1985; Haagensen et al., 1981). Although the incidence rate among black women is increasing, the incidence of breast cancer in the American black over age 45 is less than in the American caucasian (Frankl, 1980; Kelsey & Berkowitz, 1988; Ries, Hankey, & Edwards, 1990). The breast cancer rate among hispanic women is lower (42%) than among blacks (53%). Thus, those at highest risk in the United States are white women followed by blacks, hispanics, and orientals (Love, 1989).

The majority of breast cancer studies reviewed consisted
of populations that were primarily white (90% or more). Thus, few studies examined their results as they relate to race differences. Two studies that did examine breast cancer risk as it relates to race reported no significant differences between white and black women (Sattin et al., 1985; Shapiro, Strax, Venet, & Fink, 1968). Such a finding may be due to similar background characteristics like the subjects' number of pregnancies, age at menarche, etc..

This observation is supported by the case-control study conducted by Schwartz, King, Belle, Satariano, and Swanson (1985) which examined family history as it related to breast cancer risk. These authors reported that race was not a significant predictor of risk in sisters of cases or controls. However, among mothers of cases, black women were at lower risk (0.37) of breast cancer than white. The black cases and controls averaged a greater number of relatives (2.4) than their white counterparts (1.5).

**Socioeconomic Status**

Early studies have consistently reported a direct relationship between breast cancer risk and socioeconomic status (Dorn & Cutler, 1959; Graham, Levin, & Lillenfeld, 1960; Valaoras, MacMahon, Trichopoulous, & Polychronopoulou, 1969; Faisal & Paffenbarger, 1975). Breast cancer is more common among women in upper social classes than those in lower social classes (Kelsey & Berkowitz, 1988; Kelsey & Gammon, 1991) with the risk about twice as great in the highest social class compared with the lowest (Kelsey,
1979).

When socioeconomic status was defined in terms of number of years of education, the relative risk of developing breast cancer for women with 12 or more years of education was 1.7 (95% C.I. = 1.5 - 2.9) compared to those with less than 12 years of education (Helmrich et al., 1983). Similarly, Ewertz (1988) reported that women with 13 years of education or more (N=351/271) had a 30% excess risk of developing breast cancer in relation to women with eight years of education or less (R.R. = 1.3; 95% C.I. = 1.06 - 1.60).

Fascal and Paffenbarger (1975) reported that breast cancer patients tended to be better educated and of higher occupational status than their control counterparts. Women with greater than 12 years of education (N=378/728) were at 36% significantly greater risk of developing breast cancer before menopause, and at a 29% significantly greater risk of developing breast cancer after menopause (N=1038/1791) than were women with less education (Paffenbarger, Kampert, & Chang, 1980).

In a recent prospective cohort study of approximately 7,500 American women, Carter, Jones, Schatzkin, and Brinton (1989) examined the relationship between two measures of socioeconomic status (income and education), and breast cancer risk. In this cohort, a consistent trend of increased breast cancer risk was found with increasing level of education. In addition, women with the highest relative
income were at a two fold risk for developing breast cancer.

Ewertz (1988) suggested that studies which show an increased breast cancer risk in mainly white collar workers may reflect lifestyle patterns rather than exposure to carcinogens. Such lifestyle factors would include reproductive patterns which are related to social class since women of high social status may tend to start childbearing at a later age and have fewer children than their blue collar counterparts.

Contrary to the above, Brinton et al. (1979) reported a slightly higher percentage of controls (N=1,156) than patients (N=405) who reported education levels beyond high school. However, a significantly higher proportion of patients had missing information on educational status, and thus, such data must be interpreted with caution. Table 1 summarizes the findings related to these demographic variables and breast cancer risk.

**Reproductive Factors: Age at Menarche**

The average age of puberty in the United States is about 12.8 years (Haagensen et al., 1981). Women who experienced puberty before age 12 are thought to have an increased risk of developing breast cancer. While some early case study data found no significant relationship between age of puberty and increased breast cancer risk (Wynder, Bross, & Hirayama, 1960; Levin, Sheehe, Graham, & Glidewell, 1964; Salber, Trichopoulos, & MacMahon, 1969; Wynder, MacCormack, & Stellman, 1978), a trend toward earlier menarche among
Table 1

Demographic Variables and Breast Cancer Risk

<table>
<thead>
<tr>
<th>Variable</th>
<th>High Risk Group</th>
<th>Low Risk Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Older</td>
<td>Young</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>Oriental</td>
</tr>
<tr>
<td>Socioeconomic Status</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

breast cancer patients was reported by Brinton et al. (1979), Shapiro et al. (1968), Henderson et al. (1974), Lubin et al. (1982), and Negri et al. (1988).

A statistically significant relationship between early menarche and breast cancer risk was reported by Staszewski and Czerwonej (1971), Henderson et al. (1974), Farewell, Math, and Math (1977) and Alexander, Roberts, and Huggins (1987). In two case-control studies that analyzed data in relation to the subjects' menopausal status, Choi et al. (1978) reported that postmenopausal cases had a younger age at menarche than did their control counterparts. There was little evidence of an association for the premenopausal group. However, Helmrich et al. (1983) observed that late age at menarche was associated with a lower risk of breast cancer among premenopausal women only. Similarly, Ewertz (1988) reported a highly significant trend ($p = .0006$) of decreasing risk with increasing age at menarche among premenopausal women.

Thus, although age differences in some studies were
small and no statistically significant associations were reported in others, the consistent direction of the difference when found strongly suggests that a relationship does exist. In addition, a recent review article by Willet (1989) concluded that generally, early menarche confers approximately a 1.5 to 2.0 increase in breast cancer risk when compared with late menarche.

**Age at First Birth**

Although a study by Choi et al. (1978) did not demonstrate a protective effect of early age at first pregnancy, generally, women who gave birth to their first child after the age of 30 have an increased risk of breast cancer as compared to those who had their first child at age 20 or earlier (MacMahon, Cole, & Brown, 1973). In a review of the literature on this topic that examined data published from 1963-74, Haagensen et al. (1981) reported that the relative risk for American women who had their first child under the age of 20 was 1.0 compared to 2.0 to 3.4 for those whose first child was born at age 35 or later.

More recent studies continue to support this trend. Helmarich et al. (1983) reported that the relative risk of breast cancer for women whose age at first birth was less than 20, 20 to 24, 25 to 29, and 30 or older were 1.0, 1.5, 2.4, and 2.8 respectively. This trend was statistically significant. Similar studies by Brinton et al. (1979), Wynder, Bross, and Hirayama (1960), MacMahon et al. (1970) and Negri et al. (1988) support these findings.
It is thought that the protective effect of having the first child at an early age is likely to be associated with full term pregnancies which change a woman's hormonal milieu (Salber et al. 1969; Kelsey, 1979; Spratt, Donegan, & Greenberg, 1988) and a permanent differentiation of mammary stem cells such that these tissues are less susceptible to carcinogens (Willett, 1989; Kelsey & Gammon, 1991). "The increased risk with older age at first birth may be attributed to either a direct protective effect of early age at first birth, which could be brought about by accompanying hormonal changes, or to a factor that causes delayed first pregnancy, i.e., anovulatory cycles, and also causes breast cancer" (Kelsey, 1979, p.78).

**Family History**

There is ample available data to support the concept of familial predisposition to breast cancer (Macklin, 1959; Shapiro et al., 1968; Anderson, 1972; Choi et al., 1978; Sattin et al., 1985; Spratt et al., 1988). Generally, women who have an affected mother or sister are considered to have a high breast cancer risk (RR=1.8 & 2.3 respectively) (Lilienfeld, 1963; Frankl, 1980; Lubin et al., 1982; Sattin et al., 1985; Spratt et al., 1988). A review of the literature involving studies published from 1946 thru 1959 on this issue revealed that all but two of eight case-control studies consistently found a twofold excess frequency of breast cancer among mothers and sisters (Lilienfeld, 1963). More recent studies have continued to
report similar relative risk estimates for first degree relatives of breast cancer patients (Lubin et al., 1982; Schwartz et al., 1985; Sattin et al., 1985; Ottman, Pike, King, & Henderson, 1983; Choi et al., 1978).

Breast cancer patients with a family history of the disease were generally younger and had a higher frequency of bilateral cancer than did breast cancer patients with a negative family history (Anderson, 1971, 1974; Wynder et al., 1978; Frankl, 1980; Sattin et al., 1985; Lynch, Watson, Conway, Fitzsimmons, & Lynch, 1988). Frankl (1980) reported that the incidence of a positive family history was similar among premenopausal (19%) and postmenopausal (21%) breast cancer patients.

Macklin (1959) showed that in addition to mothers and sisters, grandmothers, aunts and female cousins of breast cancer patients also manifested a significantly increased risk (RR=1.5). This finding has been supported by work from Anderson (1975), Sattin et al. (1985), and Choi et al. (1978).

However, risk among relatives is not uniform. Studies by Anderson (1971, 1974) and Anderson and Badziocn (1985) were among the first to show that a woman's risk of breast cancer is influenced by her age, i.e., pre vs. postmenopausal, and by the laterality (unilateral vs. bilateral) of her affected relatives. In relatives of postmenopausal patients, risk was not increased, however, among relatives of premenopausal patients, breast cancer
risk increased substantially (RR=3.1). A fivefold increase was noted in families of patients with bilateral disease, while a ninefold excess was reported if the cancer occurred both premenopausally and bilaterally.

In addition, the pattern of familial occurrence, i.e., present in one generation or two, also plays a role. Kelly (1988) stated that in a family in which the mother is unaffected but two sisters have premenopausal bilateral breast cancer, the lifetime risk to a sister or daughter of an affected woman is about 50 percent. In a similar family but one with postmenopausal unilateral breast cancer in two sisters, the lifetime risk is only about 10 percent. In a family in which two generations of women have premenopausal bilateral disease, the lifetime risk to a sister or daughter of an affected woman is again about 50 percent. However, if in this family the breast cancer is postmenopausal and unilateral, the lifetime risk is approximately 16 percent (Kelly, 1981; 1988). Table 2 summarizes risks to mothers, sisters and daughters with different types of family histories. The highest relative risk existed among those first degree relatives who had developed the disease premenopausally and bilaterally. The lowest risks were associated with unilateral postmenopausal relatives.

Indications that breast cancer risk is genetically influenced are found in its association with genetically determined traits and medical conditions, racial predispositions, and familial tendencies. However,
Table 2

<table>
<thead>
<tr>
<th>Classification of Breast Carcinoma Patients</th>
<th>Mothers, Sisters, Daughters of Breast Carcinoma Patients</th>
<th>Age Adjusted % with Relative Risk Compared with Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total Number</td>
<td>567</td>
<td>1.8</td>
</tr>
<tr>
<td>2. Premenopausal</td>
<td>188</td>
<td>4.9%</td>
</tr>
<tr>
<td>3. Premenopausal</td>
<td>379</td>
<td>6.7%</td>
</tr>
<tr>
<td>4. Unilateral Disease</td>
<td>486</td>
<td>4.2%</td>
</tr>
<tr>
<td>5. Bilateral Disease</td>
<td>81</td>
<td>4.2%</td>
</tr>
<tr>
<td>6. Premenopausal &amp; Unilateral</td>
<td>155</td>
<td>13.1%</td>
</tr>
<tr>
<td>7. Postmenopausal &amp; Unilateral</td>
<td>33</td>
<td>3.4%</td>
</tr>
<tr>
<td>8. Premenopausal &amp; Bilateral</td>
<td>48</td>
<td>3.5%</td>
</tr>
<tr>
<td>9. Postmenopausal &amp; Bilateral</td>
<td>48</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

*Relative to a breast cancer risk of 1.0 for 699 first degree relatives of the control group.*

environmental factors cannot be excluded in accounting for some, if not all, of the observed phenomena (Spratt et al., 1988). Although the extent to which increased breast cancer risk is brought about by exposure to environmental or genetic factors is as yet unknown, Lynch and Krush (1971) reported that the 50 percent risk found in primary relatives is a figure that is consistent with autosomal dominant inheritance. However, studies of female monozygotic and dizygotic twins have been unable to determine whether genetic or environmental influences are dominant (Holm, Hauge, & Harvald, 1980; Haagenson et al., 1981). Further evidence of a hereditary component to breast cancer was provided more recently by Swift, Reitnauer, Morrell, and Chase (1987). These researchers reported that in families with ataxia-telangectasia (an autosomal recessive syndrome) women had an excess risk of breast cancer.

In summary then, in the general population there is a twofold increase in risk for a woman with an affected first degree relative. The postulated genetic effect is greater in pre vs. postmenopausal cases, and is stronger in bilateral vs. unilateral cases. Risk also varies according to which relatives are affected (Kelsey, 1979). Thus, family history of breast cancer does affect a woman's risk of developing the disease. But, how it does so, i.e., genetically and/or environmentally, is as yet unknown.

Number of Breast Biopsies
Due to the result of scarring and fibrosis that results from a breast biopsy, physical exam and/or breast self-exam can be less accurate or reliable (Frankl, 1980). In addition, the rationale for breast biopsy relates to the presence of an already existing abnormality in the breast. Thus, it is not surprising that the research literature suggests a relationship between women with histories of breast biopsy and an increased risk of breast cancer.

Frankl (1980) compared 332 post-menopausal and 118 premenopausal breast cancer patients with normal controls in an effort to determine the importance of risk factors in the development of breast cancer. Although statistical significance was not calculated, Frankl reported that 14% of the women in the breast cancer group reported a prior benign breast biopsy compared to only 6% of the women in the control group. Twelve percent of the premenopausal and 15% of the post-menopausal breast cancer cases reported the presence of this risk factor.

In a case/control study by Brinton et al. (1979), women who had more than one biopsy for benign breast disease (N=30/37) had a statistically significant relative risk of 2.05 (95% C.I.=1.2 - 3.4) compared to women with only one (RR=0.83) or no previous biopsies (RR=1.0). Similarly, Roberts et al. (1984) studied 791 women who attended a diagnostic breast clinic during 1967 - 1970. Of the 356 women from this sample who underwent one or more breast biopsies, their relative risk was reported to be 3.55.
Paffenbarger et al. (1980) interviewed 1,416 breast cancer patients and 2,519 controls in order to during 1970 thru 1977 in order to determine important breast cancer risk factors. Women were categorized as pre, para, and postmenopausal based on the date of their breast cancer diagnosis. Among women in the pre and paramenopausal groups who had undergone a previous benign breast biopsy (N=488/851), the relative risk of developing breast cancer was reported to be 1.53 (p < .05). Women in the postmenopausal group (N=331/672) who had had a previous benign breast biopsy also had a significant relative risk of 1.61 (p < .01). Thus, prior benign breast biopsy was associated with a 50 to 60% increase in breast cancer risk before and after menopause.

With consideration to the studies reviewed here, the consistent positive association found in the relatively large case/control studies provides rather compelling evidence that prior history of breast biopsy is an important risk factor.

In summary, those breast cancer risk factors which have yielded consistent relative risk scores include the following: (1) early age at menarche, (2) late age at first birth, (3) positive family history of breast cancer especially among first degree relatives, and (4) history of one or more breast biopsies. In addition, the pattern of demographic variables that has been associated with increased breast cancer risk includes older, white women of
high socioeconomic status.

**Health Threat Appraisal**

The review of the literature related to the concept of health threat appraisal will be presented in two sections. First, studies which examined the general aspects of threat appraisal will be presented followed by a section devoted to examining how women appraise their threat of developing breast cancer.

**Health Threat Appraisal: General Studies**

Threat is one of the most pervasive phenomena in human experience and can be understood as a form of stress (Withey, 1962). The concept of threat has two major characteristics: (1) it is anticipatory or future oriented; and (2) it is brought about by cognitive processes which involve perception, learning, memory, judgment, and thought (Lazarus, 1966; Lazarus & Folkman, 1984).

Threat is defined as "the anticipation by the individual of a harmful occurrence" (Lazarus, 1966, p.33). Similarly, Withey (1962) states that the "notion of threat specifically implies that noxious stimuli are not actually present. Only the cues heralding their coming are involved" (p. 94).

The anticipatory nature of threat has been clearly demonstrated in the literature regarding disasters (Janis, 1962; Chapman, 1962; Wallace, 1956; Withey, 1962). A common thread in this literature is that the concept of threat involves a stage of anticipation of harmful events before any harm has occurred. It is during this anticipatory
period that cues about what may follow and what can be done to cope with the threat are sought and evaluated (Lazarus, 1966).

The threat stimulus announces the potential for confrontation, communicates evidence about how imminent and harmful it is, and how vulnerable the individual is to it. The more imminent the probability of confrontation, the more severe the level of perceived threat. When confrontation is perceived to be delayed, the threat is easier to ignore and thus perceived as less severe (Lazarus, 1966; Paterson & Neufeld, 1987).

Throughout the stress and coping literature, the importance of assessing a person's perception of an event in order to determine what makes it threatening has been reiterated. Lazarus and his colleagues have been instrumental in advancing the importance of "cognitive appraisal" in the understanding of human behavior in threatening situations.

Cognitive appraisal is defined as an individual's continuously changing set of judgements about their interactions with the environment and the availability of their coping resources or options (Lazarus & Launier, 1978). It is largely an evaluative process that is focused on the meaning or significance of the event for well-being (Lazarus & Folkman, 1984). From this perspective then, it is the individual's perception of a health threat and not the threat itself that has important implications.
According to Lazarus and Folkman (1984), a stressful event can be appraised as either a loss (i.e., damage that has already occurred), a threat (i.e., anticipated harm or loss), or a challenge (i.e., the potential for mastery or gain). The type of appraisal that occurs in response to a particular event depends on the "configuration of the environmental events themselves and on the person's belief about the potential for mastery" (Lazarus & Launier, 1978, p. 304). Thus, a health threat appraisal is not made on the basis of a single feature of the health threat, but rather on the total arrangement of its elements.

Threat appraisal is a function of a specific set of environmental conditions that are appraised by a particular person with particular psychological characteristics (Folkman, Lazarus, Gruen, & DeLongis, 1986). Lazarus (1966) reported that the psychological and environmental factors that are important determinants of threat appraisal include an individual's (1) perception of their susceptibility to the threat, (2) perception of control over the threat based on an evaluation of resources available to deal with the threat, (3) appraisal of what is at stake, and (4) determination of outcome expectancy.

Research by Gass (1987) supports these factors. This study examined the health of bereaved widows and reported that women who had perceived higher degrees of threat in this situation, also perceived that they had less resources available to them to cope with this event. Thus, for this
population, threat was greater in the absence of resources.

Another study that lends support to these factors was conducted by Rogers and Mewborn (1976). These researchers examined the effect of different levels of severity of threat on attitude change. The threat situations were presented by film and concerned the dangers of cigarette smoking and venereal disease. The degree of threat severity had no effect on attitude change unless effective alternative practices were identified. When such practices were addressed, the greater the degree of appraised health threat, the greater the behavior change.

Other researchers hypothesized that the degree of health threat appraisal may be related to one's sense of control over the threat. For example, Parkes (1984) investigated the effect of an individual's locus of control on appraisal of the importance of a stressor and whether or not the stressor was perceived as amenable to change. Over a four year period, 171 first year nursing students were asked to recall an episode within the past month that they found particularly demanding or that had troubled them in some way. The subject was then asked to indicate the extent to which the episode mattered to them at the time, i.e., low, medium, high importance. In addition, the subject was also asked to indicate whether they appraised that situation as something they could change, must accept, or could change but must accept (mixed category).

Results indicated that locus of control was not
significantly related to type of appraisal. Parkes (1984) believes this result was due to the incongruency between the situations the subjects described. Locus of control did significantly influence the subject's rating of importance of the event.Externals more frequently rated their stressor as having high importance compared to internals. This result occurred most frequently with mixed appraisals, thereby suggesting that ambiguity may pose problems for externals.

In a longitudinal design, Seeman and Seeman (1983) hypothesized that subjects with a greater sense of control should take more preventive health measures, know more about cancer risks, and be more attuned to resources available for corrective action than subjects with a lesser sense of control. They interviewed a representative metropolitan sample (N = 2141) at the beginning of 1976 and the close of 1977, with telephone contacts interspersed at six week intervals to trace health related incidents.

When subjects were asked how dangerous cigarette smoking might be, a large difference emerged between those who thought it affected chances of developing cancer to a great extent (n = 502) and those who thought it affected their chances only somewhat (n = 275). When the cancer risk was appraised as great, the person's expectancies for control were not significant. However, when the threat was appraised to be ambiguous, the difference in sense of control between the "indifferent" smokers and the
"concerned" group was significant ($p < .01$). Thus, a high degree of health threat appraisal served to override expectancies for control. But, when the degree of health threat appraisal is lower, it was the steady indifferent smokers who were more external in their health orientation.

There is extensive literature on threatening health communications and the role of health threat appraisal in relation to behavior. Messages that constitute a health threat are termed fear arousing messages. Threatening messages about the effects of cigarette smoking, drinking and driving, heart disease, obesity, and breast self exams, among others, have been examined (Sutton, 1982; Meyerowitz & Chaiken, 1987). Typically, these studies have demonstrated that the more threatening the message, the higher the level of fear produced and the greater the likelihood of compliance with recommended actions (McGuire, 1985).

However, the research findings in this area are inconsistent. It is well established that health threat appraisals vary considerably among people and often show little correspondence to epidemiologic findings. One case in point relates to smokers who are aware of the association between cigarette smoking and lung cancer, but do not believe themselves to be personally vulnerable (Pechacek & Danaher, 1979).

Kegeles (1969) reported that people tend to underestimate their own susceptibility to illness as
subjects in his study tended to rate "people like me" as more susceptible to disease than themselves. Siero, Kok, and Pruyn (1984) reported that women overestimated the seriousness of breast cancer, yet underestimated their own susceptibility to the disease. Similarly, over half of Avis, Smith, and McKinlay's (1989) sample rated their risk of cardiovascular disease as lower than average. Such findings support the notion that people tend to rate their own risk as lower than that of their peers.

Slovic (1978) and Weinstein (1982) documented an "optimistic bias" in peoples' judgements concerning their own susceptibility to health threats. A similar effect was later reported by Joseph et al. (1987) among AIDS patients where although approximately 40 percent of the cohort was already demonstrating HIV antibodies, very few believed their risk of AIDS was great.

And finally, Leventhal's (1970) work can also be used to explain the inconsistencies found in the health communication literature. Leventhal found that while messages that contained high levels of fear arousal did consistently result in attitude change in the direction of the message, this positive relationship was not consistently found between level of fear and health behaviors. Thus, attitude change and behavior change are related but not equivalent.

In summary, from this literature on general health threat appraisal, one can conclude that a person's
perceptions about (1) their susceptibility to the threat, (2) what is at stake in the situation, (3) the expected outcome, and (4) the controllability of a threat, in relation to the availability of an effective response, are key factors in determining the degree of health threat appraisal present in a situation.

Health Threat Appraisal: Breast Cancer

Cancer is an emotionally loaded word which is often associated with a high degree of threat (Pender, 1975). The nature of the threat posed by the potential to develop breast cancer is extreme and has a negative or hopeless connotation for most women (Champion, 1984). By the time most women discover a lump, 60 percent already have lymph node involvement which reduces their survival rates to 40 to 45 percent (Stillman, 1977). Survival beyond five years is limited, and those who may contract this cancer face the potential burdens of disfigurement from surgery, chemotherapy, and/or radiation therapy, disability, dependence, financial burdens, and eventually death. Thus, because breast cancer patients are so profoundly affected by their disease, it would be surprising if their families were not affected as well.

Research has demonstrated that female relatives of breast cancer patients, especially first degree relations, are at increased risk for the development of breast cancer (Choi et al., 1978; Helmrich et al., 1983; Negri et al., 1988; Sattin et al., 1985). The occurrence of an illness in
one family member contributes to the family's appraisal of the degree and nature of the health threat (Turk & Kearns, 1985). Generally, those experiences which have been previously associated with harm, either directly or vicariously, are likely to result in a threat appraisal (Lazarus, 1966). Thus, the greater the incidence of breast cancer within the family and the closer the blood relationship of the affected person to an individual, the greater the likelihood of that individual perceiving their degree of susceptibility as high (Pender, 1975).

It is argued that women from families of breast cancer patients would be more likely to undertake risk reduction behaviors due to a better understanding of their potentially increased breast cancer risk, and realization of the seriousness of the disease (Valentine & Sheldon, 1984). From the few articles that have examined the effects of breast cancer on a woman's family, it was reported that the daughters of breast cancer patients became frightened about their own risk of developing breast cancer (Lichtman et al., 1984; Krush, Lynch, & Magnusm, 1965; Kelly, 1980). Thus, due to their identification with the breast cancer patient, the female relatives of breast cancer victims suffer a special vulnerability (Kelly, 1980).

Much of the research investigating the concept of health threat appraisal, as it relates to the woman at risk for breast cancer, has been formulated within the Health
Belief Model. This model was generated by Hochbaum, Leventhal, Kegeles, and Rosenstock during the 1950's. In this model, health behavior is explained as resulting from the combination of attitudes related to four concepts: perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers. These four concepts have been tested individually and in combination as predictors of health related behaviors.

When taken together, the concepts of perceived susceptibility and seriousness in the Health Belief Model are equivalent to that of perceived threat of disease, sometimes termed vulnerability, (Kirsch, 1983; Wallston & Wallston, 1984). Thus, the concepts from the Health Belief Model that are most relevant to this discussion of health threat appraisal are that of perceived susceptibility and seriousness.

Perceived susceptibility refers to a person's view of their likelihood of contracting a potentially harmful condition within a specified time frame. Perceived seriousness is concerned with the perceived degree of severity of the potential illness if it is left untreated (Champion, 1984).

Harris and Guten (1979) conducted an exploratory study (N=842) to examine the relationship of the health belief model constructs to protective health behaviors. In relation to the perceived threat posed by illness, the effect of perceived vulnerability was found to be...
curvilinear. Those persons who perceived themselves to be more likely or less likely than others to get sick, performed more protective health behaviors than those who perceived themselves as likely as others to get sick.

In a study on women's health beliefs about breast cancer and the practice of self breast exam, Stillman (1977) found that 87% of the sample (N = 122) of women with no family history of breast cancer or breast lumps rated their perceived susceptibility to breast cancer development as high. When asked to describe women at increased risk for developing breast cancer, 78% of the sample knew about the relationship between breast cancer risk and family history. Twenty to thirty percent believed that being married with no children or being single or post-menopausal were contributing risk factors, while 22% selected use of oral contraceptives as a breast cancer risk factor.

In an effort to determine why some women utilize breast self-exam and others do not, Kelly (1979) interviewed 158 women who had a current complaint of breast pain or had discovered a breast lump. Sixty-six percent (n=104) of the women surveyed practice breast self-exam while 34% (n = 54) did not. When asked why they originally began to practice regular breast self-exam, 56% stated it was due to an increased awareness of the need for early detection. Forty-four percent stated they began the practice of breast self-exam because of an increased awareness of their own personal vulnerability to breast
cancer. Women became concerned about their own risk of breast cancer primarily because of a change in their own health, or because of the experience of knowing a friend or relative with breast cancer.

When asked why they currently examine their breasts, the importance of early detection (11%) was mentioned less frequently than the woman's own risk (89%). The majority of subjects practiced breast self-exam in order to improve their prognosis should a malignancy develop. The majority of the reasons (75%) that women gave for doing breast self-exams centered around an awareness that the woman herself could get breast cancer. Nonexaminers did not practice breast self-exam because they did not appraise that they were at risk (43%) or chose to avoid thinking about the risk by not examining their breasts. Other major reasons given for not practicing breast self-exam were that the exam was frightening (27%) and they did not know how to perform it (23%).

The longitudinal study by Seeman and Seeman (1983) provides greater insight into why some women may choose not to practice breast self-examination. Breast self-examination is a very different kind of primary prevention coping behavior as compared to weight reduction or smoking cessation. As a screening intervention, breast self-examination involves fear and potential risk of finding breast cancer. Baric (1969) emphasized that screening behaviors involve a unique "at risk" role because
they require an individual to subject him/herself to the risk or possibility of an undesirable diagnosis. Thus, it is not surprising if these factors serve to override a woman's sense of control in determining her own breast self-exam behavior.

This situation would be similar to the smoking case described earlier in which a sufficiently high degree of health threat appraisal overrides one's sense of control. Seeman and Seeman did find that both high health motivation and a sense of control is required to generate consistent breast self-exam behavior. Those women who combined both high internality with high motivation were significantly more involved in breast self-exam than the internals with low motivation scores. The ANCOVA for these breast self-exam scores yielded a .007 probability for the interaction of internality and motivation (controlled for age, education level, and socioeconomic status). Thus, the internals who do not care about health avoid breast self-exams, while the internals with high health motivation undertake breast self-exams.

Using a sampling frame that resulted in women characterized as having a higher breast cancer risk (N = 708), Howe (1981) examined the subjects' knowledge, attitude and practice of breast self-exam. His results revealed that a high degree of health threat appraisal related to breast cancer risk was not associated with use of breast self-exam. Women in this sample generally
believed that their risk for breast cancer was low despite a high actual risk score. Perhaps this finding may be attributed to an ignorance of breast cancer risk factors or the use of denial of personal susceptibility to breast cancer thus resulting in the optimistic bias reported by Slovic (1978) and Weinstein (1982).

In a prospective study, Calnan and Moss (1984) examined if the health belief model predicted attendance at a breast self-exam class and compliance with the education provided by the class. They found that women who felt particularly susceptible to breast cancer were more likely to attend than those who had moderate to low levels of susceptibility ($p < .001$). Also, women who had personally known someone with breast cancer and those who had had an abnormality of the breast they perceived to be serious, were also among those more likely to attend the class.

Ollenn (1981) and Massey (1986) reported that age, education level, and race were significantly related to perceived susceptibility. Manfredi, Warnecke, Graham, and Rosenthal (1977) found that women with the lowest levels of perceived threat were the least likely to have knowledge of self-breast exam.

Calnan (1984) conducted a prospective study based upon the health belief model variables in an effort to determine which factors are associated with a woman's decision to participate or not participate in one of two prevention programs involving self breast exam ($n = 678$) or
mammography (n = 610). Calnan reported that participants in either program were more likely than nonparticipants to feel vulnerable to breast cancer. Participants in the mammography group were more likely than nonparticipants to have shown moderate to high levels of vulnerability to breast cancer. Similarly, those women who attended self breast exam classes were more likely to feel highly vulnerable to the threat of breast cancer compared to women who did not attend such a class.

Vogel, Graves, Coody, Winn, and Peters (1990) studied whether or not participation in the 1987 American Cancer Society Texas Breast Screening project had an impact on the subsequent screening behaviors of participants. Project participants (N = 42,000) returned questionnaires that contained a variety of information including data on the women's perceived personal lifetime risk of developing breast cancer, as well as her family history of breast cancer. While results indicated that having at least one affected first degree relative did not affect compliance with mammography recommendations, the subject's perceived lifetime risk of developing breast cancer strongly influenced compliance behaviors. Among those women who perceived their lifetime risk to be very small, 16.4% complied with the recommendation to have a mammogram. Those women whose perceived lifetime risk was high had an 80% compliance rate ($x^2 = 14.46, p < .0002$). Thus, perception of lifetime breast cancer risk was considered a
strong motivating factor for participation in breast cancer screening mammography programs.

Vernon, Vogel, Halabi, Jackson, Lundy, and Peters (in press) compared attitudes and behaviors related to breast cancer screening among white (n = 31,000), black (n = 1,100), and Hispanic (n = 1,800) women. Women rated their perceptions of their risk of ever developing breast cancer from very small to very high. Perceived risk was inversely correlated with age in all three groups of women. Older women were less likely to perceive their breast cancer risk as high or very high. No association between years of education and perceived risk was found among the groups. In all three groups, those women with family histories of breast cancer (30%) perceived their risk as high or very high compared to those women with no family history of breast cancer (10%).

The work of Vernon et al. was supported by a study conducted by Chrvala (1990). Over a period of seven months, 2,144 women completed a questionnaire at a breast cancer screening clinic. Based on an assessment of actual breast cancer risk factors, subjects were categorized into the following groups: baseline risk; slightly increased risk; moderately increased risk; and high risk. The women rated their own perceived susceptibility to breast cancer on a five point Likert scale. Univariate analysis of variance revealed that higher actual risk was significantly (p < .001) associated with perceptions of high
susceptibility to breast cancer.

Kelly (1980) interviewed 39 women with a maternal history of breast cancer to determine their needs, concerns, and health practices pertaining to breast cancer. Each said they were profoundly affected by their mother's illness and 82% perceived themselves to be at increased risk for breast cancer due to their mother's illness. Most daughters began to worry about their own risk of breast cancer within a day of learning about their mother's diagnosis. Those daughters whose mothers died from breast cancer all worried about their own death from the disease. Those women who perceived their risk to be average or lower said they decreased their risk by such means as dietary changes, positive thinking, and being fortunate enough not to resemble their mother.

A qualitative study of how six women who had discovered a breast lump lived with the immediate threat of being diagnosed with breast cancer was conducted by Hesky (1987). This study indicated that although the six women studied shared a common threat, they did not share a common experience of that threat. The differences among their experiences were grounded in the way in which women interpreted the events that had occurred.

In Hesky's study, some women, categorized as "worriers" focused on the possibility that they would get cancer. For those in the worrier group, the threat of breast cancer was a focus of attention in their lives.
Women classified as "minimizers" focused on the possibility of not getting breast cancer, viewing their risk as a vague possibility that occasionally emerged from their background of awareness. Worriers were further categorized as those who were dominated by fear and those who tried to prepare themselves for what may occur. Worriers who were dominated by fear of the breast cancer threat were overwhelmed by it and less able to effectively cope with it. Those women who tried to prepare for the possibility of being diagnosed with breast cancer strongly believed that it was important to be emotionally strong and ready to constructively cope with whatever lie ahead. The threat was perceived not only as a source of anxiety but also as a challenge to be overcome.

The purpose of a case-control study (N = 501) conducted by Vogel et al. (1990) was to determine whether the attitudes, beliefs, and practices of women with positive family histories of breast cancer differed from women without this risk factor. Of the women reporting a family history, 24% reported an affected mother, 20% an affected sister, 2% an affected daughter, and the remainder reported some other relative with breast cancer. Significantly more cases (79%) perceived their risk for breast cancer to be moderate or high compared to those women without a family history of breast cancer (54%) \( (p < .0001) \). The perception of breast cancer risk among women having first degree relatives with breast cancer was
significantly higher \( (p < .00001) \) than the risk perceived by women with other family histories of breast cancer. Thus, degree of health threat appraisal was influenced more strongly by having a mother, daughter, or sister with breast cancer than by having any other affected relative.

In summary, based on the research presented, when faced with the health threat of breast cancer, most women were dominated by fear and perceived the threat as a source of anxiety. Women with a positive family history appraise their threat of breast cancer as significantly greater than women with no family history of breast disease. High degrees of health threat appraisal were related to a change in the woman's own health status or experience with a friend or relative with breast cancer. In addition, the reviewed studies demonstrate that use of various coping behaviors were associated with various patterns and degrees of health threat appraisal. Therefore, the available literature lends support for the existance of the theoretical relationships proposed by Lazarus and his colleagues.

**Primary Prevention Coping Behaviors**

In addition to the need to determine a person's appraisal of a health threat, it is also important to assess the coping options and resources available to an individual to deal with such threats. The evaluation of available coping resources or options through which potential harms or losses can be avoided is referred to as
"secondary appraisal" (Coyne & Lazarus, 1981). When coping efforts are being utilized due to the appraisal of a health threat, they can be referred to as primary prevention coping behaviors. Neuman (1982; 1989) defines primary prevention behaviors as voluntary actions taken to minimize the potential threat of illness. Such behaviors are performed by an individual when the degree of health threat appraisal is known but a stressor reaction has yet to occur.

Primary prevention coping behaviors arise from an individual's health threat appraisal and serve to either prevent the development of a disease or detect symptoms of it at an early stage. The mechanisms by which primary prevention coping behaviors accomplish these functions include: (1) altering the stressful person-environment relationship by dealing with the problem that is causing the distress (problem focused), and/or (2) regulating the emotional reaction from that relationship (emotion focused) (Coyne & Lazarus, 1981).

Pearlin and Schooler (1978) reported that the greater the scope and variety of an individual's coping behaviors, the more protection coping affords. Previous research has shown that in virtually every type of stressful encounter, effective copers typically engage in both problem and emotion focused coping behaviors. Thus, one aspect of research in this area has been the identification of what type of coping mode(s) people use when faced with different
types of stressors. For example, in the 1,332 coping episodes that were described by 100 middle aged community residing adults, less than two percent utilized only one mode of coping (Folkman & Lazarus, 1980).

Similarly, in a qualitative study among women (N=6) who were at increased risk for developing breast cancer, Hesky (1987) reported that women both faced and avoided their threat of breast cancer through the use of a mixture of both problem and emotion focused coping behaviors. All six women faced this breast cancer health threat by trying to control the outcome through prayer or lifestyle changes, thinking about a positive outcome in which the threatened harm does not occur, i.e., the biopsy will show the lump was benign, or thinking about both positive and negative possibilities should the threatened harm actually occur. The women avoided dealing with the threat by denying that it existed or distracting themselves from it.

Problem focused coping involves the management or alteration of a problem causing distress. Generally, such coping efforts usually refer to behaviors that reflect healthy, adaptive, reality oriented activities (Koenig, George, & Siegler, 1988).

Emotion focused coping behaviors are cognitive efforts that are directed at reducing or managing emotional distress (Folkman & Lazarus, 1980). They do not directly alter the actual environmental circumstances that are present, but rather serve to change how such circumstances
are perceived (Lazarus, in press). These coping behaviors are used in an attempt to maintain hope and optimism, to deny fact and implication, to refuse to acknowledge the worst, or to act as if what may happen does not matter (Lazarus & Folkman, 1984). This type of coping works by creating a sense of safety or gratification that is often the product of self-deception or reality distortion.

Although such behaviors do not alter the risk factors associated with a health threat, they may reduce or short circuit stress reactions. This is accomplished by temporarily reducing anxiety to an endurable level in an effort to achieve a sense of control over the threat, and thereby provide an opportunity for primary prevention coping (Lazarus, 1981, 1985; Koenig et al., 1988; Cohen & Lazarus, 1973; Pearlin & Schooler, 1978).

However, while the use of denial and avoidance can succeed in lowering emotional distress, it may also simultaneously prevent an individual from realistically addressing a threat that is responsive to action (Lazarus & Folkman, 1984; Matheny, Aycock, Pugh, Curlette, & Cammella, 1986). In this case, a person may cope with a health threat by misinterpreting the situation in a way that leads to a benign appraisal (Lazarus, Averill, & Opton, 1974).

One research study that clearly supports the need for, as well as the drawbacks to emotion focused coping was conducted by Katz, Weiner, Gallagher, and Hellman (1970). These investigators interviewed 30 women who had developed
a breast lump and were awaiting breast biopsy. The primary aim of this study was to identify how women in such an ambiguous and potentially life-threatening situation coped with this health threat.

Katz et al. reported that six basic defensive behaviors were utilized by these women in an attempt to effectively buffer them from this health threat. The defensive behaviors included displacement, projection, denial with rationalization (the most common and effective defense pattern), stoicism-fatalism, prayer and faith, and a mixture of multiple defenses. Those women who used the defense of denial with rationalization (N=11) were also those who delayed the longest in seeking medical help, and thus, greatly impaired their chances for surgical cure if their breast lesions were found to be malignant.

Research conducted by Rippetoe and Rogers (1987) examined the effects of providing 153 adult women with various types of information about their degree of health threat from breast cancer. Subjects who read the high threat message perceived themselves as more vulnerable to breast cancer than did subjects in the low threat message group. Those women who appraised the threat of developing breast cancer as having no effective response, i.e., no positive outcome, demonstrated fatalistic thinking, resigned themselves to the situation, or put the predicament in the hands of God. When effective coping responses were presented, i.e., women were told of the
efficacy of self breast exam and were convinced that they could effectively utilize this technique, women engaged in more problem focused and less emotion focused coping behaviors.

However, the study by Rippetoe and Rogers (1987) also revealed that when women's level of fear about their risk of developing breast cancer was increased, they responded with efforts to deny or evade thinking about this health threat. While this emotion focused coping behavior did serve to decrease the level of fear these women reported, it also served to decrease their use of self breast exam, a proven problem focused coping behavior (Glaser, 1985).

Health threat appraisals of increased susceptibility to or severity of the disease resulted in increased feelings of hopelessness and use of wishful thinking to deal with the threat. Although this emotion focused coping behavior made the threat appear less severe to these women, it also increased the women's levels of fear. Feelings of hopelessness and use of wishful thinking were classified as maladaptive responses to this health threat by Rippetoe and Rogers, since they served to weaken the women's intentions to practice self breast exam.

Within the problem and emotion focused coping functions are four modes of coping: information seeking, direct action, inhibition of action, and intrapsychic. Each of these modes can be directed at the person or the environment in a threat situation (Lazarus & Launier,
Direct action can take various forms and is defined as any concrete act one carries out to handle stressful events. However, prior to taking direct action to cope with a health threat, an individual may use the information seeking mode of coping in an effort to gather sufficient information about the health threat in order to plan an effective course of action to deal with the threat (Lazarus & Launier, 1978).

The opposite of direct action is inhibition of action, the third mode of coping identified by Lazarus and Launier (1978). This mode of coping involves refraining from action that is impulsive, poorly grounded in information, or potentially dangerous or embarrassing, i.e., an individual protects himself from non-helpful actions (Cohen & Lazarus, 1979). In situations where the person perceives a high degree of helplessness, inhibition of action may become the primary mode of coping (Lazarus & Launier, 1978).

The final mode of coping includes all cognitive processes designed to regulate emotions by making the person feel better. This mode, referred to as the intrapsychic mode of coping, only changes the state of mind of the individual to make the person more comfortable. No actual change in the situation occurs. Traditionally, it includes processes such as denial, repression, avoidance, distancing, positive thinking, wishful thinking, faith,
fatalism, seeking social support, etc.

In situations in which knowledge of the threat is limited or ambiguous, it is hypothesized that there would be less direct action and greater information seeking, and that failure of the information seeking mode would result in an increase in the intrapsychic mode of coping (Ben-Sira & Padeh, 1978; Cohen & Lazarus, 1979).

This hypothesis was supported by a study undertaken to examine the process people used to cope with the experience of having coronary artery by-pass surgery (King, 1985). In this study, information seeking was used most often during the pre-operative period when the level of uncertainty was greatest. Direct action modes of coping were higher after surgery when subjects could participate in their recovery. Positive thinking, an intrapsychic mode of coping, was found to be the most helpful of all the coping strategies at any point in time.

A number of other studies support these theoretical notions about the modes of problem and emotion focused coping. For instance, in a study by McCrae (1984), 151 adult men and women who were faced with a threat situation frequently took concrete actions, sought help, and persevered in a course of action in an effort to cope with the threat. In addition to these problem focused behaviors, subjects also reported utilizing humor, wishful thinking, self-restraint, and tried to avoid thinking about the threat. Such intrapsychic coping behaviors were used
in an attempt to reconstrue the threat or its potential outcome and thereby control the emotions related to the threat.

In 1980, Folkman and Lazarus analyzed the ways 100 community residing middle-aged men and women coped with the stressful events of daily living over the course of one year. They reported that the nature of the threat, i.e., whether it was work or health related, influenced the predominant mode of coping utilized by this sample. Appraisal of health threats were associated with increased use of emotion focused coping. This finding was consistent with other studies that examined how people cope with physical illness or disabilities (Cohen & Lazarus, 1979; Lipowski, 1970; Moos, 1977). In these studies, coping was generally directed toward managing feelings of anxiety and fear, and was thus, primarily emotion focused.

Five years later, Folkman and Lazarus (1985) investigated how college students coped with the stress of course exams. It was reported that students more frequently utilized problem focused forms of coping during the preparation period before the exam, as compared with the waiting period after the exam when nothing could be done to change the outcome. In addition, a positive relationship was found among those students who reported feeling a sense of control over the exam situation and the use of problem focused coping behaviors. A feeling of control was negatively related to the use of emotion
focused coping behaviors.

Folkman and Lazarus'(1985) findings were supported by the work of Wong and Reker (1985) who also found that when a threatening event was appraised by their type A subjects as less controllable, more emotion focused coping behaviors were utilized to deal with it. Problem focused coping behaviors were more frequently utilized among this sample when the threat was perceived to be controllable.

Similarly, Bachrach (cited in Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986) studied the way community residents coped with the threats associated with having a hazardous waste facility in their neighborhood. Bachrach reported that those residents who appraised this health threat as changeable utilized primarily problem focused coping behaviors to deal with this threat.

Building on this earlier work, Folkman et al. (1986), sought to examine the relationships among the concepts of cognitive appraisal and coping behaviors. The same subject (N=150) was compared with him/herself across five stressful encounters, one of which was a threat to one's own physical health. In such health threat appraisal situations, subjects tended to cope with the health threat by seeking social support and using escape avoidance behaviors. However, those subjects who appraised the health threat situation as changeable used more confrontive coping and planful problem solving behaviors. Whereas, subjects who appraised the health threat situation as one which had to
be accepted, utilized more emotion focused behaviors such as distancing and escape avoidance to deal with the health threat.

The degree of threat appraised by the client also influences the predominant mode of coping utilized. According to Lazarus and Folkman (1984), clients that perceive relatively low degrees of threat use problem and emotion focused modes of coping relatively equally. Moderate levels of perceived threat result in predominately problem focused coping behaviors. At high levels of threat, the predominant form of coping used is emotion focused.

Gass (1987) reported that the higher the degree of perceived threat among conjugally bereaved widows, the greater the use of "less adequate", i.e., emotion focused ways of coping. This study lends support for Lazarus' position that more adaptive reality oriented forms of coping occur when threat is comparatively mild.

Another study supportive of the relationships described above was conducted by Strauss, Solomon, Costanza, Worden, and Foster (1987). The purpose of the study was to compare breast self-exam practices and beliefs of women who had a history of breast cancer (n = 59) with women who had a surgically treated benign breast lump and those who had not had a breast lump that required treatment (n = 33).

Women in the breast cancer group perceived breast cancer to be significantly less threatening than did either
the benign or general population groups [F (2, 160) = 5.0, p < .01]. The frequency of breast self-exam, a problem focused coping behavior, was significantly higher in the breast cancer group than in either of the other two groups [F (2, 169) = 17.5, p < .001]. These findings lend support to the theoretical notions presented earlier which hypothesized that level of perceived threat impacts ability to effectively cope with health threat.

In addition, Strauss et al. found that women in the breast cancer group were significantly more proficient and knowledgeable about correct breast self-exam technique compared to women in the general population group. Since there were not significant differences in the percentage of women in each group who had been taught breast self-exam by a physician or nurse, this result cannot be attributed to whether or not a woman had been previously trained to conduct breast self-exam.

In summary, this review of research reveals that regulation of emotional response to a threatening event is a necessary but not sufficient condition to achieve effective coping. Both problem and emotion focused modes of coping are utilized to effectively cope with health threats. Secondly, if a health threat is appraised as amenable to change, then the problem focused mode of coping is most likely to predominate. However, if through the health threat appraisal process a person believes that nothing can be done to modify their risk of illness, then
the emotion focused form of coping will be most prominent.

The literature also indicates that when a high degree of health threat is appraised, emotion focused coping will predominate. Problem focused modes are more abundant when the degree of health threat is moderate. And finally, having both an awareness of a health threat and effective ways to cope with it are necessary in order to take action or gain knowledge aimed at reducing a health threat.

Research Questions and Hypotheses

The specific research questions and hypotheses which have been developed from the literature and theoretical propositions are:

**Questions**

1. What is the degree of breast cancer threat appraisal reported by women with family histories of breast cancer?
2. What are the primary prevention coping behaviors used by women with family histories of breast cancer?
3. What is the relationship between the degree of breast cancer threat appraisal and the number of primary prevention coping behaviors used by women with family histories of breast cancer?
4. Among women with family histories of breast cancer, how much of the explained variance in primary prevention coping behaviors is accounted for by actual breast cancer risk and breast cancer threat appraisal scores?

**Hypotheses**
1. Various patterns of breast cancer threat appraisal are associated with the types of primary prevention coping behaviors used among women with family histories of breast cancer.

2. Among women with family histories of breast cancer, a positive relationship exists between actual breast cancer risk and breast cancer threat appraisal.

The following chapter reviews the study design, description of the sample, data collection methods, and reliability and validity data for the instruments utilized in this research.
CHAPTER 4
Methodology

Based on existing knowledge about the relationships between actual breast cancer risk, breast cancer threat appraisal, and primary prevention coping behaviors among women with family histories of breast cancer, an ex-post facto descriptive correlational design was used to explore the relationships among these variables. The objective of this type of design is to describe and obtain a measure of the strength of the relationships among the variables of interest. Thus, since no experimental controls were introduced, causality cannot be established through this research.

Sample

Due to lack of a national registry of female relatives of breast cancer patients, a purposive sampling technique (Babbie, 1973) was used to obtain subjects. A list of potential subjects was compiled by asking women with family histories of breast cancer to provide the names and addresses of female relatives. In addition, approximately 125 subjects were obtained from a list provided by the principle investigator of a breast cancer risk project at Harper Hospital, Detroit, Michigan.

To be eligible to participate in the study, each subject met the following inclusion criteria:

1. Was able to respond to a written questionnaire.
2. Was at least 18 years of age or older.
3. Had a first (mother and/or sister) and/or second
(grandmother and/or aunt) degree relative diagnosed
with breast cancer.

4. Consented to complete a mailed questionnaire.

Based on a power analysis (Cohen, 1977), a sample of
120 subjects would be adequate to detect a moderate effect
size (.15) with a power of .80 and alpha of .05 (based on
multiple regression analysis). A minimum return rate of
50% was needed to assure representativeness of the sample
(Burns & Grove, 1987). In an effort to encourage response
to the questionnaire, the cover letter stated that for
every questionnaire returned to the principle investigator,
a contribution would be made to the American Cancer
Society's research fund.

Data Collection Procedure

The cover letter (see Appendix A), postcard consent
form (see Appendix B), and the questionnaire along with a
stamped pre-addressed return envelope was sent to 297
subjects. Anonymity of each participant was maintained by
requesting the subjects to return the pre-addressed stamped
postcard separately from the questionnaire. By signing the
post card, the subject indicated her agreement to
participate in the study and that she had returned the
questionnaire under separate cover. Upon receipt of the
questionnaire, the investigator arbitrarily assigned it a
code number. The postcards were filed and used to forward
each requesting participant a copy of the study's
abstract. After a period of three weeks, this initial mailing yielded a response rate of 59% or 176 subjects.

A follow-up letter (see Appendix C), a second questionnaire, pre-addressed stamped return envelope, and postcard was mailed to 121 nonrespondents thee weeks after the initial mailing. This second mailing yielded an additional 49 subjects (17% response rate).

A second follow-up letter (see Appendix D), third questionnaire, pre-addressed stamped return envelope and postcard was sent to the remaining 72 nonrespondents during the fifth week of data collection. Three weeks later, an additional 18 subjects (6% response rate) had responded.

Data collection closed at the end of eight weeks.

The overall response rate was 82% with a total of 243 subjects responding to the questionnaire. However, several questionnaires were eliminated from the sample due to large amounts of missing data, lack of a family history of breast cancer, or the development of breast cancer in the subject.

**Description of the Sample**

The final sample consisted of 209 women with family histories of breast cancer. Thus, the data collection procedure yielded a sample size that exceeded the requirement as identified in the power analysis.

Ninety-three percent of the respondents were caucasian ranging in age from 18 to 76 years. As shown in Table 3, the majority of the women were married, employed in a professional role, and were primarily catholic or
Table 3

Demographic Characteristics of Sample (N = 209)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>42.9</td>
<td>10.7</td>
<td>18 - 76</td>
</tr>
<tr>
<td>Education in years</td>
<td>15.8</td>
<td>2.4</td>
<td>9 - 19</td>
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<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Percentage</th>
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<td><strong>Marital Status</strong></td>
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<tr>
<td>Single</td>
<td>39</td>
<td>18.8</td>
</tr>
<tr>
<td>Married</td>
<td>141</td>
<td>67.8</td>
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<tr>
<td>Widowed</td>
<td>4</td>
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</tr>
<tr>
<td>Separated</td>
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<tr>
<td>Divorced</td>
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<td>Total</td>
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<tr>
<th>Occupation</th>
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<tr>
<td>Officials/Managers</td>
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<tr>
<td>Professionals</td>
<td>86</td>
<td>41.3</td>
</tr>
<tr>
<td>Technicians</td>
<td>14</td>
<td>6.7</td>
</tr>
<tr>
<td>Sales</td>
<td>10</td>
<td>4.8</td>
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<tr>
<td>Office/Clerical</td>
<td>30</td>
<td>14.4</td>
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<tr>
<td>Skilled Craft Worker</td>
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</tr>
<tr>
<td>Service Worker</td>
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<td>2.9</td>
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<tr>
<td>Other</td>
<td>36</td>
<td>17.3</td>
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<tr>
<td>Total</td>
<td>208</td>
<td>100.0</td>
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<tr>
<td>Catholic</td>
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<tr>
<td>Protestant</td>
<td>76</td>
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<tr>
<td>Jewish</td>
<td>11</td>
<td>5.3</td>
</tr>
<tr>
<td>Agnostic</td>
<td>14</td>
<td>6.7</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>6.7</td>
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<tr>
<td>Total</td>
<td>208</td>
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<table>
<thead>
<tr>
<th>Income</th>
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<tbody>
<tr>
<td>$ 5,000 - 9,999</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>10,000 - 14,999</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>15,000 - 24,999</td>
<td>19</td>
<td>9.5</td>
</tr>
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<td>25,000 - 34,999</td>
<td>23</td>
<td>11.4</td>
</tr>
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<td>35,000 - 49,999</td>
<td>36</td>
<td>17.9</td>
</tr>
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<td>50,000 - 74,999</td>
<td>56</td>
<td>27.9</td>
</tr>
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<td>75,000 - 99,999</td>
<td>31</td>
<td>15.4</td>
</tr>
<tr>
<td>100,000 or more</td>
<td>29</td>
<td>14.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
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</tbody>
</table>
protestant with high education and income levels.

The majority of subjects (n = 177) had at least one primary relative, i.e., mother or sister, who had been diagnosed with breast cancer. The remainder of the sample (n = 32) had second and third degree relatives with breast cancer. In terms of the number of affected relatives each subject reported, 100 women had only one relative diagnosed with breast cancer, 63 subjects reported two relatives with breast cancer, 31 with three relatives, and 15 women reported breast cancer diagnoses in four or more of their relatives. Most subjects reported that the affected relative was their mother or aunt while a smaller percentage reported sisters or grandmothers afflicted with the disease (see Table 4).

**Instruments**

The description of each instrument used in this study includes the conceptual, theoretical, and operational definition for the variable of interest, followed by a description of the instrument used to measure the variable in question. The conceptual-theoretical-empirical structure upon which this research was based is presented in Figure 2.

**Breast Cancer Risk Index**

Conceptually, breast cancer risk factors are defined as any internal and/or external environmental stressor that has the potential to penetrate a client's flexible and normal lines of defense and disrupt client stability.
Table 4

Relationship and Number of Affected Relatives per Subject

<table>
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<tr>
<th>Variable</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Relatives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>100</td>
<td>47.8</td>
</tr>
<tr>
<td>Two</td>
<td>63</td>
<td>30.1</td>
</tr>
<tr>
<td>Three</td>
<td>31</td>
<td>14.8</td>
</tr>
<tr>
<td>Four</td>
<td>13</td>
<td>6.2</td>
</tr>
<tr>
<td>Five</td>
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</tr>
<tr>
<td>Six</td>
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</tr>
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<td><strong>Total</strong></td>
<td>209</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Type of Relative</strong></th>
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</thead>
<tbody>
<tr>
<td>Mother</td>
<td>134</td>
<td>35.0</td>
</tr>
<tr>
<td>Sister</td>
<td>62</td>
<td>16.5</td>
</tr>
<tr>
<td>Daughter</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Grandmother</td>
<td>40</td>
<td>10.5</td>
</tr>
<tr>
<td>Aunt</td>
<td>103</td>
<td>27.0</td>
</tr>
<tr>
<td>Great aunt/grandmother</td>
<td>25</td>
<td>6.5</td>
</tr>
<tr>
<td>Cousin/niece</td>
<td>17</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>382</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(Neuman, 1982; 1989).

At the theoretical level, breast cancer risk factors are defined as any genetic/biological characteristics, personal health habits, lifestyle, and/or environmental factors that are present prior to the development of breast cancer signs and symptoms, and which predispose a woman to the development of breast cancer.

This variable will be measured by obtaining a woman's relative risk score from the Breast Cancer Risk Index (Gail et al., 1989) which examines the following four breast cancer risk factors: (1) breast cancer history in first degree relatives, (2) age at menarche, (3) age at first childbirth, and (4) history of benign breast biopsies.
<table>
<thead>
<tr>
<th>Conceptual Level Concepts</th>
<th>Stressor</th>
<th>---›</th>
<th>Stressor Appraisal</th>
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<td>---›</td>
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<td>---›</td>
<td>Primary Prevention</td>
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<tr>
<td></td>
<td>Risk Factors</td>
<td></td>
<td>Threat Appraisal</td>
<td></td>
<td>Coping Behaviors</td>
</tr>
<tr>
<td>Empirical Indicators</td>
<td>Breast Cancer</td>
<td></td>
<td>Moneyham Threat</td>
<td></td>
<td>Jalowiec Coping Scale</td>
</tr>
<tr>
<td></td>
<td>(Gail et al.,</td>
<td></td>
<td>Susceptibility</td>
<td></td>
<td>Coping Scale</td>
</tr>
<tr>
<td></td>
<td>1989)</td>
<td></td>
<td>Scale (Champion,</td>
<td></td>
<td>(Lancaster, 1989)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1988)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2.** Conceptual-Theoretical-Empirical Model.
The Breast Cancer Risk Index (See Appendix E) is a method, devised by Mitchel Gail and collaborators from the National Cancer Institute, to estimate the chance that a woman with a given age and risk factors will develop breast cancer. The development of this index was based on data obtained from the Breast Cancer Detection Demonstration Project which was jointly sponsored by the American Cancer Society and the National Cancer Institute. During 1973 thru 1978, 284,780 women between the ages of 35 and 74 years were recruited to obtain annual screenings, i.e., physical exams and mammographies, for breast cancer. The project was carried out at 29 project centers that were widely distributed throughout the United States. When screening was completed in 1979, 64,185 women from the initial sample were selected for an additional five year follow-up to assess the biology and natural history of breast disease.

Gail et al. (1989) developed a model of relative risks for various combinations of four breast cancer risk factors that was based on data from 2,852 white cases and 3,146 white controls from the Breast Cancer Detection Demonstration Project. For each case, a matched control was selected from women who did not receive a recommendation for breast biopsy between 1978 and 1980. The matching variables included age at entry into the screening program (in 5 year intervals), race, participant's screening center, time of entry into the
screening program (within 6 months), and length of participation in the screening program. Risk factor information was collected during a home interview of both cases and controls.

Analysis of a variety of breast cancer risk factors was conducted from the data supplied by this population. The major predictors of breast cancer risk in this population were a family history of breast cancer in a first degree relative, a late age at first childbirth, early menarche, and multiple previous benign breast biopsies. As presented in the review of literature, these four risk factors have been consistently identified in other population based studies, and thus, are the four breast cancer risk factors that comprise this risk model.

The relative risks of these breast cancer risk factors and their combinations were determined from an unconditional logistic regression analysis that included the main effects of age at menarche, number of breast biopsies, age at first live birth, number of first degree relatives with breast cancer, and age of the subject (< 50 years or ≥ 50 years). Interaction effects between the age category and number of biopsies, as well as between age at first live birth and number of affected first degree relatives were also examined.

The coefficients from the equation derived from the log of the odds ratio for breast disease was converted to relative risk factors. Thus, the relative risks for
individual combinations of these risk factors can be obtained by multiplication of the relative risk scores for each risk factor present.

A relative risk is defined as the "probability of the outcome among the exposed (cases), divided by the probability of the outcome in the unexposed (controls)" (Freeman, 1990). If the probability of the outcome is the same in both groups, then the relative risk ratio is 1.0 (unity). A relative risk of 1.0 is called the value of no effect or the null value. A relative risk of 3.0 means that the cases were three times as likely to have the outcome in question. If the relative risk was 0.5, a preventive effect would be indicated for that factor because 0.5 is less than unity.

The Breast Cancer Risk Index yields interval level data and has content validity as established by a critical review of the research literature which was found to be congruent with the risk factors selected. However, should future research studies reveal that risk factors beyond those included in this measure contribute to a woman's risk of developing breast cancer, the model may not be valid. Thus, to the extent that future research may discover a truly better model, this index is subject to systematic error.

Moneyham Threat Index & Breast Cancer Susceptibility Scale

The variable of breast cancer threat appraisal was measured by obtaining a woman's score on both the Moneyham
Threat Index (1989) and the Breast Cancer Susceptibility Scale (Champion, 1988). The conceptual definition of breast cancer threat appraisal is as follows: The process of evaluating the meaning a health related stressor has to the client and through which the client evaluates whether that health related stressor is relevant to the maintenance of client system stability (Neuman, 1982; 1989).

At a theoretical level, breast cancer threat appraisal occurs when one is faced with the presence of actual breast cancer risk factors. It is defined as the process involved in evaluating one's own perceived (1) susceptibility to breast cancer, (2) situational controls, (3) involvement of personal stakes, and (4) expected outcomes.

The Moneyham Threat Index (See Appendix F) is a 15 item self-report measure that yields interval level data from a five point Likert scale. The Likert scale ranges from "strongly disagree" to "strongly agree". It assesses thoughts and behaviors associated with three dimensions of appraisal through its three, five item subscales. These include stakes, outcome expectancy, and control. The scale is scored by summing the five items on each subscale and obtaining a total score from the addition of scores from each of the three subscales.

Content validity of the index was assessed by a panel of 5 experts in the area of stress and coping. The panel was in 100 percent agreement on 24 out of 34 of the original items. Comments from the experts regarding all
items were used to evaluate and delete additional items (L. L. Moneyham, personal communication, April 25, 1989). The final form of the current instrument consists of 15 items.

As reported by Moneyham, the instrument has a Cronbach's alpha of .86 among an adult female population. Its three dimensional structure was supported by factor analysis and accounted for 67% of the variance in threat appraisal. Internal consistency measures for the subscales were as follows: Stakes=.77; Outcome Expectancy=.85; and Control=.87.

Construct validity was assessed by calculating correlations of the MTI to the Profile of Moods State Questionnaire. Consistent with predictions derived from theory about the relationship between threat and emotional response, scores on the MTI were positively correlated with negative mood states as measured by the Profile of Mood States ($r = .54, p < .001$) and negatively correlated with positive mood ($r = -.40, p < .001$). Discriminant analysis revealed that scores on the MTI were found to predict high and low negative mood groups at a significant level ($\chi^2 = 45.82, p = .0001$).

Champion's (1988) breast cancer susceptibility scale is a seven point Likert scale that consists of five items which reflect a woman's perceived probability of developing breast cancer (See Appendix G). This scale yields interval level data and is scored by summing responses to the items. Content validity was established using a panel of
national experts to rate items for clarity and meaning (Champion, 1984; 1988). Evidence of construct validity was established through factor analysis and multiple regression techniques (Champion, 1984; 1988). The internal consistency of the scale is .89 (V. L. Champion, personal communication, April 5, 1989) while the two week test-retest stability correlation coefficient was .86 (Champion, 1984). These findings are similar to those reported by Lashley (1987) in which this susceptibility scale yielded an alpha coefficient of .82, but a three week test-retest correlation of only .68.

For the purposes of this research, the five items on the Susceptibility scale and the 15 items on the Moneyham Threat instrument were combined to form an index to measure the concept of breast cancer threat appraisal. These 20 items were examined to confirm the nature and number of factors that were theorized to comprise the concept of threat appraisal. Data from these 20 items were subjected to factor analysis using a principal components solution followed by varimax rotation. A criterion factor loading of .45 was used to include an item within a factor since loadings of this magnitude indicate at least a 20% overlap in variance between the variable and the factor (Tabachnick & Fidell, 1983).

As noted in Table 5, factor analysis of the data yielded the expected four factors all with eigenvalues over 1.0. The first factor contained the five susceptibility
Table 5

Varimax Factor Pattern Matrix from the Breast Cancer Threat Appraisal Scale

<table>
<thead>
<tr>
<th>Factors/Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Susceptibility</strong></td>
<td></td>
</tr>
<tr>
<td>I am likely to develop breast cancer during my lifetime</td>
<td>.89</td>
</tr>
<tr>
<td>I feel I will get breast cancer in the future</td>
<td>.89</td>
</tr>
<tr>
<td>There is a good chance I will get breast cancer</td>
<td>.91</td>
</tr>
<tr>
<td>My chances of getting breast cancer are great</td>
<td>.89</td>
</tr>
<tr>
<td>I am more likely than the average woman to get breast cancer</td>
<td>.82</td>
</tr>
<tr>
<td><strong>Factor 2: Control</strong></td>
<td></td>
</tr>
<tr>
<td>I feel helpless in this situation</td>
<td>.74</td>
</tr>
<tr>
<td>There is no way to solve the problems in this situation</td>
<td>.76</td>
</tr>
<tr>
<td>There is little I can do to make things right</td>
<td>.82</td>
</tr>
<tr>
<td>I have little control over things that are happening in this situation</td>
<td>.83</td>
</tr>
<tr>
<td>There is little I can do to change things in this situation</td>
<td>.83</td>
</tr>
<tr>
<td><strong>Factor 3: Stakes</strong></td>
<td></td>
</tr>
<tr>
<td>This situation is very important to my wellbeing</td>
<td>.71</td>
</tr>
<tr>
<td>Things involved in this situation make it important to me</td>
<td>.76</td>
</tr>
<tr>
<td>I have a lot at stake in this situation</td>
<td>.81</td>
</tr>
<tr>
<td>Things that I value are involved in this situation</td>
<td>.87</td>
</tr>
<tr>
<td>Something very important to me is involved in this situation</td>
<td>.87</td>
</tr>
<tr>
<td><strong>Factor 4: Outcome Expectancy</strong></td>
<td></td>
</tr>
<tr>
<td>I don't count on good things happening here</td>
<td>.76</td>
</tr>
<tr>
<td>Chances are I will be harmed</td>
<td>.63</td>
</tr>
<tr>
<td>I don't believe this cloud will have a silver lining</td>
<td>.68</td>
</tr>
<tr>
<td>I doubt things will get better</td>
<td>.72</td>
</tr>
<tr>
<td>I expect the worst to happen</td>
<td>.69</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>% Variance Explained</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.25</td>
<td>36.3</td>
<td>36.6</td>
</tr>
<tr>
<td>2</td>
<td>3.35</td>
<td>16.8</td>
<td>53.1</td>
</tr>
<tr>
<td>3</td>
<td>2.82</td>
<td>14.1</td>
<td>67.2</td>
</tr>
<tr>
<td>4</td>
<td>1.11</td>
<td>5.6</td>
<td>72.8</td>
</tr>
</tbody>
</table>
items and accounted for 36.3% of the variance. The second factor contained the five control items and accounted for 16.8% of the variance. The third factor reflected the five stakes items accounting for 14.1% of the variance while the fourth factor, outcome expectancy consisted of the remaining five items and accounted for an additional 5.6% of the variance. In total, these four factors accounted for 72.8% of the variance in breast cancer threat appraisal. Cronbach's alpha for the total scale was .90 while the alphas for the subscales ranged from .85 to .94 which were similar to findings reported by Champion (1988) and Moneyham (1989) (see Table 6).

Jalowiec Coping Scale & Breast Cancer Coping Scale

Primary prevention coping behaviors were measured by obtaining the subjects' scores on two instruments: the revised version of the Jalowiec Coping Scale (Jalowiec, 1989), and the Breast Cancer Coping Scale (Lancaster, 1989). Conceptually, Neuman (1982; 1989) defines primary prevention coping behaviors as the protective buffer that prevents stressors from breaking through the normal line of defense, through the process of interacting and adjusting to one's environment and adjusting the environment to the client based on the appraisal of the stressor experience.

Integration of work by Lazarus and colleagues led to the formulation of the following theoretical definition: The process of initiating both problem and emotion focused modes of coping before breast cancer develops which serve
Table 6

Internal Consistency Measures for the Breast Cancer Threat

Appraisal Scale and Subscales

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Champion</th>
<th>Moneyham</th>
<th>Lancaster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susceptibility</td>
<td>.89</td>
<td></td>
<td>.94</td>
</tr>
<tr>
<td>Stakes</td>
<td>.77</td>
<td></td>
<td>.88</td>
</tr>
<tr>
<td>Outcome Expectancy</td>
<td>.85</td>
<td></td>
<td>.85</td>
</tr>
<tr>
<td>Control</td>
<td>.87</td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td>Total BCTA</td>
<td></td>
<td></td>
<td>.90</td>
</tr>
</tbody>
</table>

to strengthen the client's flexible line of defense through management of appraised health threats (Lazarus & Folkman, 1984; Neuman, 1982; 1989).

The original Jalowiec Coping Scale (Jalowiec & Powers, 1981; Jalowiec, Murphy, & Powers, 1984) was a 40 item measure with a five point Likert scale ranging from "never" to "almost always". It was indicative of the frequency with which each identified coping method was used. The revised version of the Jalowiec Coping Scale (1989) is a 60 item self-report measure that yields interval level data from a four point Likert response format (See Appendix H).

The Likert scale ranges from "never used" (0) to "often used" (3). Subjects are asked to rate how often they use each of the identified strategies to cope with a particular stressor, in this case, the risk of breast cancer. In addition, an effectiveness rating scale has been added to the revised questionnaire to assess the degree of helpfulness of each coping strategy. A four point Likert
scale ranging from "not helpful" (0) to "very helpful" (3) was used to rate the effectiveness of selected coping strategies. Thus, two types of scores were derived from the revised version of the Jalowiec scale, use scores and effectiveness scores.

Jalowiec examined the 60 coping items to determine common conceptual themes. The following eight coping styles emerged from this analysis: confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant. When a sufficient data base has been gathered with this revised scale, factor analysis will be conducted to determine if there is statistical support for the construct validity of this eight factor structure (A. Jalowiec, personal communication, March 19, 1989).

Correlations obtained on use and effectiveness subscale scores from pre and post-op cardiac transplant patients showed almost all nonsignificant correlations (Jalowiec, 1989). Jalowiec contends that this supports the construct validity of the tool. That is, the nonsignificant, and sometimes negative correlations demonstrate that cardiac transplant patients did change their coping behaviors during their pre and post-op experiences because in each of these time periods subjects were dealing with different stressors. The only significant positive correlation was obtained on the self-reliant effectiveness subscale (.82). This finding suggests that no matter when patients used self-reliant coping methods, i.e., pre or post-operatively,
they perceived them to be effective (Jalowiec, 1989).

Three month test-retest reliability coefficients for the revised Jalowiec total use scores were reported as .78, while total effectiveness scores were .59 (Jalowiec, 1989). Thus, coping effectiveness seems less stable over time than coping use subscales. One explanation for this finding may be that not all coping strategies are perceived as effective when dealing with a variety of stressors.

Alpha reliabilities on the revised Jalowiec scale for total use scores ranged from .88 to .94; alpha reliabilities for total effectiveness scores were .81 to .96. Similar internal consistency results were found among this study's sample as the cronbach alpha for the total use scale was .94 and for total effectiveness it was .93. Thus, the revised scale offered good homogeneity reliability.

However, when each of the eight coping subscales were examined, Jalowiec (1989) reported unsatisfactory alphas for the fatalistic and palliative use and effectiveness subscales. Herth (1988) used the revised Jalowiec scale with an elderly sample of widows and widowers (N=75) and also reported unsatisfactory alphas on the palliative use and palliative effectiveness subscales. Herth reported that the alphas for the fatalistic use and fatalistic effectiveness subscales were acceptable (.74 & .71 respectively).

Consistent with reports from Jalowiec and Herth, in
this study unsatisfactory alphas were obtained for the fatalistic and palliative use and effectiveness subscales (see Table 7). However, unlike previously reported results, an unsatisfactory alpha was also obtained for the emotive effectiveness subscale. It is interesting to note that these three subscales are those which have only four to five items per scale as compared to the other five subscales which have five to 13 items per scale and satisfactory alphas. Because these subscales did not adversely affect the overall alpha for use and effectiveness measures, and due to the fact that the alpha coefficient is partly a function of the number of items on a scale (Nunnally, 1978), further analysis was conducted using these subscales. However, future efforts should be directed toward constructing additional items to strengthen these subscales.

The Breast Cancer Coping Scale (Lancaster, 1989) is an 11 item instrument that is consistent with the format of the revised Jalowiec Coping Scale that was described above (See Appendix I). Thus, this scale yields coping use and effectiveness scores. However, unlike the Jalowiec scale, the Lancaster scale seeks to measure primary prevention coping behaviors that are more specific for dealing with the threat of breast cancer than are the general coping strategies presented in the Jalowiec scale.

Content validity of this measure was assessed by four clinical nurse specialists in oncology, three of whom had
Table 7
Internal Consistency Measures for the Jalowiec Coping Use
and Effectiveness Scales and Subscales

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Jalowiec</th>
<th>Herth</th>
<th>Lancaster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confrontive Use</td>
<td>.56 - .81</td>
<td>.96</td>
<td>.85</td>
</tr>
<tr>
<td>Confrontive Eff.</td>
<td>.58 - .84</td>
<td>.94</td>
<td>.84</td>
</tr>
<tr>
<td>Evasive Use</td>
<td>.49 - .80</td>
<td>.91</td>
<td>.83</td>
</tr>
<tr>
<td>Evasive Eff.</td>
<td>.36 - .78</td>
<td>.89</td>
<td>.78</td>
</tr>
<tr>
<td>Optimistic Use</td>
<td>.75 - .86</td>
<td>.91</td>
<td>.78</td>
</tr>
<tr>
<td>Optimistic Eff.</td>
<td>.72 - .93</td>
<td>.87</td>
<td>.79</td>
</tr>
<tr>
<td>Fatalistic Use</td>
<td>.20 - .68</td>
<td>.74</td>
<td>.57*</td>
</tr>
<tr>
<td>Fatalistic Eff.</td>
<td>.45 - .69</td>
<td>.71</td>
<td>.61*</td>
</tr>
<tr>
<td>Emotive Use</td>
<td>.39 - .79</td>
<td>.80</td>
<td>.70</td>
</tr>
<tr>
<td>Emotive Eff.</td>
<td>.06 - .79</td>
<td>.64</td>
<td>.51**</td>
</tr>
<tr>
<td>Palliative Use</td>
<td>.21 - .64</td>
<td>.03</td>
<td>.64</td>
</tr>
<tr>
<td>Palliative Eff.</td>
<td>.27 - .59</td>
<td>.26</td>
<td>.62</td>
</tr>
<tr>
<td>Supportant Use</td>
<td>.40 - .71</td>
<td>.78</td>
<td>.71</td>
</tr>
<tr>
<td>Supportant Eff.</td>
<td>.20 - .71</td>
<td>.75</td>
<td>.70</td>
</tr>
<tr>
<td>Self-reliant Use</td>
<td>.58 - .79</td>
<td>.51</td>
<td>.72</td>
</tr>
<tr>
<td>Self-reliant Eff.</td>
<td>.39 - .89</td>
<td>.72</td>
<td>.72</td>
</tr>
<tr>
<td>Total Use</td>
<td>.88 - .94</td>
<td>.64</td>
<td>.94</td>
</tr>
<tr>
<td>Total Eff.</td>
<td>.81 - .96</td>
<td>.85</td>
<td>.93</td>
</tr>
</tbody>
</table>

* Subscale composed of only four items.
** Subscale composed of only five items.

oncology certification while the fourth was doctorally
prepared. The content validity index (Waltz, Strickland, &
Lenz, 1984) for this measure was .81 and all four content
experts indicated that the items on the instrument
appropriately represented the domain of available content.

The 11 items on the Breast Cancer Coping Scale were
examined to determine the nature and number of factors that
comprise this scale. Data from these 11 items were
subjected to an exploratory factor analysis using the
principal components solution followed by varimax rotation.
The correlation matrix for the 11 items comprising this
scale was examined to insure that large correlations indicative of multicollinearity did not exist. The range of correlations for these items was −.05 to .62 thus, all variables were retained.

Examination of the eigenvalues for this scale revealed three factors that had values greater than one. Data from the scree plot was also suggestive of a three factor solution. The criterion used to include an item within a factor was a factor loading of .45 or greater (Tabachnick & Fidell, 1983).

The first factor accounted for 27% of the variance and contained four items reflecting behaviors such as increasing dietary fiber and/or vitamin intake, as well as decreasing dietary caffeine and/or fat intake. All four items reflected behaviors related to dietary interventions and were thus labeled "dietary factors".

Factor two was comprised of items that reflected a need to decrease or avoid consumption of alcohol and cigarettes and/or to avoid use of oral contraceptives. These three items reflected behaviors related to avoidance of chemical substances that could cause harm and was labeled "chemical agents"; it accounted for 13.8% of the variance.

The third factor was labeled "early detection measures" and it accounted for 11.1% of the variance. Three items comprised this factor and all related to measures of early detection for breast cancer such as obtaining a yearly physician breast exam, mammogram, or conducting monthly
self-breast exams. The only item that did not load on any of these three factors was that of maintaining an ideal body weight. The three factors together accounted for 52% of the variation in specific breast cancer coping behaviors.

Cronbach's alpha for the subscales ranged from .50 to .65 (see Table 8) while the alpha for the total use scale was .70 and the total effectiveness scale was .76. Nunnally (1978) states that a reliability coefficient of .70 or higher is an acceptable level for new scales. Thus, while additional work needs to be done to improve the reliability of this measure, it is currently acceptable for use in this descriptive correlational design.

In summary, the instruments utilized in this research were found to be reliable and valid measures of the constructs they represented. Table 9 presents a compilation of the major variables of interest and the instrument(s) used to measure each.
Table 8

Internal Consistency Values and Varimax Factor Pattern

Matrix from the Breast Cancer Coping Scale

<table>
<thead>
<tr>
<th>Factors/Items</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Dietary Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Increase dietary fiber intake</td>
<td>.69</td>
</tr>
<tr>
<td>Decrease dietary caffeine intake</td>
<td>.63</td>
</tr>
<tr>
<td>Increase vitamin intake</td>
<td>.61</td>
</tr>
<tr>
<td>Decrease dietary fat intake</td>
<td>.68</td>
</tr>
<tr>
<td><strong>Factor 2: Chemical Agents</strong></td>
<td></td>
</tr>
<tr>
<td>Decrease alcohol intake</td>
<td>.61</td>
</tr>
<tr>
<td>Avoid use of oral contraceptives</td>
<td>.72</td>
</tr>
<tr>
<td>Avoid/decrease cigarette use</td>
<td>.79</td>
</tr>
<tr>
<td><strong>Factor 3: Early Detection Measures</strong></td>
<td></td>
</tr>
<tr>
<td>Perform monthly self-breast exams</td>
<td>.57</td>
</tr>
<tr>
<td>Obtain yearly/bi-yearly mammograms</td>
<td>.79</td>
</tr>
<tr>
<td>Obtain yearly breast exam from a health care provider</td>
<td>.76</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>Alpha</th>
<th>Eigenvalue</th>
<th>% Variance Explained</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.60</td>
<td>2.97</td>
<td>27.0</td>
<td>27.0</td>
</tr>
<tr>
<td>2</td>
<td>.65</td>
<td>1.51</td>
<td>13.8</td>
<td>40.8</td>
</tr>
<tr>
<td>3</td>
<td>.50</td>
<td>1.21</td>
<td>11.1</td>
<td>51.9</td>
</tr>
<tr>
<td>Variable</td>
<td>Level of Measurement</td>
<td>Empirical Indicator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independent Variables:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Breast Cancer Susceptibility Scale (Champion, 1988)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependent Variable:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Breast Cancer Coping Scale (Lancaster, 1989)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5

Results

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS/PC+) computer program. The analyses are based on a sample with a maximum value of 209 subjects. It should be noted that when N or n's are reported, their totals may not yield 209 since some participants chose not to answer all the items.

The presentation of data from this research addresses the research questions and hypotheses as they relate to the purposes of this study which were: (1) to describe how women with family histories of breast cancer appraise this health threat; (2) to identify the primary prevention coping behaviors used by women with family histories of breast cancer; (3) to examine the relationship between a woman's degree of breast cancer threat appraisal and the number of primary prevention coping behaviors used; and (4) to determine the percent of variation in primary prevention coping behaviors that is accounted for by both the degree of actual and appraised breast cancer risk; (5) to test the hypothesis that a woman's pattern of breast cancer threat appraisal is associated with the types of primary prevention coping behaviors used; and (6) to test the hypothesis that among women with family histories of breast cancer, a positive relationship exists between actual breast cancer risk and breast cancer threat appraisal.

Degree of Breast Cancer Threat Appraisal
The first research question sought to determine the degree of breast cancer threat appraisal reported by women with family histories of breast cancer. The possible range for a woman's breast cancer threat appraisal score was 20 to 110. For this sample, the mean breast cancer threat appraisal score ranged from 20 to 110 with a mean of 67.7 (SD=14.7). Subjects scores were collapsed to form a low, moderate, and high threat group. Scores ranging from 20 to 50 indicated that the degree of appraised breast cancer threat was low. Scores of 51 to 79 reflected a moderate degree of appraised breast cancer threat and scores ranging from 80 to 110 indicated high degrees of breast cancer threat appraisal.

When scores were collapsed into groupings as described above, 10% of this sample indicated low threat appraisal, 71% of the group indicated moderate threat appraisal, and 19% of the subjects were in the high threat appraisal group. The moderate to high degree of breast cancer threat appraisal reported by 90% of this sample was expected considering that all participants had at least one relative who had been diagnosed with breast cancer.

When asked to compare themselves to the average woman, 79.4% rated their perceived risk of developing breast cancer as higher than that of the average woman while only 20.6% believed that their potential of developing breast cancer was the same or less than the average woman's. Thus, among this sample of women with family histories of
breast cancer, a moderate to high degree of perceived breast cancer risk was present.

In addition, subjects were asked to evaluate their own chances of developing breast cancer relative to factors in their own past and present behavior. Only 7.7% of the sample felt that either they had no chance at all or only a small or very small chance of developing breast cancer. Thus, 92.3% of this sample felt their chances of developing breast cancer were related to factors in their own past and present behavior.

Description of Primary Prevention Coping Behaviors

The identification of the type of primary prevention coping behaviors used by women at increased risk for breast cancer was the focus of the second research question. Two instruments were utilized to obtain this data. The Jalowiec Coping Scale, an eight subscale measure, was used to identify general types of primary prevention coping behaviors whereas the Breast Cancer Coping Scale was used to identify coping behaviors specific to dealing with the threat of breast cancer.

The only item that was rated as "often used" and "very helpful" by more than 75% of the sample came from the Breast Cancer Coping Scale and was the early detection measure of obtaining a yearly breast exam by a physician. The coping behaviors on the Jalowiec scale that were rated as "often used" and "very helpful" by 50 to 75% of the sample are presented in Table 10. Three items were
<table>
<thead>
<tr>
<th>Subscale/Behaviors</th>
<th>Often Used</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Jalowiec Coping Scale:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optimistic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tried to keep life as normal as possible</td>
<td>153</td>
<td>73.9</td>
<td>124</td>
</tr>
<tr>
<td>Tried to think positively</td>
<td>142</td>
<td>67.9</td>
<td>115</td>
</tr>
<tr>
<td>Thought about the good things in their life</td>
<td>118</td>
<td>56.7</td>
<td>111</td>
</tr>
<tr>
<td><strong>Confrontive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tried to find out more about the problem</td>
<td>125</td>
<td>60.4</td>
<td>116</td>
</tr>
<tr>
<td>Tried to handle things one step at a time</td>
<td>108</td>
<td>51.9</td>
<td>104</td>
</tr>
<tr>
<td><strong>Breast Cancer Coping Scale:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Early Detection Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtained yearly breast exam from a health care provider</td>
<td>179</td>
<td>85.6</td>
<td>160</td>
</tr>
<tr>
<td>Obtained yearly/biyearly mammogram</td>
<td>146</td>
<td>69.9</td>
<td>137</td>
</tr>
<tr>
<td><strong>Chemical Agents</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoided or decreased use of cigarettes*</td>
<td>111</td>
<td>67.7</td>
<td>104</td>
</tr>
<tr>
<td>Avoided use of oral contraceptives**</td>
<td>91</td>
<td>53.5</td>
<td>80</td>
</tr>
<tr>
<td>Decreased alcohol consumption***</td>
<td>98</td>
<td>51.3</td>
<td>75</td>
</tr>
<tr>
<td><strong>Dietary Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tried to keep body weight within recommended range</td>
<td>124</td>
<td>59.3</td>
<td>100</td>
</tr>
<tr>
<td>Decreased dietary intake of fat</td>
<td>105</td>
<td>50.2</td>
<td>101</td>
</tr>
</tbody>
</table>

* This item not applicable for 45 non-smokers.
** This item not applicable for 39 subjects who never used oral contraceptives.
*** This item not applicable for 17 non-drinkers.
from the optimistic subscale while two others were from the confrontive subscale.

Although 50 to 75% of the sample rated six items on the Breast Cancer Coping Scale as behaviors they "often use" to cope with their breast cancer risk, only two of them were identified by more than 50% of the sample as "very helpful" in dealing with breast cancer risk. They included "obtaining a yearly mamography" and "avoiding or decreasing use of cigarettes" (see Table 10).

There were no behaviors on the Breast Cancer Coping Scale that more than 50% of the sample rated as "never used" or "not at all helpful". However, Table 11 identifies those behaviors on the Jalowiec scale that at least 50% of the sample said they "never used" and/or which were rated as "not at all helpful" in dealing with perceived breast cancer threat. Six of the 13 "evasive", three of the five "emotive", three of the seven "palliative" and two of the four "fatalistic" behaviors were "never used" by the majority of this sample. Only one behavior from the 10 possible items on the confrontive subscale fell into this category.

There were several behaviors on the Jalowiec scale that were utilized by some of the women in this sample but were rated as "not at all helpful" in dealing with perceived breast cancer threat. Again, these items came primarily from the "evasive" (n = 3), "emotive" (n = 1), and "fatalistic" (n = 1) subscales. Only one behavior from
Table 11
Non-utilized and/or Ineffective Primary Prevention Coping Behaviors by Subscale

<table>
<thead>
<tr>
<th>Subscale/Behaviors</th>
<th>Never</th>
<th>Used</th>
<th>Not Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Emotive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Worried about the problem</td>
<td>29</td>
<td>13.9</td>
<td>137</td>
</tr>
<tr>
<td>Got mad and let off steam</td>
<td>102</td>
<td>48.8</td>
<td>123</td>
</tr>
<tr>
<td>Took out tensions on someone else</td>
<td>104</td>
<td>50.0</td>
<td>174</td>
</tr>
<tr>
<td>Did something impulsive or risky</td>
<td>138</td>
<td>66.3</td>
<td>166</td>
</tr>
<tr>
<td>Blamed self for situation</td>
<td>160</td>
<td>76.9</td>
<td>194</td>
</tr>
<tr>
<td><strong>Fatalistic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Told self just having bad luck</td>
<td>153</td>
<td>73.2</td>
<td>178</td>
</tr>
<tr>
<td>Resigned self to situation because things looked hopeless</td>
<td>125</td>
<td>60.1</td>
<td>169</td>
</tr>
<tr>
<td>*Prepared for the worst</td>
<td>80</td>
<td>38.3</td>
<td>106</td>
</tr>
<tr>
<td><strong>Evasive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Told self problem was someone else's fault</td>
<td>183</td>
<td>88.0</td>
<td>199</td>
</tr>
<tr>
<td>Avoided being with people</td>
<td>158</td>
<td>76.0</td>
<td>175</td>
</tr>
<tr>
<td>Tried to get out of the situation</td>
<td>146</td>
<td>71.2</td>
<td>162</td>
</tr>
<tr>
<td>Daydreamed about a better life</td>
<td>121</td>
<td>58.2</td>
<td>145</td>
</tr>
<tr>
<td>Slept more than usual</td>
<td>119</td>
<td>57.2</td>
<td>145</td>
</tr>
<tr>
<td>Told self that problem was unimportant</td>
<td>115</td>
<td>55.3</td>
<td>137</td>
</tr>
<tr>
<td>*Wished that the problem would go away</td>
<td>44</td>
<td>21.1</td>
<td>144</td>
</tr>
<tr>
<td>*Put off facing up to the problem</td>
<td>74</td>
<td>35.6</td>
<td>128</td>
</tr>
<tr>
<td>*Tried to ignore/avoid the problem</td>
<td>80</td>
<td>38.5</td>
<td>120</td>
</tr>
<tr>
<td><strong>Palliative</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Took medications</td>
<td>183</td>
<td>88.0</td>
<td>185</td>
</tr>
<tr>
<td>Had a drink</td>
<td>153</td>
<td>73.6</td>
<td>172</td>
</tr>
<tr>
<td>Ate/smoked more than usual</td>
<td>134</td>
<td>64.1</td>
<td>192</td>
</tr>
<tr>
<td><strong>Confrontive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tried to work out a compromise</td>
<td>105</td>
<td>51.7</td>
<td>118</td>
</tr>
<tr>
<td><strong>Self-reliant</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Kept feelings to yourself</td>
<td>44</td>
<td>21.2</td>
<td>103</td>
</tr>
</tbody>
</table>

*Items used to some degree but rated as not helpful by at least 50% of the participants.
seven possible items on the "self-reliant" subscale fell into this category. Thus, the majority of items on the "evasive", "fatalistic", and "palliative" subscales, and all five items on the "emotive" subscale were identified by this sample as ineffective ways of coping with perceived breast cancer threat.

Prior to reading any item on the Jalowiec and Breast Cancer Coping Scales, women were asked to identify actions they took to decrease their risk of developing breast cancer. Eighty-five percent of the subjects (n = 179) responded to this open ended question.

The majority of the responses focused on the need for optimistic and positive attitudes, getting as much information on breast cancer as they could, use of early detection measures, dietary interventions, and avoidance of chemical agents such as alcohol, estrogen, caffeine, etc. Some of these items are components of either the Jalowiec or Breast Cancer Coping Scales. Those that were not on either scale are presented in Table 12.

Subjects who identified participating in breast cancer research as an action they felt decreased their breast cancer risk explained that such an activity provided them with hope for medical breakthroughs, evidence of advances in existing treatments, monitoring by breast cancer specialists, and the most reliable information on breast cancer that was available. The category of avoiding environmental toxins included such activities as avoiding
Table 12

Coping Behaviors Identified by Subjects That Were Not
Components of Either Coping Scale

1. Participate in breast cancer research
2. Increase my exercise/activity level
3. Avoid use of estrogen replacements post menopause
4. Have a prophylactic simple mastectomy
5. Have children and/or breast feed them
6. Avoid environmental toxins
7. Effectively manage stress
8. Practice self-healing exercises
9. Find health care provider with an aggressive approach
to managing breast cancer risk
10. Think about successful recovery of my relatives who
have breast cancer.

chest x-rays, tanning beds, chemical additives in foods,
and air pollutants. Women who identified effective
management of stress as an activity they used to decrease
breast cancer risk did so in a variety of ways including
taking stress management courses, listening to music, using
relaxation techniques, and going for long walks.

In summary, the majority of the women in this sample
utilized confrontive, optimistic and early detection
behaviors to cope with their perceived risk of developing
breast cancer. Emotive, evasive, fatalistic, and
palliative styles of coping were avoided or identified as
ineffective in coping with appraised breast cancer risk.
Those behaviors identified by the subjects themselves were
congruent with the pattern of coping identified by the
Jalowiec and Breast Cancer Coping Scales.

Degree of Appraised Threat and Number of Coping Behaviors
Research question three asked "what is the relationship between the degree of breast cancer threat appraisal and the number of primary prevention coping behaviors used by women with family histories of breast cancer?"

Data analysis revealed a moderate positive significant relationship, $r = .41, p < .001$, between breast cancer threat appraisal and the total number of general coping behaviors used as measured by the Jalowiec Coping Scale. Thus, as degree of perceived threat increased, so did the number of general coping behaviors used. However, breast cancer threat appraisal accounted for only 16% of the variance in general coping behaviors.

No significant relationship was found between breast cancer threat appraisal and the total number of specific coping behaviors used, $r = .13, p > .05$, as measured by the Breast Cancer Coping Scale. As with general coping behaviors, only a small percentage of variance (1.7%) in specific coping behaviors was accounted for by degree of breast cancer threat appraisal. In general, the findings showed that the higher the degree of appraised breast cancer threat, the higher the number of general coping behaviors used. However, similar results were not found for specific coping behaviors.

**Actual Breast Cancer Risk, Breast Cancer Threat Appraisal, and Coping Behaviors**

The fourth research question asked "how much of the
variance in primary prevention coping behaviors is accounted for by breast cancer risk and breast cancer threat appraisal?" The data for this question was analyzed using stepwise multiple regression techniques. Stepwise multiple regression was chosen because it is a statistical technique that allows the investigator to analyze the relationship between a dependent variable (primary prevention coping behaviors) and a set of independent variables (degree of actual breast cancer risk and degree of breast cancer threat appraisal) in an effort to identify the best predictive model from the selected variables.

Examination of the histogram residuals indicated that the data points for these variables followed a normal curve but examination of the scatterplots for those variables indicated a curvilinear relationship when the variable breast cancer risk was involved. Thus, in order to address the assumption of linearity for multiple regression, the log of the independent variable breast cancer risk was calculated and utilized in these analyses.

Two multiple regression analyses were conducted. In the first analysis which predicted the use of general coping behaviors as measured by a subject's total score on the Jalowiec Coping Scale, the log of actual breast cancer risk scores and breast cancer threat appraisal scores were the predictor set of variables. In the second analysis which predicted the use of specific coping behaviors as measured by a subject's total score on the Breast Cancer
Coping Scale, the log of actual breast cancer risk scores and breast cancer threat appraisal scores were again used as the predictor set of variables.

**General Coping Behaviors**

In the first stepwise regression equation that involved general coping behaviors as identified on the Jalowiec Coping Scale, the overall $R^2$ was 17.8% and was significant at $p < .001$. The first independent variable to enter into the regression equation was that of breast cancer threat appraisal. It accounted for 16.9% of the variance in general primary prevention coping behaviors. The log of actual breast cancer risk scores entered next. Although it significantly contributed to the overall amount of variance accounted for, it only explained .9% of additional variance (see Table 13).

Thus, the degree of breast cancer threat appraised is a better predictor of use of general primary prevention coping behaviors than a woman's actual breast cancer risk and, when taken together, the two variables accounted for 17.8% of the variance in general coping behaviors.

**Specific Coping Behaviors**

The overall $R^2$ was only 5.8% in the second stepwise multiple regression equation which explained the variance in the use of specific primary prevention coping behaviors ($p < .05$). While both independent variables entered the equation, this time the log scores of actual breast cancer risk entered first and accounted for the majority of the
Table 13

**Stepwise Multiple Regression Predicting General Primary Prevention Coping Behaviors from Actual and Appraised Breast Cancer Threat**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>Beta Coefficient</th>
<th>Multiple R</th>
<th>R Squared</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>BCTA</td>
<td>.78</td>
<td>.41</td>
<td>.17</td>
<td>37.64*</td>
</tr>
<tr>
<td>Two</td>
<td>BCRisk</td>
<td>12.24</td>
<td>.42</td>
<td>.18</td>
<td>20.03*</td>
</tr>
</tbody>
</table>

* p < .001

variance (3.9%) in specific primary prevention coping behaviors. The scores for the breast cancer threat appraisal variable entered next and accounted for an additional 1.9% of the variance (p < .05) (see Table 14).

Thus, actual breast cancer risk is a slightly better predictor of use of specific primary prevention coping behaviors. However, as with the results for the general coping behaviors, these two variables together explained only a very small percentage (5.8%) of the total variance in specific coping behaviors.

**Breast Cancer Threat Appraisal and Type of Coping Behaviors**

The first hypothesis which proposed a relationship between the pattern of breast cancer threat appraisal and the types of primary prevention coping behaviors used was supported. All of the eight subscale scores and the overall total score on the Jalowiec scale were significantly correlated with the total breast cancer
Table 14

Stepwise Multiple Regression Predicting Specific Primary Prevention Coping Behaviors from Actual and Appraised Breast Cancer Threat

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>Beta Coefficient</th>
<th>Multiple R</th>
<th>R Squared</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>BCRisk</td>
<td>5.46</td>
<td>.19</td>
<td>.04</td>
<td>6.17*</td>
</tr>
<tr>
<td>Two</td>
<td>BCTA</td>
<td>.06</td>
<td>.24</td>
<td>.06</td>
<td>4.62*</td>
</tr>
</tbody>
</table>

* p < .05

threat appraisal score (see Table 15). However, only one of the three subscales on the Breast Cancer Coping Scale, chemical agents, had a modest but significant correlation with the total breast cancer threat appraisal score. Thus, high degrees of appraised breast cancer threat was associated with avoiding alcohol, oral contraceptives, and smoking.

In addition to these preliminary analyses, canonical correlation procedures were also used to examine the data relevant to this research hypothesis. The aim of canonical correlation is to produce a linear combination of the original variables (in this case, breast cancer threat appraisal and general/specific primary prevention coping behaviors) while accounting for a maximum amount of variance in the relationship between the two sets of variables. One assumption of multivariate analysis is that the variables have a normal distribution. Analysis of
Table 15
Pearson Correlation Coefficients Between Breast Cancer Threat Appraisal and the Coping Subscales

<table>
<thead>
<tr>
<th></th>
<th>Susceptibility</th>
<th>Outcome Expectancy</th>
<th>Control</th>
<th>Stakes</th>
<th>Total BCTA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jalowiec Coping Scale:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confrontive</td>
<td>.34***</td>
<td>.04</td>
<td>-.10</td>
<td>.22**</td>
<td>.22**</td>
</tr>
<tr>
<td>Evasive</td>
<td>.25***</td>
<td>.37***</td>
<td>.37***</td>
<td>.26***</td>
<td>.44***</td>
</tr>
<tr>
<td>Optimistic</td>
<td>.27***</td>
<td>-.02</td>
<td>-.00</td>
<td>.18*</td>
<td>.18*</td>
</tr>
<tr>
<td>Fatalistic</td>
<td>.35***</td>
<td>.50***</td>
<td>.44***</td>
<td>.19*</td>
<td>.53***</td>
</tr>
<tr>
<td>Emotive</td>
<td>.25***</td>
<td>.34***</td>
<td>.27***</td>
<td>.29***</td>
<td>.40***</td>
</tr>
<tr>
<td>Palliative</td>
<td>.24***</td>
<td>.20**</td>
<td>.14</td>
<td>.23**</td>
<td>.30***</td>
</tr>
<tr>
<td>Supportive</td>
<td>.23***</td>
<td>.03</td>
<td>-.02</td>
<td>.26***</td>
<td>.20*</td>
</tr>
<tr>
<td>Self-reliant</td>
<td>.34***</td>
<td>.20**</td>
<td>.14*</td>
<td>.17*</td>
<td>.34***</td>
</tr>
<tr>
<td>Total JCS</td>
<td>.37***</td>
<td>.24***</td>
<td>.17*</td>
<td>.30***</td>
<td>.41***</td>
</tr>
<tr>
<td><strong>Breast Cancer Coping Scale:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary factors</td>
<td>.16*</td>
<td>.04</td>
<td>-.02</td>
<td>.07</td>
<td>.11</td>
</tr>
<tr>
<td>Chemical agents</td>
<td>.30***</td>
<td>.10</td>
<td>-.01</td>
<td>.06</td>
<td>.20*</td>
</tr>
<tr>
<td>Early detection</td>
<td>.07</td>
<td>-.20*</td>
<td>-.19*</td>
<td>.10</td>
<td>-.05</td>
</tr>
<tr>
<td>Total BCCS</td>
<td>.26***</td>
<td>.00</td>
<td>-.09</td>
<td>.11</td>
<td>.13</td>
</tr>
</tbody>
</table>

* p ≤ .01; ** p ≤ .005; *** p ≤ .001; all two tailed tests skewness and kurtosis values for the subscales involved in the canonical correlations were generally indicative of
normal distributions.

The set of independent variables that comprised the breast cancer threat appraisal construct consisted of the following four subscales: stakes; outcome expectancy; control; and susceptibility. The set of dependent variables representing the construct of primary prevention coping behaviors in the first canonical analysis included the eight subscales of the Jalowiec Coping Scale, i.e., confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant. The three subscales from the Breast Cancer Coping Scale, i.e., dietary factors, chemical agents, and early detection measures comprised the set of dependent coping variables in the second canonical analysis. 

**Breast Cancer: Threat Appraisal & General Coping Behaviors**

The overall relationship between the two sets of variables (appraisal subcales and Jalowiec subscales) as tested by Wilks lambda (.426) was significant ($p < .001$). The analysis generated three significant canonical variates (see Table 16). Root one explained 38.8% of the variance, root two accounted for an additional 20.7%, and root three added only an additional 7.8%. Thus, a total of 67.3% of the explained variance in both sets of variables was accounted for by these three canonical variates.

Table 16 presents the loadings for the three canonical variates on both sets of variables. Canonical variate one reflected an internal control/positive outcome dimension of breast cancer threat appraisal. Perceptions of having some
Table 16

**Canonical Correlations and Variate Loadings for Breast Cancer Threat Appraisal and General Primary Prevention Coping Behaviors**

<table>
<thead>
<tr>
<th>Root</th>
<th>Eigenvalue</th>
<th>Canonical Correlation</th>
<th>Squared Correlation</th>
<th>Wilks Lambda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.634</td>
<td>.62</td>
<td>.39</td>
<td>.426**</td>
</tr>
<tr>
<td>2</td>
<td>.261</td>
<td>.46</td>
<td>.21</td>
<td>.696**</td>
</tr>
<tr>
<td>3</td>
<td>.085</td>
<td>.28</td>
<td>.08</td>
<td>.878*</td>
</tr>
</tbody>
</table>

**Variate Loadings**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>One</th>
<th>Two</th>
<th>Three</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breast Cancer Threat Appraisal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Susceptibility</td>
<td>.016</td>
<td>-.787</td>
<td>-.704</td>
</tr>
<tr>
<td>Outcome Expectancy</td>
<td>-.587</td>
<td>.019</td>
<td>.182</td>
</tr>
<tr>
<td>Control</td>
<td>-.542</td>
<td>.354</td>
<td>-.127</td>
</tr>
<tr>
<td>Stakes</td>
<td>.073</td>
<td>-.540</td>
<td>.874</td>
</tr>
<tr>
<td><strong>General Primary Prevention Coping Behaviors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confrontive</td>
<td>.484</td>
<td>-.681</td>
<td>-.045</td>
</tr>
<tr>
<td>Evasive</td>
<td>-.257</td>
<td>.272</td>
<td>.627</td>
</tr>
<tr>
<td>Optimistic</td>
<td>.402</td>
<td>-.218</td>
<td>-.205</td>
</tr>
<tr>
<td>Fatalistic</td>
<td>-.740</td>
<td>-.175</td>
<td>-.696</td>
</tr>
<tr>
<td>Emotive</td>
<td>-.130</td>
<td>-.238</td>
<td>.602</td>
</tr>
<tr>
<td>Palliative</td>
<td>-.078</td>
<td>.027</td>
<td>.320</td>
</tr>
<tr>
<td>Supportant</td>
<td>-.047</td>
<td>-.153</td>
<td>.336</td>
</tr>
<tr>
<td>Self-reliant</td>
<td>-.202</td>
<td>.019</td>
<td>-.810</td>
</tr>
</tbody>
</table>

*p < .05; ** p < .001

control over one's breast cancer risk and perceived positive outcomes in such a situation was associated with use of confrontive and optimistic types of general coping behaviors, and avoidance of fatalistic coping behaviors.
The second canonical variate loaded heavily on the susceptibility aspect of breast cancer threat appraisal and to a lesser extent on the stakes dimension. For the coping indicators, canonical variate two loaded negatively on confrontive behaviors. Thus, this variate indicates that a low degree of perceived susceptibility and perceptions that important values are not at risk in this situation was associated with avoidance of confrontive types of general coping behaviors.

The third variate loaded negatively on the susceptibility dimension of breast cancer threat appraisal and positively on the stakes aspect. On the general coping indicators, canonical variate three loads positively on evasive and emotive behaviors and negatively on fatalistic and self-reliant coping behaviors. Therefore, subjects who did not perceive themselves to be highly susceptible to breast cancer but who perceived that important values were involved in this risk situation tended to utilize evasive and emotive coping behaviors and avoided use of fatalistic and self-reliant behaviors. Table 17 presents a summary of these three appraisal and resultant coping patterns.

**Breast Cancer Threat Appraisal and Specific Coping Behaviors**

The overall relationship between the breast cancer threat appraisal subscales and the Breast Cancer Coping subscales as tested by Wilk's lambda (.784) was significant ($p < .001$). The analysis generated two significant
Table 17

Summary of Breast Cancer Threat Appraisal Patterns and Resultant Types of General Coping Behaviors

<table>
<thead>
<tr>
<th>Appraisal Pattern</th>
<th>Resultant Coping Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of control over the situation and positive outcomes resulting from the situation.</td>
<td>Confrontive and optimistic behaviors used; fatalistic coping behaviors avoided</td>
</tr>
<tr>
<td>Perception of low degree of susceptibility and low stakes in the situation.</td>
<td>Confrontive coping behaviors avoided</td>
</tr>
<tr>
<td>Perception of low degree of susceptibility and high stakes in the situation.</td>
<td>Evasive and emotive coping behaviors used; self-reliant coping behaviors avoided</td>
</tr>
</tbody>
</table>

canonical variates (see Table 18). Root one explained 14.2% of the variance, and root two accounted for an additional 8.5 percent. Thus, a total of 22.7% of the explained variance in both sets of variables was accounted for by these two canonical variates.

Table 18 presents the loadings for the two canonical variates on both sets of variables. Canonical variate one reflected perceptions of high susceptibility to breast cancer in which the individual has much at stake but over which the subject perceived some control. Subjects with such perceptions tended to use measures of early detection and avoid use of chemical agents in an attempt to cope with their perceived breast cancer risk.

The second canonical variate reflected perceptions of low susceptibility to breast cancer and a positive outcome
Table 18

Canonical Correlations and Variate Loadings for Breast Cancer Threat Appraisal and Specific Primary Prevention Coping Behaviors

<table>
<thead>
<tr>
<th>Root</th>
<th>Eigenvalue</th>
<th>Canonical Correlation</th>
<th>Squared Correlation</th>
<th>Wilks Lambda</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.166</td>
<td>.38</td>
<td>.14</td>
<td>.784**</td>
</tr>
<tr>
<td>2</td>
<td>.093</td>
<td>.29</td>
<td>.09</td>
<td>.914*</td>
</tr>
</tbody>
</table>

Variate Loadings

Indicators | One | Two
--- | --- | ---
Breast CA Threat Appraisal
Susceptibility | .780 | -.526
Outcome Expectancy | -.347 | -.791
Control | -.527 | .134
Stakes | .512 | .420
Specific Primary Prevention Coping Behaviors
Dietary Factors | .089 | -.143
Chemical Agents | .517 | -.781
Early Detection Measures | .738 | .699

* p < .05; ** p < .001

... evolving from this risk situation which was still perceived as one in which the subject had much at stake. For the coping indicators, canonical variate two loaded negatively on chemical agents and positively on early detection measures. Thus, this variate suggests that women who perceive their risk situation as one in which their susceptibility is low, the outcome positive, and one in
which there is much at stake also used methods of early
detection to cope with their risk but did not avoid use of
chemical agents such as oral contraceptives, alcohol, and
nicotine. Table 19 summarizes the two patterns of
appraisal and their resultant coping behaviors.

Actual and Appraised Breast Cancer Threat

The second hypothesis proposed a positive relationship
between the degree of actual breast cancer risk, and the
degree of breast cancer threat appraised. Prior to
analysis, the data was examined by scatterplot to assess
for linearity and was found to be curvilinear in nature.
This curvilinear relationship revealed that women with low
and high degrees of appraised breast cancer threat had low
actual breast cancer risk scores. Whereas women with
moderate degrees of appraised breast cancer threat had
higher actual risk scores (see Figure 3).

Because a curvilinear relationship was found, an eta
correlation coefficient rather than a Pearson's product
moment correlation was calculated as an indicator of the
strength of the relationship between these two variables
(Nunnally, 1978). The eta correlation coefficient revealed
a moderate, positive relationship between these variables
($n = .53$). By squaring the eta correlation coefficient,
the percentage of variance in breast cancer threat
appraisal that was accounted for by breast cancer risk was
28 percent. Thus, the second hypothesis was partially
supported. However, it is clear from the small amount of
Table 19

Summary of Breast Cancer Threat Appraisal Patterns and Resultant Types of Specific Coping Behaviors

<table>
<thead>
<tr>
<th>Appraisal Pattern</th>
<th>Resultant Coping Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of high stakes, high susceptibility, and ability to maintain control in the situation.</td>
<td>Early detection coping behaviors used; use of chemical agents avoided</td>
</tr>
<tr>
<td>Perception of high stakes, low susceptibility, and positive outcome in the situation.</td>
<td>Early detection coping behaviors used; use of chemical agents not avoided</td>
</tr>
</tbody>
</table>

explained variance that additional variables impact the appraisal of breast cancer threat.

Summary

To summarize, the results from the data analyses show that the majority of women in this sample perceived their threat of breast cancer to be moderate or high. The most common type of coping behaviors used to deal with the perceived threat of breast cancer was that of confrontive, optimistic, and early detection behaviors. Coping styles that were generally avoided or rated as not helpful were the fatalistic, emotive, evasive, and palliative behaviors.

In terms of the number of coping behaviors that were used, breast cancer threat appraisal was moderately positively related to the number of general coping behaviors used but no such relationship was established for the number of specific coping behaviors used.
Multiple regression analyses demonstrated that actual breast cancer risk and threat appraisal account for only small percentages of variance in general and specific primary prevention coping behaviors. Of the two independent variables, the better predictor of use of general coping behaviors was breast cancer threat appraisal scores whereas breast cancer risk scores were the better predictor of specific coping behaviors.

Canonical correlation analyses revealed that the type of coping behaviors used varied with how the breast cancer threat was perceived thereby supporting the proposed hypothesis. And finally, a moderate positive relationship was found between actual breast cancer risk scores and breast cancer threat appraisal scores. However, this relationship was a curvilinear one in which women with high and low degrees of appraised health threat had low actual breast cancer risk scores, whereas women with moderate degrees of appraised threat tended to have higher actual breast cancer scores. Thus, the hypothesized relationship between these two variables was only partially supported.

The next chapter discusses these results as they relate to the proposed theory and prior literature. In addition, the study's strengths and limitations are presented as well as implications of the research findings for nursing theory, research, and practice.
CHAPTER 6

Discussion

Major Study Findings

Unlike previous studies in which subjects tended to underestimate their susceptibility to general health threats (Kegeles, 1969; Slovic, 1978), lung cancer (Pechacek & Danaher, 1979), cardiovascular disease (Avis, Smith, & McKinlay, 1989), and AIDS (Joseph et al., 1987), no such "optimistic bias" was found in this sample. Ninety percent of the women perceived their risk of developing breast cancer as moderate to high. Similar results were found in other studies that investigated various aspects of breast cancer (Stillman, 1977; Vernon et al., in press; Chrvala, 1990; Kelly, 1980; Vogel et al., 1990; & Wellisch et al., 1991).

Congruent with the proposed theory and prior research (Lazarus & Folkman, 1984; Folkman & Lazarus, 1980; Hesky 1987; Wellisch et al., 1991), women in this study utilized both problem and emotion focused behaviors to cope with their perceived risk of developing breast cancer. The majority (71%) of women in this sample perceived their risk of developing breast cancer to be moderate. Thus, based on theoretical projections, it is not surprising that the predominant type of coping behaviors used were problem focused. This finding is congruent with the work of Lazarus and Folkman (1984) who theorized that low degrees of perceived threat result in relatively equal use of
problem and emotion focused coping, moderate levels of perceived threat result in predominantly problem focused behaviors, and when high levels of threat are perceived, emotion focused coping predominates.

The problem focused behavior used by most study participants and judged to be the most effective mechanism for dealing with increased breast cancer risk was that of obtaining a yearly breast exam from a health care provider. The second best mechanism was that of obtaining a yearly or bi-yearly mammogram. It is also interesting to note that less than half of this sample consistently performed monthly self-breast exams. However, among those subjects who did, all rated self-breast exam as "very helpful" in coping with their perceived risk of developing breast cancer.

These results are congruent with findings from other studies. Based on data from the 1985 National Health Interview Survey, Makuc, Freid, and Kleinman (1989) reported that 70% of the 40,000 women sampled had had a breast exam by a health care provider within the previous two years. However, use of this early detection measure among women decreased with increasing age. Because the incidence of breast cancer increases with increasing age, it is important to work toward developing interventions that would serve to increase use of health care provider breast exam among older women.

In relation to use of mammography among women with
family histories of breast cancer, recent studies have shown that family history is one of the most influential variables associated with obtaining a mammography exam. Taplin, Aderman, and Grothaus (1989) reported that 71% of the 2,422 women with family histories of breast cancer in their sample responded to a letter inviting them to participate in mammographic screening. Similar percentages reflecting a high rate of mammography use were also reported by Zapka, Stoddad, Costanza, and Greene (1989) as well as by Wellisch et al. (1991).

In addition to these problem focused behaviors, women in this sample also indicated that living as normal a life as possible and maintaining a positive attitude toward the situation were the most effective emotion focused behaviors they used to deal with their breast cancer risk. Use of other less effective emotion focused modes of coping, e.g., emotive, evasive, fatalistic, and palliative behaviors were not used by this sample and this finding is similar to those reported by Wellisch et al. (1991).

Although approximately 50% of the sample reported that they used the two coping behaviors that are preventive in nature, i.e., dietary modifications and weight control, it was disappointing to find that less than half of the sample found them to be an effective mechanism for coping with their breast cancer risk. One possible explanation for this may be the reporting of inconsistent findings about these types of factors and interventions in the media.
Such conflicting reports may have confused women about the advantages of such interventions.

Overall, the use of these coping behaviors by study participants to deal with the threat of developing breast cancer suggests that women with family histories of breast cancer are not immobilized by the moderate to high degrees of risk they perceive in such a situation. Rather they utilize both problem and emotion focused behaviors and they rate them as effective in helping them cope with their perceived risk.

Another interesting finding was the small percentage of variance in general and specific coping behaviors that was accounted for by the combined effect of actual and perceived breast cancer risk. One explanation for this finding may be related to women's knowledge of breast cancer risk factors. If women are not knowledgeable about the risk factors which may predispose them to the development of breast cancer, their perception of the health threat may be lowered and thus potentially alter the number and types of coping behaviors they may use to deal with their perceived risk (Ben-Sira & Padeh, 1978; Cohen & Lazars, 1979).

A second explanation for this finding relates to the need to measure other variables that impact a woman's perception of breast cancer risk. In this study, four major components of breast cancer threat appraisal were measured: perceived susceptibility, stakes, expected outcome, and control in the situation. A recent study by Wellisch et al.
(1991) suggests that variables such as the affected relative's survival status, quality of life since diagnosis and treatment, length of time since diagnosis, etc., may also impact how the threat of breast cancer is perceived.

Although not a focus of this study, the multiple regression analyses revealed that of actual or perceived breast cancer threat, the better predictor of use of general coping behaviors was perceived threat while the better predictor of use of specific coping behaviors was actual breast cancer threat.

Findings from this study support the theoretical notion that an individual's pattern of coping is dependent upon the way in which the health threat is perceived. In relation to general coping behaviors as measured by the Jalowiec Coping Scale, three different patterns emerged. Women who perceived that they had control over their risk of developing breast cancer and who believed that the situation would have a positive outcome tended to use both confrontive and optimistic coping behaviors. However, the use of confrontive coping behaviors was avoided by women who perceived their risk of developing breast cancer as low and who perceived the stakes involved in the situation as minimal. A third pattern that emerged involved women with low perceived breast cancer risk but this time the stakes in the situation were perceived to be high. Women with this pattern of breast cancer threat appraisal utilized evasive and emotive types of coping behaviors and avoided
use of fatalistic and self-reliant behaviors.

In relation to the specific coping behaviors measured by the Breast Cancer Coping Scale, two patterns emerged. Women who perceived their breast cancer threat situation as one in which the perceived susceptibility and stakes were high, but over which they maintained control, used early detection methods and avoided use of chemical agents to cope with their breast cancer risk. Women who perceived their situation as one in which their susceptibility was low, the stakes high, and the outcome positive only used measures of early detection to cope with this health threat. Thus, the degree of perceived susceptibility did not impact whether or not a subject utilized early detection measures but did affect a woman's choice about use or avoidance of chemical agents.

Although prior studies did not investigate the four aspects of breast cancer threat appraisal that were utilized here, the findings of this study are congruent with similar research in this area. Studies by Hesky (1987), Wong & Reker (1987), and Folkman et al. (1986) generally revealed that when subjects perceived that they had control over the health threat, the predominant mode of coping was problem focused. Perceptions of little to no control resulted in the use of primarily emotion focused behaviors. Studies reporting high degrees of perceived susceptibility and control over the health threat resulted in use of primarily problem focused coping behaviors.
(Rippetoe & Roger, 1987; Rogers & Mewborn, 1976). When only the variable of susceptibility was examined, high degrees of perceived susceptibility resulted in use of emotion focused behaviors (Gass, 1987) and increased self breast exam performance (Kelly, 1979; Calnan & Moss, 1984).

The moderate positive association found between the variables of actual and perceived breast cancer threat is congruent with findings reported by Chrvala (1990). However, the relationship is a curvilinear one in which those women who perceived their threat of developing breast cancer as high or low had lower actual breast cancer risk scores than those subjects who perceived their risk of developing breast cancer as moderate. One explanation for such a relationship may be that some women with positive family histories of breast cancer tend to overestimate their actual risk of breast cancer. Such a finding has been reported by other researchers in this area (Ottman et al., 1983; Love, 1989; & Henderson, 1990; Stefanek, 1990).

Another explanation may be related to the findings that the occurrence of an illness in one family member impacts the family's appraisal of the degree and nature of the health threat (Turk & Kearns, 1985; Kelly, 1979; Lichtman et al., 1984; Wellisch et al., 1991). Thus, for those women who perceived a high degree of threat but had low actual risk, variables such as the affected family member's response to diagnosis and treatment, quality of life since diagnosis and treatment, quality of the
relationship with the affected relative, and relative's survival status may have contributed to perceptions of high threat in this situation. Initial support for this explanation is provided by the finding that only a small percentage of variance in perceived breast cancer threat is accounted for by the relationship between actual and perceived breast cancer threat. Thus, it is clear that other variables impact a woman's degree of perceived breast cancer threat and future research is needed to identify them.

Evaluation of the Middle Range Theory

The middle range theory tested in this research was derived from the Neuman conceptual model of stress and coping. The major theory concepts are concrete in nature as they are measurable and restricted by time and space (Walker & Avant, 1983). Theoretical and operational definitions for each concept were clear, explicit, and consistently used. The operational definitions reflected the content of the theoretical definitions. The instruments used to operationalize the theoretical concepts were shown to be reliable and valid measures of the concepts involved.

The middle range theory is parsimonious as the propositions are precise and do not overlap one another (Walker & Avant, 1983). The diagram of the theoretical relationships accurately reflects and helps to clarify the verbal description of the theory. Of the three
propositions within this middle range theory, two were empirically tested and supported in this research.

The first hypothesis read as follows: "there are various patterns of breast cancer threat appraisal that are associated with the types of primary prevention coping behaviors used among women with family histories of breast cancer." The majority of study participants perceived a moderate degree of breast cancer risk. Although both problem and emotion focused behaviors were utilized, ten out of twelve of the identified coping behaviors were problem focused.

When the relationship between pattern of breast cancer threat appraisal and type of coping behaviors used was examined, the variety of appraisal patterns that emerged resulted in differing coping responses. These findings support the hypothesis that it is both degree and type of appraisal that are important determinants of coping responses among women at increased risk for breast cancer.

The findings from this study only partially supported the relationship identified in the second hypothesis which read "a positive relationship exists between actual breast cancer risk and breast cancer threat appraisal." While findings indicated a moderate positive association between these variables, the relationship was a curvilinear one. Therefore, women who appraised their breast cancer risk as moderate, tended to have higher actual breast cancer risk. Whereas women who percieved their risk of developing breast
cancer to be low or high, were more likely to have low actual breast cancer risk.

**Study Limitations and Strengths**

Prior to discussing this study's important implications for nursing theory, research, and practice, certain limitations in its design need to be addressed. The three major problems of descriptive correlational research comprise the major threats to internal validity for this study. These include: (1) the inability to actively manipulate the independent variables, (2) lack of control/ experimental group comparisons, and (3) inability to randomly assign subjects to groups (Kerlinger, 1986). Because the nature of breast cancer risk factors is such that these factors are a characteristics of the individual and are inherently not subject to experimental control, the researcher was unable to randomly confer various breast cancer risk factors on study participants.

Although the second independent variable in this study, breast cancer threat appraisal, could technically be manipulated by providing women with differing assessments about their breast cancer risk factors, such manipulation has the potential to result in physical and/or mental harm, thus manipulation of this variable was not possible for ethical reasons. Therefore, due to the inability of the researcher to manipulate the independent variable of interest, there is no need for experimental or control groups, and thus, no possibility for random assignment to
groups.

Another threat to internal validity was that of a bias toward socially desirable responses on the questionnaire. Social desirability refers to the need for subjects to obtain approval by responding in a culturally appropriate and acceptable way (Kristiansen & Harding, 1984). Thus, if this threat was operating in this study, subjects may have claimed to utilize more primary prevention coping behaviors than was actually the case.

Threats to external validity were present because the sample for this study was not formed by a random process but rather by self-selection, i.e., women were in the sample because they possessed the characteristics of interest. Many subjects were participants in an established breast cancer risk project and thus, may have been more knowledgeable or coped more actively with their breast cancer risk than women who were not project participants. In addition, differences may have existed between those women who chose to return the questionnaire and those who did not. In an effort to assure a somewhat representative sample of women, the acceptable return rate for the study had been set at 50%, and the final return rate for the questionnaires exceeded this standard (82%). However, because this sample was primarily white, well educated, and from middle to upper income families, it was not representative of the general population. Therefore, the use of nonprobability sampling decreases the
generalizability of the study findings and may have introduced selection bias into the sample.

The strengths of this design were that it allowed investigation of variables that were not inherently manipulable and, unlike many experimental studies, it cannot be criticized for its artificiality. The threat to construct validity of inadequate apriori explication of constructs was addressed by a thorough review of the literature and careful conceptualization of the variables of interest. Each was precisely defined, conformed to the public use of the terms, and were operationalized through use of reliable and valid measures. However, should future studies demonstrate that breast cancer risk factors beyond those measured by the Breast Cancer Risk Index significantly contribute to a woman's risk of developing this disease, this index may become invalid.

Threats to statistical conclusion validity were addressed by conducting a power analysis prior to the initiation of the project, establishing the alpha level at .05 for all statistical analyses, and selecting reliable and valid measures to operationalize the variables of interest. The assumptions of the statistical tests selected for data analysis were evaluated and addressed based on the data collected.

In addition, the researcher was aware that the aim of descriptive correlational research is to describe relationships among variables rather than to infer cause
and effect. Thus, the tendency to imply causation from these results was avoided.

Implications for Nursing Theory

Existing research on the Neuman model has focused on problems that already exist for patients, i.e., illness. Such an approach is inadequate if health is to be viewed as holistic in nature. Thus, this study explored variables within the primary prevention aspect of the Neuman Systems Model.

In addition, the theory could potentially be expanded to examine the relationship among other health threats and resultant use of coping behaviors. Thus, the theory has potential for broad generalizability.

Because of the ability to derive and empirically test hypotheses generated from the middle range theory, it does contribute to nursing's body of scientific knowledge. Therefore, this middle range theory has the potential to influence nursing practice and research, and has evidence of initial empirical support.

Implications for Nursing Research

The only instrument that did not have previously established reliability and validity was the Breast Cancer Coping Scale. Exploratory factor analysis provided initial support for the construct validity of this instrument and the reliability measures for it were acceptable for use in this descriptive correlational design. However, one mechanism by which the reliability of this instrument might
be improved would be to incorporate additional relevant items into the instrument. The responses of the subjects to the open ended coping question revealed additional areas that the instrument did not address. Examples of items that could be added to and tested in a revised instrument include behaviors like "increasing one's current level of exercise", "avoiding environmental pollutants/toxins", and "focusing on advances in breast cancer research".

Another change to the instrument involves the addition of a "not applicable" category so that more accurate assessment of responses to items involving alcohol consumption, cigarette smoking, and oral contraceptive use can be made. These three items were problematic for several subjects due to the absence of a "not applicable" or "never used" category and resulted in missing data for these items. Missing data for the remaining eight items was not problematic indicating that those items were better understood by subjects and do not require a "not applicable" category. It is only through refinements such as these and continued testing of this instrument among a variety of samples that this tool can become a valuable instrument which nurses can use to assess the coping responses of women at risk for breast cancer.

In order to address the threats to external validity that were present in this research, this study needs to be replicated among sociodemographically diverse populations of women. Studies similar to this one need to be conducted
among women at increased breast cancer risk due to factors other than family histories as well in an effort to determine if differences in appraisal and coping exist between two such groups. Longitudinal studies of women at increased risk for breast cancer would not only add important data to the body of knowledge related to differences in appraisal and coping patterns over time, but would also help to determine the long term effects of utilization of such coping behaviors on the development of breast cancer. If these findings can be replicated across various populations, the reliability and validity of these results would be substantiated. Data from future studies such as these may help to shift the focus of current nursing interventions from that of early detection to those involving primary prevention.

The small percentage of variation in general and specific coping behaviors that was accounted for by the combined effect of actual and perceived breast cancer threat suggests that numerous other variables also impact selected coping behaviors. Such variables that need to be addressed in future studies include: the subject's knowledge of breast cancer risk factors; the quality of the relationship between the subject at risk and her affected relative; the length of time since the affected relative's diagnosis; the outcome of the affected relative's treatment; the type of treatment given to the affected relative; and the perceived quality of life of the affected
relative during treatment. In order to gather such personal information, interviews of subjects as well as completion of survey instruments would be in order. Thus, although this study only begins to reveal the complexity of the relationships among the variables of interest, it does provide a solid base from which future research may begin.

Implications for Nursing Practice

Although the current state of knowledge does not permit one to claim a reduction in the incidence of breast cancer through the use of the coping behaviors described here, it does reveal that there are coping behaviors which women utilize in an effort to maintain a positive outlook regarding their risk for breast cancer.

This research clearly demonstrated that different patterns of coping emerged from the way in which these women appraised this health threat. Consequently, in order to accurately diagnose and appropriately intervene in such situations, it is essential that nurses incorporate into their assessment of this population, some measure of how women at increased risk for breast cancer perceive such a risk. The index used in this study for the purpose of assessing breast cancer threat appraisal was demonstrated to be a reliable and valid measure. It requires less than 10 minutes to complete, thereby making it a practical tool for use in the clinical setting.

Consistent with results from prior research, the majority of women in this sample did not consistently
utilize the early detection measure of self-breast exam to cope with their perceived increased risk. This finding, congruent with that of so many other studies suggests a need to shift the focus of early detection education from self-breast exam techniques to that of education regarding the benefits of mammograms and health care provider breast exams. If further studies validate this high degree of dependence on health care providers for breast exams, educational programs through which health care providers can sharpen their breast exam skills need to be developed and made readily available. Changes such as these would still allow a woman to maintain responsibility for and control over her own health (Lickman, 1988), and would be more congruent with behaviors such women use to cope with the threat of breast cancer.

The lack of use of dietary modifications and their poor effectiveness ratings suggest a need for further education of women in this area. Although research findings related to dietary interventions have been contradictory, the American Cancer Society has established guidelines for reduction of dietary fat and maintenance of ideal body weight for this population. Such interventions have been proven to be beneficial in reducing other health problems and thus, until the research findings related to breast cancer risk become more consistent, women should be taught about and encouraged to follow the dietary guidelines established by the American Cancer Society.
In addition, the results of this study also suggest that the profession reconsider the way in which women are encouraged to utilize measures of early detection. Much of the advertising related to breast cancer focuses on fear and negativism. Breast cancer is frequently depicted as a death sentence and the individual whom it strikes as a victim.

However, the frequent use and high effectiveness rating given to optimistic coping behaviors by women in this sample suggests that breast cancer education and advertisements focus more on the positive aspects of early detection and advances in treatment. For example, due to the advances in early detection techniques and treatments, nurses can emphasize that those who may be at high risk for developing breast cancer need not be at high risk of dying from it (Henderson, 1990). In addition, if the disease is found early, chances are that treatment may be less severe and offer positive outcomes (Brown, 1989). Such a positive focus provides the woman with the comfort of knowing that she can maintain a certain degree of control when dealing with this health threat, and serves to counter misconceptions that may result in feelings of powerlessness. And finally, while it would be tempting to isolate one or two coping strategies identified here and construct nursing interventions around them, such an effort would be premature. Although coping through use of confrontive and optimistic behaviors were identified as the most effective measures to deal with this health threat,
not all women made use of such behaviors. Additional research, designed to examine how other subpopulations of women cope with their breast cancer risk needs to be conducted first. Once these tasks have been achieved, such research will allow the nurse to function in a more holistic manner by providing him/her with the knowledge needed to help women improve their ability to cope with risk factors and thereby prevent illness rather than cope with its effects.

Conclusion

In summary, this research explored how women with family histories of breast cancer appraise and cope with that health threat. While the body of knowledge about coping with appraised threat of breast cancer is at best limited, studies such as this reveal the importance of assessing how women appraise and cope with their breast cancer risk.

Because nursing is concerned with helping women to maintain optimal levels of health, the knowledge generated from this study is essential to nurses who are involved in assisting women to effectively cope with their risk of breast cancer. As knowledge of the relationships between breast cancer risk appraisal and coping is enriched and refined by future studies, women will benefit by an improved quality of life. In short, the overall findings of this research support Seyle's (1981) claim that it is not really what we face, but rather, how we face it that truly matters.
Appendix A

Initial Cover Letter
February 11, 1991

Dear Participant:

I am a doctoral student in nursing at Wayne State University and am conducting a research project concerning how women at risk for breast cancer perceive and cope with that health risk. Because of your family history of breast cancer, you have been chosen to participate in this project.

Your participation is voluntary and involves completing the enclosed questionnaire which requires approximately 45 minutes of your time. I also request that you sign the enclosed self-addressed stamped postcard consent form. By reading and signing the consent form, you indicate your agreement to participate in this project and indicate that you have returned the questionnaire under separate cover. You may return the questionnaire in the enclosed stamped self-addressed envelope by February 25, 1991. Please be assured that your responses will remain completely anonymous. If you have any questions about how to complete the instrument or if you would like further information about the study, you may contact me at [contact information]

I realize that this request requires an investment of your good will and time. However, through your participation, you will be instrumental in providing information about how women perceive and cope with their threat of breast cancer. Knowledge gained from this project may assist other women to effectively cope with this health threat. In addition, for every questionnaire returned, a donation to the research fund of the American Cancer Society will be made in an effort to continue to fight the battle against breast cancer.

Upon your request, I would be happy to send you a copy of the abstract of my study when it is completed. Your prompt cooperation in this endeavor is greatly appreciated. Thank you for your assistance.

Sincerely,

Diane R. Lancaster, R.N., M.S.N.

Enclosures
Appendix B

Post Card Consent Form
Post Card Consent Form

I have read the letter accompanying the questionnaire I received and understand that the purpose of this research project is for nurses to gain an understanding of how women perceive and cope with the threat of breast cancer. I understand my participation would involve completing the questionnaire I received and returning it in the envelope provided.

I further understand that:
- All information is confidential and my identity will not be revealed.
- My participation is voluntary and I am free to withdraw my consent at any time.
- Any questions I have about the project will be answered by Diane Lancaster who can be reached at the phone number provided in the letter that accompanied the questionnaire.
- If I have any questions regarding my right as a participant in this project, I may contact the WSU Human Investigation Committee at [redacted].

On the basis of the above statements, I agree to participate in this project and have returned my questionnaire under separate cover.

Participant's Signature: __________________________

Date: ______________________________

I would like a copy of the study results  ____ Yes  ____ No
Appendix C

First Follow-up Cover Letter
February 25, 1991

Dear Participant:

In mid February, you received a letter requesting your participation in a research study examining how women at risk for breast cancer perceive and cope with that health threat.

Since that time, I have learned that some participants were traveling or attending meetings and did not have an opportunity to complete and return the Breast Cancer Survey by the initial deadline date. Consequently, I have extended the deadline to March 11, 1991, and have enclosed a second copy of the questionnaire and consent form for your convenience. I request that you return the questionnaire in the self-addressed stamped envelope provided and mail the postcard consent form after reading and signing it.

I am most anxious to receive your response and look forward to the insights you can provide. The information you share will of course be held in strictest confidence and a donation to the American Cancer Society's research fund will be made for every questionnaire returned.

Thank you very much for your assistance. Upon your request, I will be happy to send you a copy of the abstract of my study when it is completed.

Sincerely,

Diane R. Lancaster, R.N., M.S.N.

Enclosures
Appendix D

Second Follow-up Cover Letter
March 11, 1991

Dear Participant:

In mid and late February, I contacted you in an effort to gather information about the way women at risk for breast cancer perceive and cope with such a health threat. Thus far, I am delighted with the response to my questionnaire and have discovered several interesting results.

However, my study would be further strengthened if an even larger number of participants would respond. Your experiences regarding the threat of breast cancer are needed to insure that my research includes all points of view. The information you provide on the questionnaire will be held in strictest confidence. I request that you return the enclosed questionnaire by March 31, 1991 in the self-addressed stamped envelope provided. I also request that you return the enclosed self-addressed stamped postcard consent form indicating your agreement to participate.

Thank you very much for taking time to reflect upon and share your experiences. In appreciation of your efforts, a donation to the American Cancer Society will be made for every questionnaire that is returned. I look forward to hearing from you and, upon your request, would be happy to send you an abstract of my study upon its completion.

Sincerely,

Diane R. Lancaster, R.N., M.S.N.

Enclosures
Appendix E

Breast Cancer Risk Index
Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

Appendix E, 141
Appendix F, 143–144
Appendix G, 146
Appendix H, 148–155

University Microfilms International
Appendix F

Moneyham Threat Index
Appendix G

Breast Cancer Susceptibility Scale
Appendix H

Jalowiec Coping Scale
Appendix I

Breast Cancer Coping Scale

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Unlike the previous section of the questionnaire which asked you about general ways of coping with your threat of developing breast cancer, the following items are specific behaviors women have been known to use to deal with their threat of developing breast cancer. For each of the 11 methods listed on the next page, two questions are asked:

**Part A:** How consistently do you use the identified method to deal with your risk of developing breast cancer?

**Part B:** If you have used the method, how helpful has it been in assisting you to deal with your risk of developing breast cancer?

---

**Instructions**

**Part A**

For each method listed on the next page, circle a number from 0 to 3 in Part A to show **HOW CONSISTENTLY** you use the method to deal with your risk of breast cancer. The coding for the numbers in Part A is as follows:

0 = Never  
1 = Seldom  
2 = Sometimes  
3 = Often

**Part B**

For each method that you have used, circle a number from 0 to 3 in Part B to show **HOW HELPFUL** that method has been in assisting you to deal with your risk of breast cancer. The coding for the numbers in Part B is as follows:

0 = Not helpful  
1 = Slightly helpful  
2 = Fairly helpful  
3 = Very helpful

---

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<table>
<thead>
<tr>
<th>Part A</th>
<th>TO COPE WITH YOUR BREAST CANCER RISK, HOW CONSISTENTLY DO YOU . . .</th>
<th>Part B</th>
<th>HOW HELPFUL HAS THE METHOD BEEN?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>METHODS</td>
<td></td>
<td>Not Helpful</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
</tr>
<tr>
<td>1.</td>
<td>Perform monthly self-breast exams?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>Obtain a yearly or bi-yearly mammogram?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>Increase your dietary fiber intake?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>Decrease your alcohol intake?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>Decrease your caffeine intake?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td>Obtain a yearly breast exam from a health care provider?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>7.</td>
<td>Try to keep your body weight within the recommended range?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>8.</td>
<td>Alter your method of birth control to avoid use of oral contraceptives?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>9.</td>
<td>Avoid or decrease your use of cigarettes?</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Methods</td>
<td>Part A</td>
<td>Part B</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>To cope with your breast cancer risk, how consistently do you...</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
</tr>
<tr>
<td>10. Increase your vitamin intake?</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11. Decrease your dietary fat intake?</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

(Lancaster, 1989)
Appendix J

Demographic Items
This section of the questionnaire provides some background information about yourself. Please fill in the blank or place an "X" next to the appropriate answer to each question.

1. What is your age? ________

2. What is your occupation? ____________________________

3. How would you categorize your occupation?
   _____ Professional/Technical   _____ Craftsman/Foreman/Skilled   _____ Laborer
   _____ Managerial/Proprietor/   _____ Apprentices/Semi-skilled   _____ Farm Laborer/Foreman
      Public Official             _____ Serve worker/Farmowner      _____ Military

3. Using the numbers below, please indicate the highest level of education that you have completed by circling the number that most appropriately corresponds to the number of years of education you have had.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<th>12</th>
<th>13</th>
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<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>&gt;18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>Grade School</td>
<td>High School</td>
<td>College Graduate</td>
<td>College Degree</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

4. What is your marital status?
   _____ Single   _____ Married   _____ Widowed   _____ Separated   _____ Divorced

5. What is your family's total yearly gross income?
   _____ Less than $5,000   _____ $15,000 - $24,999   _____ $50,000 - $74,999
   _____ $5,000 - $9,999   _____ $25,000 - $34,999   _____ $75,000 - $99,999
   _____ $10,000 - $14,999   _____ $35,000 - $49,999   _____ $100,000 or more
6. What is your racial background?
   _____ Black/Negro/Afro-American   _____ White/Caucasian   _____ Other (Please state)
   _______________________________________________________
   _____ Oriental/Asian-American   _____ Mexican-American/Puerto Rican/Latin American

7. What is your religion?
   _____ Catholic   _____ Jewish   _____ Seventh-Day Adventist
   _____ Protestant   _____ Mormon   _____ Other (Please State)
   _______________________________________________________

Your cooperation with this project and your generous gift of time is greatly appreciated. The knowledge you have helped to generate through your participation in this project will be used to assist other women who find themselves faced with the threat of breast cancer. Please return the completed questionnaire in the stamped envelope provided. THANK YOU!
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ABSTRACT

COPING WITH APPRAISED THREAT OF BREAST CANCER: PRIMARY PREVENTION COPING BEHAVIORS UTILIZED BY WOMEN AT INCREASED RISK

by

DIANE RENEE NOVOTNY LANCASTER

DECEMBER 1991

Advisor: Laurel Northouse, R.N., Ph.D.
Major: Nursing
Degree: Doctor of Philosophy

Breast cancer affects nearly one in nine women and is a leading cause of cancer related deaths among this group. Yet, little is known about how high risk women deal with this health threat. Conceptualized within the Neuman Systems model, the purpose of this study was to examine how women with family histories of breast cancer appraise and cope with their breast cancer risk.

Using a descriptive correlational design, a convenience sample of 209 women responded to a mailed questionnaire. Instrument content and construct validity was established and alpha reliabilities ranged from .70 to .93.

Ninety percent of the sample perceived their degree of breast cancer risk to be moderate or high. However, women with high and low degrees of appraised threat had low actual breast cancer risk scores, whereas women with
moderate degrees of appraised threat tended to have higher actual breast cancer risk scores. Thus, a curvilinear relationship was present and lends partial support to the hypothesized relationship between these variables.

The most common and effective coping modes used by at least 50% of the sample were confrontive, optimistic, and early detection behaviors. Over 75% of the sample rated evasive, emotive, palliative, and fatalistic modes of coping as behaviors they did not use and which were ineffective in dealing with this health threat. A significant moderate correlation ($r=.41, p<.001$) was found between a subject's appraised degree of breast cancer risk and the number of general coping behaviors used. Therefore, the higher the degree of threat appraised, the more coping behaviors used.

Multiple regression analyses demonstrated that actual and appraised breast cancer risk accounted for only small percentages of variance in coping behaviors. Canonical correlation analyses revealed five different patterns of appraisal and resultant types of coping. The type of coping behaviors used varied with how the breast cancer threat was perceived, thereby supporting the hypothesized relationship between these variables.

The knowledge generated from this study can help nurses to assist women at increased risk to maintain optimal levels of health. And, it is an important step in testing a middle range theory derived from the Neuman model.
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Name: Diane Renee Novotny Lancaster

Address: [Redacted]

Education

Wayne State University
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Degree: Doctor of Philosophy
Date: December 1991

The Catholic University of America
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Washington, D.C. 20064

Degree: Master's of Science in Nursing
Date: May 1983
Honors: Summa Cum Laude

University of Pittsburgh
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Pittsburgh, PA 15260

Degree: Bachelor of Science in Nursing
Date: April 1979
Honors: Magna Cum Laude

Research

The Incidence and Characteristics of Mentors Among Master's Prepared Female Nurses

Powerlessness among Caregivers of Oncology Patients Experiencing an Acute Hospitalization.

Publications


Honors/awards in last five years

1991 Research Grant from the Boston University Hospital Ross Nursing Resource Committee
1990 Who's Who in American Nursing
1989 Graduate Professional Scholarship, Wayne State University
1989 Research Grant from Michigan Chapter of the American Cancer Society
1989 Who's Who of Women Executives
1988 Who's Who in American Nursing

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