DIFFERENCES BETWEEN THE URBAN AND RURAL WOMEN WITH BREAST CANCER: TELEPHONE INTERVENTION PROJECT

by

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STATEMENT BY AUTHOR

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# Differences Between Urban & Rural Women with Breast Cancer

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ABSTRACT

This study is an examination of the differences between rural and urban women with breast cancer for depression, cancer treatment-related fatigue, and quality of life who participated in the Telephone Intervention: Rural Women with Cancer & Partners Project over time. Urban and rural participants did not have statistically significant differences in depression, general fatigue, physical fatigue, reduced activity, or reduced motivation, regardless of treatment group assignment over time. Rural participants did have significantly lower mental health related quality of life compared to urban participants. Urban and rural participants in the treatment group had significantly improved mental fatigue over time, and greater physical and mental health related quality of life compared to their counterparts in the control group. This study provides further evidence that psychosocial interventions modulate fatigue and improve quality of life for women with breast cancer. Significant findings were limited by the small sample size of the study.
CHAPTER ONE

This study is an examination of the differences between rural and urban women with breast cancer for depression, cancer treatment-related fatigue, and quality of life who participated in the Telephone Intervention: Rural Women with Cancer & Partners Project over time. Chapter One includes a discussion of the problem and its significance, the purpose and research questions, an overview of the umbrella study, a discussion of the conceptual framework, and a review of the concepts under study.

Introduction

Problem & Significance

Breast Cancer

Breast cancer is a significant cause of morbidity and mortality within the United States (U.S.) population (American Cancer Society, 2004; Perez, 2004). One in eight women will develop breast cancer in their lifetimes (Jemel, Thomas, Murray, & Thun, 2002). There will be an estimated 217,440 new cases of breast cancer diagnosed nationally with 40,580 deaths from breast cancer this year alone (American Cancer Society, 2004). Breast cancer is the leading cause of cancer in females at 32%, and the second leading cause of cancer deaths among females at 15%.

Along with mortality, the side effect burden of breast cancer treatment is high resulting in significant morbidity. Side effects include pain, nausea, anorexia, weight loss, fatigue, and depression. In fact, depression is the most commonly reported psychological side effect of breast cancer diagnosis and treatment (Badger, Segrin, Meek,
Lopez, & Bonham, 2004; Badger, Braden, & Mishel, 2001; Badger, Braden, Mishel, Longman, 2004; McDaniel & Nemeroff, 1993; Pasacreta, 1997). Estimates of depression in cancer patients range from 4.5 to 50% (McDaniel & Nemeroff, 1993; Passik et al., 2000), and include symptom complexes diagnostic for major depression, adjustment disorder, and dysthymia (McDaniel & Nemeroff, 1993; Pasacreta, 1997). However, many other breast cancer patients have elevated levels of depressive symptoms that do not meet the diagnostic criteria for Major Depressive Disorder (MDD), but still influence their recovery and quality of life (McDaniel & Nemeroff, 1993).

Breast cancer patients with depression have an increased burden of other side effects related to breast cancer treatment, have slower cancer recovery, and reduced quality of life (Badger, Braden et al., 2004; Badger, Segrin et al., 2004; Badger et al., 2001; Lewis, 1998; McDaniel & Nemeroff, 1993; Pasacreta, 1997). Badger, Braden et al. (2004) note that, “despite evidence that depression is consistently linked to reduced quality of life, poorer adherence to medical care, longer hospital stays, and higher mortality…depression is often unrecognized in the early phases of cancer treatment” (p. 20). Furthermore, psychosocial interventions are not offered to these women despite evidence that it helps.

Cancer treatment-related fatigue (CRF) is strongly associated with depression (Badger, Braden et al., 2004; Badger et al., 2001) and depression has been shown to be the greatest predictor of fatigue in recent explanatory models of fatigue in breast cancer patients (Bower et al., 2000). While depression is the most common psychological side effect of breast cancer treatment, fatigue continues to be the most common and disabling
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symptom experienced by cancer patients (Jacobsen et al., 1999). Studies of fatigue in breast cancer patients estimate as many as 99% of breast cancer patients experience some level of fatigue whether mild or severe and that greater than 60% rate their fatigue as moderate to severe (Bower et al., 2000, para. 1). Moreover, fatigue has been consistently demonstrated in studies to have a negative impact in overall quality of life and to interfere in daily functioning in breast cancer survivors to a greater extent than in healthy controls (Bower et al., 2000; see also Badger, Braden et al., 2004; Badger et al., 2001; Payne, 2002). Not only does fatigue significantly impact breast cancer patients’ quality of life, it adversely affects favorable recovery outcomes for those patients receiving treatment (Payne, 2002, p. 1334).

The current research on depression and fatigue as side effects of breast cancer diagnosis and treatment is limited in that it fails to elucidate racial or geographical differences in the experience of this symptom among breast cancer patients due to primarily racially homogenous samples in urban settings. Research elucidating urban-rural differences in the experience of breast cancer treatment-related depression and fatigue is vital to nursing’s understanding of these significant symptomatic burdens of breast cancer treatment.

Rurality

Rural nursing research has been described as, “riddle, rhyme, and reality” (Weinert, 2002, p. 37). Riddle because of the persistent problems of the definition of rurality in nursing research and an increasingly diverse rural population. However, the reality of rural life cannot be ignored and the complexity of the cultural and
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socioeconomic milieu, and health problems facing rural residents, is obscured in such
stereotypical characterizations of what it means to be rural. It should be the purpose of
nursing research to delve beyond the “riddle and rhyme” and explore the complexities of
health, wellness, and illness within the context of the cultural and socioeconomic milieu
that is the rural reality. The paucity of rural nursing research especially with regard to
women with breast cancer reflects the riddle, rhyme, and lack of reality so eloquently
voiced in metaphor by Weinert.

In general, rural residents are considered to be in poorer health than their urban
Additionally, rural residents have higher rates of being un-insured and not surprisingly
have lower levels of access to a regular primary care provider (Ricketts, 2000).
Additionally, rural residents more often report being in fair to poor health and as having
reduced or restricted activity (HHS Rural Task Force, 2002). These statements of urban-
rural differences are not limited to generalizations but are actualized in rural women’s
experience of breast cancer. Rural women suffer higher incidences of breast cancer, are
generally in more advanced stages of disease at diagnosis, have poorer prognoses, and are
less likely to receive the same treatment options as their urban counterparts (Badger,
2002). Additionally, rural women are rarely included in breast cancer research – making
it nearly impossible to truly grasp the reality of the rural woman’s experience of breast
cancer.

Rural life is often portrayed in popular culture as idyllic: a place where people go
to escape the stresses of urban squalor, white picket fences, and the ‘typical’ American
family – Caucasian, husband, wife, with children – resides over a farm or ranch. Nevertheless, the reality is one of cultural and racial heterogeneity with diverse social, economic, and regional differences across the rural continuum (Weinert, 2000).

Economic diversity is demonstrated in occupations historically known for high rates of accidental injury – such as logging, farming, ranching, fishing, mining – and jobs associated with retirement communities, the National Parks, and those who utilize technology to work from home (p. 39). Capturing this diversity of culture, economics, and social life within nursing research is difficult enough without the problem of defining “rural”.

Two definitions of “rural” are widely used by the government and within nursing research. The U.S. Census Bureau delineates those people living in towns of 2500 or more as urban, while those living in towns of less than 2500 as rural (NACRHHS, 2004; Weinert & Burman, 1994). The definition of rural to be used in this study is based on the Office of Management and Budget (OMB) definition which differentiates metropolitan (urban) and non-metropolitan (rural) areas based on Metropolitan Statistical Areas (MSA) (NACRHHS, 2004; Badger, 2002). An MSA contains one or more central cities of at least 50,000 residents or an urbanized area with at least 50,000 inhabitants and a total MSA population of at least 100,000. The umbrella study from which this study is drawn utilized the OMB classification of the MSA in order to maximize the number of rural counties included in the study; in that by this classification scheme 10 of Arizona’s 15 counties are considered rural and the remaining 5 counties have rural areas within them (Badger, 2002).
Having two such decidedly different classifications schemes for rural is challenging for nursing research; because, unfortunately, these definitions of rural are not equivalent and often describe different populations making comparisons across research studies problematic in that health related “conclusions may be quite different, depending on what classification scheme is used” (Weinert, 2002, p. 39).

Nearly a fifth of the nation’s population, 55.5 million people, are considered rural (U.S. Census Bureau, 2002a). Rural residents have lower annual incomes, tend to use fewer preventative services such as screening programs, have lower rates of seat belt and helmet use, and exercise less than their urban counterparts (Weinert, 2002). As many as 24% of rural dwellers (those not adjacent to urban areas) are uninsured, compared to only 18% of their urban counterparts (NACRHHS, 2004). Rural residents in general have higher rates of hospitalization, and particularly for primary care sensitive conditions, or those conditions which when managed well in primary care result in fewer hospitalizations (HHS Rural Task Force, 2002). Rural dwellers have the highest rates of tooth loss and the fewest dental visits each year. Furthermore, “injury-related death rates are 40% higher in rural people” (Weinert, 2002, p. 41).

The situation is just as grim when focusing on the health of rural women. Fully one-third of all U.S. women live in rural areas (Mulder et al., 2001); however, they, “tend to have less access to health education, lower rates of cancer screening, fewer choices in insurance plans, fewer options for cancer treatment, and less access to oncologists” (Weinert, 2002, p. 42). Nearly 41% of rural women are depressed and anxious compared to only 13-20% of their urban counterparts (Mulder et al., 2001). Dismally, rural primary
care providers are less likely to identify and diagnose depression in their female patients and 60% of rural areas are considered mental health professions shortage areas (Mulder et al., 2001). As Mulder observes, the challenges rural women who have cancer face daunting challenges such as long, difficult drives to treatment centers and the need to depend upon others for that transportation; along with the psychological burden of cancer diagnosis and the often debilitating treatment-related side effects.

Arizona

In 2000, the total urban population of the U.S. was 225.5 million, or 80 percent of total population. The remaining 55.5 million people were considered rural, or a full 20 percent of the population. Arizona’s demographic profile differs somewhat from the nation with only slightly over 10% of Arizona’s population considered rural, 0.6 million people. Nevertheless, 10 of Arizona’s 15 counties are considered rural, with the other 5 counties having rural areas within them (Badger, 2002). However, breast cancer statistics in Arizona mirror national statistics with 32% (3,043) of all new cases of cancer in females being breast cancer. Breast cancer remains the second leading cause of all female cancer deaths in Arizona with 636 women or 16% of all female cancer deaths attributed to breast cancer (Perez, 2004). The implications of this are staggering for the state of Arizona. A disproportionate number of rural women in Arizona suffer from breast cancer compared to their rural counterparts nationally; making breast cancer related morbidity and mortality a significant issue for all health care workers in Arizona. Rural women’s differing experience of breast cancer and higher rates of breast cancer morbidity and mortality make this issue quite significant to nursing research.
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Purpose

Little is known about the rural woman’s experience of depression and fatigue as a breast cancer treatment-related side effects and if it differs from their urban counterparts. This study will fill in significant gaps in the current knowledge related to the experience of depression, fatigue, and quality of life of urban and rural women with breast cancer. Therefore, the purpose of this study is to examine differences between urban and rural women with breast for depression, cancer treatment-related fatigue, and quality of life over time.

Research Questions

The data for this study are drawn from the larger umbrella study, Telephone Intervention: Rural Women with Cancer & Partners (Badger, Segrin et al., 2004) and will examine differences among the rural and urban participants’ abilities to manage breast cancer treatment-related symptoms of depression and fatigue, and quality of life from baseline to completion of the study. The women participants were assigned to either the telephone-delivered interpersonal counseling intervention (TIP-C) or the attentional-usual care (UC) control group. (See Chapter 3: Interventions for a detailed description of both TIP-C and UC). The following research questions will be answered:

1. What are the demographic differences between rural and urban women who participated in the Telephone Intervention: Rural Women with Cancer & Partners at baseline?
2. What are the differences between urban and rural women’s abilities to manage cancer treatment-related symptoms of depression and fatigue who participated in the telephone intervention counseling compared to usual care over time?

3. What are the differences between urban and rural women’s quality of life who participated in the telephone intervention counseling compared to usual care over time?

_Umbrella Study_

The purpose of the umbrella study, hereafter referred to as the Telephone Intervention Project was to test a telephone-delivered interpersonal counseling intervention (TIP-C) for symptom management (cancer treatment-related depressive symptoms and fatigue) and quality of life for rural women with breast cancer and their partners compared to a self-managed exercise program (SEP) and attentional-usual care (UC) control treatment. Specific aims of the study were to examine effectiveness of TIP-C compared of SEP and UC on rural women’s and their partners’ management of depressive symptoms and fatigue, quality of life, cancer knowledge, social support, stress and partner relations (Badger, 2002). The long-term goal of the umbrella study is to, “develop an innovative psychosocial counseling intervention that will improve symptom management and quality of life for women with breast cancer by removing many of the barriers associated with rural women receiving services during the breast cancer experience” (p. 45). For an in depth discussion of the purposes and methodology employed in the umbrella study, see Chapter 3.
Conceptual Framework

The conceptual framework for this study is grounded in the theoretical framework for the Telephone Intervention Study in that this study examines data from the umbrella study.

The conceptual framework (Figure 1) for the Telephone Intervention Project was derived from the diathesis-stress vulnerability and interpersonal models of depression. The major assumption of the framework is that individuals are predisposed, or vulnerable, to developing depressive symptoms which may make them more susceptible to increased health related morbidity and mortality following a major life stressor such as cancer diagnosis or treatment (Badger et al., in press; Segrin, 2001; Segrin & Abramson, 1994). Within the framework cancer treatment-related symptoms are conceptualized as either a response to cancer diagnosis and treatment or as a side effect of cancer treatment. In this way depressive symptoms would be considered a response to cancer diagnosis and treatment, while cancer treatment-related fatigue would be considered a side effect (Badger et al., in press).

Furthermore, social support is integral to the framework and thus the Telephone Intervention Study in that it can mediate the effects of the life stressor on cancer treatment related symptoms and responses by decreasing the negative health outcomes that can be precipitated by the diagnosis and treatment of cancer. Within this framework social support is broadly defined as having affective, instrumental, informational, and appraisal components (Segrin, 2001). Social support is achieved primarily through interpersonal relationships and communication within those relationships (Segrin, 2001),
in which the person is allowed to, “‘work through’ the affective reaction to the stressor, to marshal instrumental support for tangible assistance with roles and functions, informational support for advice or suggestions, and appraisal support for gauging and adjusting to the stressor” (Badger, 2002, p. 47; see also, Badger et al., in press; Segrin, 2001).

*Figure 1. Conceptual Framework of the Telephone Intervention Project.*

The presence of social support and personal competency in obtaining social support among women with breast cancer and their partners can significantly improve their ability to cope with the diagnosis and treatment-related symptoms and responses of breast cancer (Segrin, 2001; Segrin & Abramson, 1994). This component of the framework is central to the major assumptions underlying the telephone-delivered
interpersonal counseling (TIP-C) intervention of the umbrella study. The assumptions are: social support influences depressive symptoms; and that disruption of interpersonal relationships providing social support can increase depressive symptoms and fatigue (Badger, Segrin et al., 2004; Badger et al., in press). According to Badger, Segrin et al. (2004), TIP-C, targets the interpersonal components of social support; thus providing social support and cancer knowledge to women and their partners, and in so doing decreasing the negative health consequences for them both. TIP-C will modulate women and their partners’ social and emotional adjustment, therefore decreasing their depressive symptoms, CRF, and stress, while increasing their social support, partner relations’ quality, and QOL (Badger, Segrin et al., 2004; Badger et al., in press).

![Conceptual framework for this study.](image)

*Figure 2.* Conceptual framework for this study.
This study will endeavor to elucidate any differences among the urban and rural women with breast cancer treatment related symptoms and responses – depression, fatigue, and quality of life – including the effect of the intervention (TIP-C) on those differences. Figure 2 is a representation of the conceptual framework as it applies to this study.

Concepts

This section includes the conceptual definitions of the core concepts under study – depression, fatigue, and quality of life. The reader can refer to Chapter 3 for the operational definitions of each of these concepts.

Depression

Two conceptual and measurement approaches exist for the study of depression in the cancer patient. One is exclusive in nature in which all of the somatic symptoms, such as fatigue and anorexia, are disregarded and diagnostic criteria are emphasized (McDaniel & Nemeroff, 1993; see also Badger, 2002; Badger et al., in press). Patients are dichotomized into depressed or not depressed categories. In this way it maximizes specificity for depression but may obscure the significant interactions between depression and fatigue that occur in the cancer patient. A more inclusive conceptual and measurement approach will be used in this study in which all signs and symptoms of depression the women present with will be considered. This approach maximizes sensitivity and guards against under-diagnosing a symptom complex which significantly impacts a cancer patient’s treatment and disease outcomes. McDaniel and Nemeroff
Differences Between Urban & Rural Women with Breast Cancer (1993) indicate that the risk of over-diagnosis with the inclusive approach is small, ranging from 1.5-8%.

Like Barsevick et al. (2002) and Holland (1997) depression is conceptualized as a continuum and is used in this study to denote the entire range of depressive symptoms, including normal sadness in response to loss, as well as, chronic depressed emotional affect and chronic depression meeting specific criteria for a psychiatric disorder.

Cancer Treatment-related Fatigue

In many breast cancer studies, cancer treatment-related fatigue (CRF) is conceptualized as a multidimensional and multifactorial construct characterized by subjective feelings of tiredness, weakness, and a lack of energy (Bower et al., 2000; Payne, 2002). As in the umbrella study (Badger, 2002; Badger et al., in press), CRF will be conceptualized as a perceived sensation experienced by the woman that fluctuates in severity over time; and as such the approach to measurement will be based on self report.

Health-related Quality of Life

Health-related quality of life (QOL), is simply the woman’s perceived physical and mental health (Badger, 2002; Badger et al., in press). In this way QOL reflects the impact of chronic illness and disease on the woman’s overall health and well-being, and illuminates the interference of the illness on the woman’s every day life.

Summary

Chapter One provides an overview of the problem, including a discussion of the significance of breast cancer and breast cancer treatment-related morbidity and
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mortality; and the intersection of rurality on the experience of breast cancer and breast
cancer treatment-related symptoms and responses – depression, fatigue, and quality of
life. Additionally, the research questions, the conceptual framework, and the umbrella
study from which this study will be drawn were discussed. Chapter Two will include a
review of the literature in which the major concepts are critically examined and gaps for
further research are identified.
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CHAPTER TWO

Chapter Two provides an in-depth discussion of the current literature pertaining to the concepts under study—breast cancer treatment-related depression, fatigue, and quality of life—with a particular emphasis on analysis and synthesis of research findings. The current literature on rural breast cancer research is examined separately to more clearly identify gaps in the current knowledge and delineate areas for further study.

Review of the Literature

Breast Cancer

Breast cancer treatment-related depression, fatigue, and quality of life are closely associated in the literature, as they are in the experience of breast cancer patients. In the review which follows, their discussions will be separated where possible. However, where this is not possible or appropriate the studies will be included in the most appropriate section.

Depression

The literature on breast cancer and depression can be separated into those studies differentiating between a prior diagnosis of depression, those examining cancer treatment-related depression, and those investigating interventions for breast cancer patients suffering from breast cancer treatment-related depression.

Mood and breast cancer. Stage at breast cancer diagnosis is known to be one of the strongest predictors of survival; however, Desai, Livingston Bruce, and Kasl (1999) noted that psychological and psychiatric variables, such as comorbid diagnosis of
depression, have been known to cause delays in the diagnoses of other cancers. In 1999, they examined the effect of major depression and phobia on stage of diagnosis of breast cancer. In a retrospective analysis, data from the New Haven site of the Epidemiologic Catchment Area (ECA) – a large scale examination of the prevalence and incidence of psychiatric disorders in five U.S. communities – were linked with data from the Connecticut Tumor Registry to study the effect of premorbid psychiatric disorder on stage, early (in situ and localized tumors) or late (regional and distant tumors), of breast cancer at diagnosis. Consistent with their hypotheses, they found that a positive history of major depression was associated with late-stage diagnosis of breast cancer; while a history of phobic disorders was associated with an early-stage diagnosis of breast cancer (p. 29). The authors noted, depressive symptoms have been associated with delays in seeking medical care for cancer symptoms and with reduced adherence to cancer screenings; while measures of anxiety and worry have been demonstrated to motivate breast cancer screening behaviors (p. 30). Despite the methodological limitations of the study, these findings warrant consideration. Both depression and breast cancer cause significant morbidity and mortality among women. Desai et al.’s findings indicate there is great opportunity for the provider of care to promote the health and well being of depressed patients by encouraging appropriate breast health related behaviors – such as yearly mammograms for women over 40 years of age and monthly breast self examinations.

More recently, Goodwin, Zhang, and Ostir (2004) examined not only the effect of depression on diagnosis, but on treatment and survival of women with breast cancer.
They performed their retrospective analysis of records from the Surveillance, Epidemiology, and End Results (SEER) of women, aged 67-90, from the years 1993-1996, by linking them to Medicare claims and analyzing those claims for a diagnosis of depression in the two years prior to breast cancer diagnoses. Seven-and-a-half percent of the sample (or 1,841 of the 24,696 women) were given a diagnosis of depression in the two years prior to their breast cancer diagnosis. The statistical analysis demonstrated no difference in tumor size or stage at diagnosis between women with a prior diagnosis of depression and those without one. However, women with a prior diagnosis of depression were less likely to receive treatment considered definitive even after controlling for covariates such as age, ethnicity, and comorbidity. Additionally, women with a prior diagnosis of depression had a 42% higher risk of death from breast cancer within three years of diagnosis while controlling for other factors affecting survival (again age, ethnicity, comorbidity, marital status, number of physician visits, and SEER area). This increased risk of death remained for those women with a prior diagnosis of depression who did receive definitive treatment. While not consistent with Desai et al. (1999) findings that a prior diagnosis of depression increased the risk of late-stage diagnosis, both studies are limited by their retrospective, non-experimental designs. Nevertheless, the negative effects of comorbid depression diagnosis and breast cancer on survival outcomes is clearly of concern and warranted further study.

The influence of psychological response, either premorbid/comorbid depression or cancer treatment-related depression, on survival in breast cancer patients is of great import to both those treating breast cancer patients and the patients themselves. Popular
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Culture often gives people the notion that with a positive attitude and a “fighting spirit”, they can “beat the odds” and survive cancer. Watson, Haviland, Greer, Davidson, and Bliss (1999) examined this hypothesis in their study replicating earlier findings demonstrating that those breast cancer patients diagnosed with early-stage disease and categorized as having a fighting spirit or denial were more likely than those with a response of helplessness or stoic acceptance to be alive and relapse-free five years post diagnosis. However, in that previous study the analysis did not control for important prognostic indicators such as tumor staging. In their prospective study of 578 women with early-stage breast cancer, Watson et al. (1999) examined the participants’ psychological response with measures from the Mental Adjustment to Cancer Scale (MAC), the Courtauld Emotional Control Scale (CEC), and the Hospital Anxiety and Depression Scale (HADS) over time and followed the participants for a minimum of 5 years, controlling for clinical factors known to effect survival in the analysis of the data. Their findings indicated that women who scored high on the HADS depression subscale had a significantly increased risk of death by 5 years; those women with high scores on the helplessness and hopelessness subscale of MAC had a significantly increased the risk of relapse or death at 5 years compared to those with low scores on those subscales. Results related to the fighting spirit subscale were non-significant. The findings of this study while inconsistent with the previous study are significant due to a more thoughtful and well designed research plan and methodology and are consistent with Goodwin et al.’s (2004) findings that premorbid depression significantly reduced survival for breast cancer patients. Caution should be exercised in generalizing the results to U.S.
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populations in that the study was performed in the United Kingdom. Be that as it may, the findings are intriguing and indicate that providers should carefully assess breast cancer patients for preexisting depression or breast cancer treatment-related depression early in and throughout the treatment process.

*Cancer and depression.* Many researchers examining depression in breast cancer diagnosis are plagued with difficulties differentiating depressive symptoms and cancer treatment-related symptoms; for many of those symptoms are similar and include, fatigue, insomnia, weight loss, and anorexia. Also, many researchers recognize that depressive symptoms are appropriate given the stress and psychological burden accompanied by a diagnosis of cancer (McDaniel & Nemeroff, 1993; Pasacreta, 1997).

The current body of literature is consistent in its conclusion that depression is a significant aspect of breast cancer diagnosis and treatment. However, as Pasacreta (1998) notes, “owing to the expected nature of somatic and affective changes secondary to cancer illness and treatment, understanding when symptoms of depression reach clinical significance is inherently difficult” (Related Literature, para. 5). She goes on to state that treating psychological responses to the diagnosis of cancer are subsumed to treating the cancer itself and the physical problems associated with its treatment which assume the greatest priority in most oncology settings. This has led to a lack of understanding the significance of depressive symptoms in cancer patients and to “the assumption that depression is an appropriate response to a physically and emotionally disruptive chronic illness” (Related Literature, para. 5). Breast cancer patients with depressive symptoms, regardless of the presence of an actual depressive disorder (according to the Diagnostic
and Statistical Manual criteria), have “worse physical, social, and role functioning; worse perceived current health status; and greater bodily pain than patients with no chronic conditions” (Related Literature, para. 7).

In her study of 79 women three to seven months after breast cancer diagnosis, Pasacreta (1998), examined the nature and scope of depression and its relationship to physical symptom distress and functional status. She found that 9% of the sample had a depressive disorder according to the DSM criteria (general population rates are approximately 4%) and 24% of the sample had elevated depressive symptoms. The multiple regression analysis examining key variables contributing to functional status were symptoms distress and depressive symptoms which accounted for 35% of the variance in functional status among the sample. Despite the limitations of the study (i.e. homogenous sample), the study findings are significant for practice in that even low levels of depression among breast cancer patients, “are clinically significant and deserve attention” (Discussion, para. 2). Furthermore, Pasacreta concludes that “depressive symptom severity (simple counts of depressive symptoms) and functional status outcomes should be used to classify depressive phenomena” (Discussion, para. 8) and are an appropriate diagnostic tool for depression in women diagnosed with breast cancer.

**Interventions.** With the knowledge that depression in women diagnosed with breast cancer significantly increases the burden of other side effects, slows cancer recovery, reduces life quality, and leads to longer hospital stays and higher mortality, Badger et al. (2001, 2004) has endeavored to examine the effects of a constellation of
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self-help interventions on depression burden, side effect experience, psychological adjustment and quality of life in women with breast cancer.

Badger et al. (2001) examined the effect of five different, but complimentary self-help interventions (SHIP) for six weeks on depression burden, fatigue burden, anxiety burden, difficulty concentrating burden, nausea burden, number of side effects, and severity of side effects. Side effect burden was defined, “as the level to which one finds the side effect problematic” (p. 568). Study findings indicate that self-reported depression burden significantly influenced “severity of side effects, number of side effects, and the burdens of fatigue, difficulty concentrating, and anxiety” (p. 567). Women with a high level of depression burden in the intervention group experienced significant improvements in fatigue burden. Additionally women with both high and low levels of depression in the intervention group experienced improvement in fatigue burden, pain burden, and nausea burden. The authors conclude that self-help interventions administered in community oncology clinics can significantly “reduce side effects and promote quality of life in women with breast cancer” and that those interventions can significantly improve the burden of fatigue in depressed breast cancer patients. Given the importance of depression in women with breast cancer, the authors further stress, “the importance of assessing depression and depression burden for every woman who is undergoing treatment for breast cancer” (p. 572).

Psychosocial interventions such as the self-help (SHIP) interventions examined by Badger et al. (2001), “can influence cancer patients’ daily activities, such as diet, exercise, sleep, and adherence to medical treatment and can have positive effects on
psychological distress, including reducing depressive symptoms” (Badger et al., 2004, p. 21; see also Spiegel, 1997). SHIP interventions were again examined to determine their influence on depression burden, psychological adjustment and life quality for women with breast cancer. In this study the authors conceptualized psychological adjustment as a “pessimistic or fatalistic mood” (p. 23) and life quality as “the perceived degree of well-being”. Twenty-eight percent of the women in the intervention group and 23% of women in the control group reported depression as one of the most problematic side effects they were experiencing. In general, women with high depression burden had poor psychological adjustment compared to the low depression women at baseline. Furthermore, women with high depression burden demonstrated improved psychological adjustment over time in the intervention group, while those in the control group evidenced a decrease in psychological adjustment (i.e. they had increased negative affect or mood). Not surprisingly, women with high depression burden had lower levels of life quality regardless of membership in the intervention or control group at baseline. However, all women in the intervention group (low depression burden and high depression burden) demonstrated improved life quality over time, while women in the control group “evidenced a sharp decrease in life quality over time” (p. 24). Badger et al. conclude that:

although women with high depression burden showed the largest psychological adjustment gains, these findings highlight that even low levels of depression burden warrant attention. Interventions to increase life quality over the time
women are receiving adjuvant therapy are indicated regardless of depression burden level (p. 25).

Antoni et al. (2001) has also examined the effect of cognitive-behavioral interventions on depression in breast cancer patients. The authors were particularly interested in reducing depression and improving benefit finding among the participants having conceptualized breast cancer as a life crisis from which psychological benefit or harm could result. The 100 participants were randomly assigned to the control, a 1 day seminar, or intervention, ten 2-hour weekly sessions focusing on training participants to use problem-focused and emotion-focused coping strategies (cognitive reframing, planning, relaxation, etc.), assisting them in mobilizing social and emotional support, and in training them in improved conflict resolution. Depression, optimism, and benefit finding were measured repeatedly over time using various scales. Findings indicate that the intervention improved depression in women with moderate symptoms and improved benefit finding for the cohort as well, particularly women who scored lower on the optimism scales. The authors conclude that cognitive-behavioral interventions focusing on emotional processing, problem- and emotion-focused coping strategies, and social support are effective in benefiting those women who need them most. The small homogenous sample, and un-tested instruments (i.e. the benefit finding instrument was new and no information as to validity and reliability were included) threaten the generalizability of the study findings.

Barsevick, Sweeney, Haney and Chung (2002) performed a qualitative analysis of psychoeducational interventions for depression in cancer patients. In their meta-analysis
they examined 48 quantitative, 3 qualitative, and 3 meta-analysis studies of psychosocial interventions incorporating behavioral interventions, counseling interventions, and cancer education interventions in which participants were involved in information giving and receiving; learned problem solving and coping skills; received social support; and were able to express emotion. The authors conclude that psychoeducational interventions do benefit depression in cancer patients. Sixty-five percent of the behavioral studies included in the meta-analysis, 70% of counseling interventions, 57% of the education interventions, and 58% of the combination interventions (including education) demonstrated benefit in improving depression among cancer patients. The totality of these findings suggest that behavior therapy or counseling alone or in combination with cancer education is beneficial in reducing depression among cancer patients.

Despite the limitations of Antoni et al. (2001), those findings taken together with the SHIP intervention findings (Badger et al., 2001, 2004) and Baservick et al.’s (2002) meta-analysis, demonstrate the benefit of psychosocial interventions on depression to improve side effect burden, psychological adjustment, quality of life, and benefit finding in women with breast cancer. As in the treatment of depression outside of the context of breast cancer, psychosocial and pharmacologic interventions are often used in tandem. There is little research studying the benefit of pharmacotherapy in the treatment of breast cancer treatment-related depression. Grassi, Biancosino, Marmai, and Righi (2004) performed an open label study examining the effect of reboxetine on major depressive disorder in breast cancer patients. Reboxetine is a norepinephrine reuptake inhibitor previously shown to be safe and efficacious in the treatment of depression in patients.
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with other medical illnesses such as Parkinson’s disease and human immunodeficiency virus. After 8 weeks of treatment the subjects showed significant reductions in depression, hopelessness, and anxiety with minimal side effects or adverse reactions. However, the generalizability of this study is hampered by methodological problems including a small sample; lack of control group; and that it was not randomized, double-blind, placebo, controlled (there was no control group – all 8 patients were in the treatment group). Further studies in U.S. patients with recognized methods for experiments involving medications would clarify the benefit of an anti-depressant medication that could improve the psychological, treatment, and survival outcomes for women suffering from breast cancer treatment-related depression.

Fatigue

The current literature on breast cancer treatment-related fatigue (CRF) can be roughly separated into descriptive research examining the occurrence, characteristics, and correlates of fatigue and experimental research investigating interventions mediating fatigue in breast cancer patients.

Descriptive research. Fatigue is considered the most common side of cancer treatment. As many as 70% of patients undergoing radiation and/or chemotherapy experience fatigue. Some studies have suggested that up to 99% of patients experience some level of fatigue and 60% rate that level of fatigue as moderate to severe (Bower et al., 2000). Bower and her colleagues examined the extent to which fatigue continues to affect survivors of breast cancer. Their 2000 study described the occurrence of fatigue in a large sample of breast cancer survivors, examined fatigue in breast cancer survivors
compared to general population norms, and identified correlates of fatigue among participants. They found that the majority of breast cancer survivors had levels of fatigue comparable to age-matched women in the general population, but slightly more fatigued than a more demographically compatible reference group. However, approximately one-third of the breast cancer survivors reported more severe fatigue which was associated with higher levels of depression, pain, and sleep disturbance. Survivors suffering from more severe fatigue were also more likely to have received chemotherapy (with or without radiation therapy). In further analysis depression and pain were the strongest predictors of fatigue in this cohort of breast cancer survivors. The authors suggest that while most women who survive breast cancer do not continue to experience persistent fatigue that is correlated with depression and pain.

Jacobsen et al. (1999) investigated fatigue in women receiving adjuvant chemotherapy for breast cancer compared to age matched controls and found that fatigue increased significantly for women after the initiation of chemotherapy and was positively correlated with the more frequent occurrence of pain, emotional upset, nausea, mouth sores, muscle weakness, change in taste, sleep problems, chills, and vomiting (p. 239). Of import, the “women receiving chemotherapy reported that fatigue interfered to a greater extent with their general activity, ability to bathe and dress, normal work activity, ability to concentrate, relations with others, enjoyment of life, and mood” (p. 239). Fatigue, then, has an incredible and negative effect on mood and quality of life for women with breast cancer undergoing chemotherapy.
Berger and Higginbotham (2000) similarly found that greater symptom distress (pain, problems with bowels, and concentration), lower activity, poorer physical and social health status, and disturbed sleep patterns were correlated with fatigue in their prospective, repeated measures study of correlates of fatigue during and following adjuvant breast cancer chemotherapy. Furthermore, they found that patients experienced the highest levels of fatigue and symptom distress during the first four days after treatment three of the regimen under study (p. 1443).

Experimental research. Descriptive research has indicated that lower activity level is associated with fatigue; and while counterintuitive, exercise has been proposed as an intervention to reduce fatigue in breast cancer patients. Schwartz, Mori, Gao, Nail, and King (2001) examined the relationship between fatigue and exercise in women with breast cancer who participated in a home-based exercise intervention using a one-group pretest-post-test design. The intervention was done in conjunction with the women’s chemotherapy regimens in order to examine the relationship between fatigue and exercise over time during chemotherapy treatment. Participants were instructed to exercise between 15-30 minutes 3-4 days per week at an intensity that did not aggravate their symptoms (i.e. pain, nausea, fatigue) and were encouraged to choose an aerobic activity they enjoyed. The researchers found that exercise significantly reduced the intensity of fatigue from 14% to 35%; and this effect remained significant after controlling for baseline fatigue and functional ability. Measures of fatigue were significantly reduced on exercise days compared with non-exercise days and the effects of exercise on fatigue generally lasted one day. Moreover, the amount of exercise was significantly associated
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with fatigue in that the longer a participant exercised the less fatigued she felt on that day. The homogenous sample and lack of a control group limit the generalizability of these findings; however, they are confirmed by other studies in the literature.

Mock et al. (2001) examined fatigue and quality of life outcomes of exercise during breast cancer treatment. The prospective, controlled, randomized design stratified participants by cancer treatment of adjuvant chemotherapy or radiation therapy. The exercise intervention began concurrently with cancer treatment and consisted of a walking program with guidelines for each participant developed with an exercise physiologist and an exercise dairy kept by participants. As the researchers began the data analysis, emerging data indicated that as many as one-third of the women randomized into the exercise group did not engage in regular exercise while many of those in the control group persisted in regular exercise. In order to examine the effect of exercise on fatigue the researchers separated the participants into “high walk” (exercised at least 90 minutes per week on 3 or more days) and “low walk” groups based on the reports in the participants’ diaries. Overall, women in the high-walk group reported significantly less fatigue and emotional distress as well as higher functional ability and quality of life than women in the low-walk group while undergoing treatment for breast cancer. These findings are consistent with Schwartz et al. (2001).

The design flaws and methodological problems exhibited in both of these studies demonstrate the difficulties of engaging in exercise research with breast cancer patients, in that pre-study exercise levels were strongly associated with exercise during the study regardless of group assignment (Mock et al., 2001). Further research in large,
heterogeneous samples examining methods to increase adherence to the exercise program and to further validate these research findings should be performed.

Research has also been done examining the effects of interventions focusing on general education related to self-care behaviors and specific interventions targeting one aspect of fatigue correlates, such as sleep disturbance.

Williams and Schreier (2004) investigated the effectiveness of informational audiotapes on self-care behaviors, state anxiety (which can lead to depression), and the use of self-care behaviors. In their randomized clinical trial, participants receiving outpatient chemotherapy for breast cancer were assigned to experimental or control groups in which the former were given two 20 minute audiotapes with self-care instructions for common cancer treatment-related side effects and the latter were given usual care. Both groups were repeatedly interviewed in which they were asked to rate the occurrence and intensity of various cancer treatment-related side effects and the use and effectiveness of self-care behaviors. Participants were also assessed for state anxiety (transitory) and trait anxiety (general). Of the side effects included in the analysis, fatigue, nausea and vomiting, and taste changes were most commonly reported among participants. Significant differences were reported in side effects experienced between the control and experimental groups over the course of the study with a 50% reduction in the number of women reporting nausea and vomiting in the experimental group over time. Levels of fatigue did increase for both groups over time. Interestingly, the experimental group increased the use of recommended self-care behaviors and found them to be effective, whereas the control group persisted in using the same self-care
behaviors without effectiveness over the course of the study. Furthermore, state anxiety for both the experimental and control groups diminished over time; however, state anxiety remained significantly higher in the control group compared to the experimental group. These findings are encouraging in that they demonstrate that women with breast cancer undergoing treatment can effectively utilize self-care behaviors with guidance and that audiotapes are an effective means of providing women with that information.

Berger et al. (2003) investigated an intervention aimed at promoting sleep and modulating the sleep disturbance often correlated with fatigue in women receiving adjuvant chemotherapy for breast cancer. The intervention had multiple components with the primary outcome being levels of fatigue. Overall adherence to the components of the individualized sleep promotion plan (ISPP) was relatively high at 77% to 88%, and fatigue scores remained low. However, this prospective repeated measures design failed to compare to a control group so the results cannot with confidence be attributed to the intervention. As a feasibility study the potential to employ a control group in the design of later phases of the study would clarify the true effect of the intervention and strengthen the findings as a whole.

There is consensus in the current research as to the correlates of fatigue and to its often persistent quality. Multiple studies have demonstrated strong associations between CRF and depression/mood disturbance, pain, symptom distress, sleep disturbance, decreased activity, and poor functional status. Exercise has been shown to be an effective intervention at reducing fatigue if not difficult to encourage adherence. Education as a
mechanism of social support is also supported as a beneficial strategy to improve self-care behaviors, self-efficacy, and reduce fatigue.

**Quality of Life**

Little research has been performed solely studying quality of life in the breast cancer literature; more often, it has been examined in conjunction with other symptom complexes such as depression and fatigue in women with breast cancer. Previous analyses of the Self-Help Intervention Project (SHIP) have examined the interaction of depression burden and many of the functional aspects comprising quality of life frameworks: primarily physical functioning and impairment, such as fatigue, pain, and nausea (Badger et al., 2001; Badger et al., 2004). Braden and Mishel (2000) postulated that the five different, but complimentary self-help interventions comprising the SHIP intervention would positively influence the meaning-focused aspects of the framework for quality of life utilized in the study, mainly resourcefulness and uncertainty. They also examined the influence of depression burden on the intervention’s efficacy in mediating the resourcefulness and uncertainty aspects of quality of life. Within the quality of life framework utilized resourcefulness is conceptualized as the, “level of enabling skills (problem solving, cognitive reframing, belief in self) available to eliminate or modify effect of adversities to reach desired goals” (p. 29); while uncertainty is the, “extent to which one is unable to make meaning of illness and treatment experiences”. They found that level of depression burden significantly effected both resourcefulness and uncertainty regardless of random assignment to intervention or control groups; meaning that, “women in the high depression burden group had greater uncertainty and less
resourcefulness” (p. 32). Furthermore, independent of entry-level depression burden, women participating in the intervention had less uncertainty and more resourcefulness compared to women in the control group. The authors conclude that all women with breast cancer regardless of entry-level depression burden benefited through the SHIP intervention by improved quality of life (more resourcefulness and less uncertainty).

Lee, Ku, Dow, and Pai (2001) investigated the relationship among individual characteristics, disease characteristics, psychological factors (anxiety, depression, self-esteem), social support and quality of life among Taiwanese (in Taiwan) breast cancer patients undergoing chemotherapy. The homogeneity of the sample and its international origins limits the study’s generalizability. Nevertheless, it is interesting to note that family factors most influenced patients’ quality of life. However, the study indicated many other factors also affected quality of life among participants including socioeconomic status, number of children, stage of disease, commencement and number of chemotherapy treatments, social support of relatives and health professionals, and self-esteem. The authors state, “the most influential factor affecting breast cancer patients’ total quality of life was the psychological factor of self-esteem” (p. 57). However, they do not clarify how these contradictory conclusions with regard to family factors positively influencing quality of life. Findings of this study should not be generalized to the U.S. population of women with breast cancer due to significant cultural differences and the inconsistent conclusions of the authors; nevertheless, the study does highlight the importance of health professionals offering social and emotional support to breast cancer patients and the beneficial effect this may have on their quality of life.
Rural Breast Cancer

Bushy (1998) offers an overview of health issues of women in rural environments. Women comprise about 52% of the rural population within the U.S. and experience significant health differences from their urban counterparts. She reports that rural women, “have higher rates of chronic conditions, especially hypertension, arthritis, back disorders, bursitis, hearing, and visual impairments. Yet rural residents make fewer doctor visits than their urban counterparts, and they are sicker and more likely to be hospitalized when they seek medical care” (p. 53). Bushy provides an excellent analysis of the social structures of rural communities, noting that generalizations should be cautiously made given the heterogeneity of rural communities and their residents. Additionally, she identifies multiple barriers rural residents must overcome to access health care services, not the least of which is poverty, distance to care, lack of transportation, and language differences (p. 54). Of great interest are the many rural women who are vulnerable and at-risk for multiple adverse health-related outcomes as a result of the confluence of both their rural and racial or ethnic status. Minority rural women face poverty, shorter life expectancies, and poorer overall health (p. 55). “For them, access to health care is usually limited to crisis care, and health promotion services are virtually nonexistent” (p. 55). For example, rural African American women have “poor perinatal outcomes; high rates of chronic problems related to obesity, hypertension, and diabetes; and a higher cancer mortality rate, particularly breast cancer” (p. 55). This issue of increased breast cancer mortality is not simply limited to African American women, but as Badger (2002) notes: “rural women with breast cancer are often in more
advanced stages of cancer by the time they seek medical care, have poorer prognoses, and are less likely to be offered the same treatment options as urban women” (p. 45).

Little evidence in the literature exists examining urban-rural differences in the experience of breast cancer treatment-related depression. In fact, the only literature found examining urban-rural differences in breast cancer at all, was a study examining the effects of a physician outreach program on urban-rural differences in breast cancer management (Howe, Lehnerr, & Katterhagen, 1997). Howe et al. found that there were significant urban-rural differences in how breast cancer was managed in Illinois. Using an experimental design that implemented an intensive outreach program in 4 rural hospitals, and a low intensity outreach program in 9 rural hospitals and 4 urban hospitals serving rural patients. The intensive intervention was marked by activities which brought oncology expertise and collaboration to the rural hospitals in an attempt to avoid altering the “pattern of care” (p. 110) so that patients would not be referred to urban health care centers and abandon their rural treatment centers. The low intensity outreach program included physician seminars and promotional materials acting as physician reminder cards. Their data suggest, “that the more intensive intervention was more successful in improving the complete composite of stage-appropriate disease management” (p. 116) for women with breast cancer in rural areas.

Few other research studies examining urban-rural differences and breast cancer are currently available. Robertson et al. (2004) investigated the factors influencing the time from presentation to treatment of colorectal and breast cancer in urban and rural areas of Scotland. The analysis includes slightly over 1,000 women with breast cancer
and interestingly found that those women living farther away from cancer centers were
treated the most quickly. Clinical factors at presentation such as breast lump, change in
skin contour, lymphadenopathy, more signs and symptoms, and increasing age most
influenced time to treatment. A possible explanation for this counterintuitive finding is
that rural individuals may have presented at a later stage of disease necessitating faster
treatment. The analysis could have benefited from an examination of urban-rural
differences of stage of disease at presentation. These findings are not generalizable to
U.S. rural populations due to the international nature of the study, however, they are
interesting and offer insights into possible future areas of study examining urban-rural
differences in stage of disease at diagnosis and factors influencing time from presentation
to treatment for rural women with breast cancer.

The nursing literature in Australia is very focused on the health of its rural
dwellers and while the generalizability to U.S. patients is limited because of cultural,
social, and geographic differences, the results of McGrath et al.’s (1999a, 1999b) series
of studies examining the psychosocial support needs of rural and geographically isolated
women with breast cancer in Queensland, Australia are intriguing. In part I, McGrath et
al. (1999a) focused on the personal concerns of the rural breast cancer patients
participating in her study by developing a telephone interview based on psychosocial
support issues including personal support, available support, the support received from
health professionals, practical support, emotional support, and information support. The
analysis consisted of frequencies with little statistical analysis. Eighty-three percent of
participants stated that fear of recurrence of cancer was a major to moderate concern and
75% stated that psychological or emotional concerns were major to moderate for them. 54% were very worried about their family and rated that as a major to moderate concern. 54% of the sample rated pain or physical distress, financial worries, and loss of functional ability as of no concern to minor concern with the other 46% of the sample rating them as major to moderate concerns. The authors state, “that themes of concern for women with breast cancer are a fear of cancer recurring, physical distress, and worries about the impact of the experience on the family” (p. 40). However, they fail to acknowledge the 75% of the sample rating psychological or emotional concerns as a moderate to major concern.

In part II, McGrath et al. (1999b) examined sources of informal and formal support for rural women with breast cancer. Women were interviewed and identified sources of support. Data were presented in frequency form with no statistical analyses. Eighty-three percent of participants identified their partner and family as major to moderate sources of support; while 95% identified their friends and neighbors as sources of informal support. All of the women identified themselves and the need for self-care and support as a major to moderate source of support to assist them through the crisis of being diagnosed and treated for breast cancer. Formal support given by health care professionals was facilitated when the women were confident about the knowledge and expertise of the health care professionals, when adequate informational support was provided, when health care professionals were demonstrated a sensitivity for the women’s concerns, and when their was follow-up and attention to the women’s needs. Women sighted complacent or poor attitudes, lack of continuity, lack of choice, and lack
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of trust as hindering support. Most women were unaware of the services available for support in the wider community outside of their health care provider and were most likely to utilize breast cancer volunteers and most likely to be aware of (but not attend) breast cancer support groups.

These studies are hampered by small sample size and poor methodology. The data were quantitative, but the researchers performed the data analysis as if it were qualitative data. Primarily, they failed to perform meaningful statistical analyses on the data and simply included descriptive statistics relying heavily on participants’ free responses when further statistical tests would have been beneficial to the overall analysis. It then would have been appropriate to use limited excerpts that strongly supported the analysis and reflected the quantitative data. However, this does not negate the noteworthy personal concerns identified by the women (fear of breast cancer reoccurrence and psychological and emotional concerns) as well as the both positive and negative actions identified by the women health care providers can take to provide (or not) support to women with breast cancer. The authors insightfully conclude that these findings indicate, “cancer patients need support, honesty, sensitivity and information, and are harmed by poor communication with health professionals who care for them, a lack of follow-up, or feelings of distrust or abandonment” (p. 51). This is true for women diagnosed with breast cancer in the U.S. as well.

Passik et al. (2000) article does not specifically examine depression among rural women with breast cancer it does address an important issue for health care providers in rural areas. Passik and colleagues examined a group of rural oncology staff’s
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(physicians and nurses) ability to recognize depressive symptoms in two cancer patients.
The oncology staff were trained in the Mini-International Neuropsychiatric Interview (MINI) specific to DSM-IV criteria for major depression and adjustment disorder. The staff then viewed videotapes of the patients being interviewed with the MINI and were asked to rate the presence or absence of depressive symptomology and to then diagnose the patient according to the MINI interview schedule. Oncologists and nurses did quite well and were able to recognize a fairly straightforward presentation of depression using the MINI; however they were much less confident of their diagnosis of adjustment disorder in the second case which was much less clear with more subtle symptomology. The authors recommended use of screening tools to identify those patients at high risk for depression and appropriate for MINI assessment. Furthermore, they underscored the absolute necessity of repeated use of new diagnostic tools to maximize the benefit of identifying depressed patients. However, more than endorsing a single depression assessment tool, this research is noteworthy in that it indicates that in order to identify depressed cancer patients, health care providers must be aware of and looking for the problem in all patients due to its pervasive presence in cancer patients.

Summary

The current body of research clearly demonstrates the significant impact breast cancer treatment-related depression and fatigue have on morbidity, mortality, and quality of life for those suffering with breast cancer. Furthermore, the literature suggests that breast cancer disease burden and mortality is greater for rural women, however, minimal
literature exists related to rural-urban differences in the experience of breast cancer
treatment-related depression, fatigue, and quality of life.
CHAPTER THREE

Research Design

The following research design reflects the methods, sample, setting, interventions, and instruments of the Telephone Intervention Project. However, the data analysis plan presented here reflects the plan for answering the research questions of this study through various statistical methods.

Methods of Umbrella Study

The Telephone Intervention Project was a repeated measures experimental design comparing the effectiveness of the 6 week TIP-C intervention, a 6 week self-managed exercise program (SEP) intervention, and the 6 week UC control intervention on women with breast cancer and their partners’ abilities to manage depressive symptoms and fatigue, improve quality of life, enhance cancer knowledge and social support, reduce stress, and improve partner relations. Measurements of the various outcome variables were taken at baseline upon enrollment into the study (T1), upon completion of the study (T2), and 1 month after T2 (T3) for all subjects.

Research Questions

The following research questions will be answered by this study:

1. What are the demographic differences between rural and urban women who participated in the Telephone Intervention: Rural Women with Cancer & Partners at baseline?
2. What are the differences between urban and rural women’s abilities to manage cancer treatment-related symptoms of depression and fatigue who participated in the telephone intervention counseling compared to usual care over time?

3. What are the differences between urban and rural women’s quality of life who participated in the telephone intervention counseling compared to usual care over time?

**Interventions**

For the purposes of this study, only data on the outcome variables from the women participants in the TIP-C and UC interventions will be utilized in this analysis. The TIP-C and UC interventions are described below.

*Telephone-delivered interpersonal counseling intervention.* The telephone-delivered interpersonal counseling intervention (TIP-C) is based on interpersonal psychotherapy in which the primary focus is on interpersonal functioning and the role it has in initiating and sustaining depressive symptomology (Badger, 2002; Badger, Segrin et al., 2004; Badger et al., in press). TIP-C differs somewhat from traditional interpersonal psychotherapy in that information about cancer, its treatment, side effects, and interpersonal influences and interventions to treat side effects are included, as is the woman’s partner. Furthermore, the intervention is short-term (six weeks, one 30 minute session per week) and delivered over the phone. The partners received three 30 minute sessions over the same six week time period. The practitioner uses an exploratory stance to assess and address the woman’s and her partner’s most immediate and relevant issues and concerns during the session.
Attentional-usual care control intervention. The attentional-usual care control (UC) intervention was designed to compare TIP-C to usual care and to protect against the Hawthorne effect. Women and their partners in this group received a resource list about cancer and its treatment from Dr. Susan Love’s Breast Book (2000). This list is a compilation of books, websites, and other resources covering a range of topics including psychosocial/emotional aspects, reconstruction, financial aid, clinical trials, and political action. The women were phoned to determine if they had received the list and if they had any questions regarding the list (the attention aspect of the intervention). If questions arose they were answered and the woman and/or her partner were referred to the resource list and their primary care provider if need be. Counseling or encouragement to exercise were not included in the sessions. The women were phoned once a week for six weeks and sessions lasted approximately 10 minutes; while the partners were phoned three times over the six week period with sessions lasting again approximately 10 minutes.

Sample & Setting

Inclusion criteria for the women participants: stage 1-3 breast cancer, currently receiving treatment for breast cancer or within 6 months post-treatment, over age 21, English-speaking, access to a telephone. Inclusion criteria for partners: nominated by the woman, over age 21, English-speaking, access to a telephone. Women in each intervention group will be matched for type of treatment and stage of cancer.

Recruitment of participants for the Telephone Intervention Project occur through two primary mechanisms: health care providers/volunteers and through brochure advertising. Health care providers and volunteers in both the rural and urban clinical
settings introduced the study by providing a brochure about the study to the women with breast cancer and their partners (Badger, 2002). Additionally, investigators placed brochures advertising the study in the waiting rooms of various statewide facilities where women receive breast cancer treatment (e.g., all Arizona Oncology Associates Offices), as well as, in the new patient packets at the Arizona Cancer Center, and at support groups throughout the state. The brochure contains contact information including a toll-free number, email address and fax number for the research team should the woman wish to participate in the study.

The settings for the Telephone Intervention Project include the University of Arizona, College of Nursing; the Arizona Cancer Center (Tucson, AZ) and its satellites (Sierra Vista, AZ); and the Arizona Oncology Associates located throughout the state (Badger, 2002, p. 58)

Protection of Human Subjects

The original study, the Telephone Intervention Project, was reviewed and approved by the institutional review board (IRB) of the Arizona Health Sciences Center of the University of Arizona. This secondary analysis of the Telephone Intervention Project was reviewed and approved by the IRB as well. Participant confidentiality was maintained through the use of de-identified computer summaries of raw data (i.e. demographic and illness characteristics data, and depression, fatigue, and quality of life scores) for statistical analysis.
Data Collection & Instruments

Data collection at baseline in the Telephone Intervention Project has been accomplished by trained nurse counselors who also administer the interventions to the study participants and their partners. The data collectors at T2 and T3 were different than the nurse counselor participating in the intervention. The nurse counselors were advanced practice nurses with expertise in psychiatric-mental health nursing or oncology nursing receiving an additional 21+ hours of training by experts in cancer, treatment, depressive symptoms, fatigue and interpersonal counseling techniques. Training includes classroom instruction, outside class readings, and supervised practice sessions with ‘pretend’ patients. (p. 63). Nurse counselors have also received an additional 8 hours of training in data collection and data management (p. 64).

A variety of instruments have been used in the Telephone Intervention Project to obtain demographic data on the participants and their partners, and to measure the various outcome variables: depressive symptoms, mood, fatigue (women only), social support, stress, quality of life, relationship satisfaction, and cancer knowledge. These instruments were used to collect data from both the women and their partners at each of the measurement times; however, only those data collected from the women participants will be used in the data analysis for this study. Only data related to depression, fatigue, and quality of life will be used in the analysis to answer the research questions of this study.

Table 1 (See Chapter Four: Results) contains the instrument-concept measured and reliability information from which data for this study were obtained, including their reliability data based on the data analyzed in this study. Participant information was
obtained in the investigator produced Demographic and Illness Survey – a 29 item checklist taking approximately 5 minutes for participants to complete. The instrument used to measure depressive symptoms – the Center for Epidemiological Studies Depression Scale (CES-D) – produces a summed score with a range of 0-60 with higher scores indicating greater depressive symptoms (Radloff, 1977). The Multidimensional Fatigue Inventory (MFI) has various subscales which once summed produce a score of general fatigue ranging from 4-28 with higher scores indicating lower fatigue (Smets, Garssen, Bronke, & de Haes, 1995). Health related quality of life (QOL) was measured using the Medical Outcomes Study (MOS-SF-36) Short Form, a 12 item version (MOS-SF-12) with a summed score ranging from 0-100 with higher scores indicating greater quality of life (Essink-Bot, Krabbe, Bonsel, & Aaronson, 1997). The MOS-SF-12 has two subscales measuring quality of life as defined by physical health and mental health.

Data Analysis Plan

Statistical analysis software at the University of Arizona, College of Nursing, Office of Nursing Research will be used to perform descriptive statistical analyses of the sample. Chi-square and t-tests (at a significance level of .05) will be used to answer research question one: What are the demographic differences between rural and urban women who participated in the Telephone Intervention: Rural Women with Cancer & Partners? Repeated measures analysis of variance (ANOVA) will be used to answer research questions two and three: What are the differences between urban and rural women’s abilities to manage cancer treatment-related symptoms of depression and fatigue who participated in the telephone intervention counseling over time?; and What
Differences Between Urban & Rural Women with Breast Cancer

are the differences between urban and rural women’s quality of life who participated in
the telephone intervention counseling over time?

Conclusion

A significant gap in knowledge exists related to rural women and their partners’
experience of breast cancer treatment-related depression and its effect on their quality of
life. Literature is clear, however, that depression in women with breast cancer
significantly effects their quality of life, experience of other symptoms, and their
mortality. A definite need exists then, to examine these phenomena in rural women and
determine if urban and rural differences are present. This information which will be
gleaned from this study, would greatly inform oncology nursing and advanced nursing
practice in rural communities by simply describing the phenomenon of breast cancer
treatment-related depression in rural women and their partners. Additionally, the
Telephone Intervention Study will offer great insight and direction to practice by
clarifying the effect of community based psychosocial interventions on the burden of
depression in rural women and their partners.
CHAPTER FOUR

Results of Analysis of Data

Chapter Four presents the results of the analysis of data of the Telephone Intervention Project for this study. Descriptive statistics were used to describe the sample; while t-tests and Chi-square analyses were used to examine the demographic differences among urban and rural participants. Repeated measures ANOVA was used to examine differences among urban and rural participants in the treatment (telephone delivered interpersonal counseling intervention or TIP-C) versus control (attentional-usual care control intervention or UC) groups over time. The level of significance used in this study was $p \leq .05$.

Sample Description

Table 1 contains the instrument-concept measured and reliability information from which data for this study were obtained, including their reliability data based on the data analyzed in this study.

The total sample size for this study was $N = 69$. Forty-nine (71.0%) participants were classified as urban and 20 (28.9 %) as rural (See Table 2). Of the 49 urban participants, 26 (53.1%) were in the TIP-C treatment intervention and 23 (46.9%) were placed in the UC, control intervention. Sixty percent (n = 12) of the rural participants were in the TIP-C and 40.0% (n = 8) were in the UC. Of the total sample, 38 (55.1%) participants were enrolled in TIP-C the treatment intervention, and 31 (44.1%) in the UC control intervention.
Table 1

*Instruments*

<table>
<thead>
<tr>
<th>Concept</th>
<th>Measure</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cronbach’s alpha on Standardized Items</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>CES-D</td>
<td>.87</td>
</tr>
<tr>
<td></td>
<td>MFI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Fatigue</td>
<td>.79</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Physical Fatigue</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td>Mental Fatigue</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>Reduced Activity</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td>Reduced Motivation</td>
<td>.70</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>Physical Health</td>
<td>.81</td>
</tr>
<tr>
<td></td>
<td>Mental Health</td>
<td>.86</td>
</tr>
</tbody>
</table>

Tables 3 includes the sample description and selected demographic data for level of education and race/ethnic background. A more extensive discussion of demographic characteristics of the sample will be included in relation to Research Question One.
Differences Between Urban & Rural Women with Breast Cancer

Table 2

Urban versus Rural Participants by Group

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th></th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>55.1</td>
<td>31</td>
</tr>
<tr>
<td>Urban</td>
<td>26</td>
<td>53.1</td>
<td>23</td>
</tr>
<tr>
<td>Rural</td>
<td>12</td>
<td>60.0</td>
<td>8</td>
</tr>
</tbody>
</table>

A majority of the urban (77.6%) and the rural (75.0%) participants were educated beyond high school – including vocational education, some college education, completed college, or post-graduate or professional degree. Similarly, a majority of both the urban (85.7%) and rural (75.0%) samples were white. Twenty-five percent of the rural sample was classified as Hispanic, while only 12.2% of the urban sample was classified thus.
Table 3

Level of Education and Race/Ethnicity by Urban/Rural Groups

<table>
<thead>
<tr>
<th>Highest level of education</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Middle school</td>
<td>2</td>
<td>4.1</td>
</tr>
<tr>
<td>High school</td>
<td>9</td>
<td>18.4</td>
</tr>
<tr>
<td>Vocational/some college</td>
<td>14</td>
<td>28.6</td>
</tr>
<tr>
<td>College</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>Post-graduate/professional</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>Race/Ethnic background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>6</td>
<td>12.2</td>
</tr>
<tr>
<td>White</td>
<td>42</td>
<td>85.7</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Research Question One

Research question one examines the demographic differences between the urban and rural women participants in the Telephone Intervention Project at baseline (T1). T-tests ($p \leq .05$) were used to analyze between group differences for interval level demographic data such as age, years married, number of children, call length, etc. Chi-square tests ($p \leq .05$) were utilized to examine nominal level data, such as marriage status, race/ethnicity, employment status, cancer stage and treatment, for between group
Differences Between Urban & Rural Women with Breast Cancer

The urban and rural participants of the Telephone Intervention Project had no statistically significant differences for age, years married, level of education, number of children at home, total call time, marital status, race/ethnicity, employment status, stage of cancer at diagnosis, and type of treatment (Tables 4, 5, 6). However, there was a trend toward significance ($p \leq .10$) with regard to total number of children with rural women trending toward a slightly higher average number of children (Table 4).

The average age of urban participants was approximately 54 years old and rural participants averaged 55 years old (Table 4). The majority of both urban (73.5%) and rural (65.0%) participants were married. Urban married participants tended to be married 22 plus years on average, while rural participants on average were married 27 plus years. The total call time for urban participants averaged 140.0 minutes and for rural participants averaged 148.0 minutes (Table 4). Average call time per session was similar for both urban and rural women with 23.3 minutes/session for urban participants and 23.5 minutes/session for rural participants. Interestingly, the rural participants demonstrated less deviation for total call time than urban participants. The standard deviation of total call time for urban participants was 97.8 minutes, but only 76.0 minutes for rural participants (Table 4). While not significant, more urban participants were unemployed than rural participants and more rural women were working full-time than urban participants (Table 5).
There were no statistically significant differences in stage of cancer or treatment modality for participants regardless of group assignment (Table 6). Approximately 85% of both urban and rural participants were diagnosed with stage I or II breast cancer (p = .42). Thirty-five percent of rural and urban participants were diagnosed at stage I; while 50.0% of urban and 55.0% of rural participants were diagnosed at stage II. Eighty percent of rural participants and 66.0% of urban participants received chemotherapy (p = .25); while approximately 60% of urban participants received radiation therapy and only 45.0% of rural participants received this form of treatment (p = .27). The majority of both urban and rural participants did not receive hormone treatment (57.4% and 65.0%, p = .56) or any other form of treatment (97.9% and 100.0%, p = .51).
Table 5

Marital & Employment Status by Urban/Rural Groups

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th></th>
<th>Rural</th>
<th></th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Current marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>36</td>
<td>73.5</td>
<td>13</td>
<td>65.0</td>
<td>.48</td>
</tr>
<tr>
<td>Unmarried</td>
<td>13</td>
<td>26.5</td>
<td>7</td>
<td>35.0</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed (seeking employment)</td>
<td>7</td>
<td>15.2</td>
<td>1</td>
<td>5.0</td>
<td>.16</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>10</td>
<td>21.7</td>
<td>1</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Employed full-time</td>
<td>19</td>
<td>41.3</td>
<td>13</td>
<td>65.0</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>10</td>
<td>21.7</td>
<td>5</td>
<td>25.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 6

*Stage of Cancer and Treatment Type by Urban/Rural Groups*

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Stage of Cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>17</td>
<td>35.4</td>
<td>7</td>
</tr>
<tr>
<td>II</td>
<td>24</td>
<td>50.0</td>
<td>11</td>
</tr>
<tr>
<td>III</td>
<td>7</td>
<td>14.6</td>
<td>2</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>34.0</td>
<td>4</td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
<td>66.0</td>
<td>16</td>
</tr>
<tr>
<td>Radiation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>40.4</td>
<td>11</td>
</tr>
<tr>
<td>Yes</td>
<td>28</td>
<td>59.6</td>
<td>9</td>
</tr>
<tr>
<td>Hormone Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>57.4</td>
<td>13</td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>42.6</td>
<td>7</td>
</tr>
<tr>
<td>Other Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>46</td>
<td>97.9</td>
<td>20</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>2.1</td>
<td>0</td>
</tr>
</tbody>
</table>
Research Question Two

Research question two examined the urban and rural women’s abilities to manage cancer treatment-related symptoms of depression and fatigue who participated in the telephone intervention counseling, TIP-C (the treatment group), compared to the attentional-usual care, UC (the control group), over time. Repeated measures analysis of variance (ANOVA) were used to analyze interval level data generated from participant scores from the various instruments based on urban/rural group status and treatment versus control group assignment over time. Measurements of the various outcome variables were taken at baseline upon enrollment into the study (T1), upon completion of the study (T2), and 1 month after T2 (T3) for all subjects. Between subjects analysis (significance p ≤ .05) occurred at baseline.

Depression

Repeated measures ANOVA of mean CES-D scores revealed no significant differences in depressions scores regardless of urban and rural women’s assignment in the treatment (TIP-C) or control (UC) groups (F = 1.21; p = .25). Table 7 presents these group means over time (T1-T3).
Table 7

*Mean Depression CES-D Scores by Urban/Rural and Treatment Group Assignment Over Time*

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Urban</td>
<td>13.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Rural</td>
<td>11.7</td>
<td>14.2</td>
</tr>
</tbody>
</table>

There was, however, a trend effect (p = .085) for treatment group at baseline. As seen in Figure 3, mean depression scores for the control group (UC) are much lower than those for the treatment group (TIP-C) at baseline entry into the study, T1. Mean depression scores at T1 in the treatment group were 12.4 and only 9.1 in the control group. This trend toward significance suggests a baseline group difference in depression levels. Nevertheless, for participants in both TIP-C and UC depression scores are slightly higher at T2 upon completion of the study than they were upon at baseline, T1. One month after completion of the study (T3) depression scores return toward baseline for the control group but remain stable for the treatment group. Differences of one point can be explained by normal fluctuations in scores over time.
Urban and rural participants did not have significantly different mean depression scores at baseline (p = .68). However, the plot of mean depression scores over time reveals possible trends, that while not significant in the overall ANOVA analysis, demonstrate possible differences between these two populations of women. Figure 4 plots the mean depression scores by urban/rural status over time. At T1 rural and urban depression scores are similar at 10.9 for rural and 10.5 for urban. Upon completion of the study (represented by T2) mean depression scores for the urban and rural participants have diverged greatly. Rural depression scores average 13.2 at T2; whereas urban scores only averaged 11.6. This represents a 2.1 point increase for rural participants in depression scores and a 1.1 point increase for urban participants in depression scores. By one month post-study (T3) rural and urban scores converge and approach baseline depression scores but remain higher than upon entry into the study with rural participants continuing to have higher depression scores than urban participants on average. Overall,
rural participants evidenced a greater increase in depression scores throughout the data collection period.

![Graph showing depression scores by urban/rural over time](image)

**Figure 4.** Mean depression scores by urban/rural over time.

**Fatigue**

The Multidimensional Fatigue Inventory (MFI) has various subscales which once summed produce a score of general fatigue ranging from 4-28 with higher scores indicating less fatigue. The data for the subscales – physical fatigue, mental fatigue, reduced activity, and reduced motivation – is also analyzed and presented here.

**General fatigue.** Table 8 presents the mean MFI general fatigue scores by urban/rural and treatment group over time. Repeated measures ANOVA demonstrated no significant differences for means over time for general fatigue ($F = 0.77; p = .74$). Of interest to note, however, is that both urban and rural participants in the UC control group had much higher (almost two full points) general fatigue scores at baseline than did their
counterparts in the TIP-C treatment group, indicating less fatigue. Rural participants’
general fatigue scores in the UC control group increased at T2 and dropped below
baseline at T3, indicating more fatigue. Rural participants in TIP-C had the same mean
general fatigue scores at T1 and T2 but increased to levels similar to UC control levels at
baseline by T3; again having less fatigue at T3.

Table 8

*Mean MFI General Fatigue Scores by Urban/Rural and Treatment Group Assignment Over Time*

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>6.6</td>
<td>6.9</td>
<td>5.9</td>
<td>8.4</td>
<td>7.2</td>
<td>8.0</td>
</tr>
<tr>
<td>Rural</td>
<td>6.4</td>
<td>6.4</td>
<td>8.5</td>
<td>8.6</td>
<td>10.1</td>
<td>7.4</td>
</tr>
</tbody>
</table>

The TIP-C and UC general fatigue scores differed at baseline; however, the
differences were not statistically significant (p = .13). Average general fatigue scores
were higher in the UC control group indicating less fatigue in this analysis at baseline.

General fatigue scores at baseline for the control group were 8.5 and for the treatment
group, 6.5. General fatigue scores rose slightly at T2 for both the treatment and control
groups indicating less fatigue, then dropped sharply below baseline for the control group
to 7.7. General fatigue scores rose slightly again for the treatment group to 7.2 at T3.

Figure 5 graphically represents the mean general fatigue scores for the treatment and
control groups over time.
Figure 6 demonstrates the mean general fatigue scores for the urban and rural participants over time. At baseline urban and rural participants had general fatigue scores of 7.5 on the MFI. Rural general fatigue scores rose steeply upon completion of the study (T2) indicating less fatigue, but then returned toward baseline at T3. This differs greatly from what occurred for urban participants in that their general fatigue scores declined over the data collection points indicating greater levels of fatigue over the data collection points; although these changes in fatigue level were not statistically significant.
Figure 6. Mean general fatigue scores by urban/rural over time.

Physical fatigue. Table 9 includes the MFI physical fatigue scores by urban/rural and treatment group over time. Repeated measures ANOVA revealed no significant between groups in physical fatigue, regardless of group assignment over the various data collection points (F = 1.08; p = .37). However, there were trend effects for treatment group and urban/rural status over time (F = 3.68; p = .06). Urban participants in the treatment and control groups had similar levels of physical fatigue at baseline entry into the study. However, by T3 urban participants in the control group had increased physical fatigue scores indicating less fatigue than their treatment group counterparts. Interestingly, rural participants in the treatment group began the study with slightly lower on average physical fatigue scores indicating higher fatigue than all of the other groups of participants. Nevertheless, upon completion of the study they ended up with physical fatigue scores similar to those of urban participants in the control group. Rural
participants in the control group began the study with the highest mean physical fatigue
scores (less fatigue) and ended the study with the lowest mean scores (more fatigue).

Table 9

*Mean MFI Physical Fatigue Scores by Urban/Rural and Treatment Group Assignment*

*Over Time*

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Urban</td>
<td>9.2</td>
<td>9.0</td>
</tr>
<tr>
<td>Rural</td>
<td>8.3</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Figure 7 visually represents the mean physical fatigue scores for participants in
the treatment (TIP-C) and control groups over time. Similar to the depression and
general fatigue scores, the treatment group and control group average physical fatigue
scores differed at baseline (p = .77). Physical fatigue scores steadily rose to 9.6 at T3 for
the treatment group indicating less physical fatigue than at baseline; while control group
scores decreased to a low of 8.9 at T2 indicating higher fatigue and then scores rose again
at T3 to stabilize at baseline.
Similar to the depression scores (Figure 4) and general fatigue scores (Figure 6) for urban and rural participants, the physical fatigue scores for these groups are similar at baseline and diverge over the course of the data collection points (Figure 8). The mean physical fatigue scores for both the urban and rural participants at baseline are 9.4. However upon completion of the study, urban participants’ physical fatigue scores are much lower than their rural counterparts indicating an increase in fatigue from baseline, but then scores rise steeply at T3 (one month after completion of the intervention). In essence, by T3, urban participants report less fatigue than do rural participants, although the differences are not statistically significant. These differences in physical fatigue scores for urban and rural participants over time can be seen in Figure 8.
Figure 8. Fatigue as defined by physical fatigue by urban/rural over time.

*Mental fatigue.* Table 10 includes the MFI mental fatigue scores by urban/rural and treatment group over time. The treatment and control groups’ mental fatigue scores differed at baseline, with the TIP-C group evidencing more mental fatigue (Figure 9). While these differences were not statistically significant ($F = 1.20; p = .25$); there were statistically significant differences in mental fatigue scores over time ($F = 3.87; p = .05$). Over time, the treatment group evidenced steady increases in mental fatigue scores indicating less mental fatigue; whereas the control group had mental fatigue scores slightly higher than baseline scores by T3 indicating stable mental fatigue. However, control group mental fatigue scores remain higher over all data collection points than treatment group scores indicating overall less mental fatigue for participants in the control group. It is interesting to note, however, that urban participants’ mental fatigue
scores remain higher (indicating less mental fatigue) than rural participants across all data collection points (Figure 10).

Table 10

*Mean MFI Mental Fatigue Scores by Urban/Rural and Treatment Group Assignment*

*Over Time*

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th></th>
<th></th>
<th>UC</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
<td>T3</td>
<td>T1</td>
<td>T2</td>
<td>T3</td>
</tr>
<tr>
<td>Urban</td>
<td>8.7</td>
<td>8.8</td>
<td>9.4</td>
<td>10.8</td>
<td>11.4</td>
<td>11.5</td>
</tr>
<tr>
<td>Rural</td>
<td>7.4</td>
<td>8.5</td>
<td>9.8</td>
<td>9.0</td>
<td>10.4</td>
<td>9.4</td>
</tr>
</tbody>
</table>

*Figure 9. Fatigue as defined by mental fatigue by TIP-C versus UC over time.*
Figure 10. Fatigue as defined by mental fatigue by urban/rural over time.

Reduced activity. Table 11 consists of the MFI reduced activity scores by urban/rural and treatment group over time. Repeated measures ANOVA demonstrated no significant differences in mean reduced activity levels for treatment group by urban/rural over time ($F = 1.23; p = .23$). Activity levels appear to be fairly consistent for urban participants in both the treatment (TIP-C) and control (UC) groups and for rural participants in the control group over the data collection points. However, rural participants receiving the intervention had the highest mean reduced activity levels one month post-study (T3), indicating more activity or less reduced activity.
Table 11

Mean MFI Reduced Activity Scores by Urban/Rural and Treatment Group Assignment Over Time

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Urban</td>
<td>10.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Rural</td>
<td>10.6</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Figure 11 represents the mean reduced activity scores for the participants in the treatment and control groups over time. Baseline levels of activity were not statistically different (p = .62). Over the course of the study, mean reduced activity scores lowered to below baseline levels for the control group indicating less activity; while the treatment group had a dramatic rise in reduced activity scores at T2 with scores continuing to rise at T3, indicating more activity over time.

Figure 12 pictures the mean reduced activity scores by urban/rural group over time. Baseline levels of activity are similar between the rural and urban participants. Both the urban and rural participants’ experience a greater mean score for reduced activity upon completion of the study (T2). However, at T3, rural participants experience an increase in reduced activity scores indicating more activity while their urban counterparts return to near baseline levels of reduced activity indicating stable activity levels over time.
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Figure 11. Fatigue as defined by reduced activity by TIP-C versus UC over time.

Figure 12. Fatigue as defined by reduced activity by urban/rural over time.

Reduced motivation. Table 12 consists of the MFI reduced motivation scores by urban/rural and treatment group over time. Repeated measures ANOVA demonstrated no
significant differences in reduced motivation means for treatment group by urban/rural over time ($F = 0.41; p = .99$). Rural treatment and urban control means for reduced motivation are similar at baseline, with urban treatment means the lowest indicating the greater reduced motivation (or less motivation). Rural participants’ in the treatment group have persistently higher reduced motivation scores across all data collection points indicating less reduced motivation (or greater motivation).

Table 12

*Mean MFI Reduced Motivation Scores by Urban/Rural and Treatment Group Assignment Over Time*

<table>
<thead>
<tr>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
</tr>
<tr>
<td>Urban</td>
<td>10.4</td>
</tr>
<tr>
<td>Rural</td>
<td>12.2</td>
</tr>
</tbody>
</table>

Figure 13 includes the mean reduced motivation scores for TIP-C treatment group participants versus their UC control group counterparts over time. At baseline and upon completion of the study the control group had higher mean reduced motivation scores (less reduced motivation or more motivation) than the TIP-C group, although not significant. In both groups, the participants had less reduced motivation by T2, but returned to greater reduced motivation similar to baseline by T3. The UC group had the sharpest drop in motivation with the TIP-C group maintaining more of its gains.
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Figure 13. Fatigue as defined by reduced motivation by TIP-C versus UC over time.

Figure 14 represents the mean reduced motivation scores for the urban and rural participants over time. Over the course of the study both the urban and rural participants experienced an increase in reduced motivation scores at T2 indicating less reduced motivation. At T3, reduced motivation levels fell to below baseline levels for both of the groups of participants indicating greater reduced motivation. Again, the urban participants had lower reduced motivation scores indicating greater reduced motivation than their rural counterparts over time.
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Figure 14. Fatigue as defined by reduced motivation by urban/rural over time.

**Summary**

Few of the results for research question two were statistically significant. However, there were some trend effects for group differences for depression scores at baseline by treatment group and for physical fatigue by treatment group and urban/rural status over time. Participants in TIP-C treatment group in general had higher depression scores at baseline and overtime compared to participants in the UC control group. The TIP-C group also had improving physical and mental fatigue; while the control group had worsening physical and mental fatigue over time.

Participants in TIP-C also had less general fatigue; greater overall mental fatigue; and greater activity and motivation over time compared to UC participants over time (although differences were not significant). Rural participants had higher depression scores; greater physical and mental fatigue; less general fatigue; but were more active and
Differences Between Urban & Rural Women with Breast Cancer

had greater motivation than their urban counterparts overtime (although these differences were not significant either).

Research Question Three

Research question three examined the differences between the urban and rural women’s quality of life who participated in the telephone intervention counseling compared to usual care over time. Health related quality of life (QOL) was measured using the Medical Outcomes Study (MOS-SF-36) Short Form, a 12 item version (MOS-SF-12) with a summed score ranging from 0-100 with higher scores indicating greater quality of life. Repeated measures analysis of variance (ANOVA) (significance $p \leq .05$) were used to analyze interval level data generated from participant scores of the two subscales of the MOS-SF-12 measuring quality of life as defined by physical health and mental health.

Physical Health

Table 13 consists of the MOS-SF-12 physical health related quality of life scores by urban/rural and treatment group over time. Repeated measures ANOVA demonstrated no significant differences in mean physical health scores for treatment group by urban/rural over time ($F = 1.42; p = .11$). However, there was a significant ($F = 7.40; p = .01$) time by treatment group interaction for physical health. As seen in Table 13 and in Figure 15 in which mean MOS-SF-12 physical health scores are plotted by treatment group over time, the time by treatment group interaction is readily apparent. At baseline (T1) participants in the control group had higher physical health scores than those in the
treatment group. Physical health scores plummet dramatically for the control group; while the participants in the treatment group have significantly higher physical health scores over time.

Table 13

*Mean MOS-SF-12 Physical Health Scores by Urban/Rural and Treatment Group
Assignment Over Time*

<table>
<thead>
<tr>
<th></th>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Urban</td>
<td>55.9</td>
<td>60.5</td>
</tr>
<tr>
<td>Rural</td>
<td>56.5</td>
<td>61.5</td>
</tr>
</tbody>
</table>

*Figure 15.* Physical health related quality of life by TIP-C versus UC over time.

Figure 16 presents the mean MOS-SF-12 physical health scores for the urban and rural participants over time (p = .17). The urban and rural participants have similar
physical health scores at baseline. Upon completion of the study, however, physical health scores differ greatly. Urban participants experience higher physical health scores than rural participants at T2 and then again at T3, indicating greater physical health related quality of life over time. The rural participants’ physical health scores plummet at T2 and do not recover to baseline at T3; indicating an overall lower physical health related quality of life over time.

![Estimated Marginal Means](image)

Figure 16. Physical health related quality of life by urban/rural over time.

**Mental Health**

Table 14 consists of the MOS-SF-12 mental health related quality of life scores by urban/rural and treatment group over time. Repeated measures ANOVA demonstrated significant differences in mean mental health scores for treatment group by urban/rural over time ($F = 2.03; p = .01$). Additionally, there was a trend effect ($F = 3.07; p = .09$) for time by treatment group interaction for mental health related quality of life.
The data in Table 14 clearly demonstrate the significant effect TIP-C had on both the urban and rural participants’ mental health related quality of life. Even though the urban treatment and control groups’ scores differ greatly at T1, over the data collection points the mental health scores for the control group vary little, however, they significantly increase for the treatment group. Among the rural participants in the treatment group the intervention had a positive effect and at T3 mental health scores were significantly higher than upon entry into the study. Conversely, their counterparts in the control group experienced a slight increase in mental health scores at T2; but at T3 had a significant reduction in mental health scores below their baseline levels. Of interest to note is the fact that on average rural participants in the treatment group had higher mental health scores than their urban counterparts, although not statistically significant.

Table 14

*Mean MOS-SF-12 Mental Health Scores by Urban/Rural and Treatment Group*

*Assignment Over Time*

<table>
<thead>
<tr>
<th>Assignment</th>
<th>TIP-C</th>
<th>UC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Urban</td>
<td>55.5</td>
<td>63.0</td>
</tr>
<tr>
<td>Rural</td>
<td>63.1</td>
<td>66.3</td>
</tr>
</tbody>
</table>
Figure 17. Mental health related quality of life by TIP-C versus UC over time.

Figure 18 represents the mean MOS-SF-12 mental health scores for the urban and rural participants over time. At baseline, rural participants had slightly higher average mental health scores than their urban counterparts. Both groups evidenced an increase in mental health related quality of life by T3; however by T3 the results were mixed. In the urban group, mental health related quality of life remained relatively stable from T2 to T3. In contrast, in the rural group there was a dramatic decrease between T2 and T3 for mental health related quality of life.
Summary

This chapter contains the results of the data analysis for each of the three research questions. The specific data are also included as tables and figures in the discussion of the results.
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CHAPTER FIVE

Discussion

This chapter presents the results and conclusions of this study related to the conceptual framework and literature review. Also included in this chapter are the implications for nursing practice, the limitations of this study, and recommendations for future research.

Results and Conclusions

No significant differences were found between the urban and rural participants in the Telephone Intervention Project at baseline for the demographic or illness characteristics. The urban and rural participants were similar in age, marital status, employment, call length, ethnicity, stage of breast cancer at diagnosis, and treatment type. Rural participants had more children than their urban counterparts in this study. In this study urban and rural participants were similar.

These findings differ somewhat from the literature. Urban and rural differences in stage of breast cancer at diagnosis and form of treatment for breast cancer have been demonstrated to exist in the literature. According to the literature, rural women have higher incidences of breast cancer, are generally in more advanced stages of disease at diagnosis, have poorer prognoses, and are less likely to receive the same treatment options as their urban counterparts (Badger, 2002; HHS Rural Task Force, 2002; Weinert, 2002; Bushy, 1998). Similarities between the urban and rural participants and their form of treatment may be due to similarity of setting. Rural participants may have
been diagnosed and received treatment for their breast cancer through satellite clinics of larger tertiary care networks and cancer centers of the state which might offer consistency in form of treatment with what is offered to urban women receiving care in the urban centers.

*Depression*

There were no significant differences between groups for depression scores over time. There was a trend toward a significant group difference in depression scores at baseline for the TIP-C and UC groups. This suggests that in fact the treatment and control groups were not equal, but had differing levels of depression upon entry into the study. Perhaps a larger overall sample size would have added statistical power to the analysis to produce significant results for this between groups difference in baseline depression scores. In examining Figure 3, mean depression scores for participants in both TIP-C and UC had elevations in depression at T3 from T1, although not significant. While one might be tempted to conclude that TIP-C was ineffective or, in fact, resulted in increased depression levels in this sample of women with breast cancer; these conclusions would be in error. Due to the baseline difference in depression scores between the treatment and control groups, one must first question the similarity of the groups. Any assumptions made about the effectiveness of TIP-C altering depression scores in women with breast cancer is founded in an experimental design in which the treatment and control groups are similar. If the two groups are not similar, the control group has failed as such and conclusions about the treatment are questionable.
In the conceptual framework underlying this study (see Chapter 1: *Conceptual Framework*), it is postulated that depressive symptoms in a woman with breast cancer disrupt the interpersonal relationships which provide social support for that woman and modulate the negative cancer treatment related responses (i.e. depression and fatigue) (Badger, Segrin et al., 2004; Badger et al., in press). As interpersonal relationships providing social support are disrupted, depression and fatigue increase, and quality of life decreases for the woman with breast cancer (Badger, Segrin et al., 2004; Badger et al., in press). In the framework, TIP-C, as a treatment intervention, targets the interpersonal components of social support; thus providing social support and cancer knowledge to the women participants, and in so doing decreasing depression and fatigue, and increasing quality of life (see Figure 2). Thus, one would have expected reduced depression scores for both the urban and rural participants in the TIP-C treatment group compared to their counterparts in the UC control group.

Improved depression scores for the urban and rural participants in the TIP-C treatment group compared to their counterparts in the UC control group would have also been consistent with the literature and previous psychosocial support/cognitive-behavioral intervention studies (Badger et al., 2001; Badger et al., 2004; Antoni et al., 2001).

These findings are important additions to the current body of knowledge in that there are no previous studies examining urban/rural differences in depression scores among women with breast cancer. However, it is known that rural women have higher
rates of depression than their urban counterparts: two to four times more rural women are depressed compared to urban women (Mulder et al., 2001).

**Fatigue**

*General Fatigue*

There were no significant differences between groups for general fatigue scores over time. Interestingly, both the urban and rural participants in the UC control group have higher, although not statistically significant, general fatigue scores compared to their counterparts in the TIP-C treatment group across all data collection points. These higher general fatigue scores indicate less fatigue for participants in the urban and rural UC groups. However, when analyzing the TIP-C and UC general fatigue scores separately as seen in Figure 5, TIP-C group members reported higher general fatigue scores indicating less general fatigue at T3 than their control group counterparts, although not statistically significant. Furthermore, Figure 6 indicates that rural participants actually had improvements in their fatigue levels with the intervention (T2) and that fatigue levels then returned toward near baseline at T3. The urban participants, on the other hand, had persistent decreases in their general fatigue scores indicating higher general fatigue over time. Should these analyses be repeated with a larger sample size significant findings may result indicating an overall beneficial treatment effect for the intervention.

Less fatigue over time for the urban and rural participants in the TIP-C treatment group compared to their counterparts in the UC control group are consistent with the conceptual framework of the study and the current body of literature on fatigue and
psychosocial support/cognitive-behavioral intervention studies (Badger et al., 2001; Badger et al., 2004).

Furthermore, in light of the current body of literature and knowledge related to fatigue in breast cancer, it is somewhat surprising that rural participants in this study had less general fatigue over time compared to their urban counterparts. In the literature, fatigue is strongly associated with depression (Badger, Braden et al., 2004; Badger et al., 2001; Jacobsen et al., 1999) and depression has been shown to be the greatest predictor of fatigue in recent explanatory models of fatigue in breast cancer patients (Bower et al., 2000). Thus, one would also expect that due to higher depression levels seen in rural participants compared to urban participants of this study, the rural participants would also have had higher not lower general fatigue compared to urban participants over time. The findings of this study were not significant, however, and group differences should be cautiously interpreted.

**Physical Fatigue**

The statistical analysis revealed no significant between group differences in physical fatigue over time. There were trend effects for treatment group and urban/rural status over time, however. Examination of Table 9 and Figures 7 and 8 reveal that rural participants in the treatment group had a significant increase in physical fatigue scores indicating less fatigue over time; while their counterparts in the control group had a significant reduction in their physical fatigue scores indicating increased fatigue over time. This implies a positive treatment effect for TIP-C on physical fatigue scores for rural participants. However, upon closer examination TIP-C and UC physical fatigue
scores overall are significantly different regardless of urban/rural status and again suggest the possibility of dissimilar treatment and control groups. This calls into question the validity of any conclusions related to the effect of the intervention on physical fatigue scores. Furthermore, this result is only a trend toward significance and not actually significant. A larger sample size is most likely necessary to produce statistically significant results in this case and to clarify the results.

Rural participants had less variation in physical fatigue scores over time, however, at T3 urban participants reported higher physical fatigue scores indicating less physical fatigue over time. This finding is supported by the literature which states that rural women in general have poorer general health than their urban counterparts and lower levels of physical functioning compared to urban women (HHS Rural Task Force, 2002; Weinert & Burman, 1994). This also contradicts the general fatigue findings of this study which show rural participants as having less general fatigue than their urban counterparts, but is supported by higher depression scores among the rural participants.

*Mental Fatigue*

The statistical analysis revealed no significant group differences in mental fatigue scores at baseline; however, there were significant group differences in scores over time. A comparison of mental fatigue scores across the data collection points indicates that while the treatment group may have had more mental fatigue compared to the control group overall, mental fatigue levels decreased from T1 to T2 and from T2 to T3 for the treatment group. In comparison, the control group evidenced an improvement in mental fatigue from T1 to T2 and then from T2 to T3 mental fatigue worsened to levels near
baseline. This indicates improving mental fatigue for participants in the TIP-C treatment intervention and worsening mental fatigue for the UC control group over time; reflecting a positive treatment effect for the intervention consistent with the conceptual framework of the study.

It is interesting to examine the urban and rural participants mental fatigue scores separately. Urban participants had less mental fatigue over time compared to their rural counterparts who evidenced greater mental fatigue over time. Compared to urban participants in this study, the rural participants evidenced higher depression, higher physical fatigue, and higher mental fatigue; yet lower general fatigue. These findings, as stated previously, are consistent with the hypotheses of the study and the current literature related to breast cancer treatment-related fatigue.

**Reduced Activity**

The statistical analysis revealed no significant group differences in reduced activity means over time. Overall rural participants in the treatment group had the highest levels of reduced activity at T3; indicating a positive treatment effect and increased activity over time for these participants. Collapsing the urban and rural data, the UC group evidenced less activity over time, while the TIP-C group evidenced greater activity over time. These findings, while not statistically significant are consistent with the conceptual framework of the study.

A comparison of the urban and rural participants reveals that the groups had similar levels of reduced activity upon entry into the study but that rural participants had greater levels of reduced activity at T3; indicating increased activity. This is not
consistent with the literature in which rural residents report greater levels of reduced or restricted activity compared to their urban counterparts (HHS Rural Task Force, 2002).

**Reduced Motivation**

The statistical analysis revealed no significant group differences in reduced motivation means over time.

It appears from the data that overall TIP-C had a limited ability to effect rural participants reduced motivation scores compared to urban participants. The data demonstrate that participants in TIP-C had higher overall reduced motivation scores indicating increased motivation over time compared to the UC control group. These findings are consistent with the conceptual framework and hypotheses of the study.

Urban and rural participants had similar reduced motivation scores at baseline, but at T2 both groups evidenced higher reduced motivation scores indicating less reduced motivation (or more motivation). At T3 scores sharply dropped for both groups of participants to below baseline, yet rural participants reduced motivation scores remained higher indicating more motivation over time compared to the urban participants. This is consistent with rural participants’ higher activity findings compared to urban participants over time.

**Summary**

Few of the results for research question two were statistically significant. However, there were some trend effects for group differences for depression scores at baseline by treatment group and for physical fatigue by treatment group and urban/rural status over time. Participants in TIP-C treatment group in general had higher depression
scores at baseline and overtime compared to participants in the UC control group.

Participants in TIP-C also had less general fatigue and physical fatigue; improving mental fatigue; and greater activity and motivation over time compared to UC participants over time (although differences were not significant). This indicates an overall positive treatment effect for the intervention over time.

The results for urban and rural analysis are mixed. Rural participants had higher depression scores; greater physical and mental fatigue; less general fatigue; but were more active and had greater motivation than their urban counterparts overtime (although these differences were not significant either).

Quality of Life

Physical Health

The statistical analysis demonstrated no significant differences in mean physical health scores for treatment group by urban/rural over time. However, there was a significant time by treatment group interaction for physical health related quality of life. TIP-C had a significant main effect on physical health scores with participants in the treatment group experiencing greater physical health related quality of life at T2 and at T3 compared to their control group counterparts. This is consistent with the literature and previous health related quality of life studies utilizing psychosocial interventions (Badger et al., 2001; Badger et al., 2004; Braden & Mishel, 2000).

While not statistically significant, rural participants did experience lower physical health related quality of life compared to their urban counterparts over time. In fact, rural participants had lower physical health related quality of life scores at T2 than at baseline.
This is consistent with literature demonstrating that breast cancer patients with depression have poorer quality of life (Badger, Braden et al., 2004; Badger, Segrin et al., 2004; Badger et al., 2001; Lewis, 1998; McDaniel & Nemeroff, 1993; Pasacreta, 1997). As has been shown previously the rural participants in this study had higher depression, and greater physical and mental fatigue. It is not surprising then that the rural participants would also demonstrate lower physical health related quality of life scores compared to the urban participants in this study. It is surprising, though, that the rural participants had higher activity and motivation levels given these other findings.

Mental Health

The statistical analysis demonstrated significant differences in mean mental health scores for treatment group by urban/rural status over time. Additionally, there was a trend toward a significant time by treatment group interaction for mental health related quality of life. TIP-C had an overall main effect on mental health related quality of life scores for both urban and rural participants indicating improving mental health related quality of life over time for TIP-C participants. At T1 and T2, urban and rural participants had similar mental health related quality of life scores. However, at T3 scores differ significantly and rural participants’ mental health scores plummet while urban participants’ scores remain stable. This indicates overall poorer mental health related quality of life for rural participants compared to urban participants over time. This is consistent with the previous findings of this study for higher depression, greater physical and mental fatigue, and reduced physical health related quality of life for rural participants compared to their urban counterparts. It is not consistent with the activity
and motivation findings. As stated previously, the literature is clear: breast cancer patients with depression have reduced quality of life (Badger, Braden et al., 2004; Badger, Segrin et al., 2004; Badger et al., 2001; Lewis, 1998; McDaniel & Nemeroff, 1993; Pasacreta, 1997). It is not surprising then that since the rural participants in this study experience higher depression and physical and mental fatigue, and poorer physical health related quality of life, that they would also experience poorer mental health related quality of life compared to the urban participants.

These significant findings demonstrating a main effect of TIP-C on both physical and mental health related quality of life over time for both rural and urban participants are consistent with the conceptual framework for the study. TIP-C provided social support, cancer knowledge, and assisted the participants in accessing social support from other interpersonal relationships modulated the negative health consequences of cancer treatment related symptoms and responses that effect quality of life, thus improving both physical and mental health related quality of life.

Implications for Nursing Practice

While many of the findings of this study are hampered by limitations due to small sample size, the benefit of the telephone-delivered interpersonal counseling intervention to improve physical and mental health related quality of life is clear. Furthermore, urban/rural differences in health related quality of life for women experiencing breast cancer are also clarified by the findings of this study. Rural women with breast cancer experience lower physical and mental health related quality of life compared to urban women with breast cancer.
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This study provides further evidence that psychosocial interventions modulate depression and fatigue and improve quality of life for women with breast cancer. Some new information has also been gleaned from this study in that urban/rural differences in physical and mental health related quality of life for women with breast cancer have been elucidated; as well as, the effects of interpersonal psychosocial intervention on improving quality of life for rural women with breast cancer. These findings provide support for the greater use of psychosocial interventions to modulate depression and fatigue and improve quality of life in both urban and rural women with breast cancer. They also indicate that psychosocial interventions can be successfully delivered to rural and urban women over the telephone which could have implications for cost-effective delivery of important interventions for improving outcomes for women with breast cancer regardless of geographic location.

The cost of breast cancer treatment-related depression and fatigue is high – higher side effect burden related to breast cancer treatment, slower cancer recovery, poorer overall prognoses, increased mortality, and reduced quality of life (Badger, Braden et al., 2004; Badger, Segrin et al., 2004; Badger et al., 2001; Lewis, 1998; McDaniel & Nemeroff, 1993; Pasacreta, 1997). The implementation of cost-effective interventions to improve outcomes for urban and rural women with breast cancer is important to nursing practice and society as a whole.

Limitations of this Study

The majority of the findings of this study were non-significant and given the small sample size (N = 69) the risk of a type II error is high. The risk of a type II error
occurring is high when non-significant findings occur for statistical analyses of small sample sizes. A type II error occurs when a null hypothesis is accepted when in reality the null hypothesis is actually false. Differences in group means are not due purely to chance as the null hypothesis states but due to a significant main effect. There is insufficient power to produce statistical significance due to small sample size.

The urban and rural groups in this study had no statistically significant differences for key demographic characteristics. However, many of the other findings raise suspicion of dissimilar treatment and control groups. Similar treatment and control groups are necessary as part of an experimental design to attribute main effects to the treatment or intervention. Dissimilar or unequal treatment and control groups seriously limit the researcher’s ability to draw conclusions about the intervention’s affect on the data. In fact treatment and control group differences, significant or not, cannot be attributed to the intervention and the possibility of covariation when other variables must be considered.

Recommendations for Future Research

The validity and generalizability of the study results are greatly hampered by the limitations of the study – primarily a small sample size and many non-significant results. This study should be replicated with a larger sample size to reduce the risk of a type II error and improve the power for statistical significance. Additionally, the similarity of the treatment and control groups should be verified.
Summary

This chapter encompasses the discussion of the results of the data analysis and resultant implications for nursing practice. Also contained in the chapter are a review of the limitations of the study and recommendations for future research.
REFERENCES


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Differences Between Urban & Rural Women with Breast Cancer


McGrath, P., Patterson, C., Yates, P., Treloar, S., Oldenburg, B., & Loos, C. (1999b).  A
Differences Between Urban & Rural Women with Breast Cancer


Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in
Differences Between Urban & Rural Women with Breast Cancer


