Global meaning and emotional expressivity as possible protective and mediating factors to mental health status and psychological adjustment to breast cancer.

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GLOBAL MEANING AND EMOTIONAL EXPRESSIVITY AS POSSIBLE PROTECTIVE AND MEDIATING FACTORS TO MENTAL HEALTH STATUS AND PSYCHOLOGICAL ADJUSTMENT TO BREAST CANCER

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SUMMARY

Based on theories of adjustment to chronic illness, cognitive and emotional processing of traumatic events, and meaning- making in the context of stress and coping, this study explored two factors believed to influence psychological adjustment to breast cancer. The main variables of interest was existential meaning (defined as the existence of purpose, and personal meaning in life) and emotional expressivity (characterized by the outwardly display of emotions). The aim was twofold: First, to test whether high levels of existential meaning or expressivity (moderators) could weaken the effect of adverse psychological responses to breast cancer (intrusive thoughts) on psychological adjustment to it. Second, to test whether the higher the intensity of the adverse psychological responses to cancer (e.g., intrusive thoughts, helplessness), the lower a patient's existential meaning or emotional expressivity levels (mediators), which would, in turn, be associated with higher levels of psychological maladjustment. One hundred and fifty three women with breast cancer, five years on average after diagnosis of their disease, were recruited from the breast clinic of an Athenian public cancer hospital, during their follow- up. They completed interview and mail surveys that assessed their level of existential meaning, emotional expressivity, and approach to coping. Main results of the study show that (a) as unwanted, recurrent, and uncontrollable intrusive thoughts and memories about breast cancer become more disturbing, psychological adjustment becomes poorer, (b) as sense of existential meaning, coherence and purpose in life become stronger, psychological adjustment to breast cancer is enhanced, (c) existential meaning partially mediates the relationship between psychological responses to breast cancer and psychological adjustment to it. Implications of these findings for future research, theory development, and clinical practice are discussed.

DECLARATIONS AND STATEMENTS

I declare that this work has not previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree. The thesis is the result of my own investigations, while other sources are acknowledged by footnotes giving explicit references and a bibliography is appended. I give my consent for my thesis, if accepted, to be available for inter- library loan, and for the title and summary to be made available to outside organizations.

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Writing and completing a dissertation seems to me to be a symbolic “passage”, with its triple meaning: a journey from one place to another, the process of time passing, and a way through something. In this journey, you are invited to go through a process of skills development, master the scientific way of reasoning, and respect time, since time limits are often pressing. I would not have been able to complete this journey without the aid and support of a number of people. First of all, I would like to express my sincere gratitude to my supervisor, Dr Julie Slater, for her guidance, advice, encouragement, support and understanding throughout the course of this project and the writing of this thesis. Her constructive feedback, comments and amendments to the manuscript have been significantly useful in shaping the thesis up to completion. I would also like to thank Dr Gareth Noble for his encouraging comments and feedback. I wish to express my deepest thanks to my wife for providing her steadfast support to me in undertaking my postgraduate studies. I would also like to thank my daughter who helped me in coming out of many tough moments during my MPhil research. I greatly acknowledge the assistance and cooperation of the medical and nursing staff of St Savvas Cancer Hospital, in collecting the data utilized in this study. My gratitude goes to the many patients who made the effort to participate in this study in spite of their illness. I hope that their efforts weren’t in vain and that results from this study will be useful in helping present and future patients who are suffering from cancer.

DEFINITION OF MAIN TERMS

Existential Meaning: Existential meaning as a psychological construct has been defined as "the cognizance of order, coherence, and purpose in one's existence, the pursuit and attainment of worthwhile goals, and an accompanying sense of fulfillment" as well as "a person's feeling that his or her life is meaningful; a cognitive notion that the person's individual existence is meaningful, and the motivation to attain both the affective experience and the cognitive perspective" (Reker & Wong, 1988, p. 217). When faced with a crisis such as a breast cancer diagnosis, patients are likely to question the order, coherence and purpose of their existence and the meaning of this diagnosis for their lives (Coward, 2000). Finding meaning under such circumstances can involve changing one's fundamental belief systems or goals, which may entail the rebuilding of shattered global beliefs (about justice, order and fairness of the world, about personal deservedness, about the comprehensibility and controllability of the world, and about purpose in life), or drastically altering goal hierarchies (by revising old goals, abandoning them, rearranging priorities, or finding goal substitutes). Existential meaning has also been referred to as "personal meaning" (Wong, 1998). The lay term for existential meaning is purpose in life. For the present study, existential meaning was measured with the Personal Meaning Index, one of two indices of the Life Attitude Profile- Revised (LAP-R) (Reker, 1999). Existential meaning is operationally defined as having life goals, having discovered a satisfying life purpose, having a mission in life, having a philosophy of life that gives existence significance, having a framework that allows the patient to make sense of her life , and having a logically integrated and consistent understanding of self, others, and life in general (Reker, 1999).

Emotional Expressivity: Denotes a general disposition toward the outward display of different emotions across various channels, regardless of emotional valence (positive or negative) or channel of expression (facial, vocal, or gestural) (Kring, Smith, & Neale, 1994). Emotional expressivity is operationally defined as displaying emotions to other people, being able to cry in front of other people, being unable to hide the way one is feeling, or thinking of oneself as emotionally expressive.

Coping with cancer (coping style): For purposes of the present study, the operational definition of the Mental Adjustment to Cancer (MAC; Watson et al., 1988) was found applicable. The construct of coping styles is used to describe “the cognitive and behavioural responses the patient makes to the diagnosis of cancer” (p. 203). According to these authors, there are five aspects to coping style: "(1) fighting spirit; (2) avoidance; (3) fatalism; (4) anxious preoccupation; and (5) helplessness/ hopelessness (Watson et al., 1988). However, only the first three aspects of this construct have been suggested to be pure indicators of coping, while the last two aspects of it may represent cognitive appraisals and emotional reactions to cancer (Anagnostopoulos, Kolokotroni, Spanea, & Chryssochoou, 2006).

Psychosocial adjustment: Psychosocial adjustment in a cancer patient denotes a process of continued active involvement and functioning in daily life, minimal role disruption, and the ability to regulate emotional distress and dysfunction (Nicholas & Veach, 2000). Psychosocial adjustment is influenced by person, situation, and life context variables. Psychosocial adjustment will not be directly measured in this study, yet there is a direct relationship between quality of life and mental functioning (which is measured) and psychosocial adaptation (Cella, 1998; Holland, 1998).

Psychosocial maladjustment: Psychosocial maladjustment refers to the condition of being unable to adapt properly to one's environment with resulting emotional instability (WordNet, 2001), and signifies poor or inadequate adjustment (Merriam- Webster Dictionary, 2007), indicated by either impairment in social or occupational functioning, or symptoms of marked distress such as anxious or depressed mood, that are in excess of a normal reaction to a psychosocial stressor such as a chronic illness (American Psychiatric Association, 2000). For the present study, maladjustment in cancer patients was measured by the mental health component of Short Form-36 (Ware et al., 2003) and was operationally defined as displaying low vitality (fatigue and low energy levels), poor social functioning (extreme or frequent interference with normal social activities due to physical or emotional problems), more role limitations due to emotional problems (e.g., problems with work or other daily activities as a result of emotional problems), and poor mental health (capturing feelings of nervousness, unhappiness, and sadness)

Intrusive symptoms: A type of commonly reported responses to traumatic stressors (such as the diagnosis of a life- threatening illness) involving recurrent recollections or imagery of a traumatic event, flashbacks of the event, unwanted thoughts about it, strong waves of feelings about the traumatic event, especially when the individual is exposed to stimuli that serve as reminders of the original trauma, and recurrent distressing dreams during which the event is replayed (Horowitz, Wilner, & Alvarez, 1979). Intrusive symptomatology is part of the post- traumatic stress disorder (PTSD), an anxiety disorder that includes persistent reexperience of a traumatic event, persistent avoidance of reminders of the event, emotional numbness, persistent symptoms of increased arousal (e.g., irritability, trouble sleeping), and significant impairment in social, occupational, or other important areas of functioning (American Psychiatric Association, 1994).

Psychological responses to cancer: For purposes of the present study, psychological responses to cancer included intrusive thoughts and symptoms, as well as cancer- related appraisals (uncontrollability beliefs regarding the inability to handle the situation, being at a loss, giving up, being hopeless) and emotions (feelings of upset, worry, fear, apprehension). Cognitive appraisals and cancer- related emotions were measured by the helplessness/ hopelessness and anxious preoccupation scales respectively (Watson et al., 1988).

Mastectomy: Complete removal of the breast to prevent growth and spread of the tumor (Dollinger et al., 1997). During modified radical mastectomy, the entire breast tissue is removed, along with some of the axillary lymph nodes. Another surgical technique, simple mastectomy, refers to the removal of the entire breast, with preservation of both pectoral muscles and the axillary nodes.

Lumpectomy: Removal of the lump in the breast (a small volume of the breast tissue containing the tumour) and some of the surrounding healthy tissue (Dollinger et al., 1997). It is the most common form of conserving surgery, aimed at minimizing the risk of local recurrence while leaving the patient with a cosmetically acceptable breast.

Recurrence: The return of cancer, at the same site as the original (primary) tumour or in another location, after the tumour had disappeared (National Cancer Institute, 2007).

CHAPTER 1

Introduction

In this chapter, an overview of the research problem is presented and studies that are directly relevant to the current investigation and have lent it empirical and theoretical justification are cited. Arguments that explain the rationale for the stipulated research hypotheses and the study are included. The contribution that the proposed study makes to theory and practice is also described.

Background to the Problem

Breast cancer is the most prevalent site of cancer for women. In Europe, more than 360,000 women are diagnosed each year with breast cancer, while 129,000 women die of the disease (International Agency for Research on Cancer [IARC], 2004). Still, many thousands of women (as well as a small number of men) continue to have to deal with the effects of a previous breast cancer diagnosis. Breast cancer treatment commonly has a profound effect on a woman's body ranging from disfiguration to nausea, alopecia, fatigue and pain (Ray & Baum, 1985). In the social realm, a diagnosis of breast cancer may limit a woman's ability to participate in social activities (Oktay & Walter, 1991) and cause strain in relationships (Bolger, Foster, Vinokur, & Ng, 1996). In the psychological and spiritual realm, a breast cancer diagnosis may shatter a woman's sense of control and safety, force her to question her future, put her in fear of pain and suffering, and, ultimately, threaten her life (Ray & Baum, 1985). Moreover, the experience of cancer diagnosis, treatment, progression, or recurrence can be considered as a traumatic event capable of eliciting symptoms consistent with post- traumatic stress disorder (Green et al., 1998). These symptoms can include recurrent and intrusive thoughts or images, avoidance of reminder thoughts and activities, numbing (detachment, restricted affect), and increased arousal (hypervigilance, decreased concentration, irritability). Increased cancer- related traumatic stress symptoms are related with greater distress (Cordova et al., 1995) and poor psychological adjustment (Matsuoka et al., 2002).

The threat breast cancer poses to a woman's life has consistently diminished due to advancements in medical oncology (Holland, 1998), better knowledge about risk factors and improved early screening methods (Dollinger, Rosenbaum, & Cable, 1997). Unlike 20 years ago, length of life after a breast cancer diagnosis is not the single most important treatment concern anymore (Cella, 1998). With five-year survival rates between 27% (when cancer has spread out of the breast to other distant parts of the body such as lung, liver, or bones) and 98% (when cancer is localized, has not spread to any surrounding tissues and there is no evidence of cancer cells breaking out of the part of the breast in which it started), most breast cancer patients can expect to live for a longer period of time beyond the time of diagnosis and treatment than ever before (American Cancer Society, 2007). With increase in survival rates, scientific attention has begun to turn from quantity of survival to considerations of its quality and factors that influence long- term psychosocial adjustment to cancer (Spencer, Carver, & Price, 1998).

Adjustment is a multidimensional construct that encompasses a patient's preservation of functional status, perceived quality of life in several domains (e.g., psychological, social, vocational, sexual), mastery of disease- related adaptive tasks, absence of psychological symptoms or disorders, and low negative affect (Stanton, Collins, & Sworowski, 2001). Increasingly, researchers are considering positive indicators of adjustment. Maintaining a positive emotional state, and retaining a sense of meaning and purpose in life (Coward, 2000) are only a few of the aspects integral to adaptation. As such, these factors have claimed an increasingly important role in patient care. However, compared to research into other domains of adjustment, there is comparatively little empirical research on the concepts of meaning in life and emotional expressivity for breast cancer patients (Coward, 2000; Ell, Mantell, Hamovitch, & Nishimoto, 1989; Vickberg et al., 2001).

Statement of the Problem

Even though there have been significant advances in the study of psychological issues related to cancer over the past decade, researchers seemingly have not been responsive to particular issues of importance to patients in their overall adjustment to cancer. According to qualitative and clinical accounts by patients, two neglected issues are patient's emotional expressivity (Stanton et al., 2000) and patient's sense of life satisfaction and perceived level of existential meaning (Coward, 2000).

Regarding the former issue, expressing one's emotions regarding a stressful or traumatic experience, can be thought of as a way of reducing the distress associated with intrusive cognitions. However, two conceptualizations of emotional expression exist. Emotional expression can be considered as a dispositional tendency or as a coping strategy. In the first case, dispositional expressivity has been defined as a tendency to display one's emotions outwardly (Kring, Smith, & Neale, 1994). Internal barriers, or constraints, to emotional expression may inhibit cognitive processing of stressful events, thus leading to heightened intrusion- related distress, and poor adaptation. According to Zakowski, Valdimarsdottir, and Bovbjerg (2001), dispositional expressivity exerts a buffering effect on the relationship between intrusive thoughts and psychological distress, such that women who are less emotionally expressive may be more likely to be distressed by their high intrusive cognitions about breast cancer. Moreover, dispositional expression of positive emotions has negatively been associated with psychological distress, while negative emotional expressivity moderated relations between intrusive thoughts and distress in patients with cancer (Quartana, Laubmeier, & Zakowski, 2006). In the second case, emotional expression is considered as an emotion- focused coping strategy, directed toward managing emotions surrounding a stressor. Use of coping through emotional expression has been associated with lower psychological distress and thus with better psychological adjustment to breast cancer (Stanton et al., 2000). In either cases, emotional expressivity in the context of cancer can be regarded as a form of patients' communication with others, in order to reduce the dissonance created by traumatic events surrounding the cancer experience (between fundamental beliefs regarding personal control, safety, self- worth, and current information inherent in the trauma). Communication with supportive others can enhance cognitive processing by enabling patients to contemplate and discuss trauma- related thoughts and feelings. Discussing traumas with supportive others and disclosing emotions to them might help patients to maintain or reestablish a coherent worldview, an increased sense of control over negative emotional responses and might promote adjustment (Lepore, 2001).

Regarding the latter issue of existential meaning, throughout the course of the illness, breast cancer patients face many challenges that can lead to meaning questions, such as "why me?", or “what are the implications of the illness experience for my life?” (Loscalzo & Brintzenhofeszoc, 1998). Due to the impact of a disease as serious as cancer, patients may struggle more with issues of meaning and the purpose of their lives after diagnosis than individuals who have not had to face a life-threatening illness. Existential issues such as the threat to life, the meaning of life, the meaning of illness, and the impact of cancer on loved ones are only a few examples of commonly experienced concerns of cancer patients along the continuum of the illness (Rowland, 1989). These concerns tend to be related to and parallel the course of the physical illness; thus, it is not uncommon for cancer patients to experience times of high hope as well as times of deep despair, depending on the progression of the illness (Rowland, 1989). Even though existential issues appear to be an integral part of the illness experience, empirical investigations of the construct of existential meaning and breast cancer are rare (Vickberg et al., 2001). In existentialist terms, meaning has been defined as "the cognizance of order, coherence, and purpose in one's existence, the pursuit and attainment of worthwhile goals, and an accompanying sense of fulfillment" (Reker & Wong, 1988, p. 217). Furthermore, the authors specified that meaning is "a person's feeling that his or her life is meaningful; a cognitive notion that the person's individual existence is meaningful, and the motivation to attain both the affective experience and the cognitive perspective" (p. 217). As cancer is presumed to threaten and possibly alter a person's life perception or sense of meaning, this meaning factor then becomes an important aspect in the overall adjustment process.

The theoretical foundation for inclusion of existential meaning into a model of psychosocial adjustment to breast cancer is threefold: First, theories of illness and trauma response explicate the effects of illness on the patient's sense of meaning and purpose in life (Janoff-Bulman & McPherson, 1997; Ryff & Singer, 1996). Second, Park and Folkman (1997) expanded the transactional theory of stress and coping proposed by Lazarus and Folkman (1984) to include meaning-based coping as a factor. This expansion is an attempt to integrate coping theory with a person's broader meaning-based framework for conceptualizing and appraising events. Third, existentialism as a psychotherapy orientation purports that a lack of existential meaning could lead a person into despair, especially when faced with suffering and death (Yalom, 1980). A diagnosis of breast cancer almost inevitably would force a woman to face potential suffering- if not death- and, in turn, trigger a reflection on existential issues, such as the meaning of life.

Qualitative accounts have shown that to be the case. In several studies, dealing with meaning issues was identified by breast cancer patients as an integral part of psychosocial adjustment after the cancer diagnosis (Coward, 2000; Pelusi, 1997). In fact, studies have shown that a high level of existential meaning was associated with greater psychological well-being (Reker & Chamberlain, 2000) and higher quality of life in patients (Vickberg, et al., 2001; Wong & Fry, 1998). External (such as an illness diagnosis) and internal events (such as depression) influence a person's sense of well-being as well as his or her sense of existential meaning (Reker & Chamberlain, 2000; Wong & Fry, 1998). This influence process apparently can lead to either a loss of meaning, a consolidation of previous levels of meaning, or significant gains in a sense of meaning and life purpose (Coward, 2000; Reker & Chamberlain, 2000).

The theoretical foundation for inclusion of emotional expressivity into a model of psychosocial adjustment to breast cancer is twofold: First, social–cognitive processing models of adjustment to cancer have included discharge of emotions and social sharing as important determinants of adjustment (Lepore, 2001). Second, expanding the theory of stress and coping proposed by Lazarus and Folkman (1984), emotional expression and disclosure can be added to operate as buffering factors in the relationship between cancer- related distress and adjustment

(Smyth & Pennebaker, 2001). Research has shown that to be the case. Individual differences in the expression of negative emotion appear to be associated with distress levels and psychological adjustment among patients with cancer (Quartana et al., 2006).

Researchers are interested in the psychological adjustment construct because high scores on this construct denote better physical and mental well- being and quality of life. With breast cancer diagnosis, patients' initial distress is high and psychological well-being is low (Epping-Jordan et al., 1999). Other studies have shown that a significant number of breast cancer patients experience clinically significant symptoms of anxiety and depression (Holland, 1998). In regard to the relationship between psychological responses to breast cancer (and especially intrusions) and adjustment, one study (Kornblith et al., 2003) found that 20 years after the initial treatment, the prevalence of posttraumatic stress disorder symptoms in response to having breast cancer was high (15% of survivors reported two or more such symptoms occurring moderately to extremely often, involving persistently re-experiencing the traumatic event, avoidance of stimuli associated with the trauma, numbing of responsiveness to the external world, and hypervigilance). Researchers have also found that recurrent intrusive thoughts and images (associated with mutilation, hair loss, pain, nausea) have a significant influence on psychological adjustment to breast cancer. Cancer- related traumatic stress symptoms (such as intrusions) predict poorer mental health status and thus poor adjustment (Golden-Kreutz et al., 2005). The likelihood of having intrusive memories, that refer to the patient's own experiences of having cancer (such as being given the diagnosis), or to the illness or death of a relative or friend, is strongly related to being depressed, while intrusive memories are also associated with coping with cancer (Brewin, Watson, McCarthy, Hyman, & Dayson, 1998a). Other cancer- related responses such as helplessness/ hopelessness and anxious preoccupation have also been associated with poor adjustment to cancer and lower quality of life. Schou, Ekeberg, and Ruland (2005) found that a hopeless/ helpless response to breast cancer (characterized by feelings of giving up and pessimism) was associated with poorer global health- related quality of life and decreased emotional and social functioning. Moreover, Cotton, Levine, Fitzpatrick, Dold, and Targ (1999) found that a helpless/ hopeless response to breast cancer and an anxious preoccupation with cancer (characterized by feelings of devastation, fear, and worry) were associated with lower health- related quality of life. Generally, researchers are in agreement that a cancer diagnosis lowers a patient's level of functioning and interest has now shifted more toward studying the actual pathways to adjustment.

From a review of the literature on psychological adjustment in breast cancer patients, it appears that researchers have recognized the need to study multiple aspects of adjustment in conjunction (Schnoll, Harlow, Brandt, & Stolbach, 1998a). The emphasis placed on models of psychosocial adjustment gives credence to the recognition that adjustment is multifaceted and complex (Nicholas & Veach, 2000). Most of the adjustment models have utilized the quality of life construct as an appropriate outcome measure (Epping-Jordan et al., 1999; Schnoll et al., 1998a; Stanton et al., 2000). However, only a few researchers have given attention to the variable of existential meaning (Vickberg, Bovbjerg, DuHamel, Currie, & Redd, 2000), which points to a lack of empirical research in this area. Not only could the adjustment construct encompass a person's sense of life satisfaction and meaning, there is also additional theoretical support for the inclusion of this variable into pre-existing models of psychosocial adjustment to breast cancer. Theories of health and illness, such as the ones by Ryff (1989; 1995) and Janoff-Bulman and McPherson (1997) as well as coping theories (Antonovsky, 1987; Park & Folkman, 1997) and existentialist psychotherapy theory make a convincing case for the inclusion of existential meaning when the focus is on understanding overall adjustment to an illness, such as breast cancer. Therefore, existential meaning should be included into models based on theoretical accounts and psychological adjustment concerns. The present study responded to this lack of research on existential meaning by examining two psychosocial adjustment models that addressed the meaning level of breast cancer patients. Moreover, emotional expressivity was examined in relation to adjustment. However, since the construct of coping has been suggested as exerting important influences on adjustment to chronic illness (Stanton et al., 2001), and has been employed as an additional predictor variable in models of psychosocial adjustment to cancer (Schnoll et al., 1998b), this construct was also included in the models.

Purpose of the Study

Theories of illness (Ryff, 1995) and coping (Park & Folkman, 1997) emphasize that a person's "mind health" and sense of meaningfulness of life (Ryff, 1995) influence the way this person approaches a stressful situation and how this person's adjustment is impacted by a stressor. Thus, an individual who has a high sense of meaning and purpose in life is believed to approach stressors in an adaptive way with the goal of future life satisfaction and positive outcome for mental and physical health (Wong, 1998).

Even though patients with breast cancer have consistently reported struggles with meaning, very few empirically derived models of psychosocial adjustment to breast cancer have incorporated a meaning variable (Vickberg et al., 2001). The same holds true for emotional expressivity. Few studies have included an expressivity variable in a tested psychological model of adjustment to cancer (Zakowski et al., 2001). This current study tests moderated effects of existential meaning and emotional expressivity on the relationship between intrusive thoughts (predictor) and psychological adjustment to breast cancer (outcome). In addition to this, two structural mediation models considered to reflect a woman's psychosocial adjustment to cancer are also developed and tested. The present models are an expansion of a previously developed model by Vickberg et al. (2001) but with particular attention given to the way a woman's sense of existential meaning and expressivity pertain to her psychological adjustment. The two models tested in the current study involve: the primary conceptual model with psychological adjustment being directly influenced by both existential meaning (and expressivity) and psychological responses to cancer (intrusive thoughts, helplessness/ hopelessness, anxious preoccupation), and the alternative model with psychological adjustment being influenced by existential meaning (and expressivity), which in turn are hypothesized to be influenced by psychological responses to cancer. In these models, psychological responses to cancer served as an independent variable, while psychological adjustment to cancer served as a dependent variable. Coping was considered to be a standard intervening variable in these models, based on Lazarus and Folkman's (1984) stress and coping theory.

Two models were deemed necessary for this study due to the ambiguous role that existential meaning appears to have in relation to psychological responses to cancer (Park & Folkman, 1997). In the primary model, the construct of psychological responses to cancer was hypothesized to influence psychological adjustment through a direct path to it. In the alternative conceptual model, psychological responses to cancer and psychological adjustment would not be directly related. Therefore, existential meaning (and expressivity) were thought to mediate and subsume the effects of psychological responses to cancer. Both models were theoretically driven by a previous explication of the relationship between psychological responses to cancer and meaning proposed by Park and Folkman (1997) or between intrusive cognitions, emotional expressivity and adjustment (Zakowski et al., 2001).

Importance of the Study

Since breast cancer patients frequently report concerns over emotional disclosure and meaning and purpose in life as a result of their illness (Loscalzo & Brintzenhofeszoc, 1998), meaning issues need to be given more consideration in order to truly understand and help breast cancer patients adjust to their illness. Health professionals can play a crucial role in this adjustment process by researching issues such as meaning, expressivity, and adjustment. With the advent of positive psychology (Seligman & Csikszentmihalyi, 2000), interest has increased in the study of well-being, meaning, and purpose in life. Ideally, findings from both psycho-oncology and positive psychology could be combined and used to improve breast cancer patients' adjustment and overall quality of life. Suffering from breast cancer can be a life-changing experience for the affected women. Good psychological care for breast cancer patients needs to include both an awareness of, and a responsiveness to, patients' existential concerns sparked by having a serious and potentially life-threatening illness (Coward, 2000). Health professionals are trained to address adjustment issues in their patients (American Psychological

Association [APA], 2007). One of these adjustment issues could be the adjustment to a life-threatening illness, such as breast cancer. More research on the variables influencing this adjustment process, such as research on existential meaning and expressivity in the present study, will benefit health professionals working with breast cancer patients by increasing knowledge, insight, and understanding of factors influencing this adjustment process. Ultimately, the more health professionals know about the adjustment process to breast cancer, the better they can intervene with and provide psychological treatment for breast cancer patients.

CHAPTER 2

Psychological Adjustment to Chronic Illness

This chapter provides a review of the literature on psychological adjustment to chronic illness. The definition of this construct is first presented, together with the indicators of adjustment to chronic diseases. Psychological theories and models of adjustment to chronic illness are then described, with a focus on those theories that encompass the main variables of interest (existential meaning and emotional expressivity). Relevant studies are reported and critiqued so that sufficient logical and empirical support to the assertions made regarding adjustment to a chronic illness such as breast cancer is provided.

Definitions and Concepts of Adjustment: Adjustment and Adaptation to Chronic Illness

The concepts of psychosocial adjustment and psychosocial adaptation share much. In fact, their use is often indistinguishable in the literature on disability and coping with crisis situations. Before their differentiating and overlapping features are addressed, a brief historical review of these concepts is provided.

In one of the earliest efforts to analyze psychosocial adjustment to disability, Dembo, Leviton, and Wright (1956) equated successful adjustment with a "coping" framework. In contrast, the inability to achieve successful adjustment was regarded as a reflection of a "succumbing" framework. The coping framework was predicated upon the following characteristics: (1) emphasizing what the person can do, (2) assuming an active role in shaping one's life, (3) recognizing personal accomplishments, (4) successfully managing negative life experiences, (5) reducing limitations through changes in the physical and social environments, and (6) participating in and enjoying valued activities.

Wright (1983) paralleled acceptance of disability with psychosocial adjustment as evidenced in the domain of one's value system. Acceptance, or adjustment, was equated with ability to minimize actual or perceived losses that stem from a disabling condition and ability to retain the value of existing abilities (Keany & Glueckauf, 1993). Wright (1983), accordingly, proposed four revaluation changes that limit devaluation of self and broaden acceptance of loss. These changes included (1) enlargement of the scope of values, or recognition of the existence of values other than those directly affected by the disability; (2) subordination of physique relative to other values, or decreasing the relative importance of physical appearance in comparison to other personal abilities and values; (3) containment of disability effects, or limiting the deleterious impact of disability spread to nonaffected areas; and (4) transformation of comparative-status values to asset values, or replacing external-based (i.e., standard, normative) abilities and qualities with internal-based (i.e., inherent, intrinsic) values and qualities.

Other theorists have suggested models of adjustment to chronic illness or disability from clinical observations or research data. For example, Hamburg and Adams (1967), in discussing coping behaviors manifest by persons with severe physical disabilities, observed the following behaviors as indicative of successful psychosocial functioning: (1) keeping distress within manageable limits, (2) maintaining a sense of personal worth, (3) restoring relationships with significant others, (4) increasing opportunities for recovery of physical functioning, and (5) increasing likelihood of achieving personally valued and socially acceptable life goals.

Shontz (1975) perceived psychological adjustment as a final stage in his temporal model of response to disability. He further argued that adjustment was a function of the congruence between the subjective world of the person and the external environment. The better the fit between the psychological framework and the external reality, the better the degree of adjustment. Successful adjustment, therefore, necessitated two separate processes. On the one hand, internal perceptions led to actions that maximized available environmental opportunities. On the other hand, the environment must be adapted to facilitate efficacious behaviors. Adaptation was viewed by Shontz (1975) as that dynamic, mutual accommodation of both subjective experience and external environment. The evolving process of adaptation required the individual to show sensitivity to the environment as typically evidenced by one's internal mental state, knowledge of available resources, and interpersonal skills.

Roessler and Bolton (1978) regarded adjustment to disability both as a state or a goal and as a process consisting of a succession of situations requiring specific solutions. Based on their review of the existing models of adjustment to disability, they advocated a comprehensive, synthesized model that they called a "behavioral coping" model, which incorporated such elements as survival ability, potential assets, person-environment congruence, and positive striving. According to this model, maladjustment was regarded as failure to resolve problems in living, while successful adjustment reflected the ability to manage one's environment and efficiently use problem-solving skills. DeLoach and Greer (1981), in a similar manner, argued that adjustment comprised self-acceptance, responsible behavior, appropriate social techniques, and successful coping strategies. They offered no insight into the interrelationships among these domains, nor did they discuss the specific psychosocial and coping efforts associated with successful adjustment to disability.

Clinicians and researchers (see, for example, Jacobson et al., 1990; Pollock, 1986) also failed to draw a distinction between the concepts of adjustment and adaptation. Pollock (1986), for instance, perceived adaptation to chronic illness and disability as a complex process involving both internal and external factors. Ultimately, however, she asserted that adaptation refers to the degree to which the person adjusts (i.e., functions successfully) physiologically, psychologically, and socially to the chronic condition. Jacobson et al. (1990) offered a more comprehensive definition of adjustment to chronic illness. They viewed adjustment as referring to those affective and behavioral changes made in response to the immediate external environment, to developmental stages, and to long-term situations. They further suggested that adjustment could be measured by variables, including (1) self-esteem, (2) psychological symptoms, (3) behavioral problems, (4) demonstrated skills in educational and social situations, and (5) attitudes regarding the chronic illness.

Stanton, Collins, and Sworowski (2001) identified five related conceptualizations of adjustment to chronic disease: (a) mastery of disease- related adaptive tasks such as successfully dealing with the hospital environment and treatment, (b) preservation of functional status, (c) perceived quality of life and appraisals of satisfaction or well-being in several life domains, (d) absence of psychological disorder or symptoms, and (e) low negative affect or high positive affect. Increasingly, researchers are considering positive indicators of adjustment, such as maintaining positive mood and retaining purpose in life. These conceptualizations reveal that adjustment encompasses multiple components that cross interpersonal, cognitive, emotional, physical, and behavioural domains, that are interrelated.

In concert with these theoretical formulations, psychosocial adaptation to chronic illness and disability can be regarded as an evolving, dynamic, general process through which the individual gradually approaches an optimal state of person-environment congruence manifest by (1) active participation in social, vocational, and avocational pursuits; (2) successful negotiation of the physical environment; and (3) awareness of remaining strengths and assets as well as existing functional limitations. Adjustment, on the other hand, may refer more specifically to a particular phase (i.e., set of experiences and reactions) of the psychosocial adaptation process. As such, adjustment is the clinically and phenomenologically hypothesized final phase- elusive as it may be- of the unfolding process of adaptation to crisis situations including the onset of chronic illness and disability. It is alternatively expressed by terms such as (1) reaching and maintaining psychosocial equilibrium; (2) achieving a state of reintegration; (3) positively striving to reach life goals; (4) demonstrating positive self-esteem, self-concept, self-regard, and the like; and (5) experiencing positive attitudes toward oneself, others, and the disability (Jacobson et al., 1990; Livneh, 1986; Roessler & Bolton, 1978; Wright, 1983).

As is evident from this cursory discussion, psychosocial adaptation will be manifested differently depending on the type of chronic illness or disability and its long-term implications. For example, adaptation in the case of more stable, non-life-threatening conditions, such as amputation, is vastly different from that associated with unstable conditions, such as multiple sclerosis, or deteriorating, life-threatening conditions, such as cancer of the liver.

Types of Chronic Illness

The term chronic illness refers to a wide variety of diseases which have in common that they are of a long-lasting nature. From a psychological point of view, the extended course without the perspective of cure may be of interest, possibly affecting patients' willingness and ability to perform behaviors related to managing illness and adhering to medical prescriptions. It may be important to discriminate between different categories of chronic illness beyond medical diagnostic distinctions. Attempts in this direction are scarce, however. Disease characteristics such as predictability, contagiousness, and posing a threat to life have been proposed as factors possibly affecting illness management and support from relatives and friends (Felton & Revenson, 1984). For example, cancer and AIDS, which confront the family of the patient with crisis and possibly even threaten their own health (in case of AIDS), may provoke decreased, sometimes even 'negative', support, resulting in victimizing the patient (Bishop, Alva, Cantu, & Rittiman, 1991; Manne, Taylor, Dougherty, & Kemeny, 1997). Another characteristic of interest relates to controllability of disease, referring to the actual possibilities of influencing the symptoms and course of the illness by performing self-care behaviours, such as maintaining a healthy diet or adjusting medication intake according to activity. Typical diseases which are controllable by the patient (at least to some extent) are diabetes and asthma, requiring performance of self-care routines (both medication and health habits) on a daily basis. Actual control may increase feelings of perceived control, but it may also impose a high burden on self-management routines, confronting the patient with his or her responsibility to take good care of the illness (Eitel, Hatchett, Friend, Griffin, & Wadhwa, 1995). Typical uncontrollable diseases are neurological disorders such as multiple sclerosis, with an unpredictable course and few opportunities for patients to influence symptoms (Felton & Revenson, 1984; Fournier, De Ridder, & Bensing, 2002). Uncontrollability of illness may result in feelings of helplessness, although it has been suggested that there may be adaptive benefits to surrendering control in the face of uncontrollable chronic illness (Reid, 1984). Although the issue of actual illness control is important in discriminating between types of chronic diseases, most studies show that there is a remarkably low association between actual control and perceived, subjective control. Moreover, such studies show that perceived control is a stronger predictor of adjustment than actual control (Helgeson, 1992; Taylor, Helgeson, Reed, & Skokan, 1991).

Although no scientific definition of the concept of chronic illness exists, many researchers agree that chronic illnesses typically involve diseases of a long-lasting nature without prospect of cure. In addition, most chronic illnesses are characterized by a progressive course, which means that the physical condition of patients gets worse as years go by. Due to improved public health and to better medical control over acute infectious diseases such as influenza, tuberculosis, measles and polio, and to the increased life expectancy of the population associated with it, during the twentieth century chronic diseases have become important health risks in Western societies (e.g. Glasgow et al., 1999; MacKeown, 1979). Reliable epidemiological data from European countries are scarce, but available figures demonstrate that amongst the most prevalent chronic diseases are various forms of cardiovascular disease (coronary heart disease, stroke and heart failure), rheumatoid arthritis, diabetes, asthma, and different types of cancer (WHO, 1994). For example, figures on diabetes prevalence show that about 3 to 10 per cent of the population in European countries are afflicted by this condition (King & Zimmet, 1988). Asthma, on the other hand, is more variable across countries, with a high prevalence in the United Kingdom and a much smaller prevalence in other European countries (European Community Respiratory Health Survey [ECRHS], 1996). Estimates of European figures on the prevalence of cancer and heart disease can only be derived from mortality statistics (Boyle, 1992). Unfortunately, such figures are difficult to compare across countries as they are related to country-specific differences in screening and registration procedures (Ruwaard et al., 1994). It is expected that in the near future the prevalence of diabetes (due to increased unhealthy diet and associated obesity - Seidell, 1995; Zimmet, 2000) and breast cancer and ovarian cancer (due to increased use of hormone suppletion therapy in menopausal women) will rise (Boyle, 1992). In contrast, it is expected that lung cancer will decrease in the future, at least in the north European countries, because of the decreased smoking behaviour in men; for women, however, the prevalence of lung cancer is rising (Ruwaard et al., 1994).

Taking all chronic conditions together, it is estimated that at any given moment 50% of the population suffers from a chronic illness requiring some form of medical intervention (Taylor & Aspinwall, 1996). Most chronic illnesses occur in older adults; and as the average age of the population increases, so does the prevalence of chronic illnesses. It is estimated that people aged 60 years and older have, on average, 2.2 chronic conditions (Rothenberg & Koplan, 1990). Most chronic illnesses have a late onset, but some, such as asthma and diabetes, may even manifest themselves in young children (Suris & Blum, 2001). It is estimated that about 35% of young adults aged 18 to 44 years have at least one chronic condition (Taylor & Aspinwall, 1996). Because chronic diseases are ones with which people often live many years, medical management of these chronic disorders is costly and accounts for 75% of US health spending (Hoffman, Rice & Sung, 1996).

Adaptive Tasks in Chronic Illness

Other research on features of chronic illness corroborates the importance of subjective evaluations of disease characteristics and proposes the concept of 'adaptive tasks' as a relevant construct for studying psychological aspects of chronic illness (Bensing, Schreurs, De Ridder, & Hulsman, 2002; De Ridder, Schreurs & Bensing, 1998; Moos & Schaefer, 1984). The concept of adaptive tasks refers to the subjective evaluation of disease-related stressors which challenge adjustment, and comprises such stressors as dealing with pain and incapacity, dealing with hospital environment, developing adequate relationships with health-care staff, establishing and assimilating the meaning of the situation, acknowledging personal significance of the situation, preserving emotional balance, preserving a satisfactory self-image, maintaining a sense of competence and mastery, sustaining relationships with family and friends, and preparing for an uncertain future (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992; Moos & Schaefer, 1984). The majority of psychological studies on chronic illness have employed a disease-specific framework, elaborating on the typical medical (disease-specific) demands associated with illness as important factors in adaptation. However, there is some evidence that adaptive tasks are similar across a wide range of chronic illnesses, although the relative importance of such tasks may differ due to variation in medical demands (Heijmans et al., 2001). Some researchers have therefore proposed that a disease-generic framework, highlighting the common psychological demands of chronic illness, may offer a promising perspective for studying the psychological aspects of chronic illness (Glasgow, Strycker, Toobert, & Eakin, 2000; Heijmans et al., 2001; Stanton, Collins & Sworowski, 2001). Besides similarities in adaptation processes across diseases, another reason for maintaining a generic view on the psychological aspects of chronic illness relates to the fact that many patients suffer from more than one chronic condition at the same time (known as 'comorbidity') (Rothenberg & Koplan, 1990), which inevitably challenges the validity of a disease-specific approach. Taken together, research on a wide variety of chronic illnesses has failed to identify clear categories of chronic illness according to objective disease characteristics. Subjective evaluations of disease are important for understanding the way patients adjust to illness and are similar across a wide range of chronic diseases. The following sections, therefore, will not include discussion of separate diseases but will focus on psychological issues which are common to a number of chronic diseases.

Indicators of Adjustment to Chronic Illness

Immediately following medical diagnosis of chronic illness, patients are often in a state of crisis characterized by emotional distress and finding that their habitual ways of coping do not work (Moos & Schaefer, 1984). As a result, patients may experience feelings of anxiety, fear, depression or even denial (Taylor & Aspinwall, 1996). Eventually, the crisis phase of chronic illness passes and patients enter a phase in which they make efforts to adapt to the new situation. Depending on the way they handle this phase and depending on progression of disease, most patients eventually reach a state of adjustment. Attempts to delineate a set of stages of adjustment have proven unsuccessful as disease stage is related inconsistently to adjustment (e.g. Van't Spijker, Trijsburg & Duivenvoorden, 1997). However, a number of studies suggest that, for most patients, the crisis of illness diminishes within a year following diagnosis (e.g. Cox & Gonder-Frederick, 1992).

Quality of Life

Adjustment to disease can be assessed in multiple ways. A typical measure derived from medical practice is health-related quality of life, which is generally assessed by measures of daily functioning (i.e. the ability to conduct daily personal and role-related activities). The widely used Rand 36-item Health Survey (Ware, 1993), for example, assesses physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, vitality, pain and general perceptions of health. Such functional measures of adjustment are relevant in the context of medical treatment, but do not capture adequately other indicators of adjustment, such as satisfaction with life or well-being (Taylor & Aspinwall, 1996). The basic assumption of psychological theories of well-being is that the successful pursuit of meaningful goals plays an important role in development and maintenance of psychological well-being (Brunstein, 1993; Ditto, Druley, Moore, Danks, & Smucker, 1996; Scheier & Bridges, 1995). As chronic illness may jeopardize accomplishment of goals, well-being may also be threatened. Therefore, several investigators in the field of quality-of-life research have emphasized the role of personal goals and related constructs in patients' perceptions of their quality of life. According to Calman (1984), for example, quality of life measures the gap between the individual's hopes, expectations and ambitions and his or her present experience of reality. The central element in this definition is that self-reported quality of life is assumed to involve some subjective evaluation of goal attainment. Distinguishing different conceptualizations of quality of life is relevant as patients' reports on good adjustment tend to differ depending on the type of measure of quality of life which has been used. Studies employing a functional measure mostly indicate rather poor quality of life of chronically ill patients, especially in domains related to physical functioning (e.g. Schlenk et al., 1998). Studies employing a goal-related measure, however, show that quality of life of chronically ill patients is remarkably similar to quality of life reported by healthy people. Some studies even demonstrate a positive effect of being ill (Folkman, 1997; Petrie, Buick, Weinman, & Booth, 1999; Sodergren & Hyland, 2000). For example, Collins and colleagues (Collins, Taylor, & Skokan, 1990) reported that 90 per cent of cancer patients in their study named at least some beneficial changes in their lives as a result of the cancer, including an increased ability to appreciate each day and the inspiration to get on with important life tasks, putting more effort in their relationships, and more awareness of other's feelings and more sympathy and compassion for others. Such findings may be dismissed as an artifact demonstrating the existence of defence mechanisms in chronically ill patients, such as denial of their condition (Croyle, Sun, & Hart, 1997), but the consistent observation of positive reactions seems to contradict such an interpretation. Moreover, the so-called response shift phenomenon (Sprangers & Schwartz, 1999) has been proposed as an explanation for reported positive reactions to chronic illness, implying that, during the course of illness, patients may learn to adopt new standards and values about important things in life in response to their altered life condition. Such reactions may occur because chronically ill people re-order their priorities and find meaning in other activities in response to illness. Another explanation for the apparently positive adjustment to chronic illness is that it only affects specific domains of functioning instead of creating complete maladjustment. For example, Andersen, Woods and Copeland (1997) found that cancer is more likely to produce 'islands' of life disruption in specific realms and at specific points in time than to confer a risk for global dysfunction. Regardless of why they occur, these positive reactions seem to serve a beneficial function in emotional recovery and imply that we should attend to the protective effects of positive biases in adaptation (Taylor & Brown, 1988).

Emotional Distress

Other indicators of adjustment involve assessments of negative emotional impact such as anxiety or depression. A number of studies conclude that people with chronic illness in general maintain adequate psychological functioning, although a significant minority of patients may be at risk for anxiety or depression (Cox & Gonder-Frederick, 1992; DeVellis, 1995; Ell & Dunkel-Schetter, 1994). Although anxiety in chronically ill patients may be an expression of a tendency towards anxiety which already existed before illness onset, typical illness-related situations may also increase the experience of anxiety. Examples of such situations are waiting for test results, invasive procedures, side-effects of treatment, dependency on health professionals, and uncertainty about disease course (e.g. Jacobsen, Bovbjerg, & Redd, 1993). Depressive reactions are also more common among chronically ill patients. A number of studies on different chronic diseases have reported that about 30 per cent of patients show symptoms of depression (e.g. Clark, Cook, & Snow, 1998; Dickens, McGowan, Clark- Carter, & Creed, 2002). It has been suggested that depression is a normal reaction related to the first stage of illness confronting patients with crisis and loss, but there is little evidence to support that view (Wells, Rogers, Burnam, & Camp, 1993). Unfortunately, not much is known about the course of depression over time to determine whether depression is a normal response to loss. However, some evidence exists that high levels of depression in chronically ill patients are especially found in patients with a family history of affective disorders.

Also, disease severity has been linked with increased levels of depression, as well as the absence of coping resources such as adequate social support from family and friends (Manne et al., 1997). Unfortunately, the assessment of depression in chronically ill patients can be problematic, as many physical signs of depression, such as fatigue, sleeplessness or weight loss, may also be an expression of the disease itself (e.g., Clark, Cook, & Snow, 1998). At this point, there is no standard to discriminate between 'normal' depressive reactions to illness and reactions which should be treated with psychological interventions.

Contributors to Adjustment to Chronic Illness within Existing Psychological Theories and Models of Adjustment

Psychological studies on chronic illness are generally guided by models of stress and coping which either focus on the role of stress and moderators of stress in the onset and course of illness, or highlight adaptation to stress caused by being chronically ill (Cohen, Kessler, & Gordon, 1995; Cohen & Lazarus, 1979; De Ridder & Schreurs, 1996; Stanton et al., 2001; Maes, Leventhal, & De Ridder, 1996). These models are derived from more general conceptual frameworks regarding adjustment to stressful experiences, and typically highlight the role of stressors as possibly affecting health outcomes, well-being and adjustment. The impact of stress is believed to be mediated by cognitive appraisals of the stressor and the personal and social resources available to assist coping with stress. Therefore, coping resources, coping strategies, as well as the personal and social context of stress are important areas of psychological research on chronic illness (Lazarus & Folkman, 1984; Moos & Schaefer, 1993; Taylor & Aspinwall, 1996). In addition, an important area of research is also concerned with clarifying the role of biological pathways between stress on the one hand and health outcomes on the other hand. To date, such models incorporate hormonal, or immunological aspects of adjustment (e.g., Andersen, Kiecolt-Glaser, & Glaser, 1994; Baum & Poluszny, 1999). Compared to other social sciences dealing with chronic illness, such as behavioural medicine or medical sociology, psychological models of chronic illness have equally adopted a so-called biopsychosocial view of chronic illness (Engel, 1977), in which psychological as well as social and biological factors play a role, but with more emphasis on the psychological processes associated with it. Of particular interest to this study were five theories or models that explicitly addressed issues of existential meaning for suffering patients. These theories ranged from coping and meaning theories (Lazarus & Folkman, 1984; Park & Folkman, 1997), to cognitive adaptation (Taylor, 1983), and a trauma perspective (Horowitz, 1986; Ehlers & Clark, 2000).

The Transactional Theory of Stress

Probably the most influential of all psychological models of illness is the transactional stress model of Lazarus and Folkman (1984). Lazarus and Folkman saw the state in which resources were overtaxed or lacking as creating stress and leading, in turn, to mobilization of appraisal and coping processes. Individuals; cognitive appraisals of the potential for harm (i.e., threat appraisal) and benefit (i.e., challenge appraisals) arising from the encounter (i.e., primary appraisals), as well as appraisals of their ability to control or manage the situation's demands (i.e., secondary appraisal) catalyze the initiation of coping strategies. Although their emphasis was clearly on appraisal and coping, they saw people's personal and social resources, as setting the stage for these processes. The degree to which individuals appraise something as threatening, and the coping choices they make, are largely determined by the resources they have to answer the threat or challenge. The cognitive appraisals and coping strategies engaged in response to a stressor, substantially determine adaptive outcomes in emotional and social, and somatic realms (Figure 1).

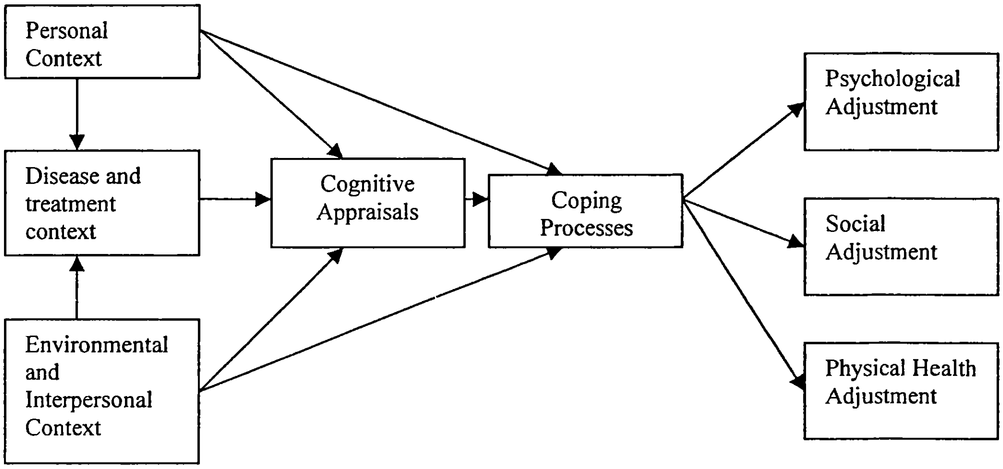

Figure 1. Diagram of personal and environmental influences on adjustment to chronic illness.

The Model of Global and Situational Meaning in the Context of Stress and Coping

Park and Folkman (1997) expanded coping theory by suggesting a tertiary coping mechanism, meaning-based coping. The meaning implicated in meaning-based coping consists of both global and situation-specific meaning. Global meaning refers to "people's basic goals and fundamental assumptions, beliefs, and expectations about the world" (Park & Folkman, 1997, p. 116) and is akin to the construct of existential meaning. On the contrary, situational meaning "refers to the interaction of a person's global beliefs and goals and the circumstances of a particular person-environment transaction" (p. 121). The authors believed that both types of meaning are implicated when individuals are faced with challenging life events and are forced to re-appraise these events. This re- appraisal takes place on a meaning level, first on a situational basis and then on a more global basis. In the model of global and situational meaning in coping, an event leads from initial appraisal of the situation to appraised situational meaning and an attempt to make situational meaning congruent with global meaning. In case situational and global meaning diverge, the person will make attempts at alleviating the distress caused by the situation. According to Lazarus and Folkman (1984) and Park and Folkman (1997), the following mechanisms are available to a person in this situation: problem-focused coping, emotion-focused coping, reappraisal of meaning, and changes in situational and/or global meaning. Park and Folkman introduced the term "meaning-making" (p. 124) to denote the process of situationally and globally appraising a stressful event. Whereas global meaning is more stable, situational meaning may change on a daily basis. Successful coping with a situation such as breast cancer depends on how discrepancies between situational and global meaning are resolved by an individual. The ultimate goal of meaning-making coping is to lead to congruency between situational and global meaning, which precipitates either the acceptance or resolution of the original stressful situation. If the attempt at achieving congruent situational and global meaning is unsuccessful, the person tends to ruminate and re-attempt previously employed coping processes or strategies.

An example of this process could be the woman diagnosed with breast cancer who (rightfully) appraises the diagnosis as life-threatening. Potential threat to life becomes the woman's appraised meaning of the situation. If this patient believes in a just and ordered world (her global meaning), her situational and global meaning are not congruent anymore, which will lead her to experiencing distress. This distress tends to spark various coping responses ultimately aimed at changing either her initial appraisal of the situation (life-threatening illness) and/ or her global meaning ("life is not fair", or "bad things do happen to good people"). If the woman can make those changes in her meaning perspectives, she can come to accept her illness and adjust psychologically. Should she be unable to match her appraisal of the situation with her worldview, she will continue to experience distress and potentially anxiety and depression (Holland, 1998). In this example (and in the model of coping as such), global and situational meaning are clearly interrelated. One of the implications from the interrelation is that when people are faced with a stressful situation such as having breast cancer, both their situational and their global meaning are affected. In the model by Park and Folkman (1997), meaning propels coping and both coping and meaning are intricately linked to the outcome of a stressful situation. Therefore, meaning needs to be regarded as an essential factor in a person's coping with and adjustment to illness. In a follow-up article on this new model, Folkman and Greer (2000) included meaning-based coping as a third type of coping behavior. According to the authors, meaning-based coping is implicated when problem-focused and emotion-focused coping both have yielded unfavorable resolutions. Meaning-based coping fulfilled a mediating role between distress and positive emotion in the proposed model.

In summary, from a coping perspective, meaning-making and coping are linked in their mediating role between stressors and psychological outcome. Research on meaning-based coping is scarce aside from the theoretical model by Park and Folkman (1997). These authors not only provided a theoretical framework for future study of meaning in relation to coping but encouraged an inclusion of the meaning construct in empirical research on the coping process.

The Theory of Cognitive Adaptation

Taylor (1983) has developed the theory of cognitive adaptation to threatening events, such as a life- threatening illness. This theory is based on the assumption that people possess unrealistically positive views of themselves to enhance their well- being. It posits that mildly positive self- relevant distortions enable individuals: (a) to search for meaning in the experience and develop an optimistic outlook, (b) to regain mastery over the event, and (c) to restore their self- esteem in response to stressful events, such as a diagnosis of cancer. The search for meaning involves the need to understand why this event occurred (which is addressed through causal attributions) and what its impact has been (which is addressed through construing positive meaning from the experience). Causal analysis helps individuals understand, predict, and control their environment. On the other hand, understanding the implications of the event for one's life, may lead to a new attitude toward and reappraisal of life, reordering of priorities, rethinking the significance of one's social relationships, restructuring one's life along more satisfying lines, positive self- change, and self- knowledge.

Regaining a sense of mastery involves cognitive control strategies, such as positive thinking and meditation, as well as behavioural control strategies, such as making dietary changes designed to decrease the likelihood of cancer recurrence, acquiring information about the disease so one can participate in and be knowledgeable about one's care, or attempting to control treatment side- effects.

Restoring self- esteem involves downward comparisons between oneself with others who are less fortunate in order to bolster self- enhancement, or upward comparisons with others who are doing better in order to learn how to cope more effectively. In addition, she found that those patients who were able to find meaning in the experience, felt a sense of control, and restored self- esteem, were emotionally better adjusted than those who lacked these attributes (Figure 2).

These positive illusions, or mild distortions of reality, of self- enhancement and finding meaning, unrealistic optimism, and exaggerated perception of personal control, were considered beneficial in bringing about psychological adaptation and protective of mental health (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000).

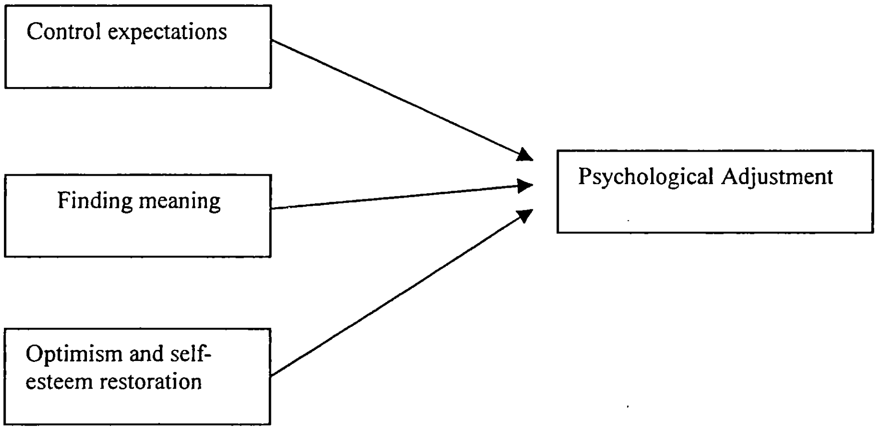

Figure 2. Diagram of components of the process of cognitive adaptation to threatening events.

Social- Cognitive Processing Models of Emotional Adjustment to Illness

According to Lepore (2001), life- threatening illnesses such as cancer, can be classified as traumatic life events, that can profoundly and sometimes irrevocably alter patients' lives. Cancer, in particular, can dissolve people's everyday assumptions about life. It can cause people to question core beliefs they hold about themselves, their relationships with others, and their future- beliefs that help people to maintain a sense of self- worth, predictability, coherence, and control in the world (Janoff- Bulman, 1992). By challenging individuals' preexisting mental models of themselves and the world, cancer can take a major psychological toll. According to cognitive- processing theories, emotional distress associated with traumas is largely due to the discrepancy between people's mental models of themselves or the world and the meaning inherent in a trauma (Epstein, 1991). Confronting, contemplating, and reevaluating aversive, trauma- related stimuli may facilitate emotional adaptation by helping people to integrate novel, trauma-related information into preexisting mental models (Horowitz, 1986; Janoff-Bulman, 1992; McCann & Pearlman, 1990; Parkes, 1971; Rachman, 1980; van der Kolk & van der Hart, 1991).

One way that patients may reduce dissonance created by traumatic events (between mental models and current information inherent in the trauma) is to initiate communication. A positive or supportive environment can enhance cognitive processing by enabling patients to contemplate and discuss trauma- related thoughts and feelings. Supportive others can suggest new and positive perspectives on a traumatic experience, provide information on how to cope, or encourage patients to accept their situation. Discussing traumas with supportive others and disclosing emotions to them might help patients to maintain or reestablish a coherent worldview, and increased control over negative emotional responses. Moreover, thoughts about cancer may be less distressing to patients with adequate social outlets, they may be in a better position to achieve cognitive and emotional resolution. In contrast, an unsupportive social network should impede cognitive processing and adjustment. Litz, Orsillo, Kaloupek, and Weathers (2000) have argued that lack of ability to experience or express emotions may be a marker of emotional numbing, that is in turn an emotional deficit associated with posttraumatic stress disorder.

Thus, low emotional expressivity and emotional numbing may be regarded as indicators of chronic posttraumatic stress disorder, where the patient tries to minimize the feelings associated with traumatic memories or exhibits conditioned "psychic analgesia" in response to uncontrollable and unpredictable aversive stimuli.

Kennedy- Moore and Watson (2001) have provided an additional social-cognitive theoretical framework for understanding how emotional expression can alleviate distress. These authors have noted the paradox of distress expression, where expression of negative feelings is both a sign of distress and a possible means of coping with that distress. They suggest that emotional expression is a means of processing and communicating information about the relationship between the self and the environment. Expression can enhance psychological well- being by helping patients to perceive their feelings as less frightening or unbearable, by fostering acceptance of painful feelings and by diminishing the frequency or emotional impact of intrusive thoughts about stressful events such as the illness experience. Moreover, expression can enhance patients' well-being by facilitating insight through construction of narratives about experience and articulation of feelings, and better recognition, elaboration, clarification and understanding of their inner subjective states. Expression can lead to new appraisals of past or present circumstances, or may enable patients to perceive some benefit from their suffering, achieve personal growth, gain a new appreciation for their own resilience in response to the trauma, and create meaning out of experience. Expression can affect interpersonal relationships, as well, and can elicit social support, comfort and reassurance, thus promoting psychological adjustment to illness.

Theories of Posttraumatic Stress

Horowitz (1976, 1986) is a pioneer in the field of posttraumatic stress disorder (PTSD) due to his long-standing interest in the processing of thoughts, images, and moods related to loss and trauma. His theory has roots in psychodynamically informed observations of normal and abnormal bereavement reactions, and in a long tradition emphasizing people's development of individual assumptive worlds. Horowitz argued that when faced with trauma, people's initial response is outcry_ at the realization of the trauma. A second response is to try to assimilate the new trauma information with prior knowledge. At this point, many individuals experience a period of information overload during which they are unable to match their thoughts and memories of the trauma with the way that they represented meaning before the trauma. In response to this tension, psychological defense mechanisms are brought into play to avoid memories of the trauma and pace the extent to which it is recalled. For example, the individual may be in denial about the trauma, feel numb, or avoid reminders of it. However, the fundamental psychological need to reconcile new and old information means that trauma memories will actively break into consciousness in the form of intrusions, flashbacks, and nightmares. These consciously experienced trauma memories provide the individual with an opportunity to try to reconcile them with pretrauma representations.

It becomes apparent that, according to Horowitz, there are now two opposing processes at work: One to defend the individual by the suppression of trauma information and one to promote the working through of the traumatic material by bringing it to mind. Therefore, the individual oscillates between avoidance and intrusions of the trauma. This oscillation allows the traumatic information to be worked through, and as this happens, the intensity of each phase decreases. In particular, longer term structures in memory representing the self or future goals can be adjusted so that they are consistent with the new data, at which point, trauma processing is considered to be completed. Failure to process the trauma information is proposed to lead to persistent posttraumatic reactions as the information remains in active memory and continues to intrude and be avoided.

Horowitz's work contains numerous important observations and has rightly been very influential. In particular, he was one of the first theorists to emphasize the impact of trauma on wider beliefs about the self, the world, and the future and to consider how recovery might involve far-reaching cognitive change. Recognizing this broader perspective and its ability to explain the breadth of beliefs and emotions encountered in PTSD, his theory was described as "social-cognitive" by Brewin, Dalgleish, and Joseph (1996). Areas not treated in any depth by his theory include the difference between flashbacks and ordinary memories of trauma, individual variations in trauma response, peri-traumatic reactions, the role of environmental factors such as trauma cues and social support, and how to distinguish remission of symptoms due to successful recovery from remission due to successful avoidance (e.g., Brewin, 2003; Litz, 1992).

Another model of traumatic information processing is Ehlers and Clark's cognitive model. Ehlers and Clark (2000) proposed that pathological responses to trauma arise when individuals process the traumatic information in a way that produces a sense of current threat, either an external threat to safety or an internal threat to the self and the future. The two major mechanisms that produce this effect involve negative appraisals of the trauma or its sequelae and the nature of the trauma memory itself.

Expanding on the work of Foa and Rothbaum (1998) and Jones and Barlow (1990), Ehlers and Clark identified a wide range of relevant negative appraisals. Some of these are focused on the traumatic event and signal overgeneralization of danger (e.g., "Others can see I am a victim") or negative appraisal of own actions (e.g., "I deserve that bad things happen to me"). Other appraisals focus on sequelae, such as the PTSD symptom of numbing ("I'll never be able to relate to people again"), other people's reactions ("They think I am too weak to cope on my own"), and life prospects ("My body is ruined"). The different types of appraisal, variously involving danger, violation of standards by self or others, or loss, explain the variety of emotions reported by patients with PTSD.

Among factors that increase the likelihood of negative appraisals are thought processes during the trauma and prior beliefs and experiences. Ehlers and Clark identified a specific frame of mind they termed 'mental defeat'. This reaction, emphasizing the inability of the person to influence their fate, is a risk factor for such self-appraisals as being weak, ineffective, or unable to protect oneself. Prior experiences of traumatization, weakness, or helplessness also increase the risk of appraising oneself as unable to act effectively, as being extremely vulnerable to danger, as being the target of others' hostility, and so on. As well as discussing various ways in which appraisals can interact with the nature of the trauma memory, Ehlers and Clark developed a detailed account of the importance of maladaptive strategies or processes in maintaining the post traumatic stress disorder. Among the maladaptive cognitive styles, the persistent use of rumination in the form of intrusions was included.

Limitations of the Literature on Adjustment to Chronic Disease

Although the gap in the literature on adaptation to life- threatening disease will be described and reviewed in detail in the next Chapter 3, a short account of the limitations of the literature on adjustment to chronic disease would be useful at this point. The psychological theories and models of adjustment to chronic illness presented by now, have included existential meaning and emotional expressivity as important predictors of adjustment. However, little is known about the mechanisms for the effects of these predictors of adjustment to chronic disease. For example, it remains to be established whether negative appraisals of the illness- related trauma or adverse psychological responses (e.g., intrusions) to it exert their effect directly on adjustment, or they influence adjustment through existential meaning or emotional expressivity. In the former case, meaning and expressivity could act as moderator variables, so that for patients who have high levels of meaning or expressivity, adverse psychological responses (e. g., intrusions) and adjustment may be positively related. In the latter case, meaning and expressivity would act as mediator variables, which would transmit a portion of the effect of a prior variable (e.g., intrusions) onto a subsequent one (e.g., adjustment). Examining mediated and moderated relationships in adjustment to chronic disease would have important implications for intervention. Thus, it is imperative that moderated effects be distinguished from mediated ones.

CHAPTER 3

Psychological Adjustment to Breast Cancer

This chapter provides a review of the literature on psychological adjustment to breast cancer. Epidemiological characteristics of breast cancer, together with medical variables (such as disease staging and prognostication) that affect the impact of breast cancer are first discussed. The psychological impact of breast cancer and certain predictors of adjustment to breast cancer (such as intrusive thoughts, existential meaning, emotional expressivity, and coping) are then presented. In addition, the empirically validated models of psychological adjustment to breast cancer are described. Finally, the gap in the literature is identified and the way the proposed study is expected to contribute to the existing body of knowledge is explicated.

Disease- related Influences on Adjustment to Breast Cancer

Epidemiological Characteristics

Breast cancer has a major impact on the health of women. Approximately 180,000 new cases of invasive breast cancer are diagnosed each year among women in the U.S. and nearly 41,000 women die of the disease (American Cancer Society, 2007). In American women, breast cancer is the most frequently diagnosed cancer and the second leading cause of cancer death. In women aged 40 to 55, breast cancer is the leading cause of all mortality. There has been a slight decline in breast cancer mortality overall, which can be attributed both to the success of early detection programs and to advances in treatment, particularly developments in systemic therapy. In Europe, more than 360,000 women are diagnosed each year with breast cancer, while 129,000 women die each year of the disease (IARC, 2004).

In Greece, 4,543 new cases of women with breast cancer are diagnosed each year, and 1,569 women die of the disease (IARC, 2004). According to Figure 3, however, the age- standardized incidence rate (ASR- per 100,000) of breast cancer in Greece (using the World standard population) is low, compared to that of other countries in Northern or Western Europe. The same holds true for breast cancer mortality in Greece.

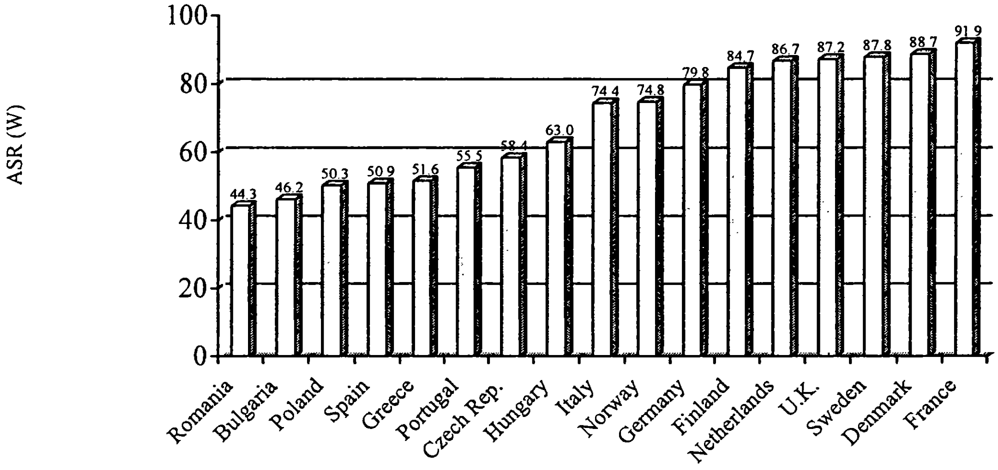

Figure 3. Age- standardized incidence rate (per 100,000) of breast cancer in selected European countries.

Staging of Breast Cancer

Staging refers to the grouping of patients according to the extent of their disease. It is the process physicians use to assess the size and location of a patient's cancer. Staging is useful in (1) determining the choice of treatment for individual patients,

(2) estimating their prognosis, and (3) comparing the results of different treatment programs. Several tests may be performed to help stage breast cancer including clinical breast exams, biopsy, and certain imaging tests such as a chest x-ray, mammogram, bone scan, computed tomography (CT) scan, and magnetic resonance imaging (MRI) scan. Blood tests, used to evaluate a woman's overall health and detect whether the cancer has spread to certain organs, often follow imaging tests. Currently, staging of cancer is determined by the American Joint Committee on Cancer (AJCC, 1997), which is jointly sponsored by the American Cancer Society and the American College of Surgeons. The AJCC system is a clinical and pathologic staging system and is based on the TNM system, in which T refers to tumor size, N to palpable nodes, and M to metastasis. The TNM system classifies the tumour by its size, site and spread.

Tumor size (T). The letter T followed by a number from 0 to 4 describes the tumor's size and whether it has spread to the skin or chest wall under the breast. Higher T numbers indicate a larger tumor and/or more extensive spread to tissues surrounding the breast. For example, T1 indicates a tumor of 2 cm or less in diameter, while T3 indicates a tumor of more than 5 cm in diameter.

Palpable nodes (N). The letter N followed by a number from 0 to 3 indicates whether the cancer has spread to lymph nodes near the breast and, if so, whether the affected nodes are fixed to other structures under the arm. For example, N1 indicates that cancer has spread to the movable ipsilateral axillary lymph nodes (underarm lymph nodes on same side of breast cancer), while N3 indicates that cancer has spread to the ipsilateral mammary lymph nodes or the ipsilateral (same side of body as breast cancer) supraclavicular lymph nodes.

Metastasis (M). The letter M followed by a 0 or 1 indicates whether or not the cancer has metastasized (spread) to distant organs (*i.e.,* the lungs or bones) or to lymph nodes that are not next to the breast, such as those above the collarbone.

Numerical Stages of Breast Cancer

The stage of a breast cancer describes its size and the extent to which it has spread. The staging system ranges from Stage 0 to Stage IV (International Union Against Cancer, 2002). The numbers 0, I, II, III and IV are used to denote the grouping of Ts, Ns, and Ms into stages, and each number refers to a possible combination of TNM factors (Table 1).

Table 1

Staging system for breast cancer

Stage	**Tumor (T)**	**Node (N)**	**Metastasis (M)**
Stage 0	Tis	N0	M0
Stage 1	T1	N0	M0
Stage IIA	T0	N0	M0
	T2	N0	M0
Stage IIB	T2	N1	M0
	T3	N0	M0
Stage IIIA	T0	N2	M0
	T1	N2	M0
	T2	N2	M0
	T3	N1, N2	M0
Stage IIIB	T4	any N	M0
	any T	N3	M0
Stage IV	any T	any N	M1

Stage 0. Cancer is localized, has not spread to any surrounding tissues and there is no evidence of cancer cells breaking out of the part of the breast in which it

started, or invading neighboring normal tissue.**Stage I**. The primary (original) cancer is 2 cm or less in diameter and has not spread to the lymph nodes. Stage I breast cancer treatment usually consists of breast conserving therapy (BCT), that is lumpectomy (removal of cancerous lump and small margin of surrounding normal tissue) and axillary node dissection (removal of underarm lymph nodes) followed by radiation, or modified radical mastectomy (removal of the affected breast) and axillary node dissection.

Stage II. The primary tumor is between 2 and 5 cm in diameter and has not spread to the lymph nodes (Stage IIA) and either has spread to the axillary (underarm) lymph nodes; or the primary tumor is over 5 cm and has not spread to the lymph nodes (Stage IIB). Common treatment for Stage II breast cancer is usually the same as Stage I treatment (lumpectomy and axillary node dissection or modified radical mastectomy), though radiation therapy is often necessary if the tumor is large or has already spread to the lymph nodes.

Stage III. Primary breast cancer has spread to the axillary (underarm) lymph nodes and to axillary tissues (Stage IIIA) or has spread to the pectoral (chest) lymph nodes (Stage IIIB). Standard Stage IIIA breast cancer treatment is modified radical mastectomy with or without breast reconstruction. Lumpectomy may be performed if the tumor may be cut free with one incision. Radiation and systemic therapy such as chemotherapy or hormonal therapy often follows surgery. If the tumor is large, neoadjuvant chemotherapy (combination of anticancer drugs administered prior to surgery to shrink the size of a tumor) may be provided, with or without hormonal therapy.

Stage IV. The primary cancer has spread out of the breast to other parts of the body (such as bone, lung, liver, brain). The treatment of Stage IV breast cancer focuses on extending survival time and relieving symptoms. Systemic treatment (treatment that affects the entire body) such as chemotherapy, hormonal therapy or both is often recommended.

Breast Cancer Survival Rates by Stage

Health care professionals are able to predict patients' mean survival rate based on the determined stage of breast cancer. Table 2 presents the 5- year survival rate for each stage of breast cancer, that is the percentage of patients who live at least 5 years after being diagnosed. Percentages will vary depending on individual medical situations.

Table 2

Survival rates for various breast cancer stages

Stage	**5-year Relative Survival Rate**
0	100%
I	100%
IIA	92%
IIB	81%
IIIA	67%
IIIB	54%
IV	20%

After seven years, the survival rate decreases for each stage. The average Stage I breast cancer survival rate is 92%. The Stage II survival rate is 71%, Stage

III survival rate is 39%, and the Stage IV survival rate is 11%. It is important to remember that these survival rates are based on averages. Some women with advanced breast cancer live significantly longer than seven years.

Prognostic and Predictive Factors

Some of the key decisions in the current management of primary breast cancer involve the need for prognostication and optimal selection of therapy. A prognostic factor is defined as a biologic or clinical measurement that is associated with disease-free or overall survival in the absence of adjuvant systemic therapy. A predictive factor is any measurement associated with response or lack of response to a particular therapy. Estrogen receptor status has been clearly shown to be a predictive factor for hormonal therapy, in both the adjuvant and metastatic disease settings. Prognostication is especially important in identifying patients whose prognoses are so favourable that adjuvant systemic therapy is unnecessary. Prognostic factors can also be useful in identifying patients whose prognoses with conventional treatment are so poor as to warrant consideration of more aggressive investigational therapies (Fitzgibbons et al., 2000; International Union Against Cancer, 2006).

The most established prognostic factor is the number of positive axillary lymph nodes. An adequate axillary dissection usually contains at least ten lymph nodes. As the number of involved lymph nodes increases, relapse rates increase, and survival rates decrease (Saez, MvGuire, & Clark, 1989).

Tumor size, one of the first prognostic variables accurately quantified, is also a valuable prognostic factor. Tumor size refers to the maximal size of the invasive component measured on microscopic sections. Tumor size correlates with the number of histologically involved nodes, but has independent prognostic significance. Tumor size is particularly useful in patients with pathologically negative nodes. Patients with negative nodes and tumor size less than 1 cm have a favorable prognosis with a 10- year disease- free survival rate of about 90%. This appears true even for patients with mammographically detected cancers, except perhaps those showing casting-type calcifications (Tabar et al., 2000).

Tumor grade is commonly provided on pathology reports, and several investigators have demonstrated that it is an important prognostic factor in individual series. Histopathologic grade ranges from 1 (well- differentiated), through 2 (moderately differentiated), 3 (poorly differentiated) to 4 (undifferentiated). Breast carcinoma tumors with a low- grade cytology have a more favourable prognosis. The use of tumor grade, however, has been limited by poor reproducibility (Dalton, Page, & Dupont, 1994).

Among clinical factors, young patient age has been reported to be an adverse prognostic factor by some (Albain, Allred, & Clark, 1994), but not all, investigators. In two large studies, breast cancer patients younger than 35 years of age had a worse prognosis than older patients. In both studies, young patients were more likely than older patients to have adverse prognostic factors, but young age remained a significant prognostic factor in multivariate analysis. At the 1998 sixth International Conference on Adjuvant Therapy of Breast Cancer, young patient age was first recognized as an adverse prognostic factor (Goldhirsch et al., 1998).

Of the biochemical measurements, the most important is hormone receptor status, that is the presence or absence of estrogen receptors (ER) and progesterone receptors (PR) in the tumor. Although hormone receptor status correlates with prognosis, it does so only weakly. Furthermore, several studies have reported that

ER are a prognostic factor for 5-year disease-free survival, although curves tend to merge with longer follow-up (Adami, Graffman, Lindgren, & Sallstrom, 1985).

Quality of Life and Supportive Care Issues

A growing emphasis has been placed on quality-of-life issues in women with breast cancer, and efforts have been made to minimize the physical and psychological side-effects that accompany breast cancer treatment. Modified radical mastectomy is still the most common surgical treatment for patients with invasive breast cancer. The term modified radical mastectomy is used to describe a variety of surgical procedures, but all involve complete removal of the breast, the underlying pectoral fascia, and some of the axillary nodes. However, breast conserving surgery has become more common. The goal of breast-conserving surgery is to minimize the risk of local recurrence while leaving the patient with a cosmetically acceptable breast. The most common form of breast-conserving surgery is referred to as lumpectomy. The surgical technique of lumpectomy differs from that used for mastectomy in that lumpectomy is not an en bloc cancer operation. Quadrantectomy is another type of breast-conserving surgery that is designed to remove an anatomic segment of breast tissue and frequently includes removal of the overlying skin and underlying pectoral fascia. Because excision of a large amount of breast tissue is the major factor responsible for a poor cosmetic outcome after BCT, lumpectomy is considered the appropriate initial surgical approach in the United States. Other surgical factors that influence the cosmetic appearance are size and placement of incision, management of lumpectomy cavity, and extent of axillary dissection (Coates et al., 1987; Tao & Ganz, 2000; Winer, 1994).

Many of the newer chemotherapy and hormonal agents have fewer side effects (such as nausea, vomiting, bone marrow depression, alopecia, ulceration, diarrhea), or at least a more manageable side-effect profile than agents that were available a decade ago. In many ways, the emphasis on single-agent therapy can be viewed as a step forward from a quality-of-life standpoint. There is also an ongoing effort to make breast cancer treatment more convenient for patients. Virtually all therapy is administered in the outpatient setting, and there is a growing interest in the development of oral chemotherapeutic agents. Patient surveys have documented a strong preference for oral treatment, but only if the oral therapy can be administered without compromising efficacy (DeMario & Ratain, 1999).

With heightened interest in quality-of-life issues, there has also been a greater emphasis on supportive care measures. There is a growing awareness of fatigue, its relationship with anaemia, and potential benefits of treatment with erythropoietin (Demetri, Kris, Wade, & Cella, 1998). Nausea and vomiting, while still a problem with many chemotherapy regimens, are far better controlled with judicious use of some of the newer antiemetic agents (Gralla et al., 1999). While availability of these newer supportive care measures represents a major advance in the care of women with breast cancer, the clinician needs to weigh carefully the advantages and disadvantages of each of these supportive care interventions.

Psychosocial Dimensions of Breast Cancer

Breast cancer is a major public- health problem for women internationally. The extraordinarily stressful aspects of the disease and its treatment have made research on its psychological effects a high priority. Early research on the psychological effects of breast cancer dealt with a disease that typically had a relatively poor prognosis and was treated with aggressive forms of surgery (e.g., total mastectomy) and adjuvant therapies (e.g., chemotherapy) that were accompanied by debilitating negative side effects. The picture of psychological adjustment to breast cancer offered by early studies was, not surprisingly, one characterized by significant distress and trauma. Notable advances in early detection, diagnostic methods, and surgical and medical treatments have improved the prognosis of the disease, and new forms of treatment (e.g., anti-emetic medications) have dramatically reduced adverse side effects that formerly plagued many patients. Approximately 50% of women with breast cancer can now expect to survive at least 15 years, and over 95% of women with localized disease will survive five years or more (American Cancer Society, 2001). Despite these advances, however, the diagnosis of, treatment of, and recovery from breast cancer remain highly stressful. Psychological research has played an essential role in helping investigators understand the impact of breast cancer on the lives of patients and their families, identify predictors of adjustment to breast cancer, develop interventions to decrease distress and enhance quality of life, and understand possible relationships between psychological factors and biological disease processes. In addition, research on the psychological aspects of breast cancer provides a valuable paradigm for studying coping with health-related stress in general.

Psychological Impact of Breast Cancer

In her now classic review, Meyerowitz (1980) delineated the psychosocial impact of breast cancer in three broad areas: psychological discomfort (anxiety, depression and anger); changes in life patterns (including insomnia, recurrent nightmares, loss of appetite, inability to concentrate, difficulty in returning to usual household chores, changes in intimate relationships, consequent to physical discomfort, marital, or sexual disruption, and altered activity level); and fears and concerns (mastectomy/ loss of breast, fear of loss of femininity, fear of recurrence and death). Although women diagnosed today may have many more treatment options, the psychological concerns remain the same. In addition to these variables, the life stage at which the cancer occurs, previous emotional stability (personality and coping style), and the presence of interpersonal support should be included.

The psychological effects of breast cancer have been documented by using patients' self-reported mood and psychological symptoms to assess their psychological distress, sexual functioning, and overall quality of life; more rarely, investigators have used structured diagnostic interviews to assess psychiatric diagnoses. Findings indicate that diagnosis of breast cancer is associated with heightened levels of negative emotions and psychological distress, especially symptoms of anxiety and depression. Elevated symptoms of anxiety and depression near the time of diagnosis are typically reported in 30% to 40% of patients, a rate that is approximately three to four times that found in the general population (e.g., Epping-Jordan et al., 1999). Rates of psychiatric diagnoses among breast cancer patients are less clear, as studies have varied widely in the methods used. Evidence suggests, however, that the rates of psychiatric diagnoses may not differ from those found in community studies. For example, Andrykowski, Cordova, Studts, and Miller (1998) found that rates of posttraumatic stress disorder (6% current and 4% lifetime) among newly diagnosed patients were comparable to rates in the general population. There is considerable evidence that breast cancer and its treatment are associated with problems concerning body image, sexuality, and sexual functioning.

For example, a recent study reported that women who had received simple mastectomy with reconstructive surgery had better body image than women who had undergone simple mastectomy without reconstruction and women who had received conservative surgery (Nicholson, Leinster, & Sassoon, 2007). These findings are consistent with results of a meta-analysis that found that lumpectomy (which conserves the breast) was associated with small but significant advantages in body image and sexual adjustment compared with mastectomy (Moyer, 1997). Prospective studies in which symptoms of psychological distress are measured at multiple points during treatment have provided a relatively consistent picture of the course of adjustment to breast cancer: Psychological distress is highest near the time of diagnosis and declines over the ensuing months (e.g., Carver et al., 1993; Epping-Jordan et al., 1999). The steepest drop in distress occurs during the first 3 months after diagnosis and surgery, or before the completion of adjuvant therapy for most patients. However, although the mean level of distress generally declines over the course of treatment and recovery, some patients continue to experience high levels of anxiety and depression many months or even years after diagnosis.

Medical Variables Affecting Psychosocial Impact to Breast Cancer

The stage of breast cancer at diagnosis, the treatment required, the prognosis, and the rehabilitative opportunities available constitute the medical variables that influence psychological adjustment. Central, however, is the relationship to the supportive surgeon, radiotherapist, or oncologist, who, ideally, is sensitive to the concerns of the patient, communicates clearly, and monitors emotional as well as physical well-being. Both the expanded length and intensity of treatments and recognition that women treated for breast cancer must be followed for the remainder of their lives have placed an added burden on health care providers who are expected to provide support across the course of care, often involving years of follow-up.

Mastectomy. Because it was for so long the standard treatment for breast cancer, and still continues to be recommended for large numbers of women, there is considerable research on the impact of loss of one or both breasts on women's physical, social, and emotional functioning. Among the effects documented are feelings of mutilation and altered body image, diminished self-worth, loss of a sense of femininity, decrease in sexual attractiveness and function, anxiety, depression, hopelessness, guilt, shame, fear of recurrence, abandonment, and death (Lewis & Bloom, 1978). While mourning for the loss of a cherished body part and the threat to life are universal, the extent to which other sequelae are experienced appears variable. Early research indicated that anywhere from 10% to 56% of women studied one to two years after mastectomy experienced some degree of social or emotional impairment (Maguire et al., 1978). However, a large prospective study found that women who are well adjusted before they have a mastectomy, and whose disease is in an early stage, can expect at one year to have a quality of life equal to that of unaffected peers, a finding since replicated in other controlled studies (Hughson, Cooper, McArdle, & Smith, 1988). In addition to more advanced disease, other predictors of poorer adaptation in this study were additional concurrent illness or stress, expectation of poor support from others, and a tendency to perceive events in life as less under one's own control. Research projects suggest that while most women report improvement in emotional and physical well-being over time, for a significant minority (20%-25%) problems may persist beyond two years post treatment (Irvine et al., 1991).

Adjuvant chemotherapy. The news that adjuvant chemotherapy is needed demands psychological adjustment to yet another mode of treatment). This involves a lengthened treatment period, and awareness of the threat to life implicit in the need for systemic therapy. Some women in this group describe their early weeks of treatment as having been characterized by "one piece of bad news after another." Deciding whether or not to undergo adjuvant treatment, and if more than one treatment is proposed choosing which drugs or protocol, constitutes the third decision point in the course of cancer (Taylor, Lichtman, & Wood, 1984).

Anticipation of chemotherapy can be difficult. Women's fears of the side effects arise from knowledge of the distressing sequelae of chemotherapy. Since many women with node-negative early stage breast cancer now receive some form of adjuvant therapy, the association of these treatments with "more serious disease" has diminished. Women anticipating and undergoing adjuvant therapy are told the specific drugs they will receive, and the transient nature of drug side effects. Despite having fears, few women refuse treatment, and most comply with their regimen (Taylor, Lichtman, & Wood, 1984). Reactive anxiety and depression identified should be treated to assist in the woman's adjustment.

Meyerowitz and colleagues (1983) studied women with breast cancer during chemotherapy and two years after completing it. Among those disease free at two years, 23% reported difficulty with personal and family relationships during treatment, and 44% had continuing physical problems two years later. Despite this, 89% stated they would recommend adjuvant chemotherapy to friends in a similar situation. Many reported that they had coped with treatment by "staying busy," "getting information about the treatment," and "keeping a positive, hopeful outlook." In this study, 41% of women reported that the treatment had been easier than they expected. Clinical experience suggests that some women cope with the short-term adverse psychological effects by focusing on delayed benefits (e.g. reassurance that they have done everything possible to eradicate their disease).

Nausea and vomiting, once common side effects of adjuvant chemotherapy, feared and dreaded by patients, are now well-controlled with pharmacologic and behavioral interventions. However, three additional troublesome side effects of adjuvant therapy that have psychological consequences have received less attention. These include hair loss, weight gain, and problems with concentration. While anticipated, the impact of alopecia for women undergoing chemotherapy is often devastating. Some women report this as more distressing than the breast surgery itself, in part because it is a visible indicator of disease but also because it is overtly disfiguring. Early discussion of the expected changes, information about wigs, and referral to the American Cancer Society sponsored *Look Good . . . Feel Better* program can all help reduce distress caused by hair loss (Manne, Girasek, & Ambrosino, 1994).

Difficulty with concentration and memory are also reported by many women undergoing chemotherapy. Not well researched or clearly documented, these symptoms may be associated with the stress of illness, antiemetic drugs, and the chemotherapy itself, and possibly with hormonal changes secondary to chemotherapy-induced menopause (Wieneke & Dienst, 1995).

A final troublesome effect of chemotherapy in younger women is premature menopause (Schover, 1994). The threatened or actual loss of fertility and acute onset of menopause anticipated with adjuvant treatment often causes distress in the woman who is premenopausal at diagnosis. The hot flashes, nightsweats, and vaginal dryness and atrophy caused by chemotherapy-induced menopause produce severe discomfort.

The latter symptoms may lead to dyspareunia. While instruction in the use of vaginal lubricants is helpful, thinning of the vaginal mucosa may still result in irritation on intercourse. A further effect of chemotherapy is loss of libido likely associated with a reduction in circulating androgens (Kaplan, 1992). For many women loss of desire is the most difficult sequela to treat.

Comparisons between Cancer Patients and Healthy Women regarding Psychological Well- being and Quality of life

In a meta- analytical review of the literature on psychological and psychiatric problems in patients with cancer, Van't Spijker, Trijsburg, and Duivenvoorden (1997) concluded that, with the exception of depression, the amount of psychological and psychiatric problems in patients with cancer does not differ significantly from the normal population. In a longitudinal study, Schroevers, Ranchor, and Sanderman (2006) examined the long- term impact of a diagnosis of cancer on physical and psychological functioning, by comparing 8-year cancer survivors with breast, colorectal, lung, or gynaecological cancer, to a randomly selected sample of similar-aged references without cancer in the Netherlands. They found that cancer survivors and references did not differ significantly in the level of depressive symptoms, anxiety, life satisfaction, self- esteem, social support, and marital satisfaction. However, survivors reported more physical symptoms (e.g., fatigue, arm problems, decreased sexual interest) and those with a recurrence of cancer also reported more limitations in household and social activities. The qualitative data of this longitudinal study also demonstrated a fear of recurrence in survivors as well as the experience of positive consequences (e.g., taking life less for granted). In interpreting their results, these authors suggested that adult cancer survivors may be remarkably resilient in the face of adversity.

Kornblith et al. (2003) studied the long- term impact of breast carcinoma and its treatment in 153 breast cancer survivors previously treated on a randomized trial, a median of 20 years after entry to the trial. Although the majority of breast carcinoma survivors demonstrated a remarkable recovery from their cancer diagnosis and treatment, a subset of survivors reported a range of cancer- related emotional problems that included posttraumatic stress disorder (4.6%) due to physical problems. Survivors also experienced sexual problems (29%) attributed to cancer such as feeling sexually unattractive and decreased sexual interest and activity. Long- term consequences also included conditioned responses of nausea and vomiting or distress due to experiencing reminders of their treatment in terms of smell (8%), sight (17%) or taste (7%), and long- term medical sequelae of lymphedema (39%) and numbness (33%) in the hands, chest, or feet, as a result of mastectomy and axillary lymph node dissection, or due to chemotherapeutic regimens.

Dorval et al. (1998) compared eight year breast cancer survivors with population controls on long-term quality of life. They found that no significant differences existed between survivors and controls with respect to psychologic (i.e., psychologic distress and symptoms) and social dimensions. However, survivors reported more arm problems (swelling, loss of sensation) and dissatisfaction with sexual life.

In another investigation, Tomich and Helgeson (2002) studied quality of life and psychological well- being of breast cancer survivors 5 years post- diagnosis, in comparison to age- matched healthy control women. Cancer survivors perceived the world as less controllable and more random compared to healthy women. A sense of purpose was associated with better mental functioning in cancer survivors. Having a sense of purpose in life was the strongest correlate of quality of life for both survivors and healthy women.

Thus, long- term breast cancer survivors demonstrate a remarkable psychological recovery from their illness. The impact of breast cancer on survivors' adjustment is minimal. Any long- term psychologic sequelae on adjustment relate to the side- effects of cancer treatment (e.g., lymphedema, conditioned nausea and emesis, fatigue, sexual dysfunction).

Predictors of Adjustment to Breast Cancer

The process and course of adjustment to breast cancer have been studied in relation to five broad factors: characteristics of the disease, characteristics of the patient, social relationships and interpersonal resources, cognitive appraisals and attributions (e.g., perceptions of the disease and its causes, sense of control over the course of the disease), and coping methods. These factors have been examined in prospective studies to determine their contribution to increases or decreases in psychological symptoms and quality of life over the course of diagnosis, treatment, and recovery. There is little evidence of a direct association of psychological distress with disease prognosis and type of treatment (e.g., surgical procedures, chemotherapy). The association between disease characteristics and psychological distress is far from simple, however, as it may change over the course of treatment and recovery. For example, one study (Compas et al., 1999) found that cancer stage (as an indicator of severity of the disease) was not associated with distress near the time of diagnosis, but was related to distress 6 months later. These findings suggest that patients' prognoses may become more salient once treatment is completed, as patients with a positive prognosis may recover psychologically more rapidly than patients with a poor prognosis and greater risk of recurrence. Patients' characteristics that have been examined as predictors of distress include demographic factors (e.g., age, education) and personality characteristics (e.g., optimism). There is consistent evidence that age is inversely related to distress, such that younger women report more symptoms of anxiety and depression than older women (Stanton et al., 2000). Less formal education is associated with poorer psychological adjustment, including attempts to cope with the stress of breast cancer by avoiding emotions, thoughts, or information related to the disease (Epping-Jordan et al., 1999). Among the various personality characteristics that have been studied, dispositional optimism, or the tendency to expect positive outcomes, has been most consistently associated with lower symptoms of anxiety and depression and higher quality of life (e.g., Carver et al., 1993; Epping-Jordan et al., 1999). In addition to patients' personal characteristics, social relationships and interpersonal resources available to patients are associated with the course of adjustment to breast cancer. Foremost among these resources is the quality of social support available to women during their treatment and recovery. Emotional support (other individuals' verbal and nonverbal communication of caring and concern for the patient) shows the most consistent relationship to lower distress and higher quality of life. Evidence for beneficial effects of emotional support has been stronger in descriptive studies of naturally occurring support in patients' lives than in studies of the effects of peer-led support groups (Helgeson & Cohen, 1996). Cognitive processes, including the patient's thoughts concerning her control over the disease or role in causing it, are also central in adaptation to breast cancer. As we have already noted, holding relatively optimistic beliefs about future outcomes is associated with better psychological adjustment (Carver et al., 1993). The tendency to attribute one's cancer to one's own stable characteristics (characterological self-blame) or to one's behavior is related to higher current psychological distress, and characterological self-blame is uniquely related to increases in distress over time. The ways that patients attempt to cope with their disease and the effects of treatment are central in determining the course of psychological distress and adjustment. Coping methods that involve disengagement from (avoidance of) the source of stress or one's negative emotions are predictive of poorer psychological adjustment and poorer health outcomes (e.g., Carver et al., 1993; Epping-Jordan et al., 1999). In contrast, coping methods that reflect engagement with the stressor and one's emotions are generally related to more positive psychological outcomes (e.g., Carver et al., 1993; Stanton et al., 2000). Furthermore, coping responses function as both mediators and moderators 3 of the effects of other factors on adjustment. At least two prospective studies have found that coping mediates the relationship between optimism and distress—optimism is associated with greater acceptance and humor, and pessimism is associated with greater avoidance and wishful thinking (Carver et al., 1993; Epping- Jordan et al., 1999), and these differences in coping style are in turn associated with different levels of distress. Coping also moderates the association between perceptions of personal control and distress in adjustment to breast cancer (Osowiecki & Compas, 1999). Distress is lowest when patients who have a sense of personal control over their cancer cope by using active, problem-oriented methods of coping. Research on predictors of adjustment to breast cancer has identified a set of processes that warrant attention in research on adaptation to other health-related stressors.

Intrusive thoughts. Diagnosis of breast cancer is accompanied by a host of concerns and problems, which can include side effects from treatment, fear of disease progression or recurrence, worries about dependency on others, disruption to family and social life, and threats to self- esteem and body image. The breast cancer experience consists of a series of events beginning with cancer detection and diagnosis, proceeding through active medical treatment, and concluding with post-treatment recovery and monitoring. Following completion of active treatment and recovery, patients face uncertainty about the future, about recurrence and cancer progression. Intrusive thoughts about cancer diagnosis or recurrence, recurrent imagery associated with having experienced cancer treatment or its side- effects (e.g., mutilation, hair loss, pain, lymphedema, nausea) are often reported (Smith, Redd, Peyser, & Vogl, 1999). Moreover, diagnosis of breast cancer may differ from other types of traumatic events, such as surviving a natural disaster, in depleting stress- buffering resources such as optimism or global meaning. Having a life-threatening illness such as cancer engages the sufferer in ongoing threat, anchored in the present and future (e.g. recurrence, metastasis, progressive deterioration, and ensuing death), rather than in the past, while the threat arises from one's own body, rather than from an external source, thus contributing to its perceived inescapability (Gurevich et al., 2002). Furthermore, breast cancer may have unique psychological effects, since its course is often unpredictable, its prognosis is uncertain, and its treatment can include visible disfigurement, pain or disability.

According to Glinder, Beckjord, Kaiser, and Compas (2007) negative intrusive thoughts are involved in adaptation to the stress of diagnosis and treatment of breast cancer. They are automatic involuntary responses to stress experienced by many breast cancer patients (Andrykowski et al., 2000; Primo et al., 2000), can occur rapidly, and typically, are experienced by the patient as uncontrollable. Intrusive thoughts and rumination are oriented toward the source of stress by attending to and processing threat- relevant information, and are characterized by engagement with the source of stress. Intrusive thoughts, as automatic engagement stress responses are associated with increased emotional distress and have been shown to be maladaptive (Andrykowski et al., 1998). Intrusive thoughts related to breast cancer were correlated positively with anxiety and depression symptoms, and disengagement coping (e.g., denial, wishful thinking), while they were correlated negatively with positive affect, and primary and secondary control engagement coping (e.g., emotional expression, cognitive restructuring, positive thinking) (Glinder et al., 2007). In that study, fewer reports of intrusive thoughts were also correlated with greater attentional bias to supraliminally presented cancer- related words (a bias that was regarded as adaptive).

Existential meaning. Coming to terms with meaning issues is an important factor in the theoretical approaches to illness and health (e.g., Park & Folkman, 1997). However, existential meaning has also been the focus of empirical investigation. A number of research studies have provided validation for the inclusion of existential meaning in theoretical models of health and illness (Park & Folkman, 1997; Vickberg et al., 2000). In regard to cancer patients, several investigations found cancer patients frequently mentioning that existential meaning was an important issue for them during the illness (Coward, 2000; Ryff & Singer, 1998). One study reported that "finding meaning in life" was identified as a concern by 42% of cancer patients, and that "the meaning of life" was an issue for 28% of patients (Moadel et al., 1999). Mast (1998) showed that women with a breast cancer diagnosis who reported a cognitive reappraisal of life meaning and values had lower levels of emotional distress than women who had not re-appraised the diagnosis. Aside from qualitative accounts, several quantitative studies reported existential meaning to be an important factor in a person's psychological well-being, efforts at prevention of illness, and successful life transitions (Fife, 1995; Reker, Peacock, & Wong, 1987; Shek, 1992). On the contrary, the absence of meaning and purpose in life has been associated, among others, with higher levels of depression (Wong, 1998) and suicidality (Harlow, Newcomb, & Bentler, 1986). Even though empirical findings about existential meaning and illness are not abundant, most studies reported a positive relationship between having a high sense of existential meaning and better overall psychological well-being (Reker & Chamberlain, 2000).

Since most of the research on meaning has focused on a lack of meaning or a threat to meaning level, it could easily be assumed that a challenge to a person's sense of existential meaning always implies that the person has to struggle with a lack of meaningfulness. However, some researchers have reported findings to the contrary. Even though the common assumption in the field of psycho-oncology is that having breast cancer causes significant psychological distress for women (Suinn & VandenBos, 1999), researchers have also identified a positive effect of a cancer diagnosis on a person's overall sense of existential meaning. Pelusi (1997) reported that the experience of cancer can actually add to perceived meaning in life for the patient. This potentially "positive" effect of an illness could be explained by research showing that successfully living through a life-changing or traumatic experience did increase meaning levels for individuals (Wong & Fry, 1998).

Thus, existential meaning has been considered as an important variable to be included in the study of psychosocial adaptation to cancer. Nicholas and Veach

(2000) proposed one of the most comprehensive models in psycho-oncology. So far, this model has theoretical and clinical support, but more empirical data are needed for it. The authors suggested convergence of three broad classes of variables on current psychosocial adaptation: patient-derived variables (past history, demographics, intra-and interpersonal variables) interact with cancer-derived variables (type, stage, prognosis, clinical course, disability) and life context (culture, health-related schema, developmental stage) to determine the patient's overall reaction to cancer-related stressors. Thus, improved psychosocial adaptation contributes to overall quality of life.

Empirical findings. Theories on illness, health, and coping have addressed the importance of meaning issues for individuals (Coward, 2000; Janoff-Bulman & McPherson, 1997; Park & Folkman, 1997). Even though in past models existential meaning was not included as a variable, studies in other areas such as trauma, substance abuse, and aging (Reker & Chamberlain, 2000) have revealed that there is a strong connection between levels of existential meaning and psychological well-being. In fact, psychological well-being was positively correlated with level of existential meaning in most of the previous studies on meaning as summarized by Wong and Fry (1998). Wong (1998) studied 335 adults of all ages in a study with the Personal Meaning Profile and the Perceived Well-Being scale (PWB) (Reker & Wong, 1984). PWB scores showed a significant positive correlation with Personal Meaning Profile (PMP) scores. The study concluded that personal meaning played a mediating role in psychological well-being in this study.

Further support for the mediating role of existential meaning can be drawn from two cancer studies. Vickberg et al. (2000, 2001) conducted two studies with a global meaning factor. One of these studies investigated the level of psychological distress in leukemia patients after bone marrow transplantation. Eighty-five patients were interviewed by phone and regression analyses revealed that after controlling for physical functioning, stressor severity, and gender, it was global meaning that was significantly negatively correlated with overall and surgery-related distress. On the other hand, global meaning and emotional and social functioning dimensions were positively correlated at $r = .30$ ($p < .01$). The instrument used to assess meaning in this study was the LAP-R (Reker, 1999).

In the second study, Vickberg et al. (2000) conducted phone interviews with 61 breast cancer patients two to fifteen years past diagnosis and in every stage of the disease to test the hypothesis that the global meaning level moderates the effect of intrusive thoughts on psychological well-being. Researchers employed the LAP-R (Reker, 1992) for their study. They used hierarchical regression analyses to control for potentially confounding variables, such as marital status and income level. Consistent with the research hypothesis, intrusive thoughts were positively correlated with psychological distress in a group of patients who had endorsed low meaning. For the high meaning group, there was no correlation between intrusive thoughts and psychological distress. Unfortunately, both studies had fairly small sample sizes and could only mark the beginning of the study of existential meaning in cancer populations. Therefore, there is need to continue and expand the empirical investigation of existential meaning in relation to psychological well-being and quality of life in breast cancer patients.

Emotional expressivity. Diagnosis and treatment of cancer significantly alter patients' lives, causing them to question core beliefs about themselves and the world in which they live, often resulting in significant psychological distress. Intrusive thoughts and images surrounding stressful health- related events inevitably begin to suffuse conscious awareness, breaking through avoidance- based coping mechanisms (Horowitz, 1986). Confrontation with intrusive thoughts and images tied to the stressful events is necessary for effective adaptation. Confrontation avails the opportunity to reinterpret, contemplate confusing and threatening aspects of the stressful experience, consequently fostering harmonization of present information and preexisting schemas. One way to actively confront intrusive cognitions and engage in cognitive processing is through emotional expression (Lepore, 2001). Repeated emotional expression accompanying recurrent intrusive thoughts may lead to habituation and distress reduction. Another possible mechanism that could account for distress reduction due to emotional expressivity is provision of social support. Expressing one's emotions may make available informational resources regarding the stressful experience, by eliciting helpful responses form others (Zakowski et al., 2001).

Empirical findings. Expressive coping has been found to predict psychological adjustment to breast cancer. In a sample of 92 women diagnosed with Stage I or II breast cancer, recruited within 5 months after completion of medical treatment, Stanton et al. (2000) found that emotional expression was negatively associated with psychological distress. Moreover, expression of negative emotion has been found to moderate relations between intrusions and distress, in patients diagnosed and treated for cancer within five years since diagnosis (Quartana et al., 2006). Zakowski et al. (2001) argued that emotional expressivity might moderate relations between intrusive cognitions and psychological distress. Barriers to emotional expression may be regarded as internal constraints that may inhibit cognitive processing of traumatic events, thus leading to poor mental health and adjustment.

Coping. Whenever an individual faces an illness such as breast cancer, demands for coping are also immediately placed on the individual (Stanton et al., 2000). In their seminal study on coping and cancer patients, Weisman and Worden (1976) defined coping as "what one does about a perceived problem in order to bring about relief, reward, quiescence, or equilibrium" (p. 27). Lazarus and Folkman (1984) extended this definition to include "the 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" (p. 141). However, aside from the seminal work by Lazarus and Folkman, other theoretical approaches to coping have included a look at coping as a defensive ego mechanism (Vaillant, 1977), a personality trait, a result of the cognitive appraisal of a specific situation (Aldwin, 1994), and coping as a perceptual style (Roth & Cohen, 1986).

The inclusion of coping as a construct in this study posed a challenge as well as it provided a promise. The challenge was methodological and the promise theoretical in nature. One of the widely acknowledged difficulties with the construct of coping is that it has been operationalized and defined in several different ways (Folkman & Lazarus, 1988; Goldstein & Antoni, 1989; Holland, 1998). Thus, results of coping studies with breast cancer patients oftentimes cannot be compared to each other due to the use of different constructs. Therefore, it seems important to choose a coping construct that has been extensively used and validated in the psycho-oncology literature.

Many of the psychosocially oriented studies on breast cancer have made use of either the Mental Adjustment to Cancer scale (MAC) (Watson et al., 1988) or the Ways of Coping Inventory (WOC) (Lazarus & Folkman, 1984). Even though the WOC scale has been equally as widely used as the MAC, one of the main advantages of the MAC is that it measures styles of coping with cancer, that are relatively enduring and characteristic ways of responding to stressful situations pertaining to cancer.

However, MAC has been used to measure a diversity of concepts ranging from patients' adjustment to cancer (Osborne et al., 1999) to coping strategies (Schwartz et al., 1992). In the present study, a shortened version of MAC was used to measure styles of coping with cancer.

Empirical findings. In regards to psycho-oncology and coping, coping models abound in the literature on breast cancer (Suinn & VandenBos, 1999). Depending on the particular coping model in use, findings on coping strategies in breast cancer patients vary. Research identified avoidant coping as a negative mechanism in that it is associated with increased levels of psychological distress (Aldwin & Revenson, 1987). However, in another study, emotionally expressive coping was positively correlated with improved psychological and physical adjustment to breast cancer (Stanton et al., 2000). The construct of coping has been employed both as a predictor and a mediator variable in models of psychosocial adjustment to cancer (Stanton et al., 2000). Other studies supported the mediating role of coping in psychological adjustment to breast cancer. Carver et al. (1993) investigated the relationship between optimism and mood disturbance. No direct association was found between the two constructs, yet they were indirectly related through mediation by coping processes (Carver, Scheier, & Weintraub, 1989).

Zabalegui (1999) provided yet another strengthening argument for the mediating role of coping. Studying 132 patients with advanced breast, lung, colorectal, and other cancers, the author found that lower levels of psychological distress were clearly associated with particular coping styles. Positive correlations were reported between psychological distress and cognitive and behavioral escape avoidance, but negative correlations between distress and distancing confirmed previous findings of the positive effect of coping through distancing (Dunkel-Schetter et al., 1992). Some studies employed coping as a predictor rather than a mediator (Clutton, Pakenham, & Buckley, 1999; Ell et al., 1989; McCaul et al., 1999). One of these studies (McCaul et al., 1999) showed the primacy of coping processes when predictors of psychological distress and quality of life were concerned. In fact, it was those women who used mostly avoidant coping who were the most distressed as well.

Coping as measured by MAC has been associated with better psychological adjustment to breast cancer (Schnoll et al., 1998a) and less distress and improved quality of life (Schnoll et al., 1998b). In a sample of women with metastatic or recurrent breast cancer, fighting spirit was found to be associated with better adjustment (Classen, Koopman, Angell, & Spiegel, 1996). Cotton et al. (1999) found that anxious preoccupation and helplessness/ hopelessnesss were negatively correlated with quality of life in a sample of women diagnosed with invasive breast cancer or with a recurrence or metastatic disease. In a Japanese study with breast cancer patients, three months after diagnosis of first recurrence, Okano et al. (2001) found that the presence of a history of major depression was associated with lower levels of fighting spirit and higher levels of helplessness/ hopelessness. In a study with women mostly diagnosed with early stage breast cancer and treated for their disease, Schou et al. (2005) found that fighting spirit and helplessness/ hopelessness mediated the relationship between optimism and psychosocial functional status. Optimistic women appeared to respond to greater degree with fighting spirit, which was associated with better emotional functioning and global health quality of life. While, pessimistic women responded with a greater degree of helplessness/ hopelessness, which was associated with poorer emotional and social functioning and global health quality of life.

Regardless of the particular role given to coping in research studies (predictor versus mediator), all of the reviewed studies showed a strong association between coping processes and either quality of life or psychological well-being. Most studies harbored support for the mediating over the predictive role of coping in psychological adjustment to breast cancer. Therefore, the approach taken by this study hypothesized that coping processes will function as a mediator for the effects of predictor variables (intrusive thoughts and negative psychological responses to cancer).

Empirically Validated Models of Psychological Adjustment to Breast Cancer

As the previous review of individual factors in adjustment already indicated, research on psychological adjustment of breast cancer patients has relied extensively on studies with several related variables. Research in psycho-oncology has moved from studying linear relationships among two or three factors to investigating integrated models of complex interactions among a large number of factors affecting a patient's well-being (Schnoll et al., 1998b; Stanton & Snider, 1993). For purposes of this study, these models were categorized into models without a meaning or expressivity component and models that included a meaning and expressivity component. On another trajectory, existing models were classified according to the design and statistical techniques used to study the experience of breast cancer. The vast amount of literature on factors of psychosocial adaptation precluded exhaustive discussion on each variable to be included in the proposed models. Therefore, only those variables and findings relevant to the development of the proposed structural model of psychosocial adjustment to breast cancer are discussed here.

The only model in the literature that explicitly focused on an existential meaning variable (termed global meaning by the authors) and cancer was developed by Vickberg et al. (2001). Studying 85 survivors, who had undergone bone marrow transplantation for the treatment of leukemia, the authors investigated the relation of global meaning to several indicators of psychological adjustment, including psychological distress symptoms (depression, anxiety, somatization, obsessive-compulsive), symptoms of posttraumatic stress disorder, mental health status, and days hospitalized as an indicator of stressor severity. Results obtained through a series of regression analyses indicated that global meaning was positively related to the mental health status and negatively related to psychological distress. In another study, Vickberg et al. (2000) investigated global meaning as a moderator variable between intrusive thoughts and psychological distress in breast cancer survivors. Results obtained through regression analyses confirmed the hypothesis that global meaning functioned as a moderator in this model. These authors found a strong positive association between intrusive thoughts and psychological distress only among patients with lower global meaning. Both studies employed multiple regression methods to analyze the data. Findings indicated that global meaning could be considered an important intervening variable between psychological adjustment and predictor variables, such as psychological distress symptoms.

Two other models of psychosocial adaptation were identified that employed regression techniques. Cotton et al. (1999) studied spiritual well-being in relation to quality of life and psychological adjustment in women with breast cancer. Correlational analyses revealed that greater spiritual "well-ness" was positively associated with specific adjustment styles (e.g., fighting spirit) while it was negatively associated with other maladaptive styles (e.g., anxious preoccupation, helplessness/ hopelessness) in breast cancer patients. Classen et al. (1996) studied coping styles in relation to psychological adjustment to advanced breast cancer. Regression analyses revealed that fighting spirit was negatively associated with mood disturbance, the latter being a measure of psychological adjustment.

Aside from regression models, several researchers employed path analysis and structural equation modeling (SEM) to investigate complex relationships among variables believed to influence psychosocial adaptation to breast cancer. Epping-Jordan et al. (1999) developed a path model of psychological adjustment in newly diagnosed women with Stages I-IV breast cancer. The process of adjustment was examined at diagnosis, and at 3- and 6- month follow- ups. This model showed different significant pathways across these times. At six months postdiagnosis, optimism had a direct effect on anxiety and depression symptoms, and partially mediated this relationship through emotion- focused disengagement coping. Intrusive thoughts positively predicted anxiety and depression symptoms at diagnosis and three months postdiagnosis. Among the limitations of the study is its less demographically varied sample, preventing the generalizability of findings to more diverse economic and ethnic groups.

In a previously established path model, Carver et al. (1993) found similar results for the mediating role of coping. In early stage breast cancer patients, coping style mediated the effects of optimism on psychological distress surrounding the illness. Both Epping- Jordan et al. (1999) and Carver et al. (1993) used a path analysis, which is a special case of structural equation modeling (Schumacker & Lomax, 1996).

Another model was proposed and tested by Schnoll, Harlow, Stolbach, and Brandt (1998b). In one of the most comprehensive attempts at studying structural relationships between biomedical and psychosocial factors and psychological adjustment in breast cancer patients, the authors included stage of the disease, age, and coping styles, as predictors of psychological adjustment. Five different models of adjustment were tested with a sample of 100 breast cancer patients diagnosed with Stage II and IV disease, undergoing oncologic care (e.g., chemotherapy, radiation therapy). Coping was assessed with the Mental Adjustment to Cancer (MAC) Scale (Watson et al., 1988), and psychological adjustment was assessed with subscales of the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983) and the Functional Living Index-Cancer (FLIC) (Schipper, Clinch, & McMurray, 1984). Structural equation modeling analyses revealed that the model with the best fit was a mediational model. In this model, coping style was significantly related to psychological adjustment and mediated the relationship between the combined effects of age and disease stage on psychological adjustment. Age and disease stage (Stage II and IV breast cancer) were directly related to coping style but not directly associated with psychological adjustment. Women with Stage II breast cancer showed more usage of adaptive coping styles than women with Stage IV breast cancer. Based on their results, Schnoll et al. (1998b) argued that it is the type of coping a woman with breast cancer uses that contributes more to how she adjusts to her medical situation, than her age or the stage of her disease. However salient these findings may be, research is needed to replicate and expand this model proposed by Schnoll et al. (1998b). In particular, more predictors should be tested in relation to coping processes, and meaning-based coping should be included in a new or revised model.

Schnoll, Knowles, and Harlow (2002) examined demographic, clinical, and psychosocial correlates of adjustment among a sample of cancer survivors, who were in remission, were not receiving any type of cancer treatment, and their mean time since diagnosis was 61 months. Using SEM, they found that higher levels of social support, optimism, and meaning in life as well as lower levels of avoidant coping were associated with better adjustment. Among the study limitations, it should be noted that participants were recruited as a convenience sample and the response rate (28%) was lower than was desired.

Hirai et al. (2002) employed SEM in order to examine the relation between self- efficacy, physical condition and psychological adjustment to advanced cancer. Their findings suggested that a strong positive relationship existed between self-efficacy (symptom coping efficacy, activities of daily living efficacy, affect regulation efficacy) and psychological adjustment (with anxiety and depression as measures of emotional distress). Moreover, these authors suggested that self-efficacy might mediate the effects of physical condition on psychological adjustment, so that patients with high self- efficacy would be able to overcome poor adjustment caused by physical condition severity. One of the limitations of the study was that participants were receiving intense palliative care, and their symptoms had been controlled comparatively well.

Vos, Garssen, Visser, Duivenvoorden, and de Haes (2004) examined associations between psychosocial adjustment and biodemographic variables, coping, and social support in newly diagnosed early stage breast cancer patients, by using SEM. The main conclusion of this study was that coping was of major importance in predicting psychosocial adjustment. Women who expressed an optimistic way of coping reported less distress and saw their body as less disfigured than women who did not use optimistic coping strategies. Optimistic coping was also associated with social adjustment and less limited social interactions. This study had a few limitations. Models were tested cross- sectionally, while a longitudinal design would allow for drawing firm conclusions about causal relationships.

After reviewing available models of psychological adjustment, it appears that in the past 10 years, several structural models of psychological adjustment to cancer have been proposed and investigated (Cotton et al, 1999; Epping-Jordan et al., 1999; Hanson-Frost et al., 2000; Schnoll et al., 1998b; Vos et al., 2004; Schnoll et al., 2002). Currently, researchers appear to find strong support for mediational factors between psychosocial variables and psychological well-being as outcome variable (Carver et al., 1993; Cotton et al., 1999; Stanton et al., 2000). Nevertheless, each of the aforementioned models needs to be replicated with larger sample sizes, different predictor variables, and a variety of instruments measuring similar constructs. Only by ways of testing and re-testing these models will researchers gain more certainty in how different factors in a woman's life relate to adjustment to breast cancer.

Summary and Conclusions

Although we see substantial advances in understanding adjustment to chronic disease, such as breast cancer, progress is uneven, and many questions remain. First, little is known about the mechanisms for the effects of variables such as existential meaning or emotional expressivity on adjustment to breast cancer. For example, existential meaning may moderate the effects of adverse psychological responses (e.g., intrusions) on adjustment. Moreover, moderated effects are not distinguished from mediated ones. Examination of moderated or mediated relations in research on predictors of adjustment can suggest variables on which to target and tailor interventions. Second, there is much more attention in the literature to issues surrounding adjustment to breast cancer in some disease phases than others and in some subpopulations of patients than others. The majority of existing research was conducted with patients who are at early-stage breast cancer, or are under treatment. Systematic research with breast cancer survivors who live longer than five years after diagnosis is missing. Third, little of the research identifying predictors of disease-related adjustment has the potential for being translated directly into interventions.

Directions for Research

Gaps apparent in the existing literature make way for further research on adjustment to breast cancer. Relatively neglected populations such as breast cancer survivors merit greater inclusion. Since structural models have become an accepted and well-utilized approach in psycho-oncology, this study proposes investigation of structural models to further and deepen investigation of psychological issues faced by breast cancer patients. These models were developed based on available theoretical, empirical, and clinical accounts reviewed above. The main variables of interest to the present study are existential meaning and emotional expressivity. Existential meaning and expressivity levels can be hypothesized as important factors in a patient's adjustment to an illness, such as breast cancer. However, quantitative approaches to the understanding and measurement of psychosocial adaptation in breast cancer patients seem to have largely ignored existential meaning and expressivity as relevant constructs (Coward, 2000). Therefore, one possible next step in expanding the available literature on psychosocial adaptation to breast cancer would be to incorporate the meaning and expressivity variables into already existing models and study psychosocial adjustment to this illness from a meaning-making and emotional processing perspective.

Whereas it has been shown that theories of illness and health certainly do incorporate existential meaning as an important factor, researchers have only rarely included this factor in their models (Holland, 1998). Future quantitative research should focus on meaning as another important variable. Research on the psychological effects of breast cancer in general has flourished, however, and many results that could be linked to meaning have been publicized (Schnoll et al, 1998a; Stanton et al., 2000; Stanton & Snider, 1993). This study, therefore relies on previously developed models and findings in order to place meaning into an already existing framework. There appear to be two reasons why the field of breast cancer research can provide fertile ground for research on existential meaning and adjustment to illness: First, theoretical and clinical accounts about breast cancer identified meaning issues as an important factor for the ill person. Second, and most important, empirically validated models of psychosocial adaptation to breast cancer have provided findings on variables hypothesized to be related to existential meaning, such as coping and psychological well-being. These models can now be used to test new variables such as existential meaning. Therefore, existential meaning should be added as additional factors to be tested in already established models.

Regarding emotional expressivity, although theories of adjustment to cancer have incorporated emotional processes as an important factor (Lepore, 2001), researchers have only rarely included this factor in their models (Stanton et al., 2000). Future quantitative research should focus on expressivity as another important variable in the adjustment to cancer process. This study, therefore, tried to place expressivity into an already existing framework. Research on expressivity and adjustment to cancer can guide the application of supportive- expressive therapy to patients with cancer (Giese- Davis et al., 2002).

Moreover, authors (Holmbeck, 1997) have suggested that a clear distinction should be made between moderators and mediators in the relationship between psychological responses to cancer and psychological adjustment to it. For example, global meaning has been considered as a moderator between intrusive thoughts and psychological distress in breast cancer patients (Vickberg et al., 2000). Coping style or predisposing factors such as optimism have been considered as mediators between medical and psychological stress variables and psychological adjustment to cancer (Epping- Jordan et al., 1999; Schnoll et al., 1998b). Thus, in the present study, separate analyses for examining moderating and mediating effects were employed.

CHAPTER 4

Method

The following chapter provides detail about how the data for this study were collected and analysed. Initially, the research hypotheses are presented. Details concerning participants, inclusion and exclusion criteria, sample size, statistical power, and data collection procedures, are then discussed. Detailed information is provided concerning the validity and reliability of the instruments used to collect data. The chapter ends with an explanation of the data analyses used in this study, including data preparation techniques, regression analyses employed for testing moderation effects and SEM analyses employed to test mediation effects and model fit. Finally, ethical considerations such as informed consent, confidentiality and anonymity are discussed.

Research Hypotheses

The purpose of this study is to expand the empirical research base on existential meaning and emotional expressivity as it relates to psychological adjustment of breast cancer patients. The aim is twofold: First, to test the moderated effects of existential meaning and emotional expressivity on the relationship between intrusive thoughts and psychological adjustment to breast cancer. Second, to test the mediated effects of existential meaning and emotional expressivity on the relationship between psychological responses to cancer (e.g., intrusive thoughts, helplessness) and psychological adjustment to breast cancer.

In order to achieve this aim, the following research questions were addressed:

Hypothesis 1: Existential meaning will serve as a protective factor against the effects of psychological response to breast cancer (intrusive thoughts) on psychological adjustment to it.

Hypothesis 2: Emotional expressivity will serve as a protective factor against the effects of psychological response to breast cancer (intrusive thoughts) on psychological adjustment to it.

In order to test these hypotheses, it was assumed that the moderators (high levels of existential meaning or expressivity) could weaken the effect of the predictor (intrusive thoughts) on the outcome (psychological adjustment to breast cancer).

Hypothesis 3: Psychological responses to cancer will influence existential meaning, which, in turn, will influence psychological adjustment to cancer.

Hypothesis 4: Psychological responses to cancer will influence emotional expressivity, which, in turn, will influence psychological adjustment to cancer.

In order to test these hypotheses, it was assumed that the higher the intensity of the adverse psychological responses to cancer (e.g., intrusive thoughts, helplessness), the lower a patient's existential meaning or emotional expressivity levels (mediators), which would, in turn, be associated with higher levels of psychological maladjustment.

In this case, two structural models were tested and compared for better fit. The primary structural model with a direct path from psychological responses to breast cancer to psychological adjustment, differed from the alternative model, without such a direct path.. It was assumed that the primary model would show better overall fit than the alternative model, given that the other paths (linking existential meaning, emotional expressivity, and coping, to psychological adjustment) would remain active in both cases. In these analyses, coping was added as an intervening variable, given that previous empirical studies have shown the significant link between coping and adjustment to cancer.

Participants

The sample consisted of a consecutive series of 208 women recruited from the Breast Clinic of a public cancer hospital in Athens, Greece. Data were collected cross-sectionally when they visited for their medical follow- up between February 2004 and March 2005. Inclusion criteria for subjects were: female of Greek nationality, who could speak and read Greek, older than 30 years of age but under 80 years, with a diagnosis of breast cancer confirmed by the histological result of an excisional biopsy, after having completed their cancer treatment at least 3 months ago, with no prior malignancy and no previous or concurrent psychiatric history (assessed by no admission to a psychiatric clinic or not being under psychiatric therapy). Metastatic (stage IV) terminal cases were excluded from the study. Metastatic spread from the carcinoma of the breast can be present at various distant sites including the nervous system, the lungs and the liver, resulting in non-metastatic complications such as metabolic and endocrinologic disturbances, and paraneoplastic syndromes, affecting emotional, cognitive, and behavioural functioning (Posner, 1979). The restriction of the completion of chemotherapy or radiation therapy was imposed, in order to avoid the immediate negative consequences of active treatment to the cognitive, emotional, behavioural and physical functioning of the patient (Posner, 1979). The age restriction was chosen for two reasons: First, there are very few women younger than age 30 being diagnosed, since most newly diagnosed breast cancer cases are in the middle- aged and older age population (Rowland, 1989). Inclusion of a younger age group of patients would result in a disproportionately small number of young patients and an unequal balance between very young, middle- aged, and older patients. Second, the cut- off point of 80 years of age was chosen because the older patients get, the more likely it is that co-morbid illnesses and disorders influence a patient's life (Vellas et al., 1994). Thus, psychological adjustment and quality of life data would possibly be confounded by distress due to illnesses other than breast cancer. However, patients up to 80 years of age were eligible to participate in this study because, as a group, women over 65 years of age comprised the majority of breast cancer patients treated at our breast cancer centre.

Of the 208 patients approached, 14 failed or refused to provide data during the interview, due to their very low educational level, poor hearing, lack of available free time, or disinterest in participating in the study. As a result, the initial subject pool consisted of 194 patients in Stage 0 to Stage III of breast cancer, who agreed to participate and were contacted by mail. There were 41 patients who did not return the questionnaires or provided incomplete data. Thus, the final subject pool of eligible participants who provided complete data for analysis was 153 breast cancer patients. Demographic and medical information about the 194 breast cancer patients, obtained either from themselves or from the hospital registry, was used to compare participants in this study to non- participants. T-tests and chi- square tests revealed that the responder group was similar to the non-responder group of patients in terms of age [t(181)= 0.19, p= .850], stage at diagnosis [χ^2 (6)= 10.48, p= .106], type of surgical treatment [χ^2 (2)= 3.59, p= .165] and time since surgery [t(188)= -0.258, p= .797].

Sample size

The target population was outpatient female breast cancer patients, having completed their cancer treatment, and without a metastatic disease. The number of patients to be selected for the present study had to be large enough to allow for an adequate sample size, taking into consideration expected response rate. An adequate sample size provides some assurance that the criterion of statistical power has been met (Pedhazur, 1997). Statistical power refers to the level of probability that actual group differences will be detected in a particular study (Cohen, 1977). Statistical power is equal to $1-\beta$, where beta symbolizes the Type II error (the probability of failing to reject H_0 when it is in fact false while the alternative hypothesis H_1 is true). If statistical power is too low, a researcher could accept the null hypothesis when in fact it should be rejected. One factor affecting power is sample size. Reasonably large sample sizes are a necessity in order to have a high power ($\geq .80$). Therefore, one of the essential steps in research studies is an analysis of statistical power to ensure adequate sample size.

In the case of multiple regression and SEM, the statistical techniques employed in this study, statistical power was examined using the <Power & Sample Size calculation> subroutine of the statistical software programs <NCSS- PASS> (Hintze, 2000) and <Statistica> (Statsoft, 2001) respectively. For determining sample size for multiple regression, the question to be answered was the following: How large a sample size would we need, to have a power value of at least .80 and a 5% probability of rejecting H_0 when in fact it is true (i.e. the Type I error termed alpha), in a situation where there are 10 predictor variables (such as emotional expressivity, purpose and meaning in life, coping styles, psychological responses to breast cancer, as well as demographic and medical variables)? One method for determining sample size in multiple regression analysis is to specify expected or meaningful values of the squared multiple correlations both with and without the specific predictors of interest (Maxwell, 2000). Given that the proportion of variance (R^2) expected to be explained by all the predictor variables was hypothesized to be 50%, a sample size (N) equal to 153 was estimated to be sufficient, in order to achieve a power of 100%, assuming that the four demographic and medical variables would explain 10% of the variance in psychological adjustment, while the remaining six psychological variables would explain 40% of the overall variance. The above mentioned figures about R^2 are based on the work of Schnoll et al. (1998b) with breast cancer patients, where demographic and medical variables (e.g. age and disease stage) explained only a very small amount of variance (4%) in psychological adjustment, while psychological variables (e.g. coping style) explained 56% of the variance.

In the case of SEM, a goodness of fit index, such as chi- square, allows the researcher to make decisions about the fit of a model. But chi-square is sensitive to sample size. Therefore, choosing an appropriate sample size directly influences acceptance or rejection of a model in SEM. The sample size is partially dependent on the number of observed outcome and predictor variables used to define latent variables, and partially on the total number of independent parameters estimated (i.e. gamma, phi, beta, lambda y, theta epsilon, psi, etc). The root mean square error of approximation (RMSEA) which represents a “badness of fit” index, can be used in assessing power and sample size in SEM (MacCallum, Browne, & Sugawara, 1996). If we want the hypothesis that the RMSEA $\leq .05$ cannot be rejected, then the question is “How large a sample size would be required to assure a power of at least .80 when the population RMSEA is at least .08?” Based on the number of these parameters, a power of .80, an alpha (the Type I error) equal to .05 and a population RMSEA= .08, a null RMSEA equal to .05, for 80 degrees of freedom (df) for the expected chi-square statistic, a N=153 results. Stevens (1996) and Schumacker and Lomax (1996) provided a relatively conservative estimate of at least 15 subjects per observed variable. Following this conservative estimation, an adequate sample size for 10 variables would have been at least 150 participants. The sample of the present study consisted of 153 participants, thus surpassing the suggested sample size of 150 participants in SEM.

Data Collection Procedures

The method of collecting the information combined personal interviewing and a mail survey. After their medical visit, the attendant physician suggested to all patients to proceed to the researcher and be informed about their possible participation in a research project regarding the illness experience. During this brief contact, the purpose and methods of the study were explained to patients, while minimal demographic and medical data were gathered. Research packets containing the psychosocial questionnaires were delivered in person, and returned by mail. Since the main problem with mail surveys is that of getting an adequate response rate, every effort was made to secure a high response rate (i.e. > 70%). If the response rate is not high enough to eliminate the possibility of serious unrepresentativeness of the sample, then non- respondents may differ significantly from the respondents, so that estimates based on the latter are biased and the findings may be of limited generalizability.

In order to raise the response rate, Dillman's (2000) Tailored Design Method was partially applied, where five steps with two complete research survey mailings are involved in the data complete collection procedure. These steps consist of an introductory letter stressing the importance of the information that will be collected, the mailing of the first research packet, a reminder postcard to all in the sample who have not yet completed the survey reemphasizing the importance of the individual's participation, the mailing of a second packet, and another final reminder postcard to non-respondents. However, two concerns shortened the five- contact process: First, breast cancer patients might be considered a sensitive population and ethically the researcher chose to restrict requests for their participation to the minimum number necessary to conduct this study. Second, since the initial contact with patients was made directly, during the face- to- face interview, the mailing of the introductory letter was omitted. Therefore, participants received one mailing including a letter to non-respondents, inviting them to respond to the survey. Out of 194 eligible participants, 153 returned complete research packets. Therefore, the response rate for the present study was assessed at 78.9%.

Measures

Each participant in this study completed a demographic and medical questionnaire and five self- report measures.

Demographic and Medical Questionnaire

A demographic questionnaire was designed to gather demographic and medical information from patients (see Appendix A). Items included were current age, educational level, employment status, marital status, parity and number of children, economic level, place of residence (capital city, rural/ provincial area), stage at diagnosis, cancer metastasis, time since diagnosis, time since operation, type of surgery (lumpectomy, partial mastectomy, simple mastectomy, modified radical mastectomy), other cancer treatments applied (radiation therapy, chemotherapy, hormonal therapy), family history of cancer, and perceived seriousness of disease (1= no serious, 4= extremely serious).

The Life Attitude Profile- Revised (LAP- R)

The LAP- R (Reker, 1999) is a 48- item self- report multidimensional measure of discovered meaning and purpose in life and the motivation to find meaning and purpose in life. Each item is rated on a 7- point Likert scale of agreement, ranging from "strongly agree" (7) to "strongly disagree" (1). The LAP- R profile consists of six dimensions and two composite scales. The six dimensions, all of which comprise eight items are:

- Purpose (PU), having life goals, a mission in life, a sense of direction to one's life,
- Coherence (CO), having an integrated and consistent understanding of self, others, and life, a clear sense of personal identity, and a sense of order and reason for existence,
- Choice/ Responsibility (CR), the perception of freedom to make life choices, the exercise of personal responsibility, personal decision making, and internal control of life events,
- Death acceptance (DA), the absence of fear and anxiety about death and the acceptance of death as a natural aspect of life,
- Existential vacuum (EV), having a lack of meaning in life, lack of goals, lack of direction, and feelings of indifference,
- Goal seeking (GS), the desire to get away from the routine of life, to search for new experiences, to welcome new challenges.

Each subscale generates one score by adding the individual scores of 8 items. A high score on each dimension reflects a high degree of the attribute in question. However, the LAP-R also features one composite scale that was labeled personal meaning index (PMI). The PMI was developed to provide a more focused measure of personal meaning. It consists of 16 items and is derived by summing the PU and CO subscales, including statements such as "I have discovered a satisfying life purpose", "My past achievements have given my life meaning and purpose", "I have a philosophy of life that gives my existence significance", "I have a framework that allows me to make sense of my life". The current study used only the PU, CO and CR subscales, as being more proximal measures of personal meaning and personal decision making about life choices.

The LAP- R was normed on a sample (n= 750) comprised of three age groups: young adults, middle- aged adults, and older adults, as well as differentiated for gender. Alpha coefficients were satisfactory, ranging from .75 to .88 for the six subscales. Test- retest reliability coefficients (estimated at a 4-6 week interval) ranged from .77 to .90 for the subscales. The two composite scales showed coefficients of internal consistency ranging from .88 to .91. Regarding validity, the LAP- R scores of the normative sample were subjected to principal components analysis with varimax rotation. Five interpretive factors emerged, accounting for 47% of the variance. The PU and CO dimensions loaded on the same factor, which strengthens the argument for combining them into the PMI index. Concurrent validity of the LAP-R was established with eight other measuring instruments, such as the Sense of Coherence scale (Antonovsky, 1987), the Purpose in Life Test (Crumbaugh & Maholick, 1969), Ryff's Purpose in Life (Ryff, 1989), and the Life Regard Index Framework (Battista & Almond, 1973). High correlations were found between the LAP-R and these meaning measures. It can be concluded that the LAP-R is a reliable and valid measure of meaning and purpose in life, the instrument shows scores predictive of certain outcome variables such as psychological well-being, life satisfaction, and the absence of depression, lending support to the notion that the LAP-R is a generalized measure of quality of life.

The Greek version of LAP-R was obtained by following standard translation procedures. The first step of the translation process involved forward translations of the original English questionnaire into Greek by two translators who were native speakers of Greek but with a high level of fluency in English. Each translator independently produced one translation of the LAP-R items and established a list of translations of the response choices. Translators were to place emphasis on conceptual and culturally sensitive rather than literal equivalence. Differences in translations were discussed, alternatives were documented and a target translation was produced. The forward- translation was given to two translators who were native speakers of English, but with a high level of fluency in Greek, who translated the questionnaire back into English. The translations were discussed for equivalence and modifications were made to some translations. The English translation was compared to the original English document, and differences were resolved until the back translation was sufficiently similar to the original document. Finally, the forward translation was pilot- tested in a small group of breast cancer patients (N=12), before being field tested in a large sample. During pilot- testing, structured interviews were conducted with each patient individually and then a focus group discussion took place. The interview was directed to each item separately to determine and comment whether any of the translated items were difficult to answer, confusing, upsetting, or difficult to understand. Confusing or difficult items were rephrased, the translated document was revised as needed, and a final version of the questionnaire was derived.

The Emotional Expressivity Scale (EES)

The EES (Kring et al., 1994) is a 17- item self- report measure of the extent to which people outwardly display their emotions, regardless of emotional valence (positive or negative) or channel of expression (facial, vocal, or gestural). It is a unidimensional scale assessing a general disposition toward expressing different emotions across various channels. EES includes items such as "I display my emotions to other people", "I am able to cry in front of other people", "I can't hide the way I'm feeling", "I think of myself as emotionally expressive". The response format for the EES is a 6-point Likert scale ranging from "always true" (1) to "never true" (6), allowing ratings of the extent to which each item applies to each participant. Reliability coefficients (Cronbach alpha) are high, with an average of .91 across seven administrations (Kring et al., 1994). Based on factor analytic results, a single general factor predominates that accounts for 23.3% of the variance. An examination of the convergent (when the scale is related to conceptually similar measures) and discriminant (when the scale is unrelated to conceptually dissimilar constructs) validities showed that the EES is related to measures that assess more specific aspects of expressivity (such as the Family Expressiveness Questionnaire – Halberstadt, 1986; the Affectometer 2- Diener, 1984; the Emotional Expressivity Questionnaire- King & Emmons, 1990) but is not related to self- esteem, or the agreeableness and conscientiousness factors of the Big Five Personality Attributes. Thus EES is a reliable and valid measure of emotional expressivity.

The Impact of Event Scale (IES)

The IES is a 15- item self- report scale that has been used for exploring the psychological responses to stressful or traumatic life events (Horowitz et al., 1979). Two major response sets are recorded by this instrument: intrusion (7 items) and avoidance (8 items). Intrusion is characterized by unbidden thoughts and images, troubled dreams, strong waves of feelings about the traumatic event, especially when the individual is exposed to stimuli that serve as reminders of the original trauma. Avoidance responses include denial of the meaning and consequences of the event, blunted sensation, awareness of emotional numbness. Participants are directed to indicate the frequency with which each item has been experienced within the past month, as a result of their illness, and rate their response on a 4- point scale ranging from "rarely/ never" (1) to "often" (4). Cronbach's alpha is high and equal to .78 for the intrusion subscale and .82 for the avoidance subscale. Twelve studies examined the IES' dimensionality and 10 of these replicated the two- factor structure of intrusion and avoidance, despite considerable differences between the samples and elapsed time since the traumatic event (Sundin & Horowitz, 2002). This current study used only the intrusion scale, as one of the measures of the psychological responses to cancer.

The Mini- Mental Adjustment to Cancer (Mini-MAC) Scale

The Mini-MAC (Watson et al., 1994) is a self- report 29- item questionnaire derived from the original 40- item MAC questionnaire (Watson et al., 1988). It was designed to operationalize and measure the concept of mental adjustment to cancer, which is a term used to describe the cognitive, emotional, and behavioural responses the patient makes to the diagnosis of cancer. Although the MAC was originally developed for assessment of responses to cancer, authors have used the scale as a measure of coping strategies or coping styles (Schwartz et al., 1992; Schnoll et al., 1998b). Questionnaire instructions ask patients to indicate how far each statement applies to them and responses are given on a four- point Likert scale ranging from "definitely does not apply to me" (1) to "definitely applies to me" (4). The five subscales are measuring

- Fatalism (F) (5 items) where the patient puts herself in the hands of God, while she takes one day at a time,
- Fighting spirit (FS) (4 items) characterized by a determination to fight the illness and the adoption of an optimistic attitude,
- Helpless- hopeless (HH) (8 items) characterized by feelings of giving up and engulfment by knowledge of the diagnosis and a pessimistic attitude,
- Anxious preoccupation (AP) (8 items) characterized by constant preoccupation with cancer and feelings of devastation, anxiety, fear and apprehension, and
- Cognitive avoidance (CA/ AV) (4 items) where the patient distracts herself and avoids thinking about the illness.

These factors emerged after principal components analysis with orthogonal rotation (n=573) and accounted for 38.4% of the variance (Watson et al., 1994). For the mini-MAC, internal consistency reliability (Cronbach alpha) estimates ranged from .62 to .88. This instrument has been validated into Greek (Anagnostopoulos et al., 2006) and proved to be a valid instrument for coping styles in cancer patients. These validation studies suggest that two Mini-MAC factors (HH and AP) may be indicators of maladaptive illness representations, while the other three factors (FS, F, AV) may be indicators of an adaptive coping style. Thus, the former scales were used as indicators of psychological responses to cancer, while the latter were used to indicate coping styles.

The Short Form 36 (SF- 36) Health Survey

The SF-36 is the most widely used health status questionnaire. It includes multi- item scales measuring each of eight generic health concepts: physical functioning (PF), role limitations due to physical health problems (RP), bodily pain (BP), general health perceptions (GH), vitality (VT) tapping energy levels and fatigue, social functioning (SF), role limitations due to emotional problems (RE), and mental health (MH) capturing feelings of nervousness, unhappiness, and sadness (Ware et al., 1998). In the present study, only the four last scales that measure mental health status, have been used. In this way, 14 items were selected, measuring VT (4 items), SF (2 items), RE (3 items) and MH (5 items). For each scale, responses to items were coded, summed and transformed into a scale ranging from 0 (worst possible health status) to 100 (best possible health status). Missing values were substituted according to the method suggested by the developers for gaining scores for missing values (Ware, Kosinski, & Gandek, 2003). The standard version of the SF-36 was administered to our sample, asking patients to report on their metal health status over the past four weeks. This instrument has been validated into Greek (Anagnostopoulos et al., 2005), while satisfactory reliability coefficients (Cronbach alphas) have been reported for the four mental health subscales, ranging from .79 to .92 (Pappa et al., 2005).

As far as the five- item MH scale is concerned, it has demonstrated sufficient criterion validity with respect to the presence of depression in community- dwelling elderly American patients (Friedman, Heisel, & Delavan, 2005), satisfactory predictive validity in screening for depressive disorders in older Swedish women (Silveira, Taft, Sundh, Waern, Palsson, & Steen, 2005), satisfactory validity to detect mood disorders in German general populations (Rumpf, Meyer, Hapke, & John, 2001), and usefulness to screen for depressive symptoms in the general population of Japan (Yamazaki, Fukuhara, & Green, 2005). The performance of the MH scale in terms of predicting mental health problems is similar to that of GHQ-12 (Hoeymans, Garssen, Westert, & Verhaak, 2004). This scale has been used to measure mental health status in large surveys conducted within the Eurobarometer Multi- national Health monitoring programmes (European Opinion Research Group [EORG], 2003).

The MH, RE, and SF scales have been shown to be the most valid of the SF-36 scales as mental health measures. Moreover, the VT scale has noteworthy correlations with both physical and mental functioning (Ware, 2000). Lower levels of the VT scale have been associated with mood and anxiety disorders (Bijl & Ravelli, 2000). Thus, the VT scale has been supposed to act as an indicator of mental well- being and positive mental health (Lehtinen, Sohlman, & Kovess-Masfety, 2005).

Data Analysis

Data Preparation and Screening

Data entry was first checked for accuracy, through examination of basic descriptive statistics (e.g. ranges) and of frequency distributions. Values that were out of range or improperly coded were detected and corrected. Procedures to handle missing observations were then applied. In the case of multi- item scales, scale scores were obtained by substituting average scores (computed across completed items in each particular scale) for any missing item of the same scale. This algorithm was applied when the respondent answered at least 50% of the items in each scale and the proportion of respondents with missing data was low (<10%). Replacement (imputation) of missing observations with estimated scores requires the assumption of data missing at random, meaning that the probability of the presence versus absence of scores on some variable is unrelated to subject's true status on that variable. This implies that subjects with missing observations differ only by chance from those who have scores on that variable. Next, outliers (i.e. cases with extreme scores more than three standard deviations away from the mean) that could contribute to non- normality of the distribution of variables, were detected and dealt with (e.g. by making their scores less extreme through changing their values to equal a less extreme score).

Data were analyzed using bivariate correlation analysis to answer research question 1 (that there were significant relationships between psychological adjustment to breast cancer and biomedical and intrapersonal variables). Curvilinear relations between variables were explored by inspecting scatterplots. No strong nonlinear relations were found between variables.

Since the LAP-R and the IES had not been validated in the Greek version, an exploratory factor analysis of these instruments was conducted, to establish subscales appropriate for our sample. The main objective of this analysis was to determine the minimum number of hypothetical common factors that would satisfactorily produce the observed correlations among the items. The Kaiser- Meyer- Olkin (KMO) measure of sampling adequacy as well as the partial correlation coefficients and Bartlett's test of sphericity were computed to evaluate appropriateness of the factor model. The number of factors necessary to represent the data was determined by inspection of Cattell's scree plot and the eigenvalue greater than 1 criterion. Having found some underlying dimensions in the data, factor- based scales were constructed by classifying each item to one scale according to its highest factor loading. Scale scores were computed by combining and summing the raw scores of all those items with relatively substantial loadings (>0.30) in each scale, and ignoring the remaining items with minor loadings.

Regression Analyses

Hierarchical multiple linear regression analysis was employed to answer research questions 1 and 2 about moderating effects that the moderators (existential meaning or expressivity) could weaken the effect of the predictor (intrusive thoughts) on the outcome (psychological adjustment to breast cancer). To draw inferences about population values based on sample results, the following assumptions are needed: (a) normality and equality of variance, that is for any fixed value of each independent variable, the distribution of the dependent variable is normal, and with a constant variance. (b) independence, meaning that observations are not interdependent (e.g. as if they are based on repeated measurements), (c) linearity, that is the mean values of the dependent variable for the values of a given independent variable all lie on a straight line. Possible violations of assumptions were checked using (a) the normal probability (P-P) plot, comparing the observed distribution of residuals (i.e. the differences between the observed values and the values predicted by the regression) to that expected under the assumption of normality. (b) the standardized residual scatterplots, plotting the residuals against the predicted values. (c) the casewise plot of studentized residuals, plotting residuals against the sequence variable (e.g.

corresponding to the order in which participants received therapy). In our case, no critical violations were noted.

One problem facing multiple regression is multicollinearity, which refers to high correlations (e.g. $>.85$) between two or more independent variables, as in the case where any independent variable is a perfect linear combination of other independent variables. Multicollinearity was checked by inspection of the tolerance levels, the conditioning index, and the variance proportions associated with each variable for each root. Very small levels of tolerance ($<.10$), at least two large variance proportions ($> .50$) for a given root number and a large conditioning index (> 30) signaled multicollinearity (Tabachnick & Fidell, 1996).

Assessment of the relative importance of each independent variable was based on the magnitude of the standardized regression coefficient and the change in the square of the multiple correlation coefficient (R^2) when all independent variables except the variable of interest were in the equation. The latter indicates how much R^2 increases when a variable is added to the regression equation. The type of multiple regression that was applied was sequential (hierarchical) regression, where the independent variables entered the equation in an order specified by the researcher (e.g. first the demographic and medical and then the psychosocial variables). The analysis proceeded in steps, and separate variables or blocks of variables were entered in each step. The squared semipartial correlations (which express the unique contribution of the independent variables to the total variance of the dependent variable) were estimated and their significance levels were used in evaluating the importance of the added independent variables.

Testing Moderated Effects through Regression Analyses

A moderator is a variable that affects the direction (sign) or strength of the relation between two variables, X (predictor) and Y (outcome) (Baron & Kenny, 1986). For example, a moderator may reduce the correlation between X and Y. In the case where both the predictor and moderator affect the outcome variable in the same direction and together have a stronger than additive effect, the interactions are called enhancing. When the moderator variable weakens the effect of the predictor variable on the outcome, the interactions are called buffering. When the predictor and moderator have the same effect on the outcome but the interaction is in the opposite direction, the interactions are called antagonistic (Frazier et al., 2004). Although there may be significant main effects for the predictor and the moderator, what is important is the significance of the interaction between the predictor and the moderator. Holmbeck (1997) has suggested that conceptual clarity is lacking when a proposed mediator (e.g. coping) represents a response to a predictor such as illness stress. He argues that when coping strategies are viewed as buffers or protective factors of the stress- adjustment relationship, then a moderational perspective is preferable. From this perspective, high levels of stress are expected to produce poor adjustment outcomes, only when the level of the protective factor is low. To examine such protective effects, one should test the significance of the interaction between stress and the protective factor, after entering the main effects. Only when the investigator provides predictions that certain specific coping strategies (e.g. fighting spirit, denial, fatalism) are expected to be more (or less) likely to be used when the level of an illness stressor is higher, does a model become mediational. The investigator would also need to propose that higher (or lower) levels of adjustment are expected when this particular coping strategy is employed with greater (or lesser) frequency. Unless the investigator can articulate a complete rationale for how these variables could serve a mediational function, he should analyze relationships between variables within a moderator model.

So, in order to test the above mentioned moderated effects, the following procedures were undertaken: Initially, the predictor and moderator main effects (and any covariates, such as demographic variables) were entered into the regression equation first, followed by the interaction of the predictor and the moderator, in a hierarchical fashion. The interaction term was represented by the product of the two main effects and only became the interaction when its constituent elements were partialled out. To eliminate problematic multicollinearity effects between first- order terms (i.e. the independent variable and the moderator) and the higher order terms (i.e., the interaction terms), the independent variable and the moderator were "centered" before testing the significance of the interaction term (Frazier et al., 2004). To center a variable, scores are put into deviation score form by simply subtracting the sample mean from all individuals' scores on the variable, thus producing a revised sample mean of zero. The centered predictor and moderator terms are multiplied to form the interaction term. When variables are centered, the first- order effect of one variable represents the effect of that variable at the average/ mean level of the other variables.

Structural Equation Modeling (SEM) Analyses

In this study, SEM was used to answer the research questions 3 and 4 about mediating effects that psychological responses to cancer (e.g., intrusive thoughts, helplessness) could influence existential meaning or emotional expressivity, which, in turn, could influence psychological adjustment to cancer. SEM is a collection of statistical techniques that allow examination of a set of relationships between one or more independent variables and one or more dependent variables. The independent (predictor) and the dependent variables can be either observed (measured) or latent (Tabachnick & Fidell, 1996). The basic statistic in SEM is variance or covariance. Thus, the main goal of SEM is to understand patterns of correlations among set of variables and to explain as much of their variance as possible with the model specified by the researcher. SEM is particularly designed to accommodate models that include measurement errors in both dependent and independent variables, multiple dependent variables, reciprocal causation, simultaneity, and interdependence. Measurement error (or unique variance) in an observed variable (presumed to measure or tap into a latent, unobserved variable) indicates the variance in it unexplained by the latent variable (factor). Measurement error represents both random error (unreliability due to luck in guessing the correct answer, or fatigue) and systematic error (due to the particular measurement method used such as self-report). This allows the modeler to explicitly capture the unreliability of measurement in the model, which allows the structural relations between latent variables to be accurately estimated.

One of the advantages of SEM is that the technique allows an estimation of underlying latent constructs which are measured by a set of observed variables (indicators). Another advantage of SEM lies in its ability to show total, direct and indirect effects among variables. Indirect effects involve one or more intervening variables that transmit some of the effects of prior variables onto subsequent variables (McDonald & Ringo Ho, 2002).

In typical applications of SEM, a number of endogenous (latent dependent) and exogenous (latent independent) variables are used, and a model that attempts to explain how these variables are associated, is specified. Part of this explanation may include presumed causal effects, where a variables Y is considered as the direct consequence (result) of another variable X. Other parts of the explanation may reflect presumed noncausal relations such as a spurious association between variables due to common causes. If the model fits the data well and is not rejected, it cannot automatically be concluded that the hypotheses about causality are correct. The inference of causality requires more than just acceptable correspondence between the model and the data. To reasonably infer that X is a cause of Y, all the following conditions must be met (Kline, 1998):

a) There is time precedence, that is X precedes Y in time.
b) The direction of the causal relation is correctly specified, that is X causes Y, instead of the reverse, or that X and Y cause each other (reciprocal causation).
c) The relation between X and Y does not disappear when external variables such as common causes of both are held constant (partialed out).

Condition (a) above is satisfied if longitudinal studies are implemented. It may be problematic to infer causality in cross- sectional studies. For such an inference to be valid, a researcher must take one of two positions (MacCallum & Austin, 2000): (i) one option is to argue that the time lag during which the causal influence operates is essentially instantaneous, (ii) another option is to assume that the causal variables under study do not change over the time period of interest, i.e., between the time the causal effect occurs and the time the causal variable is measured. If these assumptions or arguments are not valid, estimates of directional effects obtained in a cross- sectional design may be biased. Of course, temporality is just one criterion used to distinguish causal from noncausal associations. Other criteria used include consistency, specificity, plausibility, coherence, and experimental evidence (Hill, 1965). But these criteria are saddled with reservations and exceptions (Rothman & Greenland, 2005).

Regarding condition (b), even if X does indeed cause Y, the magnitude of their observed correlation may be low if the interval between their measurement is either too short (e.g., effects on Y take time to materialize) or too long (e.g., the effects are temporary and have dissipated). Thus, the specification of directionality requires a clear rationale. Condition (c) can be met when experimental manipulation of variables is applied. Statistical control (such as that represented by hierarchical multiple regression) is another way to address the third condition listed earlier. However, the potential biasing effects of omitting relevant and important variables or variables confounded with a manipulated independent variable, cannot disappear and may change the value of the paths between variables.

Thus, SEM can be considered to consist of descriptive models (which simply describe relationships) instead of causal models (which purport to give causal explanations) (Loehlin, 1998). Directional effects in SEM can be considered as causal effects in a loose sense, wherein a change in one variable somehow results in a change in another variable. Model selection should not be purely data- driven but should be based on a clear theoretical justification (theory- driven). Thus, it is usually only with the accumulation of the following types of evidence that researchers can even begin to think that the results of a SEM analysis may indicate causality (Kline, 1998): (i) replication of the model across independent samples, (ii) corroborating evidence from experimental studies of variables in the model that are manipulable, and (iii) the accurate prediction of the effects of interventions. Without such evidence, structural models are best seen as "as if" models of causality.

A recent approach to SEM assumes that there is an underlying mechanism that leads to an observed covariance structure between a series of variables (Halpern & Pearl, 2005). The objective is to specify, identify and test a model that captures the essence of this underlying mechanism. Each distinct mechanism can be represented by a structural equation (which describes the values of endogenous variables) while a set of such equations can be used to define relations among variables. This structural- model approach to actual causes uses equations to model counterfactuals (i.e., conditional statements indicating what would be the case if its antecedent were true) and yields a plausible account of causation.

Kline (1998) has suggested the following steps in testing SEM models: (1) specify the model, which means that the researcher's hypotheses are expressed in the form of a structural equation model; (2) determine whether the model is identified (each parameter in the model has a unique estimate); (3) select measures of the variables represented in the model; (4) analyze the model to derive estimates of the model's parameters; (5) evaluate model fit which means to determine how adequately the model accounts for the data; (6) re-specify the model and evaluate the fit of the revised model to the same data. These steps were applied to the present study. First of all, the literature was searched to formulate a theory and specify a model for analysis. The theory used was coping theory expanded by Park and Folkman (1997) to include a meaning component. The proposed meaning model in the present study was based on existing empirically validated models of psychosocial adaptation to breast cancer (Schnoll et al., 1998). A computer programme such as LISREL (Jöreskog & Sorbom, 1996) conducted step 4 regarding the statistical analysis. Goodness- of - fit indices were computed and the model fit was interpreted (step 5). Finally, suggestions were made for a re-specification of the models under investigation (step 6).

Goodness-of-Fit Criteria

For the proposed models to be interpretable, goodness-of-fit criteria had to be established to compare observed relationships in the data to the proposed structural models. Goodness of fit is a major consideration for research utilizing structural equation modeling. Unfortunately, finding the correct fit index for a study is one of those "gray" areas in statistical science that has sparked much debate among statisticians in the past 20 years. Tanaka (1993) reported that a number of fit indices are available to the researcher to assess the theoretical accuracy of a structural equation model, with each fit index having distinct advantages and disadvantages in regard to acceptance or rejection of a model. He distinguished between classic fit indices, which are based on a centrality assumption (Chi-square, Goodness of Fit Index), relative fit indices, which compare a model to its underlying null model, and parsimony fit indices, which estimate best model fit with the least amount of parameters necessary.

Schumacker and Lomax (1996) classified fit indices into three types. First of all, there are fit indices that compare observed and latent covariance matrices. The Chi-Square index and the goodness of fit index fit into this category. Second, several fit indices (Comparative Fit Index, Normed Fit Index) have been developed to compare a model with a null model. Finally, there are indices like the Parsimony Goodness of Fit Index to assess the parsimony of a model, with parsimony being the least required number of coefficients to achieve a good fit. For the sake of parsimony in research studies, several authors including Keith, (1996) and Loehlin

(1998) have suggested use of at least one fit index from each category proposed by Schumacker and Lomax (1996). This practice appears to be an appropriate response to the lack of specific goodness of fit conventions in the statistical sciences. The following six fit indices (one or more for each of the five categories) were chosen for the present study: Chi-square and GFI were chosen as absolute or classic fit indices for this study. With Chi-Square, a non-significant value indicates that observed and estimated matrices do not differ statistically, which means that the proposed model fits the data. In order for a model to be accepted as having good empirical fit, Chi-Square should not be significant. If the Chi-Square value <.05, the researcher's model is rejected (Schumacker & Lomax, 1996). Even though Chi-Square is not considered the best fit index to evaluate comparative fit across different models, Hoyle (1995) attested to the fact that it is a useful index when models are proposed a priori as is the case in this study. The Goodness of Fit (GFI) index is based on a ratio of the sum of the squared differences between the observed and reproduced matrices to the observed variances (Schumacker & Lomax, 1996). Hu and Bentler (1995) recommended reporting relative Chi-Square with the Satorra-Bentler correction as well, since relative Chi-Square is less driven by sample size considerations than the Chi-Square index.

Two other fit indices are reported in this study, the Adjusted Goodness of Fit index (AGFI) and the Comparative Fit Index (CFI) (Bentler, 1990). AGFI, like GFI, assesses the variance and covariance accounted for by the model (Marsh, Balla, & McDonald, 1988). The AGFI is a version of the GFI but includes an adjustment by degrees of freedom relative to number of variables in a model. GFI and AGFI are routinely performed by the LISREL statistical program and will generally fall between 0 and 1 (Marsh et al, 1988). GFI and AGFI are recommended fit indices because they are believed to be relatively independent of sample size. Both GFI and AGFI should be at least .90 to denote good fit (Hu & Bentler, 1998). The Comparative Fit Index (CFI) (Bentler, 1990) is non-centrality based and measures improvement in a target model over a baseline model, most often the null model (Hu & Bentler, 1995). CFI values range from 0 to 1. A CFI value of .80, for instance, indicates that the tested model is 80% better than the null model (Kline, 1998).

The third category of fit indices takes into consideration the need for parsimony in SEM. As Raykov and Marcoulides (1999) suggested, the best SEM models have both good empirical fit and parsimony, with parsimony referring to the least number of parameters necessary to achieve adequate model fit. The Parsimonious Goodness of Fit Index (PGFI) is used to compare models with different degrees of freedom (Schumacker & Lomax, 1996). It is employed when a researcher wants to achieve a high degree of fit with few degrees of freedom and favors the most parsimonious model.

Last but not least, researchers have utilized the Standardized Root-Mean-Square Residual index (SRMR) and the Root Mean Square Error of Approximation index (RMSEA) (Hu & Bentler, 1998). The SRMR assesses the difference between observed and implied covariance residuals (Kline, 1998). A model with perfect fit has a SRMR value of zero. The RMSEA is based on population and not sample size characteristics (Loehlin, 1998), which enables the researcher to make inferences on whether or not a particular model fits for a particular population. Unlike the SRMR, the RMSEA tests for differences between two competing models. The recommended cut-off value for the RMSEA is .06. Perfect fit is indicated by an RMSEA value of zero.

Goodness-of-fit indices are important in the decision-making process about the acceptance or rejection of proposed SEM models (Schumacker & Lomax, 1996). Two main criteria have to be met to accept a model as fitting the collected data: goodness of fit and parsimony, thus absolute, relative, and parsimony fit indices were computed for this study. Table 3 contains recommended and cut-off values for the fit indices utilized in this study.

Following guidelines provided by Schumacker and Lomax (1996), GFI and AGFI values > .90 would be desirable for good model fit. In regard to the PGFI, no fit is indicated by 0 and perfect fit is indicated by 1; thus, the closer the value comes to 1 and the farther it is away from 0, the better the model is expected to fit. In terms of the SRMR, the acceptable level was defined as (0 equals perfect fit, up to .3 is good fit), and in regard to the RMSEA, a value of < .06 indicated good model fit.

Values for χ^2 will be dependent on the number of variables in the model and this study will be guided by standard values for model fit at the $p<.05$ level. In regard to parsimony, only variables that made a statistically significant contribution to the overall model at alpha=.05 level were deemed important to the model.

Mediation Effects Analyses

Testing Mediated Effects through SEM

In this study, regression analyses were employed to testing possible mediated effects of meaning and emotional expressivity in the relationship between impact of cancer (intrusions) and psychological adjustment.

Table 3

Recommended values and interpretation for selected Goodness- of- fit indices

Index	Range of values	Recommended level and interpretation
Chi- square (χ^2)	See Chi- square tables for nonsignificant values for p≥ .05	Nonsignificant values represent good model fit
Goodness- of- Fit Index (GFI)	From 0 (poor fit) to 1 (perfect fit)	Values ≥.90 represent good fit
Adjusted GFI (AGFI)	From 0 (poor fit) to 1 (perfect fit)	Values ≥.90 represent good fit
Comparative Fit Index (CFI)	From 0 (poor fit) to 1 (perfect fit)	Percent improvement between two models
Root Mean Square Error of Approximation (RMSEA)	From 0 (perfect fit) to 1 (no fit)	Values <.06 reflect good fit, values <.08 correspond to acceptable fit
Standardized Root Mean Squared Residual (SRMR)	A zero value represents perfect model fit	Comparison of observed with implied covariance matrix. Favorable values <. 10
Non- Normed Fit Index (NNFI)	From 0 (no improvement) to 1 (substantial improvement)	Proportion in the improvement of the overall model fit relative to a null model. Values ≥.90 represent satisfactory improvement

Once a relationship between two variables (psychological responses to cancer and psychosocial adjustment to cancer) has been established, it is common for a researcher to consider the role of a third variable (e.g. existential meaning) in this relationship.

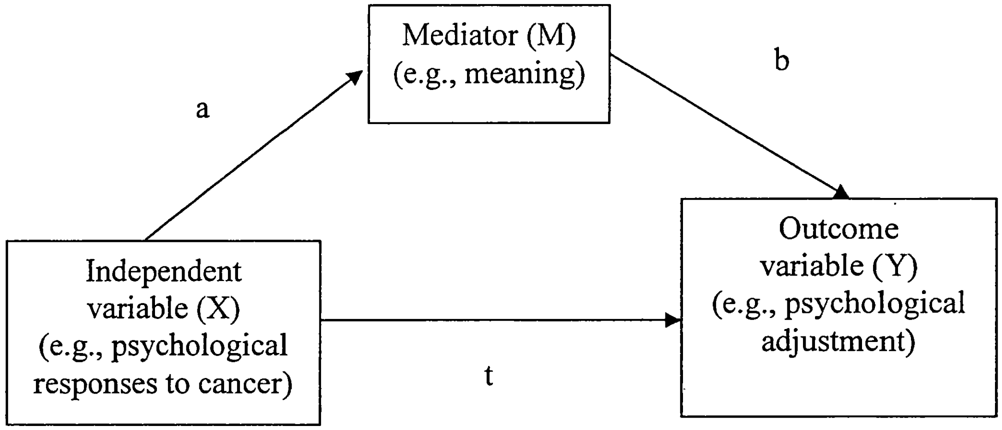

Figure 4. A three- variable mediation model.

In examining a mediational hypothesis, the relationship between an independent variable (X) and a dependent (outcome) variable (Y) is decomposed into two causal paths, as shown in Figure 4. One of these paths (with regression weight "t") links the independent variable to the dependent variable directly, and the other links the independent variable to the dependent variable by means of an intervening variable (a mediator M). Given that the variables are standardized, this indirect effect of X on Y through M is equal to the product of associated regression weights, a*b. Then, the total effect of X on Y equals the direct effect plus the indirect effect, that is (a*b) + t. According to Baron and Kenny (1986) a variable functions as a mediator to the extent that it accounts for the relation between the independent (predictor) variable and the outcome variable. In order for a variable to serve as a mediator it has to meet the following conditions. First, X has a direct effect on M (i.e. $a \neq 0$). Second, M has a direct effect on Y, controlling for X (i.e. $b \neq 0$). Third, if

M completely mediates the X-Y relation, the direct effect of X on Y (controlling for M) must approach zero (i.e. $t \approx 0$). Alternatively, if M only partially mediates the relation, t may not approach zero. Nevertheless, an indirect effect of X on Y through M must be present (i.e. $a*b \neq 0$) and the independent variable must be shown to significantly affect the dependent variable, so that there exists an effect to be mediated. These conditions can be tested with three multiple regression analyses. Use of SEM, however, is preferable when we have multiple indicators for the latent variables under investigation as well as when measurement error in the predictor and mediator variable is taken into account.

Applying the SEM strategy, and assuming that there is a latent predictor variable (A), a hypothesized latent mediator variable (B), and a latent outcome variable (C), the fit of the direct effect (A → C) model is assessed at first (Holmbeck, 1997). Assuming an adequate fit, the fit of the overall A → B → C model is then tested. Assuming that the overall model provides an adequate fit, the A → B and B → C path coefficients are examined. These should be significant in the directions predicted. The final step in assessing whether there is a mediational effect is to assess the fit of the A → B → C model under two conditions : (a) when the A → C path is constrained to zero, and (b) when the A → C path is not constrained. The second model would then be examined as to whether it provides a significant improvement in fit over the first model. Improvement in fit is assessed with a significance test on the basis of the difference between the two model chi- squares. If there is a complete mediational effect, the addition of the A → C path to the constrained model should not improve the fit. In other words, the previously well- fitted model with the significant A → C path is not improved, when the mediator is taken into account, while the A → C path is reduced to nonsignificance (near zero). If there is a partial mediation, the addition of the A → C path to the constrained model should improve the fit, but the A → C path will take a value that is different from zero, but significantly smaller than that when the model would not include the mediator.

Testing Mediated Effects through Bootstrapping

The SEM approach to testing mediation effects uses the product of unstandardized path coefficients (e.g., a, b) and their standard errors (e.g., s_a, s_b), to test for the significance of the indirect effects. The corresponding formula (known as the Sobel test) is :

$$S_{ab} = (a \times b) / \sqrt{(a^2 s_b^2 + b^2 s_a^2 + s_a^2 s_b^2)},$$

where the numerator is the product of the unstandardized coefficients for paths a and b, and the denominator is the square root of the quantity inside the parentheses. This formula is then used to test whether the indirect effect is different from zero (through *z* statistics and corresponding probability levels) and to construct confidence intervals around the estimate of the indirect effect. For example, the 95% confidence interval for the indirect effect is:

$$(a \times b) \pm (1.96)\, S_{ab}.$$

Using the product of coefficients for making inferences about the indirect effects, involves the implicit assumption that the sampling distribution of the indirect effect (i.e., of the product a X b) is normal. There are reasons to suspect that this assumption does not hold when the null hypothesis that a X b = 0 is false, that is when mediation is present. Although the sum of two normally distributed variables will have a normal shape, their product will not be normal. Indeed, products of normal variables with positive means tend to have a positive skew, and products of normal variables with means of opposite signs will tend to have a negative skew

(MacKinnon et al., 2002). The implication of this is that the usual test of the indirect effect will lack statistical power to reject the null hypothesis that a X b = 0. Thus, bootstrapping, a nonparametric resampling procedure, is being recommended (Shrout & Bolger, 2002). To bootstrap the sampling distribution of (a X b) we take a sample of size n cases with replacement from the original sample. Using this new resample of size n, reestimate a and b and then calculate $(ab)^*$, the product of a and b but derived in this resampled data set. This process is repeated a total of k times, where k is preferably at least 1,000, yielding k estimates of the specific indirect effect of the predictor on the outcome variable through the mediator. The mean of the k values of $(ab)^*$ can be used as the bootstrap estimate of the size of the indirect effect, and their standard deviation functions as an estimate of the standard error of ab. The bootstrap CI for the population indirect effect is derived by sorting the k values of $(ab)^*$ from low to high. Values cutting off the lower and upper 100 $(\alpha/2)\%$ of the distribution of $(ab)^*$ are then found and taken as the lower and upper limits of $g = 100\ (1 - \alpha)\%$ CI for the population indirect effect. For example, if $\alpha = 0.05$, then $g = 95$, generating a 95% CI. With $k = 1{,}000$ bootstrap samples, the upper and lower bounds of the interval would be the 25th and 976th values of $(ab)^*$ in the sorted distribution of bootstrap estimates.

Modeling Procedure

The statistical program LISREL 8 (Joreskog & Sorbom, 1996) was used to test hypotheses 3 and 4 and analyze the proposed mediation model. In order to reduce error variance in these models, input variables (predictors) were kept to a minimum. Models were tested as maximum likelihood models as recommended by Kline

(1998). Descriptive data were calculated using the Statistical Package for the Social Sciences (SPSS, Version 10.0). Means, standard deviations, and correlations among variables were computed and bivariate correlation analyses were performed. Raw data in the data matrix were then transferred from SPSS to PRELIS 2 (Joreskog & Sorbom, 1996) in order to obtain the asymptotic covariance matrix of the estimated variances, covariances or correlations. Since all variables were continuous, the product- moment correlation was computed from all complete pairs of observations. This matrix was then processed to LISREL.

Two models were developed and tested in this study. The primary model to be tested (Figure 1) was a model with paths between the hypothesized predictor "psychological responses to cancer" (Psyc Res), and meaning, emotional expressivity (Emot exp), and coping, as well as individual paths from these three constructs to psychological maladjustment (Psyc mal). Psychological responses to cancer had three indicators (intrusions, helplessness, anxious preoccupation), meaning has three indicators (purpose, coherence, choice), coping had also three indicators (fatalism, fighting spirit, avoidance). Emotional expressivity was measured by three indicators- items ("I don't express my emotions to other people", "Even when I am experiencing strong feelings", "I don't express them outwardly, I hold my feelings in"). Psychological maladjustment had four indicators (mental health, vitality, social functioning, role emotional). An alternative model, without a direct path from "psychological responses to cancer" to psychological maladjustment was developed to test whether or not the effect of psychological responses to cancer was indirectly exerted to psychological maladjustment through meaning and expressivity. Both models were theoretically based because of the proposed relationships between psychological responses to cancer, existential meaning, emotional expressivity and coping style.

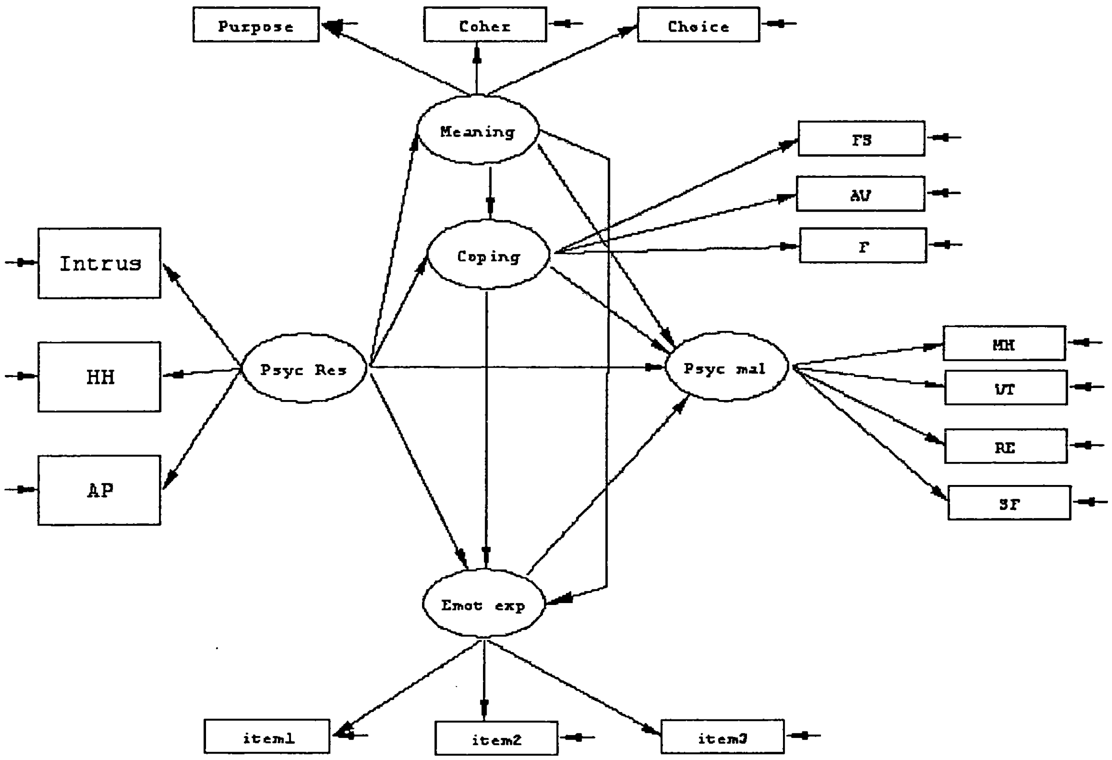

Figure 5. Conceptual path diagram for the Primary Model.

Ethical Considerations

There are practical and ethical difficulties when doing research involving people with cancer and it is important to protect the rights of all study participants. One important factor that must be considered is fatigue, both mental and physical. For this reason, the aim was to diminish respondent burden by focusing data collection on specific issues (i.e. domains of adjustment to cancer). Patient medical records were reviewed and liaison with relevant physicians was arranged prior to approaching suitable patients. Identified patients were approached by the researcher and, were provided with a detailed information sheet about the purpose of study and were asked to sign a consent form. All participants were informed that their participation was voluntary, that they would be able to withdraw from the research at any time and without giving reasons and without detriment to their care. Participants were also informed that the investigator is a research student based at the School of Health Science, University of Wales, Swansea, and permission to contact them and use their personal data (name, address, telephone number) had been obtained from their physician. They were assured that all data from this project would be confidential and would be used only for research purposes and that anonymity of collected data would also be preserved. Moreover, ethical approval was sought and gained from the ethics committee of the hospital.

CHAPTER 5

Factor Analyses of the Measures Used

In this chapter the internal consistency reliability as well as the content validity of the psychological measures is explored, based on factor analytic results.

Factor Analysis of the Life Attitude Profile- Revised (LAP- R)

For factor analysis of the LAP- R, the principal component algorithm was used for factor extraction, and retained factors were obliquely rotated to make them more interpretable. The six- factor solution that emerged from analysis of the 48 items accounted for 51.6% of the total variance and was then submitted to an oblique rotation with the Promax method with Kaiser normalization (Table 4). Factor 1 consisted of 12 items that referred to purpose and coherence and accounted for 21.4% of the variance. Factor 2 consisted of eight items that reflected death acceptance, and accounted for 8.6% of variance. Factor 3 was an eight item choice factor that accounted for 7.9% of variance, factor 4 contained eight items related to goal- seeking and accounted for 5.5% of variance, while factor 5 seemed to contain four items that reflected purpose and coherence and accounted for 4.4% of variance. The sixth factor with eight items appeared to correspond to existential vacuum, and accounted for 3.8% of variance.

Table 4

Factors derived from the LAP-R, sample items, Cronbach's alphas, and item factor loadings

Factors	Variables/ Items	Factor loadings
Factor 1 Purpose and coherence, α= .88	A philosophy of life gives my existence significance	0.731
	A framework that allows me to make sense of my life	0.715
	In my life I have very clear goals and aims	0.710
Factor 2 Death acceptance, α= .88	Even though death awaits me, I am not concerned about it	0.896
	Some people are very frightened of death, but I am not	0.851
	Death makes little difference to me	0.805
Factor 3 Choice/ responsibility, α= .79	My life is in my hands	0.738
	It is possible for me to live my life in terms of what I want to do	0.735
	I determine what happens in my life	0.732
Factor 4 Goal seeking, α= .72	I hope for something exciting in the future	0.681
	I am eager to get more out of life	0.652
	A new challenge in my life would appeal to me now	0.643
Factor 5 Purpose and coherence, α= .70	I am living the kind of life I want to live	0.619
	I know where my life is going in the future	0.574
	My personal existence is orderly and coherent	0.480
Factor 6 Existential vacuum, α= .78	I have experienced the feeling that while I am destined to accomplish something important, I cannot put my finger on just what it is	0.465
	I daydream of finding a new identity and a new place for my life	0.454
	I try new areas of interest and then these soon lose their attractiveness	0.346

Structures found by factor analysis were viewed as only suggestive, indicating some clustering in the data. Based on magnitudes of factor loadings, six factor- based scales could be developed. Since some of the purpose and coherence items loaded on factor 1, while some other purpose and coherence items loaded on factor 5, two separate scales were created, by rearranging the items in these two factors. Cronbach's alpha reliability coefficients for the six scales were all satisfactory ranging from .70 to .88. This factor structure was quite similar to the original published (Reker, 1999).

Inter- scale correlations were almost all relatively high and statistically significant, ranging from r= -.45 to .79 (Table 5). Goal seeking was the scale with non- significant correlations with the remaining scales, except with existential vacuum (r= .307, p< .01).

Table 5

Correlation coefficients among the six LAP-R scales (n= 148)

Scales	1	2	3	4	5	6
1. Purpose	1.000					
2. Coherence	.789**	1.000				
3. Choice	.605**	.475**	1.000			
4. Death acceptance	.441**	.338**	.388**	1.000		
5. Existential vacuum	-.415**	-.455**	-.226**	-.197*	1.000	
6. Goal seeking	-.027	.003	.036	-.076	.307**	1.000

*p< .05. **p< .01.

Based on these results, the personal meaning index (PMI) was computed by summing scores in the Purpose and Coherence scales. PMI scores ranged from 32 to 112 (Figure 6), with a mean value of 87.9 (SD= 13.03).

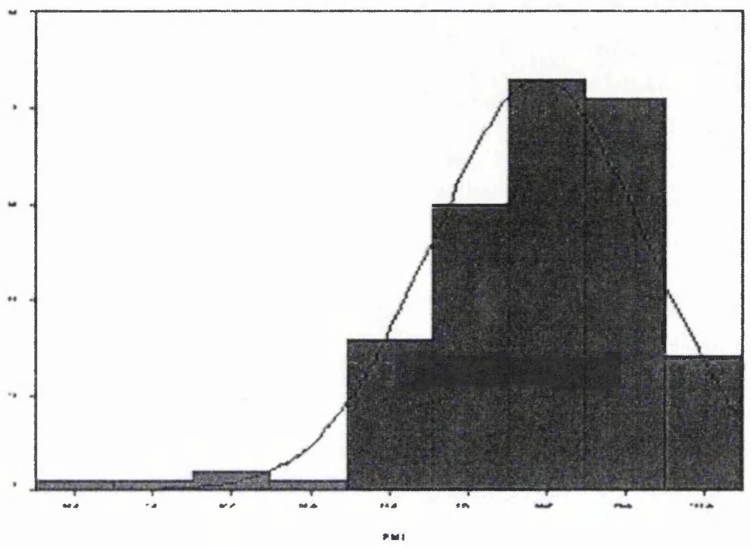

Figure 6. Frequency distribution of PMI scores.

Factor Analysis of the Impact of Event Scale (IES)

For factor analysis of the IES, the principal component algorithm was used for factor extraction, and retained factors were obliquely rotated to make them more interpretable. The two- factor solution that emerged from analysis of the 15 items accounted for 58.6% of the total variance and was then submitted to an oblique rotation with the Promax method with Kaiser normalization (Table 6). Factor 1 consisted of 7 items that referred to intrusion and accounted for 46.5% of the variance. Factor 2 consisted of 8 items that reflected avoidance, and accounted for 12.1% of variance. Cronbach's alphas for the scales of intrusion and avoidance were equal to .92 and .80 respectively.

Table 6

Factors derived from the IES, Cronbach's alphas, and sample item factor loadings

Factors	Variables/ Items	Factor loadings
Factor 1 (Intrusion, α= .92)	Any reminder brought back feelings about it	.850
	I was aware that I still had a lot of feelings about it but I didn't deal with them	.830
	I had waves of strong feelings about it	.825
	My feelings about it were kind of numb	.824
	I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind	.803
	Other things kept making me think about it	.800
	Pictures about it popped into my mind	.747
Factor 2 (avoidance, α= .80)	I tried not to think about it	.806
	I tried to remove it from memory	.799
	I avoided letting myself get upset when I thought about it or was reminded of it	.738
	I tried not to talk about it	.729
	I stayed away from reminders of it	.558
	I felt as if it hadn't happened or it wasn't real	.539

Factor Analysis of the Mini Mental Adjustment to Cancer (Mini- MAC) scale

For factor analysis of the Mini-MAC, the principal component algorithm was used for factor extraction, and retained factors were obliquely rotated to make them more interpretable. The six- factor solution that emerged from the analysis of the 29 items accounted for 68.2% of the total variance and was then submitted to an oblique rotation with the Promax method with Kaiser normalization (Table 7). Factor 1 consisted of eight items that referred to helpless- hopeless and accounted for 32.9% of the variance. Factor 2 consisted of eight items that reflected anxious preoccupation, and accounted for 17.1% of variance. Factor 3 was a four item fighting spirit factor that accounted for 7.5% of variance, factor 4 contained four items which were related to cognitive avoidance and accounted for 5.7% of variance, while factor 5 seemed to contain five items that reflected fatalism and accounted for 5% of variance.

Table 7

Factors derived from the Mini-Mac, Cronbach's alphas, and item factor loadings

Factors	Variables/ Items	Factor loadings
Factor 1 (helpless-hopeless, α= .94)	I feel there is nothing I can do to help myself	.886
	I can't cope	.862
	I feel completely at a loss about what to do	.853
	I can't handle it	.850
	I am not very hopeful about the future	.836
	I feel that life is hopeless	.832
	I feel like giving up	.804
	I think it is the end of the world	.800

Table 7

Continued

Factor 2 (anxious preoccupation, α= .94)	It is a devastating feeling	.878
	I feel apprehensive	.863
	I am upset about having cancer	.845
	I suffer great anxiety about it	.844
	I feel very angry about what has happened to me	.832
	I am a little frightened	.821
	I worry about the cancer returning or getting worse	.748
	I have difficulty in believing that this happened to me	.698
Factor 3 (fighting spirit, α= .84)	I see my illness as a challenge	.878
	I am very optimistic	.868
	I try to fight the illness	.859
	I am determined to beat this disease	.742
Factor 4 (cognitive avoidance, α= .88)	I deliberately push all thoughts of cancer out of my mind	.895
	I distract myself when thoughts about my illness come into my head	.863
	Not thinking about it helps me cope	.858
	I make a positive effort not to think about my illness	.730
Factor 5 (fatalism, α=.70)	I've put myself in the hands of God	.686
	I count my blessings	.671
	At the moment I take one day at a time	.654
	Since my cancer diagnosis I now realize how precious life is and I'm making the best of it	.581
	I've had a good time; what's left is a bonus	.493

Cronbach's alpha reliability coefficients for the five scales were all satisfactory ranging from .70 to .94. Inter- scale correlations were almost all relatively high, ranging from r= -.209 to .633 (Table 8).

Table 8

Correlation coefficients among the five Mini-MAC scales (N= 144)

Scales	1	2	3	4	5
1. Helpless-hopeless (HH)	1.000				
2. Anxious preoccupation (AP)	.633**	1.000			
3. Fighting spirit (FS)	-.166*	.036	1.000		
4. Cognitive avoidance (AV)	-.056	.026	.503**	1.000	
5. Fatalism (F)	-.209*	-.053	.429**	.422**	1.000

*p< .05. **p< .01.

Factor Analysis of the Emotional Expressivity Scale (EES)

The EES was a 17- item unidimensional scale, with a satisfactory reliability coefficient (α= .91). EES scores ranged from 28 to 100 (Figure 7), with a mean value of 63.98 (SD= 16.51).

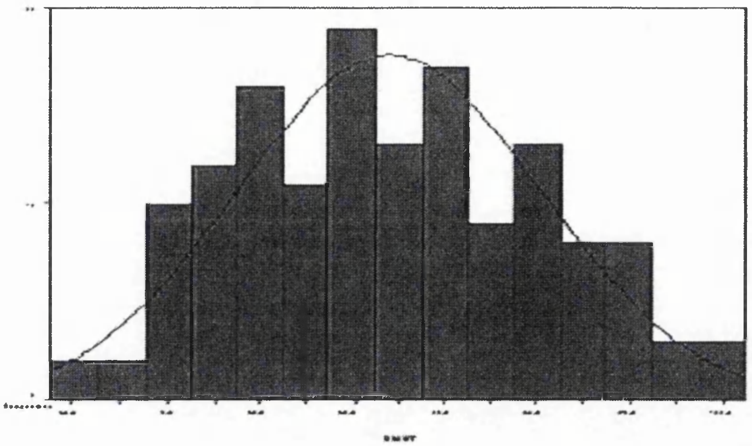

Figure 7. Frequency distribution of EES scores.

Factor Analysis of the Mental Health Component of SF- 36

Concerning the mental health component of the SF-36, previous confirmatory factor analyses have revealed a four- factor structure (Anagnostopoulos et al., 2005), measuring vitality (VT), social functioning (SF), role emotional functioning (RE), and mental health (MH). For these scales, in the present study, alpha reliability coefficients were equal to .82, .79, .92 and .83 respectively. In order to assess the distributional qualities of these scales, frequency distributions were analyzed. When deviations from the normal distribution were evidenced, transformations were performed. In the case of the mental health scale, a square- root transformation, after a reflection, was performed. Reflection (leading to the reversion of the ordering of the scale values) was also performed in the case of social functioning and vitality scales, followed by a cubed- root and a logarithmic transformation respectively (since data were initially negatively skewed). Through these transformations, original data were converted to sets of data that fitted more closely the assumptions of normality and homogeneity of variance underlying statistical tests during analysis of variance.

CHAPTER 6

Results

The aim of this study was twofold. First, to test the moderated effects of existential meaning and emotional expressivity on the relationship between intrusive thoughts and psychological adjustment to breast cancer. Second, to examine the mediated effects of existential meaning and emotional expressivity on the relationship between psychological responses to cancer (e.g., intrusive thoughts, helplessness) and psychological adjustment to breast cancer. In this case, two models were tested: the primary conceptual model with psychological adjustment being directly influenced by existential meaning, expressivity, and psychological responses to cancer, and the alternative model with psychological adjustment being influenced by existential meaning and expressivity, which in turn were hypothesized to be influenced by psychological responses to cancer. The first section of this chapter describes the characteristics of the sample including the demographic and medical characteristics of the participants, means and standard deviations for all psychological measures and intercorrelations among demographic, medical and psychological well- being measures. The next section of this chapter provides results which answer the four research hypotheses.

Descriptive Statistics

The demographic and medical characteristics of the sample are summarized in Table 9. The sample had a mean age of 58.4 years (SD= 10.1, range= 33- 80). The majority of participants (41.3%) had an elementary educational level, 66.9% were married, and 87.2% had children. Fifty six percent were housekeepers, and described their economic status as moderate (53.3%). Almost 73% had undergone lumpectomy, 56% reported no family history of cancer, 50.8% had been diagnosed in either Stage 0 or Stage I of breast cancer, while the mean years since breast surgery were 5.2 (SD= 4.7). Regarding other forms of treatment used in conjunction with surgery, 60.3% were administered radiation therapy, 38.6% were administered chemotherapy and 32.9% were prescribed hormonal therapy.

Table 9

Demographic and medical characteristics of the sample

Variable	%
Education	
Elementary	41.3
High school	17.4
Lyceum	23.3
University	18.0
Marital status	
Single	5.4
Married	66.9
Widowed	18.9
Divorced	8.8
Type of surgery	
Lumpectomy	72.6
Simple mastectomy	9.5
Modified radical mastectomy	17.9
Stage of disease at diagnosis	
0	9.3
I	41.5
IIA	32.3
IIB	14.4
IIIA	2.5

Table 10

Mean values, standard deviations and scores range psychological measures

Variable	Mean	SD	Value Range
Mental health (MH)	64.88	24.19	4- 100
Vitality (VT)	63.76	23.68	0- 100
Role- emotional (RE)	58.51	42.71	0- 100
Social functioning (SF)	71.03	28.93	0- 100
Coherence	45.02	6.62	20- 56
Purpose	42.90	7.15	12- 56
Choice	43.31	7.61	17- 56
Personal meaning index (PMI)	87.91	13.03	32- 112
Helplessness (HH)	13.25	5.01	8- 32
Anxious preoccupation (AP)	18.85	5.83	8- 32
Fatalism (F)	15.99	2.75	5- 20
Fighting spirit (FS)	13.13	2.66	4- 16
Avoidance (AV)	11.70	3.06	4- 16
Intrusions	17.83	13.18	0- 45
Emotional expressivity	63.98	16.51	28- 100

Table 10 presents mean values, standard deviations and scores range for all psychological measures. Regarding the four SF- 36 scales, SF had a relatively higher mean value, while RE had a relatively low mean value. Regarding the LAP- R scales, PMI had a mean value toward the upper limit of its value range.

Correlations among Variables

Bivariate Pearson correlation analyses were conducted examining possible relationships between psychological adjustment and demographic and medical variables. Analysis results are presented in Table 11.

Table 11

Correlations among biomedical and psychological variables

Variable	2	3	4	5	6	7	8	9
1. MH	.75**	.47**	.66**	.13	.12	.01	-.06	-.32**
2. VT		.49**	.67**	.13	.05	.02	-.07	-.36**
3. RE			.52**	.15	.07	.06	-.02	-.24**
4. SF				.10	.06	.01	-.18*	-.25**
5. Age					-.26**	.06	.36**	-.30**
6. Education						-.10	-.15	.02
7. Disease stage							.08	.12
8. Time since diagnosis								-.21*
9. Perceived illness severity								1.00

* $p < .05$, ** $p < .01$

No statistically significant correlations were found between the four scales of the mental component of SF- 36 (MH, RE, VT, SF) and age, education or disease stage. Only SF was significantly negatively correlated with time since diagnosis. However, significant negative correlations emerged between these four scales and perceived illness seriousness.

Moderated Effects tested through Regression Analyses

If we seek to test the hypothesis that the moderators (existential meaning or expressivity) could weaken the effect of the predictor (intrusive thoughts) on the outcome (psychological adjustment to breast cancer), then a test of moderating effects would be appropriate (Figure 8). In other words, existential meaning or expressivity may act as buffers or protective factors of the relationship between psychological response to cancer (intrusive thoughts) and psychological adjustment to it. From this perspective, strong adverse responses to cancer are expected to produce poor outcomes (i.e. psychological maladjustment) only when the level of the protective factor (i.e. meaning) is low. To examine such protective effects, one would test the significance of the interactions between the psychological response to cancer and meaning, after entering their main effects.

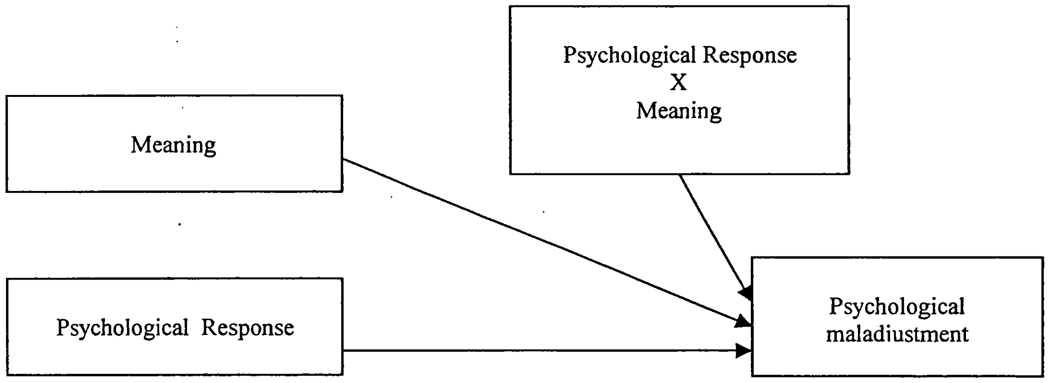

Figure 8. Moderating effects of meaning.

To test the moderating effect of existential meaning (as measured by the personal meaning index) in the relationship between psychological response to cancer (in the form of intrusive thoughts) and psychological maladjustment (in the form of poor mental health), a series of multiple regression analyses were used. The main effects of psychological response and existential meaning were entered first, while the interaction term was entered afterwards. The results are presented in Table 12.

Table 12

Hierarchical multiple regression results, with psychological maladjustment as the dependent variable

Model	Variables	Unstandardized Coefficients B	S.E.	Standardized Coefficients (Beta)	t	p	R square
1	Intrusions	.457	.089	.368	5.138	<.001	.420
	Meaning	-.066	.011	-.412	-5.753	<.001	
2	Intrusions	.459	.089	.369	5.130	<.001	.421
	Meaning	-.065	.012	-.408	-5.58	<.001	
	(Intrusions) X (Meaning)	-.002	.007	-.022	-.322	.748	

As can be seen in Table 12, the main effects of intrusive thoughts and existential meaning on psychological maladjustment are significant. Intrusive thoughts are positively associated with psychological maladjustment (B= .459), and meaning is negatively associated with psychological maladjustment (B= -.065). The regression coefficient for meaning (the moderator) represents the regression of psychological maladjustment (the outcome) on meaning, when intrusions (the predictor) is at its average level (its mean value). However, the interaction term does not add new variance explained in psychological maladjustment (R square change= 0.001, F-change (1,131)= 0.104, p= .748). Thus, no significant moderator effect exists. The same holds true, after controlling for the effects of age, education and time since cancer diagnosis, when entered in the first step of the regression equation. In order to avoid any interpretational problems caused by multicollinearity (occurring when variables are very highly correlated), Baron and Kenny (1986) suggest that the moderator be uncorrelated with both the predictor and the outcome variable. The collinearity diagnostics data obtained from regression analyses were therefore examined. No multicollinearity was evident, since tolerance values were not too low (instead, they were >.83), while no condition index was >30, and only one of the variance proportions was greater than .50.

Table 13 summarizes results obtained after examining the effects of multiple moderators (i.e., intrusions, existential meaning and emotional expressivity). However, performing a large number of statistical tests in this manner, may lead to an inflated Type I error (Cohen et al., 2003). To help control for this type of error, all moderator effects being considered were entered in a single step, after all of the predictor and moderator variables from which they were based, had been entered in previous steps.

Table 13

Hierarchical multiple regression results, with psychological maladjustment as the dependent variable, with all intervening variables included

Model	Variables	Unstandardized Coefficients		Standardized Coefficients (Beta)	95% CI for B	t	p	R square
		B	S.E.					
1	Intrusions	.643	.093	.517	.459, .827	6.921	<.001	.268
2	Intrusions	.443	.091	.356	.263, .623	4.869	<.001	.423
	Meaning	-.068	.012	-.424	-.091, -.045	-5.887	<.001	
	Expressivity	-.004	.009	-.034	-.022, .013	-.504	.615	
3	Intrusions	.441	.091	.355	.260, .621	4.835	<.001	.429
	Meaning	-.066	.012	-.413	-.090, -.043	-5.592	<.001	
	Expressivity	-.003	.009	-.030	-.021, .014	-.434	.665	
	(Intrusions) X (Meaning)	-.002	.007	-.023	-.016, .011	-.334	.739	
	(Intrusions) X (Expressivity)	.005	.005	.077	-.004, .015	1.143	.255	

The unstandardized regression coefficient for emotional expressivity was B= -.003, which was not significant at the .05 level. The unstandardized regression coefficient for meaning was B= -.066 (p < .001) suggesting that there was a significant negative relation between personal meaning and psychological maladjustment in the sample. The unstandardized regression coefficient for psychological response (intrusions) was B= .441 (p < .001) suggesting that there was a significant positive relation between adverse psychological responses and psychological maladjustment. Unstandardized regression coefficients for both interaction terms (intrusions X meaning and intrusions X expressivity) were not significant. The 95% confidence intervals for both interaction terms included zero, which meant that we could not reject the null hypothesis that these unstandardized regression coefficients differed from zero. The R square change associated with the interaction terms was .006 (p= .490). In other words, the interaction between intrusions and meaning, and between intrusions and expressivity, explained only an additional 0.6% of the variance in psychological maladjustment scores over and above the 42.3% explained by the first-order effects of meaning, expressivity and intrusions alone. Thus, no significant moderator effect existed.

Mediated Effects tested through SEM

If we seek to test the hypothesis that the psychological responses to cancer influence existential meaning and expressivity, which, in turn, influence psychological maladjustment, then a mediational analysis is appropriate. Under these conditions, we may advance the hypothesis that the higher the intensity of the adverse psychological stress responses to cancer, the weaker a patient's personal meaning or expressivity, which would, in turn, be associated with higher levels of psychological maladjustment.

Potential mediators were first tested individually in path models, followed by models in which multiple mediators were tested simultaneously. In testing the mediational function of meaning in the relation between psychological responses and psychological maladjustment, a diagram of the model was developed, depicted in Figure 9.

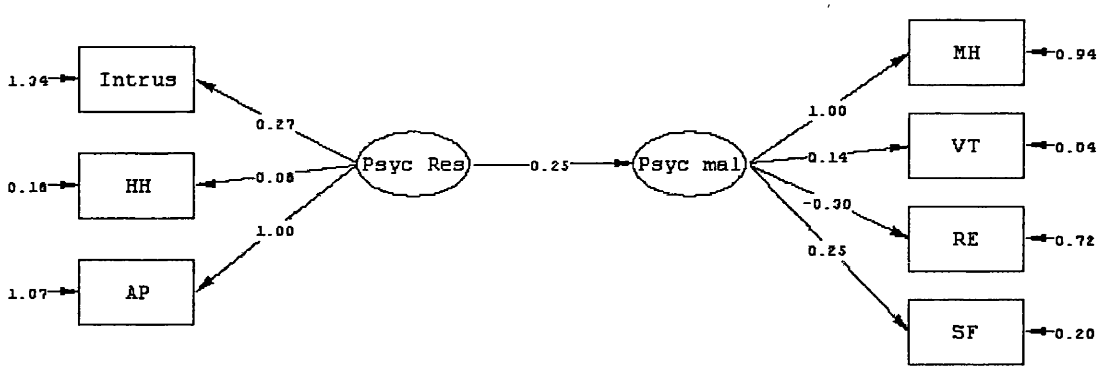

Figure 9. Path diagram showing the direct effect of psychological responses to cancer on psychological maladjustment.

In this diagram, observed variables are represented by rectangles, and latent variables are enclosed in ellipses. Path coefficient values appear as numbers in the middle of lines with one- way arrows, and errors in measured variables are at the end of one- way arrows. In order to establish the identifiability of the model, each latent variable had at least three indicators, each indicator loaded on only one latent variable, measurement errors associated with the indicators were not correlated, and the latent variables were allowed to covary. Thus, the "psychological responses to cancer" latent variable had three indicators (intrusions, helplessness, anxious preoccupation), while psychological maladjustment had four indicators (mental health, vitality, social functioning, role emotional). Meaning was assessed using three indicators (purpose, coherence, choice). Emotional expressivity was measured by three indicators- items ("I don't express my emotions to other people", "Even when I am experiencing strong feelings", "I don't express them outwardly, I hold my feelings in").

During mediational analysis, four steps were followed. First, the fit of the direct effect model, involving the relationship between psychological responses to cancer and psychological maladjustment, was assessed (Figure 9). All fit indices were satisfactory (Satorra- Bentler scaled chi- square= 22.28, df= 13, p= .051, RMSEA= .078, NNFI= .97, CFI= .98, GFI= .95). The unstandardized path coefficient between the predictor (psychological responses) and the outcome variable (psychological maladjustment) was statistically significant and equal to 0.25 (SE= 0.04, p< .05).

Assessing the fit of the overall model (Figure 10), all fit indices were adequate (Satorra- Bentler chi square = 49.64, df= 32, p> .01, RMSEA= .069, NNFI= .97, CFI= .98, GFI= .92).

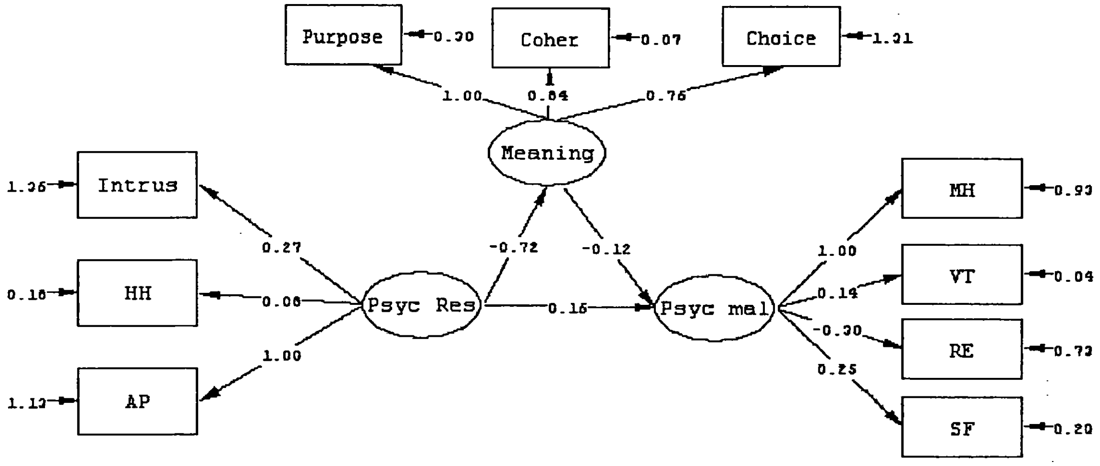

Figure 10. Path diagram showing the direct and indirect effects of psychological responses to cancer on psychological maladjustment through meaning.

The direct path between psychological responses to cancer and meaning was significant (gamma= -0.72, SE= 0.17, p< .05) and the direct path from meaning (the mediator) to psychological maladjustment was significant as well (beta= -0.12, SE= 0.03, p< .05). The path from psychological responses to cancer to psychological maladjustment remained significant (gamma= 0.16, SE= 0.04, p< .05). The indirect effect of psychological responses on psychological maladjustment (through meaning) was also significant and equal to 0.09 (SE= 0.02, p< .05). When the path from the predictor (psychological responses) to the outcome variable (psychological. maladjustment) was constrained to zero (Figure 11), the value of the Satorra chi-square changed to 63.95, df= 33, p< .001 (RMSEA= .09, NNFI= .95, CFI= .97, GFI= .90, RMR= 1.11).

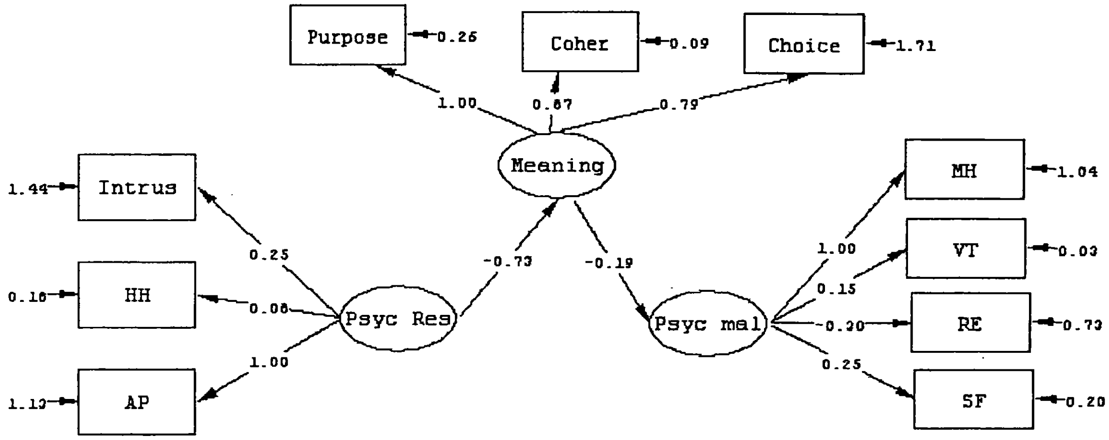

Figure 11. Path diagram showing the direct effect of psychological responses to cancer on meaning, and in turn, of meaning on psychological maladjustment.

Comparing chi square values between this last model and the previous one (where the predictor- outcome path was not constrained), we notice that $\Delta\chi^2$= 14.31, df= 1, p< .05. This means that the addition of the path between psychological responses and psychological maladjustment to the constrained model does improve the fit. However, the path coefficient is now reduced, from 0.25 to 0.16, which is a significant reduction, as indicated by the size (0.09) of the indirect effect of psychological responses on psychological maladjustment. This finding provides clear evidence of partial mediation.

The mediational function of emotional expressivity was then examined (Figure 12). Assessing the fit of the overall model, all fit indices were adequate (Satorra- Bentler chi square = 33.22, df= 32, p> .05, RMSEA= .018, NNFI= .96, CFI= .97, GFI= .92). However, the direct path between psychological responses and expressivity was not significant (gamma= -0.05, SE= 0.05, p> .05) and the direct path from expressivity (the mediator) to psychological maladjustment was not significant as well (beta= -0.08, SE= 0.19, p> .05). Not significant was also the indirect effect of psychological responses on psychological maladjustment, through expressivity (path= 0.001, SE= 0.01, p= 0.37). Only the path from psychological responses to psychological maladjustment remained significant (gamma= 0.25, SE= 0.04, p< .05).

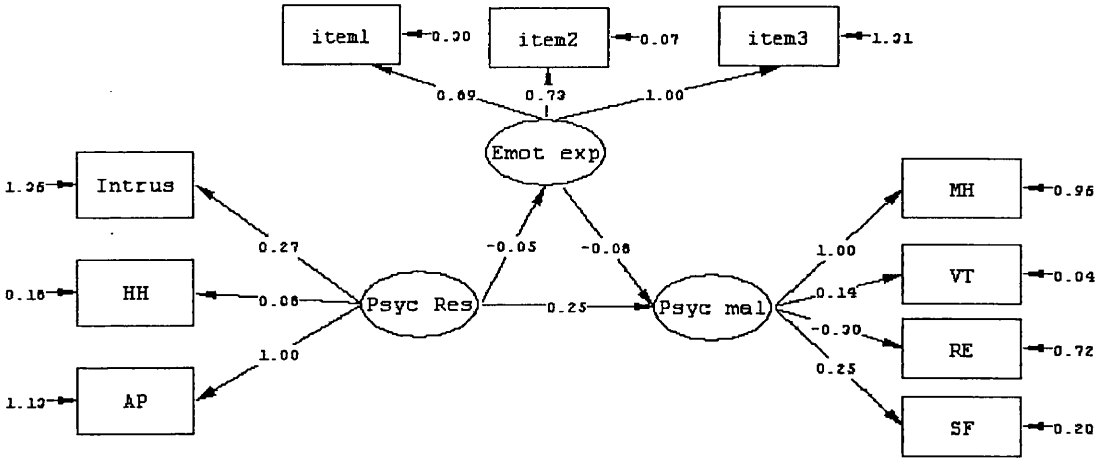

Figure 12. Path diagram showing the direct and indirect effects of psychological responses to cancer on psychological maladjustment through emotional expressivity.

In the case of emotional expressivity, no support for a mediational effect is provided.

Once it was established that meaning can have a mediating effect, this effect was examined to see if it remained intact, after controlling for the effects of coping strategies and emotional expressivity. Including several mediators in one model allows determination of which mediators are more successful than others and to pit competing theories against one another within a single model. The conceptual full model is presented in Figure 13, together with estimated unstandardized path coefficients.

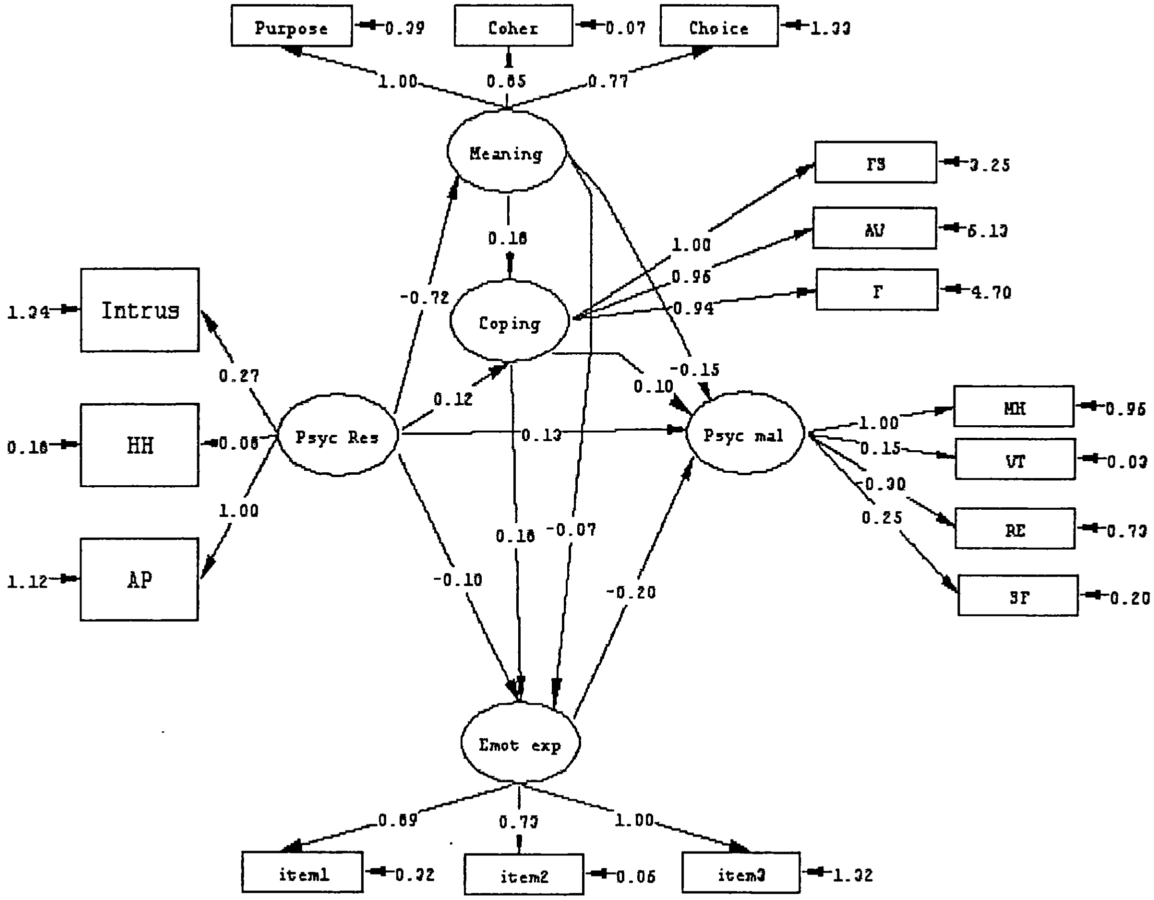

Figure 13. Path diagram showing the direct and indirect effects of psychological responses to cancer on psychological maladjustment through meaning, emotional expressivity, and coping.

This multiple- mediator model provided adequate fit to the data (χ^2 (94) = 103.78, p = 0.23, RMSEA = .03, NNFI = .96, CFI = .97, RMR = .87, GFI = .90). The only significant direct paths were from psychological responses to meaning (gamma= -0.72, SE= 0.17, p< .05), from psychological responses to psychological maladjustment (gamma= 0.13, SE= 0.05, p< .05), from meaning to coping (beta=

0.18, SE= 0.04, p< .05) and from meaning to psychological maladjustment (beta= -0.15, SE= 0.04, p< .05). There were also significant indirect effects, from psychological responses to coping (via meaning) (path= -0.13, SE= 0.04, p< .05) and from psychological responses to psychological maladjustment (mainly via meaning) (path= 0.12, SE= 0.04, p< .05). Specifically, regarding the total effect of psychological responses on coping, although the indirect effect (via meaning) was negative and significant , the direct effect was positive and not significant (gamma= 0.12, SE= 0.07, p> .05). This resulted in a nonsignificant (close to zero) total effect of psychological responses on coping (= -0.01, SE= 0.06, p> .05). Since the path from psychological responses to coping was initially not significant (gamma = 0.004, SE = 0.056, p = .073), this could not be a case of mediation. However, this could be a case of suppression, where the magnitude of the direct effect is similar to that of the indirect effect, but opposite in sign, resulting in a total effect close to zero (Shrout & Bolger, 2002). Moreover, the magnitude of the direct effect became larger (it increased from 0.004 to 0.12) when the third variable (i.e., meaning) was included in the model.

The value of the squared multiple correlations for the structural equation is a measure of the proportion of variance in the endogenous variables accounted for by variables in the structural equations. In the case of psychological maladjustment this value was equal to .58, indicating that 58% of the variance in psychological maladjustment was explained by the full model. Moreover, the squared multiple correlations for the observed independent and dependent variables ranged from .56 (in the case of fighting spirit) to .85 (in the case of purpose), indicating that none of them was a poor measure of its latent variable.

When the path from the predictor (psychological responses) to the outcome variable (psychological maladjustment) was constrained to zero, the value of the Satorra chi- square changed to $\chi^2 = 108.74$, df = 95, p= .16 (RMSEA = .035, NNFI = .95, CFI = .96, GFI = .86, Standardized RMR = .069).

Since the total effect of psychological responses on psychological maladjustment was equal to 0.25, and the direct effect of psychological responses on psychological maladjustment was 0.13, it might be concluded that 52% (= 0.13/ 0.25) of the covariance between them was accounted for by the direct influence of psychological responses and the remaining 48% being mediated through a combination of the intervening variables (namely, meaning, coping, emotional expressivity). However, the magnitude of the mediated effect is strongest for meaning alone [(-0.72) X (-0.15)= 0.108], which represents the largest proportion (63%) of the indirect effect of psychological responses on psychological maladjustment that is mediated by the intervening variables. Comparing the chi square values between this last model and the previous one (where the predictor-outcome path was not constrained), we notice that $\Delta\chi^2 (1) = 4.96$, $p < .05$. This means that addition of the path between psychological responses and psychological maladjustment to the constrained model does improve the fit, which suggests that a partial mediational effect (of meaning) does exist.

Mediated Effects tested through Bootstrapping Procedures

Based on a SPSS macro (Preacher & Hayes, 2006), the type of analysis described earlier was conducted to estimate bootstrap standard errors and CIs for total and indirect effects, based on $k = 5{,}000$ bootstrap samples and adopting a $\alpha = 0.01$ probability level, that generates 99% CIs. In these analyses, the predictor was psychological responses, the outcome variable was psychological maladjustment, while meaning, coping, and emotional expressivity served as mediators.

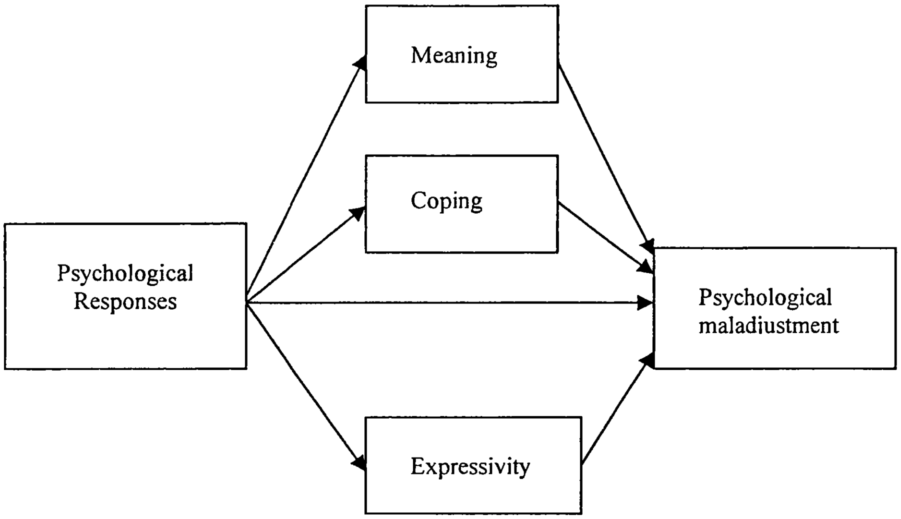

Figure 14. Conceptual diagram showing multiple mediator effects of Psychological Responses to cancer on Psychological maladjustment.

Values for these variables were obtained from LISREL, by estimating the factor scores for each latent variable depicted in Figure 14. The path from psychological responses to meaning was statistically significant (path = -0.762, SE = 0.103, p< .001), as was the path from meaning to psychological maladjustment (path = -0.178, SE = 0.026, p< .001). Regarding the total effect, of psychological responses on psychological maladjustment this was equal to 0.242 (p< .001) and the direct effect was equal to 0.096 (p = .002). The difference between total and direct effect is the total indirect effect exerted through the three mediators, with a point estimate of 0.146 and 99% CI of 0.094 to 0.211. Thus, it is possible to claim that the difference between total and direct effect of psychological responses on psychological maladjustment is different from zero, as its 99% CI does not contain zero. Thus, taken as a set, meaning, coping, and emotional expressivity do significantly mediate the effect of psychological responses on psychological maladjustment.

Table 14

Point estimates, standard errors, z- values, and 99% confidence intervals for direct and indirect effects of psychological responses to cancer on psychological maladjustment through meaning, coping, and emotional expressivity

Indirect effects	Point estimate	SE	Z	Bootstrap 99% CI	
	(Normal theory tests)			Lower	Upper
Total	0.1459	0.0255	5.7248	0.0939	0.2113
Meaning	0.1357	0.0270	5.0235	0.0820	0.2169
Coping	-0.0058	0.0061	-0.9531	-0.0339	0.0122
Expressivity	0.0160	0.0088	1.8139	-0.0013	0.0560
Meaning vs Coping	0.1414	0.0309	4.5807	0.0795	0.2447
Meaning vs Expressivity	0.1197	0.0282	4.2370	0.0489	0.2086
Coping vs Expressivity	-0.0218	0.0115	-1.8989	-0.0673	0.0043

An examination of specific indirect effects indicates that only meaning is a significant mediator of the relationship between psychological responses and psychological maladjustment, as its 99% CI does not include zero, suggesting that this specific indirect effect is statistically significant at the .01 level. Existential meaning accounts for a significant part of the relationship between psychological responses and psychological maladjustment, but not for all of it. Neither coping nor emotional expressivity contribute to the indirect effect above and beyond meaning. The bootstrapped 99% CI for the indirect effect of psychological responses on psychological maladjustment through meaning is {0.0820, 0.2169}. Relative to the 99% CI, that is {0.0663, 0.2051}, based on the product of path coefficients, the estimated standard error and assumption of normality, the lower confidence limit for the bootstrap CI is further from zero, indicating higher power for bootstrapped CIs compared to normal- theory intervals. Examination of the pairwise contrasts of the indirect effects shows that the magnitude of the specific indirect effect through meaning is significantly larger than the specific indirect effect through either coping or emotional expressivity, because zero is not contained in the corresponding intervals. Directions of the significant paths are consistent with the interpretation that stronger psychological responses to cancer lead to lower existential meaning, which, in turn, leads to greater psychological maladjustment.

CHAPTER 7

Discussion and Conclusions

In this chapter, the main findings are summarized and discussed in relation to the research hypotheses. Empirical evidence from other existing studies in support of the current findings is presented. Conclusions are drawn and the theoretical and practical implications of the results are discussed. Limitations of the present study are acknowledged and recommendations are suggested for future research.

Discussion

In summarizing briefly the background to the present study, breast cancer may be considered as a traumatic experience, challenging patients' fundamental assumptions about purpose in life, and comprehensibility of the world. Finding meaning under these conditions, rebuilding of shattered beliefs, developing new world models and altering goal priorities, may lead to distress alleviation, and better prospects for adjustment. In addition to meaning making, emotional expressivity and disclosure of emotions can help cancer patients discharge cancer- related distress, a process which may promote adjustment. This study set out to explore the role of existential meaning and emotional expressivity in the psychological adjustment of breast cancer patients. Existing empirically tested models of adjustment to breast cancer have rarely included meaning and expressivity as important variables in the relationship between psychological responses to cancer (such as intrusive thoughts) and psychological adjustment to it. Moreover, in the existing literature, the mediated effects of meaning and expressivity have not been clearly distinguished from their moderated effects. Thus, the aim of this study was twofold: First, to test whether existential meaning or expressivity (moderators) could weaken the effect of intrusive thoughts on psychological adjustment to breast cancer. Second, to test whether higher levels of the adverse psychological responses to cancer (e.g., intrusive thoughts, helplessness) could lower a patient's existential meaning or emotional expressivity levels (mediators), which would, in turn, be associated with higher levels of psychological maladjustment.

The main findings of the study can be summarized as follows. First, the direct effect of psychological responses to cancer (intrusions) on psychological adjustment is negative and statistically significant. This finding suggests that as unwanted, recurrent, and uncontrollable intrusive thoughts and memories about breast cancer become more disturbing, psychological adjustment becomes poorer. Second, existential meaning is positively and significantly related to psychological adjustment to cancer. This finding suggests that as sense of meaning, coherence and purpose in life becomes stronger, psychological adjustment to breast cancer is enhanced. Third, existential meaning partially mediates the relationship between psychological responses to breast cancer and psychological adjustment to it. This finding suggests that the higher the intensity of the adverse psychological responses to cancer (e.g., intrusive thoughts, helplessness), the lower a patient's existential meaning levels (mediator), which are, in turn, associated with higher levels of psychological maladjustment. Fourth, no indication of moderating effects of emotional expressivity and existential meaning on psychological adjustment, is apparent. This suggests that neither high meaning nor expressivity levels can weaken the effect of intrusive thoughts on psychological adjustment to breast cancer. Fifth, neither direct nor indirect (mediating) effects of psychological responses to cancer on psychological adjustment to it through emotional expressivity can be observed. Sixth, existential meaning partially mediates the relationship between psychological responses to breast cancer and coping with cancer. This finding suggests that the higher the intensity of the adverse psychological responses to cancer (e.g., intrusive thoughts, helplessness), the lower a patient's existential meaning levels (mediator), which are, in turn, associated with lower levels of adaptive coping. Seventh, the primary structural model with a direct path from psychological responses to cancer to psychological adjustment better fits the data, than the alternative model without such a path.

With respect to the relationships found among intrusive thoughts, global meaning, and psychological adjustment

Results of this study pertaining to the hypothesized significant relationships among intrusive thoughts, global meaning, and psychological adjustment (Hypotheses 1 and 3) are in line with those presented by Vickberg et al. (2001) who found that patients with cancer displayed global meaning scores that were inversely related to psychological distress and positively related to the mental health dimension of quality of life (emotional role functioning, mental functioning, vitality). These findings suggest that global meaning may be an important factor in the psychological adjustment of cancer patients. Mullen, Smith, and Hill (1993) also found that higher levels of sense of coherence in cancer patients were significantly associated with lower levels of psychological distress. Moreover, results of the current study are in line with those presented by Brewin et al. (1998a, 1998b) who found that the presence of intrusive memories in cancer patients predicted greater psychopathology (anxiety) and was strongly related to being depressed . Thus, existing research studies provide confirmatory evidence of the link, found in the present study, between meaning and adjustment.

In interpreting the above mentioned research findings of the present study, two explanatory frameworks will be provided, regarding the significant relationships found among intrusive thoughts, global meaning, and psychological adjustment to cancer. Park and Folkman (1997) have provided a framework for understanding meaning making, either situational or global, in the context of stressful life events and illness conditions. According to their model, global meaning pertains to people's assumptions about order (i.e., basic beliefs about justice, order and fairness of the world, about personal deservedness, about the benevolence, understandability/ comprehensibility, controllability, predictability of the world, as well as beliefs regarding self- worth), and about purpose (and the pursuit of goals in life). When a traumatic event occurs, finding meaning in such events can involve changing one's fundamental belief systems or goals, which may entail the rebuilding of shattered global beliefs and the development of new world models, or drastically altering goal hierarchies (by revising old goals, abandoning them, rearranging priorities, or finding goal substitutes). If patients have not managed to reconcile their appraised (or reappraised) meaning of the event with their global meaning (global beliefs, values, and goals), then this incongruence and a related mismatch will persist, leading to a ruminative process (with intrusive thoughts) and worse prospects for adjustment. On the other hand, if patients are able to integrate appraised meaning of their illness with their global meaning and achieve reconciliation, either by assimilation or accommodation, of situational and global meaning, then distress will be alleviated and adaptive resolution of posttraumatic stress will be permitted. In this way, global meaning can be associated with decreased intrusions and better adjustment to traumatic events.

In further interpreting the results of this study regarding the significant relationships found among intrusive thoughts, global meaning and psychological adjustment to breast cancer, the post traumatic stress disorder (PTSD) theoretical framework can be drawn upon. According to PTSD theories, such as the cognitive processing theories of trauma (Horowitz, 1986; Janoff- Bulman, 1989), traumatic experiences threaten one's preexisting schemas of the world and oneself within the world. In order to successfully process traumatic experiences, it is necessary to integrate the traumatic experience into one's world and self- schemas. Intrusive thoughts constitute attempts on the part of the trauma victim to integrate, or make sense of, what has happened. While intrusive thoughts may actually facilitate the long process of integration, the experience of unwanted, recurrent, uncontrollable and unexpected thoughts, memories, or dreams about the trauma may be quite aversive. Intrusive thoughts may be a mechanism through which a stressful event can have a continuing impact on an individual's level of psychological distress and well- being. Repetitive reliving or re-experiencing of the traumatic event or its aftermath (e.g., the side- effects of the treatment, waiting for the results of prognostic testing), or occurrence of persistent reminders of the disease (e.g., post-surgical scars, bodily symptoms, physical limitations, pain) can all contribute to prolonged, chronic stress. Thus, the experience of intrusive thoughts is linked to greater psychological distress and poorer quality of life, poorer psychological adjustment or mental health status (Cordova et al., 1995).

Regarding relationships among intrusive thoughts, global meaning, and psychological maladjustment, results here are partly consistent with that from previous research. For example, Vickberg's et al. (2000) findings lend support to those of the present study. These authors found that more frequent intrusive thoughts about cancer and its treatment were associated with more psychological distress in women who had been diagnosed with breast cancer. Moreover, according to these authors, a strong sense of global meaning was significantly associated with lower psychological distress. An explanation for the significant negative association between global meaning and psychological distress, found in the present study is that a patient who feels that life has purpose and coherence is possibly able to put intrusive thoughts (that result from an incongruence between global meaning and appraised meaning of the traumatic event) into perspective more easily, while the impact of intrusive thoughts may be softened in a way that the patient will not be enough distressed by them. However, contrary to Vickberg's et al. results, this study found no moderating role of global meaning in the relation between intrusive thoughts and psychological distress (or psychological adjustment). One possible explanation for this is that the measure of psychological distress, in Vickberg's study, included a psychopathological symptoms checklist, while the measure used in this study included items which tapped into mental health functioning. In addition to that, intrusive thoughts experienced by patients with high global meaning may be qualitatively different (e.g. less threatening) than those experienced by patients with low global meaning. Thus the strength of the relation between intrusive thoughts and global meaning may be variable, leading to the confounding of the true relationship between them, as well as between them and psychological distress or adjustment.

With respect to the relationships found among intrusive thoughts, emotional expressivity, and psychological adjustment

Results of the current study pertaining to the hypothesized relationships among intrusive thoughts, emotional expressivity, and psychological adjustment (Hypotheses 2 and 4) are in line with that presented by Stanton et al. (2000), who found that quality of life (including social, emotional and functional domains) of breast cancer patients was not predicted significantly by their emotional expression. Moreover, Zakowski et al. (2001) have found results similar to those of the present study, providing support for the view that no significant effects of emotional expressivity on either general distress (and the subsequent poor adjustment) or intrusions exist.

Regarding the nonsignificant effect of intrusions on emotional expressivity (EE) found in the present study, Zakowski et al. (2001) have proposed that the expression of emotion may not reduce the frequency of intrusive thoughts (as measured by the Impact of Event Scale) but rather by rendering these recurrent thoughts less distressing. Thus intrusion may be associated with EE through a different mechanism than that implied by the IES. Then, the nonsignificant relationship found between them does not come as a complete surprise and is rather expected.

Regarding interpretation of the nonsignificant effect of EE on psychological adjustment found in the present study, the theoretical framework of Kennedy- Moore and Watson (2001) posits that, in order for expression of emotions to alleviate distress, elicit positive outcomes, and to serve as a means of enhancing self-acceptance, fostering self- understanding or improving social relationships, it must occur in the context of a supportive social relationship, with minimal social constraints in talking about the cancer experience. Otherwise, distress expression may be risky, and can lead to expresser's feelings of rejection, misunderstanding, embarrassment, and betrayal. Thus, patients' unsupportive social relationships, not measured in the present study, may lead to obscurity of, or reverse any beneficial effects of EE on adaptation and psychological well- being.

Results of the current study are not confirmed by those presented by Zakowski et al. (2001). These authors reported that dispositional emotional expressivity moderated the relation between intrusive cognitions and distress, such that women who were more emotionally expressive might be less likely to be distressed by their intrusive cognitions about cancer, thus facilitating their emotional well- being and promoting their psychological adjustment. However, their sample consisted of healthy women who had family histories of breast cancer. This may partly explain the differences in study results, since the present study group consisted of female breast cancer patients.

Moreover, in contrast with the Quartana's et al. (2006) study, whose sample consisted of patients of both sexes with various sites of cancer (e.g., breast, prostate, ovarian, colon), no statistically significant relations were found between emotional expressivity and psychological adjustment. Further to this, no significant interaction effect was found between intrusions and negative emotional expressivity which is thought to be predictive of general psychological adjustment. This can be explained by the fact that the measure of emotional expressivity used in this study (i.e., EES) assesses generalized expressivity, a dispositional tendency to display emotions outwardly, regardless of the specific situation that triggers these emotions, of any particular type of emotion (e.g., anger, anxiety, sadness, fear, happiness, joy, interest, contentment), emotional valence (positive or negative), mode/ channel of expression (e.g., verbal, non- verbal) or intensity, duration, or context of emotional expression. So the emotional expressivity scale (EES) cannot distinguish between positive and negative emotional expressivity. Thus, it cannot determine if negative (but not positive) expressivity may moderate relations between intrusions and distress, or if positive (but not negative) expressivity is associated with distress, as Quartana et al. have suggested.

With respect to the relationships found among Coping, Intrusions, Global meaning, and Adjustment

Regarding coping with cancer, this study did not find any significant associations between coping and intrusions or adjustment, but found that existential meaning partially mediated the relationship between psychological responses to breast cancer and coping According to Janoff- Bulman (1992) and Horowitz (1986), a confrontation with an adverse event, such as a life- threatening illness, may have a shattering effect on a person's assumptive world (that events are nonrandom, predictable, comprehensible, controllable, or perhaps to some extent justified). Through a cognitive- emotional process, that includes intrusive and avoidant states, a person tries to rebuild his assumptive world in a direction consistent with new trauma- related information. Rebuilding is attempted through cognitive assimilation of the traumatic memory within existing models of the world, or revision of existing schemas to accommodate the new information. Initially, cancer survivors may be concerned with issues of comprehension and sense making (e.g., by developing explanations for the event, attributing it to God's will, or to lifestyle). Making sense of the event, by changing religious or spiritual beliefs or by perceiving the event as predictable or as in some way justified, can facilitate coping with threats to one's view of the world as meaningful.

However, over time, survivors come to raise issues of significance. Search for meaning- as- significance (that is deriving benefit from trauma, learning about one's strength in the face of adversity, gaining insight into the meaning of life or the importance of relationships) is necessary for benefit finding and growth (Joseph & Linley, 2005). In the case of meaning- as- significance, revision of one's life goals and reordering of priorities can facilitate coping with threats to one's sense of self and self- esteem. The event is not the central focus of coping; rather, the emphasis is more directly on understanding the self in the context of adversity (Davis, Nolen-Hoeksema, & Larson, 1998). Efforts to cope are directed not towards the event per se but towards threats to a person's self- concept. These coping efforts are influenced more strongly by an individual's characteristic ways of responding to stress, which suggests the influence of dispositional factors (e.g., personality attributes such as optimism, or relatively stable global meaning).

Thus, characteristics of the event (such as psychological responses it elicits and intrusions that it causes) are not strongly associated with coping. Rather, coping is strongly associated with more stable individual's characteristics, such as global meaning. The theorized relationship between coping and adjustment could not be detected in the present study. This finding could reflect the lack of a true relationship between coping with cancer and certain indices of psychosocial adjustment (such as mental health functioning). On the other hand, this finding could reflect shortcomings in the operationalisation of relevant concepts. The mental health component of the SF- 36 has been used to measure psychological and social aspects of adjustment and well- being of women with breast cancer (Hanson- Frost, et al., 2000), the mental health component of health- related quality of life indicating mental functioning (Tomich & Helgeson, 2002; Tomich & Helgeson, 2004; Tomich & Helgeson, 2006), health- related psychological quality of life (Golden- Kreutz et al., 2005), the mental health dimension of quality of life as a component of psychological adjustment (Vickberg et al., 2001). Thus, there is a lack of conceptual clarity regarding this component of SF-36, which may lead to variability and discrepancies in the results of studies that use this construct. It may be that this component of SF- 36 measures something generic, that is not directly associated with disease- related coping efforts. The latter (i.e., coping) may be more strongly associated with psychological distress measures, such as those involving psychological symptoms that cause discomfort, like anxiety, depression, obsession-compulsion, paranoid ideation, and somatization, or with measures of mood states and emotional disturbance (e.g., being restless, nervous, sad, blue, miserable, helpless, worthless, bitter, annoyed, fatigued, confused). Thus, coping with cancer (operationalised by Mini- MAC) may not be related with adjustment (operationalised by SF- 36).

Limitations of the Study

Despite the important findings of this study, some limitations of this study need to be considered. First, the design of the study was cross- sectional, which prevented establishing the consistency of existential meaning and emotional expressivity over time and across different disease phases (e.g., the period surrounding diagnosis and medical treatment, the periods of disease recurrence and end- stage disease). Although the Emotional Expressivity Scale and the Life Attitude Profile- Revised are supposed to measure relatively stable constructs, different psychosocial illness phases may impose different adaptational tasks, may result in changing evaluations of the medical condition and quality of life (Addington- Hall & Kalra, 2001), and call upon different existential meaning types (e.g., situational *vs* global meaning, sense- making *vs* benefit- finding meaning) or different emotional expressivity modes (e.g., negative *vs* positive emotions). Moreover, assumptions about directionality of relationships cannot be made, since such assumptions should be based on longitudinal, prospective designs.

Second, essentially all structural equation models have equivalent versions that generate the same predicted associations among variables. Moreover, alternative models need to be specified based on competing theories. For example, the association between intrusions and adjustment could operate in the opposite direction from the paths tested in the models. That is, it is plausible that poor psychological adjustment (symptoms of anxiety, depression) lead to increased intrusive thoughts and weak existential meaning or low expressivity. Thus, alternative, theory- driven models need to be considered in interpreting the findings of the present study.

Third, results are subject to sampling or selection effects with respect to individuals, measures, and occasions. Thus, it should be acknowledged that limitations exist in the generalizability of the models tested beyond the studied population (female breast cancer survivors, on average five years after diagnosis, mostly of stages I and II, with no distant metastases).

Fourth, certain psychological factors such as personality attributes (e.g., optimism) or social support indices as predictors of adjustment or as moderators of the relation between psychological responses to cancer and psychological adjustment were not included in the present study. Omitted variables that may be correlated with variables already in the model, can cause estimates of model paths to be distorted and biased. Future studies should include these variables in models of adjustment to breast cancer.

Implications from this Study

As this study was one of the first to integrate existential meaning into models of adjustment to breast cancer, it provides important leads for future research, theoretical development, and counseling practice with breast cancer patients.

Implications for Meaning Research

The present study added new information and raised more questions for research in psycho-oncology and existential meaning. Significant advances have been made in the study of psychosocial adaptation to cancer. In the past seven to ten years, psycho-oncology research has focused on developing integrated models to demonstrate patients' psychosocial adaptation to cancer (Holland, 1998; Nicholas & Veach, 2000). One of the most comprehensive models in psycho-oncology was proposed by Nicholas and Veach (2000) but has not been empirically validated. These authors suggested the convergence of three broad classes of variables on current psychosocial adaptation: patient-derived variables (demographics, intrapersonal variables) interact with cancer-derived variables (breast cancer type, disease stage, prognosis) and life context (culture, health-related schema, developmental stage) to determine the patient's overall reaction to cancer-related stressors. It is evident from the present study that existential meaning has its own place in adjustment models and needs to be included in future empirical studies on psychosocial adjustment to cancer.

The integration of psycho-oncology and meaning research in the present study proved useful for enhancing our understanding of the adjustment process of breast cancer patients. Patients tended to have a high sense of meaning and purpose in their lives, which positively influenced their psychological adjustment. It appears that cancer patients as a group can provide important information about the process of "meaning-making" during their illness. More qualitative and quantitative studies are needed to explicate the specific influence of a sense of meaning on overall adjustment.

Implications for Existential Theory

Results from this study on breast cancer patients strengthened previous findings that a sense of meaning and life purpose positively influences a person's overall sense of well-being and quality of life. Meaning has once more been shown to be an important part of a person's life, thus supporting its central role in existential thought and theory. Existential theorists suggested ways of how meaning is created by an individual (Frankl, 1963; Wong, 1998) and how its absence negatively influences the individual, yet they rarely explicated the benefits of a sense of meaning or the workings of it together with other psychological, phenomenological, and philosophical concepts. As research continues on meaning issues for individuals affected with a serious illness, existential theory needs to be expanded to include some of these research findings as well as providing more sound theoretical statements to be tested by researchers. Existential theory by nature is an abstract, philosophically based framework for understanding human functioning. At the present time, though, in order for theory and philosophy to drive science, theoretical statements have to be testable. Existential theory in its current status has a long way to go before researchers can extract clear research questions and hypotheses from it. Thus, continued theoretical work in existential theory is needed, especially in the area of integration between illness and existential meaning issues.

For coping theory, results from this study did support Park and Folkman's (1997) theorized link between meaning (global or situational) and coping. No other studies on cancer patients have been conducted with this framework so that it is unclear whether these results are unique to the present study. However, the relationship found between coping and meaning calls for a more intense and focused research effort in this area that informs theoretical statements about meaning-making and coping.

Recommendations for Counseling with Breast Cancer Patients

The present study showed breast cancer patients five years on average after diagnosis as having a level of existential meaning, that positively influences their psychological adjustment. How can that be explained in light of the general consensus that breast cancer tends to cause significant psychological distress for women (Suinn & VandenBos, 1999)? Some researchers have identified a positive effect of a cancer diagnosis on a person's overall sense of existential meaning. Pelusi (1997) reported that the experience of cancer might actually add to perceived meaning in life for the patient. This potentially "positive" effect of an illness could be explained by research showing that successfully living through a life-changing or traumatic experience did increase meaning levels for individuals (Wong & Fry, 1998).

Existential meaning was significantly and positively related to a patient's overall adjustment. Therefore, mental health professionals working with breast cancer patients need to address meaning issues with their patients as much as any other adjustment concerns. Existential meaning is a topic that can be included as part of many different psychotherapies, such as cognitive therapies and experiential therapies.

Models of cognitive- existential group therapy for cancer patients have already been proposed (Kissane et al., 1997). The goals of such therapies are for members to improve problem- solving, develop cognitive strategies to maximize coping, enhance a sense of mastery over life and re- evaluate priorities for the future. Spirituality- and meaning- centered group psychotherapy interventions (Breitbart, 2002), as well as meaning- centered group psychotherapy (Greenstein & Breitbart, 2000) have been applied to patients with advanced cancer. These groups focus on different aspects of meaning, including responsibility to others, creativity, transcendence, reframing of dying experiences, and ascertaining one's values and priorities.

Existential meaning as a concept could be specifically explained and made a focus of therapeutic work. Spirituality and beliefs about the world and one's existence in it can be addressed via direct questions, creative arts activities (writing, drawing about the experience), and experiential activities (confronting the threat of the illness by role playing, meeting other survivors, guided imagery). Different interventions can accomplish the same goal, which is for the patient to work through the emotional challenges of the illness and emerge as a stronger, more resilient person who has faced potential death and therefore embraces life.

Future Studies

The present study focused on whether or not meaning and emotional expressivity influenced overall psychological adjustment, yet it did not investigate the sources of meaning nor other pathways by which existential meaning is linked to adjustment (e.g., social support). Re-defining and re-testing the relationship between emotional expressivity and meaning would help clarify the role these constructs have in the adjustment of breast cancer patients.

Aside from re- testing the psychological constructs, future analyses in psycho- oncology need to be conducted to investigate possible direct relationships between the construct of existential meaning and new variables such as dispositional optimism, benefit finding, social constraints, and family support (provided especially from the spouse). More comprehensive model of adjustment to cancer should include the existential meaning variable and further investigate the role this construct has for holistic, integrated models of adjustment.

Finally, as existential meaning is still lacking attention and credit as an important predictor of a person's adjustment and quality of life, increasing the number of studies with existential meaning as a variable will greatly benefit the fields of psycho-oncology as well as positive psychology. These studies are needed to show the connection between a sense of purpose and a person's general functioning, not only in the population of breast cancer patients but in any population dealing with serious life stressors.

Conclusion

Illness provides not only an obstacle but also a challenge and an opportunity to re-evaluate one's life. If mental health professionals can learn to open up the conversation about these issues with their patients, they might be surprised about the extent to which individuals with a potentially life-threatening illness, such as breast cancer, have reflected on meaning issues. The breast cancer patients who participated in the present study told us clearly that out of adversity we can gain strength and a newly found appreciation of our lives. They told us that positive changes such as more meaningful interpersonal relationships, changed priorities, a richer existential life, can occur as a result of the struggle with illness and the attempt at psychological survival. They showed us that joining them in the process of their "posttraumatic growth" and putting the meaning issue to discussion, can lead us to the ultimate fulfillment of our obligation as mental health professionals.

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APPENDIX A

GENERAL INFORMATION QUESTIONNAIRE

This questionnaire asks you to provide some general information related to your demographic or medical characteristics.

Please reply to the questions below putting a mark (X) to the relevant box.

Code Number: (it is completed by the researcher)...........

1. Date of birth: ....

2. Marital status

☐ Single

☐ Married

☐ Divorced

☐ Widowed

3. Number of Children:

☐ 0

☐ 1

☐ 2

☐ >2

4. Educational level

☐ Elementary

☐ High School

☐ Lyceum

☐ College /University

5. Employment Status

☐ Currently unemployed
☐ Currently employed
☐ Household
☐ Retired
☐ On medical leave

6. Income level (per month)

☐ Less than Euro 880 (low)
☐ Euro 880-2347 Euro (medium)
☐ Over Euro 2347 (high)

7. Place of residence

☐ Metropolitan area
☐ Rural districts

8. Type of surgery

☐ Lumpectomy
☐ Simple mastectomy
☐ Modified radical mastectomy

9. Date of breast surgery: …………

10. Stage of disease at diagnosis

☐ 0
☐ I
☐ II
☐ III
☐ IV

11. Treatments received

☐ Surgery
☐ Chemotherapy
☐ Radiation therapy
☐ Hormonal therapy

12. Family history of breast cancer

☐ Positive
☐ Negative

13. Perceived seriousness of disease

☐ Not at all serious
☐ A little bit
☐ Moderately
☐ Extremely serious

LIFE ATTITUDE PROFILE-REVISED (LAP-R)

This questionnaire contains a number of statements related to opinions and feelings about yourself and life in general. Read each statement carefully, then indicate the extent to which you agree or disagree by circling one of the alternative categories provided. For example, if you **STRONGLY AGREE**, circle **SA** following the statement. If you **MODERATELY DISAGREE**, circle **MD**. If you are **UNDECIDED**, circle **U**. Try to use the undecided category sparingly.

SA	A	MA	U	MD	D	SD
STRONGLY AGREE	AGREE	MODERATELY AGREE	UNDECIDED	MODERATELY DISAGREE	DISAGREE	STRONGLY DISAGREE

1.	My past achievements have given my life meaning and purpose.	SA	A	MA	U	MD	D	SD
2.	In my life I have very clear goals and aims.	SA	A	MA	U	MD	D	SD
3.	I regard the opportunity to direct my life as very important.	SA	A	MA	U	MD	D	SD
4.	I seem to change my main objectives in life.	SA	A	MA	U	MD	D	SD
5.	I have discovered a satisfying life purpose.	SA	A	MA	U	MD	D	SD
6.	I feel that some element which I can't quite define is missing from my life.	SA	A	MA	U	MD	D	SD
7.	The meaning of life is evident in the world around us.	SA	A	MA	U	MD	D	SD
8.	I think I am generally much less concerned about death than those around me.	SA	A	MA	U	MD	D	SD
9.	I feel the lack of and a need to find a real meaning and purpose in my life.	SA	A	MA	U	MD	D	SD
10.	New and different things appeal to me.	SA	A	MA	U	MD	D	SD

SA	A	MA	U	MD	D	SD
STRONGLY AGREE	AGREE	MODERATELY AGREE	UNDECIDED	MODERATELY DISAGREE	DISAGREE	STRONGLY DISAGREE

11. My accomplishments in life are largely determined by my own efforts. **SA A MA U MD D SD**

12. I have been aware of an all powerful and consuming purpose towards which my life has been directed. **SA A MA U MD D SD**

13. I try new activities or areas of interest and then these soon lose their attractiveness. **SA A MA U MD D SD**

14. I would enjoy breaking loose from the routine of life. **SA A MA U MD D SD**

15. Death makes little difference to me one way or another. **SA A MA U MD D SD**

16. I have a philosophy of life that gives my existence significance. **SA A MA U MD D SD**

17. I determine what happens in my life. **SA A MA U MD D SD**

18. Basically, I am living the kind of life I want to live. **SA A MA U MD D SD**

19. Concerning my freedom to make my choice, I believe I am absolutely free to make all life choices. **SA A MA U MD D SD**

20. I have experienced the feeling that while I am destined to accomplish something important, I cannot put my finger on just what it is. **SA A MA U MD D SD**

21. I am restless. **SA A MA U MD D SD**

22. Even though death awaits me, I am not concerned about it. **SA A MA U MD D SD**

23. It is possible for me to live my life in terms of what I want to do. **SA A MA U MD D SD**

SA	A	MA	U	MD	D	SD
STRONGLY AGREE	AGREE	MODERATELY AGREE	UNDECIDED	MODERATELY DISAGREE	DISAGREE	STRONGLY DISAGREE

24. I feel the need for adventure and "new worlds to conquer". SA A MA U MD D SD

25. I would neither fear death nor welcome it. SA A MA U MD D SD

26. I know where my life is going in the future. SA A MA U MD D SD

27. In thinking of my life, I see a reason for my being here. SA A MA U MD D SD

28. Since death is a natural aspect of life, there is no sense worrying about it. SA A MA U MD D SD

29. I have a framework that allows me to understand or make sense of my life. SA A MA U MD D SD

30. My life is in my hands and I am in control of it. SA A MA U MD D SD

31. In achieving life's goals, I have felt completely fulfilled. SA A MA U MD D SD

32. Some people are very frightened of death, but I am not. SA A MA U MD D SD

33. I daydream of finding a new place for my life and a new identity. SA A MA U MD D SD

34. A new challenge in my life would appeal to me now. SA A MA U MD D SD

35. I have the sense that parts of my life fit together into a unified pattern. SA A MA U MD D SD

36. I hope for something exciting in the future. SA A MA U MD D SD

37. I have a mission in life that gives me a sense of direction. SA A MA U MD D SD

SA	A	MA	U	MD	D	SD
STRONGLY AGREE	AGREE	MODERATELY AGREE	UNDECIDED	MODERATELY DISAGREE	DISAGREE	STRONGLY DISAGREE

38. I have a clear understanding of the ultimate meaning of life. **SA A MA U MD D SD**

39. When it comes to important life matters, I make my own decisions. **SA A MA U MD D SD**

40. I find myself withdrawing from life with an "I don't care" attitude. **SA A MA U MD D SD**

41. I am eager to get more out of life than I have so far. **SA A MA U MD D SD**

42. Life to me seems boring and uneventful. **SA A MA U MD D SD**

43. I am determined to achieve new goals in the future. **SA A MA U MD D SD**

44. The thought of death seldom enters my mind. **SA A MA U MD D SD**

45. I accept personal responsibility for the choices I have made in my life. **SA A MA U MD D SD**

46. My personal existence is orderly and coherent. **SA A MA U MD D SD**

47. I accept death as another life experience. **SA A MA U MD D SD**

48. My life is running over with exciting good things. **SA A MA U MD D SD**

The Impact of Event Scale

Below is a list of comments made by people after stressful life events. Using the following scale, please indicate with a √ how frequently each of these comments were true for you DURING THE PAST SEVEN DAYS.

	Not at all	Rarely	Sometimes	Often
I thought about it when I didn't mean to				
I avoided letting myself get upset when I thought about it or was reminded of it				
I tried to remove it from memory				
I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind				
I had waves of strong feelings about it				
I had dreams about it				
I stayed away from reminders of it				
I felt as if it hadn't happened or wasn't real				
I tried not to talk about it				
Pictures about it popped into my mind				
Other things kept making me think about it				
I was aware that I still had a lot of feelings about it, but I didn't deal with them				
I tried not to think about it				
Any reminder brought back feelings about it				
My feelings about it were kind of numb				

The Mini-MAC Scale.

Please read the following statements that might describe your reactions to having cancer, and tick the appropriate column that indicates the degree to which each statement applies to you at present.

	Definitely does not apply to me	Does not apply to me	Applies to me	Definitely applies to me
I feel like giving up.				
I feel that life is hopeless.				
I feel completely at a loss about what to do.				
I can't handle it.				
I feel there is nothing I can do to help myself.				
I think it is the end of the world.				
I can't cope.				
I am not very hopeful about the future.				
I am upset about having cancer.				
It is a devastating feeling.				
I suffer great anxiety about it.				
I am a little frightened.				
I worry about the cancer returning or getting worse.				
I feel very angry about what has happened to me.				
I have difficulty in believing that this happened to me.				
I am apprehensive.				
I am determined to beat this disease.				
I see my illness as a challenge.				
I try to fight the illness.				
I am very optimistic.				
I make a positive effort not to think about my illness.				
Not thinking about it helps me cope.				
I deliberately push all thoughts of cancer out of my mind.				
I distract myself when thoughts about my illness come into my head.				
I've had a good life: what's left is a bonus.				
I've put myself in the hands of God.				
Since my cancer diagnosis I now realise how precious life is and I'm making the best of it.				
I count my blessings.				
At the moment I take one day at a time.				

MENTAL COMPONENT OF THE MOS 36-ITEM SHORT-FORM HEALTH SURVEY (SF-36)

INSTRUCTIONS: This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.
Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

1. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(circle one number on each line)

	YES	NO
a. Cut down the **amount of time** you spent on work or other activities	1	2
b. **Accomplished less** than you would like	1	2
c. Didn't do work or other activities as **carefully** as usual	1	2

2. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

(circle one)

Not at all ..	1
Slightly	2
Moderately	3
Quite a bit	4
Extremely	5

3. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks -

(circle one number on each line)

	All of the Time	**Most of the Time**	**A Good Bit of the Time**	**Some of the Time**	**A Little of the Time**	**None of the Time**
a. Did you feel full of pep?	**1**	**2**	**3**	**4**	**5**	**6**
b. Have you been a very nervous person?	**1**	**2**	**3**	**4**	**5**	**6**
c. Have you felt so down in the dumps that nothing could cheer you up?	**1**	**2**	**3**	**4**	**5**	**6**
d. Have you felt calm and peaceful?	**1**	**2**	**3**	**4**	**5**	**6**
e. Did you have a lot of energy?	**1**	**2**	**3**	**4**	**5**	**6**
f. Have you felt downhearted and blue?	**1**	**2**	**3**	**4**	**5**	**6**
g. Did you feel worn out?	**1**	**2**	**3**	**4**	**5**	**6**
h. Have you been a happy person?	**1**	**2**	**3**	**4**	**5**	**6**
i. Did you feel tired?	**1**	**2**	**3**	**4**	**5**	**6**

4. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle one)

All of the time	1
Most of the time	2
Some of the time	3
A little of the time	4
None of the time	5

EMOTIONAL EXPRESSIVITY SCALE

DIRECTIONS: The following statements deal with you and your emotions. Please select a number from the following scale that best describes YOU in each of the statements and place the number in the blank provided.

Never True	Rarely True	Occasionally True	Usually True	Almost Always True	Always True
1	2	3	4	5	6

1. ____ I don't express my emotions to other people.

2. ____ Even when I'm experiencing strong feelings, I don't express them outwardly.

3. ____ Other people believe me to be very emotional.

4. ____ People can "read" my emotions.

5. ____ I keep my feelings to myself.

6. ____ Other people aren't easily able to observe what I'm feeling.

7. ____ I display my emotions to other people.

8. ____ People think of me as an unemotional person.

9. ____ I don't like to let other people see how I am feeling.

10. ____ I can't hide the way I am feeling.

11. ____ I am not very emotionally expressive.

12. ____ I am often considered indifferent by others.

13. ____ I am able to cry in front of other people.

14. ____ Even if I am feeling very emotional, I don't let others see my feelings.

15. ____ I think of myself as emotionally expressive.

16. ____ The way I feel is different from how others think I feel.

17. ____ I hold my feelings in.

APPENDIX B

CONSENT FORM

TITLE OF PROJECT:

NAME OF LEAD RESEARCHER:

PLEASE INITIAL YOUR CONSENT IN THE BOXES

1 I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. I confirm I have received information on how to contact the researcher. ☐

2 I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason, and without my medical care or legal rights being affected. ☐

3 I understand that sections of my medical notes may be looked at by the researcher. I give permission for the researcher to have access to my records. ☐

4 I understand that all data will remain confidential and used for research purposes only. ☐

5. I wish to receive a summary of the study on completion ☐

6. I agree to take part in this study. ☐

Name of Patient ....

Signature of patient ....

Date ....

Name of Researcher ....

Signature of researcher ....

Date ....

MINISTRY OF HEALTH & SOCIAL SOLIDARITY

St. Savvas Cancer Hospital

171, Alexandras Av. 115 22 Athens, Greece
Tel. 210- 64.09.000

August 29, 2007

To: University of Wales Swansea
Re: Research Project

This letter is in regard to the research project that has been proposed and implemented by Fotios Anagnostopoulos. The title of the project is Psychological Adjustment and Breast Cancer. This project was carried out over a one year period, starting approximately February 2004.

This project has been approved by the director of the Breast Clinic and ethical approval was granted.

Sincerely,

ΧΡΥΣΟΧΟΟΥ ΜΗΝΑΣ
ΑΡ. ΤΣΑΥ [illegible]
ΧΕΙΡ. ΤΜΗΜΑ ΜΑΣΤΟΥ
ΑΝΑΠΛΗΡΩΤΗΣ ΔΙΕΥΘΥΝΤΗΣ

Minas Chryssochoou, MD
Co- Medical Director
Breast Clinic

ΑΝΤΙΚΑΡΚΙΝΙΚΟ - ΟΓΚΟΛΟΓΙΚΟ
ΝΟΣΟΚΟΜΕΙΟ ΑΘΗΝΩΝ "Ο ΑΓΙΟΣ ΣΑΒΒΑΣ
ΤΜΗΜΑ ΧΕΙΡΟΥΡΓΙΚΗΣ ΜΑΣΤΟΥ