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PREDICTORS OF POST-SURGICAL EMOTIONAL AND PHYSICAL WELL-BEING IN WOMEN WITH BREAST CANCER

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PREDICTORS OF POST-SURGICAL EMOTIONAL AND PHYSICAL WELL-BEING IN WOMEN WITH BREAST CANCER

By

Kathryn Christensen Beckrow

A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

PREDICTORS OF POST-SURGICAL EMOTIONAL AND PHYSICAL WELL-BEING IN WOMEN WITH BREAST CANCER

By

Kathryn Christensen Beckrow

This study analyzed data from a randomized clinical trial entitled "A Subacute Care Intervention for Short-Stay Breast Cancer Surgery" which was conducted between 1996 and 2001, included 240 women 21 years of age and older who were diagnosed with operable breast cancer, and was funded by the United States Medical Research and Materiel Command, Department of Defense, DAMD17-96-1-6325. The main hypothesis for this project was that specific demographic variables (i.e., age, income, marital status, surgery type, length of hospital stay, employment, caregiver support, and education) are predictors for how women rate their post-surgical emotional and physical health outcomes. Results across three variations of logistic regression analysis showed a significant predictive role for each of the demographic variables, excluding surgery type. Recommendations are made for creating Emotional and Physical Health Risk Profiles which could potentially be useful in clinical practice and health policy. To Jason, Justin and Caroline

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LIST OF ABBREVIATIONS

QOL	Quality of Life
PHYS	Physical
FNX	Functional
FAM	Family
SOC	Social

CHAPTER 1 INTRODUCTION

I. Background

There are many published studies regarding the influence of demographic factors on cancer screening and mortality (Bigby & Holmes, 2005), but few have examined the predictive role that demographic factors may play in emotional and physical recovery of women following surgical treatment for breast cancer (Shimozuma, Ganz, Petersen, & Hirji, 1999). Determining predictors of quality of life (QOL) in cancer patients could be of great benefit. Research has shown that demographic factors may affect QOL in breast cancer patients but it is still unclear what factors have the greatest effect (Engel et al., 2003). By identifying predictors of post-surgical emotional and physical well-being, health providers will be better able to assess which patients may need additional emotional and physical health supportive services. In addition, patients will have a better understanding of and be better prepared for what they may experience during their recovery from surgery and as they prepare for their next phase of treatment.

This thesis project examines the role of specific demographic variables as predictors for how women rate their post-surgical emotional and physical health. These variables include age, income, marital status, type of surgery (lumpectomy or mastectomy), length of hospital stay, employment, caregiver support, and education. Analyses were based on existing data from a randomized clinical trial entitled "A Subacute Care Intervention for Short-Stay Breast Cancer Surgery" which was conducted between 1996 and 2001 and included 240 women 21 years of age and older who were diagnosed with operable breast cancer. The

study was funded by the United States Medical Research and Materiel Command, Department of Defense, DAMD17-96-1-6325 (Wyatt, Donze & Beckrow, 2004).

II. Breast Cancer Statistics

Breast cancer is the most common form of carcinoma in women in the United States (U.S.), comprising approximately 32% of all female cancer cases. An estimated 211,240 new cases of invasive breast cancer and 58,940 cases of in situ breast cancer are expected to be diagnosed in the U.S. in 2005 (American Cancer Society, 2005). Breast cancer is the second leading cause of cancer related deaths among women in the U.S. (lung cancer being the most common), with approximately 40,870 deaths expected in 2005. The five year survival rate is 98% for localized breast cancer that has not spread to the lymph nodes or other organs, 80% for women with regional spread, and 26% for those with distant metastases (American Cancer Society, 2005). It is estimated that 13.2% of women in the U.S. will develop breast cancer during their lifetime (Ries et al., 2005).

III. Surgical Treatment for Breast Cancer

The majority of patients with an initial diagnosis of breast cancer will undergo surgery to excise the tumor. There are currently two types of breastconserving surgery: lumpectomy and segmental or partial mastectomy. A lumpectomy removes the tumor and a one centimeter margin of normal tissue

surrounding the tumor, while a segmental or partial mastectomy removes the tumor and a three centimeter margin of normal tissue. Three additional types of breast surgery include total (or simple) mastectomy, modified radical mastectomy, and radical mastectomy. All three types of mastectomy involve removal of the entire breast. The modified radical mastectomy also removes the lining over the pectoralis major and minor muscles, and in some cases a portion of the pectoralis muscles. Radical mastectomy involves removal of the entire numbers. Axillary hymph node dissection or sentinel node biopsy is also generally performed with breast surgery as part of the disease staging process (National Cancer Institute, 2004; Silva & Zurida, 1999).

IV. Emotional and Physical Health Issues after Breast Cancer Surgery

The World Health Organization (WHO) has defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). In the case of breast cancer, the removal of the tumor and subsequent adjuvant therapy may obliterate the disease, but women often find themselves dealing with other physical and psychological sequelae that have a substantial impact on their day-to-day lives (Repetto, Ausili-Cefaro, Gallo, Rossi, & Manzione, 2001).

In the 1990s, short-stay surgery became the standard for most breast cancer patients. This resulted in hospitalizations of less than 48 hours following surgery for the majority of patients (Krug, 1997), rather than the 10 to 14 days in the hospital which had been the prior standard of care when patients stayed until

their surgical drain was removed (Gross, 1998). During the transition period between hospitalization and returning home, the information needs of cancer patients can be extensive and lead to feelings of uncertainty and fear (Hughes, Hodgson, Muller, Robinson & McCorkle, 2000). This shortened hospital stay also limits the amount of time available for educating patients on self-care and preparing them for issues they may encounter during their recovery at home (Hughes et al., 2000).

The breast cancer experience is complex, both emotionally and physically. Possible factors affecting emotional and physical health must be examined in order to better understand the needs of breast cancer patients.

V. Possible Factors Affecting Recovery of Emotional and Physical Health

The following current research has shown that demographic factors may have an effect on QOL and the emotional and physical health of breast cancer patients (Engel et al., 2003).

In a prospective longitudinal study of 227 newly diagnosed breast cancer patients, Shimozuma et al. (1999) found physical and treatment-related problems were a frequent occurrence after breast surgery. In addition, the majority of patients experienced a profound disruption in psychosocial and physical QOL components one month after surgery.

A study by King, Kenny, Shiell, Hall, and Boyages (2000) examined QOL in a cohort of 291 Australian women three and twelve months after surgery for

breast cancer and found that the impact of disease and treatment on QOL differed by education, age, and marital status.

Wang, Cosby, Harris, and Liu (1999) conducted a survey of 102 breast cancer patients and found that major concerns and needs of women following treatment for breast cancer varied among patients with different demographic characteristics. Age, race, and marital status were key factors. They found that women who were younger, Black and single had more concerns related to finances and work. Married women had greater family counseling and support needs, and White women had greater concerns about their future.

The above mentioned research studies illustrate a sampling of the factors that may have an impact on emotional and physical health following breast cancer surgery. Specific predictors that should be examined in more detail include: age, income, marital status, type of surgery, length of hospital stay, employment, caregiver support, and education. Table 1 below is a summary of 21 studies that examined these potential predictors in relation to emotional and physical health outcomes during different phases of the cancer experience. The majority of these studies included only breast cancer patients and had samples sizes ranging from 35 to 483 participants. Ages ranged from 22 to 89 years.

able 1: Summary or Su	nales		
Study	Patient Sample	Outcome Measures	Primary Predictors
Possible Factors Affectil	ng Recovery of Emotional and Physical He	alth	
Shimozuma et al., 1999	n=227 women; Diagnosed breast cancer stage 1 or 2; Age <50, 50-59, ≥60 years	Quality of life (CARES measure)	POMS score (greater mood disturbance); Node status; Body image; Income
King et al., 2000	n=291 women; Early stage breast cancer; 3 & 12 months post surgery; Age 25-81 yrs	Quality of life (QLQ-C30 & ESBS-Specific module)	Age; Education; Marital status; Type of surgery
Wang et al., 1999	n=102 women; Newly diagnosed or treated for breast cancer; Age 27-78 years	Major concerns & needs (family, health, work, finances, self esteem)	Age; Race; Marital Status
Age as a Predictor of En	notional and Physical Health		
Ardnt et al., 2004	n=387 German women; One year after breast cancer diagnosis; Age 30-80 years	Quality of life (QLQ-C30 & EORTC)	Age
Cimprich et al., 2002	n=105 women; Long-term breast cancer survivors; Age(diagnosis) 27-79yrs; Age (current) 35-89yrs	Quality of life (Cancer Survivors Scale)	Age at diagnosis
Bloom et al., 2004	n=185 women, Age <50 years at breast cancer diagnosis; (re-interviewed 5 years later)	Quality of life (MOS SF-36 and various QOL measures)	Chronic health concerns; Chemotherapy; Employment status; Children at home
Income as a Predictor fo	r Emotional and Physical Health		
Casso et al., 2004	n= 216 women; Five to ten years after breast cancer surgery; Age 40-49 years	Quality of Life (CARES-SF and MOS SF-36)	Annual income; Breast symptoms; Chemotherapy; Type of surgery
Marital Status as a Predi-	ictor of Emotional and Physical Health		
Wang et al., 1999	(See above)	(See above)	(See above)
Vacek et al., 2003	n=195 women; Breast cancer survivors; Age 39-93 vears	Quality of life (Kaplan & Bush's Quality of Well-being)	Marital status; Comorbidity
King et al., 2000	(See above)	(See above)	(See above)
Type of Surgery as a Pre	edictor of Emotional and Physical Health		
Moyer, 1997	Meta-analysis of 40 studies	Marital/sexual, psychological/social adjustment, body image & cancer concerns	Type of surgery
Kuehn et al., 2000	n=396 women; Breast cancer surgery in 7 year period; Age 22-86 years	Psychosocial life quality & Symptom experience	Type of surgery
Casso et al., 2004	(See above)	(See above)	(See above)
King et al., 2000	(See above)	(See above)	(See above)

Table 1: Summary of St	udies, continued		
Study	Patient Sample	Outcome Measures	Primary Predictors
Length of Hospital Stay	as a Predictor of Emotional and Physical H	Health	
Warren et al., 1998	Analysis of Medicare files 1986 to 1995	Complications	Outpatient mastectomy
Bonnema et al., 1998	n=125 Dutch women; Stage 1 or 2 breast cancer: Early hospital discharge	Complications; Patient satisfaction; Psychosocial functioning	Length of hospital stay
Bundred et al., 1998	n=100 British women; Surgery for early stage breast cancer; Age 31-74	Physical (seroma, range of motion) and Psychological (Spielberger Anxiety scale)	Length of hospital stay
Chapman et al., 2001	n=35 British women; Undergoing surgery for breast cancer; Age 30-89	Patient satisfaction	Early (< 48 hrs) versus late (5 davs) hospital discharge
Pedersen et al., 1994	n=373 women; Surgery for breast cancer	Operating efficiency, costs, quality of care	Short length of hospital stay
Employment as a Predic	tor for Emotional and Physical Health		
Bradley et al., 2002	n=156 breast cancer survivors (Total n=5964 patients from the Health and Retirement Study): Age 51-51 vears	Economic Impact (employment, earnings, hours worked, wages)	Breast Cancer (≤2 years or ≥3 years since diagnosis)
Chirikos et al., 2002	n=210 women; 105 treated for breast cancer; 105 age/work matched; Age ≲60 vears (within 5 vears of age for matched)	Quality of life (MOS SF-36)	Household income; Employment status
Caregiver Support as a	Predictor of Emotional and Physical Health		
Siegel et al., 1991	n=483 patients with various cancer diagnoses & caregivers; Age 21 and older	Unmet needs	Type of caregiver (i.e, spouse or other)
Tang et al., 2004	n=60 hospice patients (majority with cancer); Mean age 73 years	Quality of life (McGill QOL scale and other instruments)	Whether or not caregiver lives in home
Education as a Predicto	r of Emotional and Physical Health		
King et al., 2000	(See above)	(See above)	(See above)
Uzon et al., 2004	n=72 Turkish women; Breast cancer surgery in past 6 years; Age 32-73 years	Quality of life (QOLS)	Education; Employment status
Schover et al., 1995	n=218 women; Mean of 4 years after breast cancer surgery	Psychosocial Adjustment to Illness Scale (PAIS-SR)	Education; Marital Status; Bodv esteem: Chemotherapv

A. Age as a Predictor of Emotional and Physical Health

Arndt et al. (2004) analyzed data from a population-based state-wide prospective cohort study conducted in Germany. The sample included 387 women 30 to 81 years of age one year after diagnosis of breast cancer. They found that younger women (30-59 years) had greater deficits in emotional, social, role, and cognitive functioning than older women (60-81). Younger women also had poorer scores than older women on a variety of QOL dimensions and suffered more psychological distress.

A cross-sectional study by Cimprich, Ronis, and Martinez-Ramos (2002) examined age at diagnosis and QOL outcomes in long-term breast cancer survivors. The sample included 107 women whose age at diagnosis ranged from 27 to 79 years. Age categories were subdivided into younger (27-44 years), middle (45-65 years), and older (>65 years) age groups. They found that older women scored significantly lower on physical wellbeing than middle aged women, and younger women scored significantly lower than older women on social wellbeing. The study concluded that age at diagnosis can be a significant predictor of long term QOL in survivors.

Bloom, Stewart, Chang, and Banks (2004) conducted a study of 185 women who were under the age of 50 at the time of breast cancer diagnosis, and assessed their baseline physical and mental well-being and re-interviewed them 5 years post-diagnosis and treatment. Between baseline and five years postdiagnosis, they found significant improvements in physical functioning and role,

emotional role, social functioning, mental health, and bodily pain. Significant decreases were found in emotional support and size of the social network.

B. Income as a Predictor of Emotional and Physical Health

A study by Casso, Buist, and Taplin (2004) examined QOL in 216 young breast cancer survivors between the ages of 40 and 49 at 5 to 10 years postsurgery. Results showed that women with a combined family income below \$35,000 per year were more likely to have poor QOL than women with income levels over \$75,000 per year.

C. Marital Status as a Predictor of Emotional and Physical Health

A survey of 102 breast cancer patients during their first visit to a university clinic after being diagnosed or treated at other clinics was conducted by Wang et al. (1999). They found that married women had a greater need for family counseling and support, and had fewer concerns about finances and work than non-married patients.

Vacek, Winstead-Fry, Secker-Walker, Hooper, and Plante (2003) conducted a longitudinal study of 195 breast cancer survivors and examined factors affecting change in QOL following the completion of breast cancer treatment. They found that having a spouse slowed the rate of decline in QOL.

A prospective cohort study of 307 women with early stage breast cancer by King et al. (2000), found that married women had fewer arm symptoms, better body image, and a better global QOL than single women. They concluded that having a close relationship may serve as a buffer against the negative effects of early stage breast cancer treatment.

D. Type of Surgery as a Predictor of Emotional and Physical Health

Breast conserving surgical techniques (i.e., lumpectomy and segmental or partial mastectomy) were developed in an effort to improve QOL for breast cancer patients. Moyer (1997) found that the literature comparing mastectomy to breast conserving surgery did not show substantial benefits, so a meta-analysis of 40 studies was conducted. The meta-analysis revealed that women who had breast conserving surgery had better outcomes in the areas of marital-sexual adjustment, psychological adjustment, social adjustment, body/self-image, and cancer related concerns/fears than women who had mastectomies.

Kuehn et al., (2000) conducted a retrospective study of 396 breast cancer patients who had undergone breast conserving surgery or mastectomy in combination with axillary dissection. Shoulder-arm morbidity (including pain, restriction in mobility and strength, and ederna) was found to be the most distressing symptom for all patients whether they had breast conserving surgery or mastectomy.

A study by Casso et al., (2004) examined QOL in 216 breast cancer patients (between the ages of 40 and 49) at 5 to 10 years post-surgery. They found that women who had a mastectomy were 2.60 times more likely to have a lower QOL than women who had breast conserving surgery.

In a prospective cohort study of 307 women with early stage breast cancer, King et al. (2000) compared women who had mastectomy with those who had breast conserving surgery at three months and twelve months postsurgery. They found that women who received breast conserving surgery had a

better body image and were using more coping strategies than those who underwent a mastectomy. The two groups were very similar on QOL scales, however, the breast conserving surgery group had poorer social functioning and more fatigue at three months post-surgery.

E. Length of Hospital Stay as a Predictor of Emotional and Physical Health

Warren et al. (1998) examined Medicare files for patients treated for breast cancer between 1986 and 1995. During this time, they found that shortstay surgeries (or outpatient mastectomies) increased from 0% to 10.8%. They found no association between length of hospital stay and subsequent emergency room visits. They did find that women who had the outpatient mastectomy were more likely to be re-hospitalized than those who had at least a one day stay in the hospital.

A study by Bonnema, van Wersch, van Gell, Pruyn, and Schmitz (1998) assessed the medical and psychosocial effects of early hospital discharge in 125 women with breast cancer. They found that patient satisfaction with short stay surgery was high. No differences were found on physical or psychological complaints for those who had a short versus longer hospitalization, and they concluded that early discharge from the hospital was safe.

Bundred et al. (1998) studied 100 women who had undergone breast conserving surgery or mastectomy with axillary node dissection and examined physical and psychological illness pre-surgery, one month post-surgery, and

three months post-surgery. They found no increase in physical or psychological illness for patients who were sent home within 48 hours of surgery compared to those who were hospitalized for a longer period.

A survey of 36 breast cancer patients in Great Britain was conducted by Chapman and Purushotham (2001) with the aim of determining the acceptability of early discharge. They found that patients regarded early discharge as safe and were satisfied with their care when they perceived a high level of support from hospital staff and community nursing.

Pedersen, Douville, and Eberlein (1994) conducted a prospective study of 373 breast cancer patients to evaluate outcomes and patient satisfaction with an accelerated surgical stay program that was developed by a multidisciplinary task force and instituted at several major cancer centers in the United States. They found that the short stay program increased operating efficiency, reduced medical costs, and did not compromise quality of patient care.

F. Employment as a Predictor of Emotional and Physical Health

Several studies have found an economic impact on patients as a result of a breast cancer diagnosis and treatment. Bradley, Bednarek, and Neumark (2002) analyzed data from the Health and Retirement Study and compared breast cancer survivors and a non-cancer control group on employment. They found that breast cancer had a negative impact on employment in terms of wages, earnings, and hours worked.

Chirikos, Russell-Jacobs, and Cantor (2002) conducted a study of 105 women treated for breast cancer and 105 age and work-matched women, and

collected demographic, economic, and changes in health data retrospectively for a five year period. They found that women who were working at the time of their diagnosis experienced a significantly larger drop in earnings than control subjects due to a reduction in hours worked.

G. Caregiver Support as a Predictor of Emotional and Physical Health

With the advent of shortened hospital stays following breast cancer surgery, caregiver support has become an important aspect of cancer care. Caregivers can help facilitate continuity of care, treatment compliance, and provide social support during a time in which patients can be extremely vulnerable (Glajchen, 2004).

Siegel, Raveis, Houts, and Mor (1991) conducted a study of 483 cancer patients and their caregivers. Participants were surveyed on whether or not needs were met in the areas of instrumental activities (cooking, housekeeping, and shopping), personal care (bathing and dressing), home health care, and transportation for medical and general activities. They found that patients were more likely to report unmet needs if their caregivers were not their spouses.

A cross-sectional study of 60 patients (the majority of whom were cancer patients) in two hospice facilities in the United States was conducted by Tang, Aaronson, and Forbes (2004). The purpose of the study was to examine the relationship between pain, physical performance, social support, spirituality, and QOL in patients receiving hospice care. They found that patients who lived alone had significantly better QOL than those who lived with a caregiver. The

researchers hypothesized that change in living environment, such as having to move to the caregiver's home, and fear of becoming a burden may have contributed to these results.

H. Education as a Predictor of Emotional and Physical Health

King et al. (2000) conducted a prospective cohort study of 307 women with early stage breast cancer at a large teaching hospital in Australia. Patients were interviewed at three months and twelve months post-surgery regarding the physical and psychological impact of treatment. They found that women with higher education (some vocational or tertiary education beyond secondary education) experienced fewer symptoms and reported higher emotional and physical functioning than those with less education.

Uzon, Aslan, Selimen, and Koc (2004) conducted a descriptive study with a convenience sample of 72 Turkish women diagnosed with breast cancer and treated at two hospitals in Turkey. Results showed that women who had a college-level education reported better QOL than did women with other levels of education (high school, primary school, or literate without any diploma).

A retrospective study of 218 women at a mean of 4 years after surgery was conducted by Schover et al. (1995). They compared psychological adjustment and other factors among women who had breast conserving surgery and those who had mastectomy with immediate reconstruction. The results showed that less education was predictive of greater psychosocial distress among both groups.

VI. Summary of Literature Review and Research Questions

Research has shown that demographic factors have an impact on QOL and various aspects of the emotional and physical health of breast cancer patients. The literature reviewed for this project showed that older women generally have more difficulty with physical well-being, while younger women are more affected by emotional, social, and QOL issues (Arndt et al., 2004: Cimprich et al., 2002; Bloom et al., 2004). Lower income women are more likely to have poor QOL than those with higher income (Casso et al., 2004). Married women may have a greater need for family counseling, but have fewer concerns related to finances, have a better global QOL and a slower decline in QOL than unmarried women (Wang et al., 1999; Vacek et al., 2003; King et al., 2000). Women who undergo lumpectomy are more likely to have better psychological and social adjustment, and women who have a mastectomy are more likely to have low QOL (Moyer, 1997; Casso et al., 2004; King et al., 2000). Women who are hospitalized for less than 48 hours are generally satisfied with their care and there is no difference in physical or psychological complaints for short versus long stay (Warren et al., 1998; Bonnema et al., 1998; Bundred et al., 1998; Chapman & Purushotham, 2001; Pedersen et al., 1994). Breast cancer can have a negative impact for those who are employed in terms of drop in earnings, wages, and hours worked (Bradley et al., 2002; Chirikos et al., 2002). Caregiver support has become an important aspect of care in that it provides social support, continuity of care, and treatment compliance; however, in one study of hospice patients, women who lived alone had better QOL than those who lived

with a caregiver (Glajchen, 2004; Tang et al., 2004). Finally, women with higher education generally report better emotional and physical functioning and QOL than those with less education (King et al., 2000; Uzon et al., 2004; Schover et al., 1995).

Strengths in the literature are in the areas of age, marital status, surgery type, caregiver support and education. There appears to be more published literature in these areas and the findings are more similar across studies. Gaps in the literature are in the areas of income, length of hospital stay, and employment. Income is a difficult variable to measure as study participants are not always willing to share financial information. In regards to length of stay, the majority of studies have looked at short-stays as 48 hours or less. Few studies have evaluated outcomes for hospitalizations of 24 hours or less following breast cancer surgery. In the area of employment, studies generally have described the negative impact it can have on QOL, but few have looked at its role as a predictor for post-surgical outcomes.

Of the 21 studies evaluated for this project, approximately half conducted only descriptive analyses. This thesis project involved an in-depth analysis to determine which components of a comprehensive group of demographic variables have the greatest impact on both emotional and physical health. It also attempted to fill the gaps in the literature related to the predictive role that specific demographic variables play in how women rate their post-surgical emotional and physical health. The demographic variables of interest include age, income,

marital status, type of surgery, length of hospital stay, employment, caregiver support, and education. The research questions include:

Research Question #1: What are the baseline demographic characteristics of this sample of patients undergoing short-stay surgery for breast cancer?

Research Question #2: What is the relationship between the baseline demographic variables and post-surgery outcome variables measuring emotional health (using the Spielberger State Anxiety Scale and the Family/Social and Emotional Subscales of the Cella FACT-B Questionnaire) and physical health (using the Physical Functional subscale of the Rand SF-36 and the Physical and Functional Subscales of the Cella FACT-B Questionnaire) in this sample of patients undergoing short-stay surgery for breast cancer?

Research Question #3: Which individual baseline demographic variables are predictive of post-surgery **emotional health** (as measured by the Spielberger State Anxiety Scale and the Family/Social and Emotional Subscales of the Cella FACT-B Questionnaire) and post-surgery **physical health** (as measured by the Physical Functional subscale of the Rand SF-36 and the Physical and Functional Subscales of the Cella FACT-B Questionnaire) in women undergoing short-stay surgery for breast cancer?

Research Question #4: Which combinations of baseline demographic variables are predictive of post-surgery **emotional health** (as measured by the Spielberger State Anxiety Scale and the Family/Social and Emotional Subscales of the Cella FACT-B Questionnaire) and post-surgery **physical health** (as

measured by the Physical Functional subscale of the Rand SF-36 and the Physical and Functional Subscales of the Cella FACT-B Questionnaire) in women undergoing short-stay surgery for breast cancer?

CHAPTER 2 METHODS

I. Data Source

Data for this thesis were obtained from the randomized clinical trial entitled "A Subacute Care Intervention for Short-Stay Breast Cancer Surgery" which was conducted between 1996 and 2001 by investigators from Michigan State University's Colleges of Nursing and Human Medicine. Funding for this trial was provided by the United States Medical Research and Materiel Command, Department of Defense, DAMD17-96-1-6325.

II. Sample

The sample included 240 women who were accrued from fifteen surgical practices in four Michigan communities, including Charlotte, Lansing, Pontiac, and Royal Oak. The physician practices included in the study were affiliated with Hayes Green Beach Hospital, Ingham Regional Medical Center, Michigan State University, Sparrow Health System (including St. Lawrence Hospital), St. Joseph Mercy Oakland Hospital, and William Beaumont Hospital.

To be included in the study, women had to be 21 years of age or older, able to speak and read English, with a positive diagnosis of breast cancer, and undergoing short-stay surgery with a planned hospital stay of 48 hours or less. Surgical procedures included lumpectomy with lymph node excision, mastectomy with lymph node excision, or mastectomy without lymph node excision. Exclusionary criteria included carcinoma in-situ, recurrent breast cancer, immediate reconstructive surgery, an acute episode of medically diagnosed mental illness at the time of the cancer diagnosis, and residing greater than 40 miles from the surgeon's office.



III. Procedure

Once women were accrued and consent forms were signed, participants were block randomized by patient within each site to the **intervention** or **control** group and both they and their surgeon's office were notified. Women in the intervention group received a targeted nursing protocol (including a minimum of two phone calls and two nurse visits) in their home for the two weeks following discharge from the hospital. Nurse interveners followed a protocol that focused on physical, psychological, and educational issues. Women in the control group received either home nursing care from an outside agency or no home care, as determined by their surgeon.

IV. Data Collection

Data used in this thesis project were collected at two time points over a six week period. When women consented to participate in the study, pre-surgery data were collected for the emotional and physical health outcome measures (i.e., anxiety, physical functioning, and four QOL subscales – physical, functional, family/social, and emotional) in the form of a self-administered questionnaire. Demographic information and post-surgery data on the emotional and physical health outcome measures (i.e., anxiety, physical functioning, and four QOL subscales – physical and physical health outcome measures (i.e., anxiety, physical functioning, and four QOL subscales – physical, functional, family/social, and emotional of the emotional and physical health outcome measures (i.e., anxiety, physical functioning, and four QOL subscales – physical, functional, family/social, and emotional) were collected via a telephone interview which was conducted with each participant four weeks after surgery.

Emotional health outcomes were measured using the Spielberger State Anxiety Scale and the Family/Social and Emotional subscales of the Cella QOL Instrument. Physical health outcomes were measured using the Physical Functioning subscale of the Rand SF-36 Health Survey as well as the Physical and Functional subscales of the Cella QOL Instrument.

V. Outcome Measures

A. Anxiety (Emotional Health)

Anxiety was measured using the Spielberger State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The State Anxiety scale includes 20 items that assess how the participant feels "right now, at this moment" and includes such statements as "I feel calm", "I feel nervous", and "I feel content." Answer choices included 1=not at all, 2=somewhat, 3=moderately so, and 4=very much so. Ten items required reverse scoring. Scores were converted to a 0 to 100 scale by using the following formula: [(summed score – minimum value)/ (maximum value – minimum value)] * 100. This score was then reversed so the higher the score, the lower (better) the level of anxiety. Spielberger, et al. (1983) tested the reliability of this instrument and found the alpha coefficient to be .93 in a sample of working women.

B. Quality of Life: (Emotional and Physical Health)

QOL was measured using four subscales from the Functional Assessment of Cancer Therapy – Breast (FACT-B) instrument (Cella & Bonomi, 1994). The subscales used to measure Emotional Health were the Emotional Well-Being and

Family/Social Well-Being subscales. The subscales used to measure Physical Health were the Physical Well-Being and Functional Well-Being subscales. Each subscale consisted of 6 to 7 statements. Respondents were asked to think about how they felt during the past seven days and rate the statements on a five point scale where 0 equals "not at all" and 4 equals "very much". Eleven items required reverse scoring. Each subscale summed score was converted to a 0 to 100 scale by using the following formula: [(summed score – minimum value)/ (maximum value – minimum value)] * 100. The higher the score, the better the QOL. Cella and Bonomi (1994) tested the reliability of the instrument and found test-retest reliabilities ranged from .82 to .92 in a sample of patients with various cancer diagnoses.

C. Physical Functioning (Physical Health)

Physical functioning was measured using the physical functioning subscale of the Rand SF-36 Health Survey (Ware, Snow, Kosinski & Gandek, 1993). The subscale consisted of ten items that patients might do during a typical day, and asked them to rate their level of limitation as 1=limited a lot, 2=limited a little, or 3=not limited at all. The ten items included vigorous activities, moderate activities, lifting or carrying groceries, climbing several flights of stairs, climbing one flight of stairs, bending/kneeling/stooping, walking more than a mile, walking several blocks, walking one block, and bathing/dressing self. A 0 to 100 score was obtained for the scale by converting the scores as follows: 1=0, 2=50, and 3=100. Each individual's scores were then summed and divided by the number of items answered. The higher the score the better the level of physical functioning.

Previous studies tested the reliability of the complete SF-36 instrument and reported alpha coefficients of .90 and greater (Ware & Sherbourne, 1992; Jette et al., 1986).

VI. Statistical Analyses

Baseline demographic data were assessed using t-tests and chi-square analysis. Mean scores and correlations were used to determine the relationship between demographic variables and outcome variables. The predictive role of the baseline demographic variables on the outcome variables was first evaluated using linear regression. Data was found to not follow a linear pattern, so binary and multiple logistic regression were utilized.

CHAPTER 3 RESULTS

I. Research Question #1

What were the baseline demographic characteristics of this sample of patients undergoing short-stay surgery for breast cancer?

A. Baseline Demographic Data (Table 2)

There were no significant pre-surgery differences between the intervention (study nurse) and control (agency or no nurse) group on the baseline demographic data. Of the total 240 participants, the mean age was 56 years (the range was 23 to 86 years) and the average yearly household income was \$60,755. The majority of women were Caucasian (92%), married (62.5%), underwent a lumpectomy with axillary node dissection (76.7%), were employed (56.6%), had caregiver support (54.5%), and had at least some college education (68.3%). Most participants were hospitalized less than 48 hours (90%), and 48.8% were discharged within 24 hours.

II. Research Question #2

What was the relationship between the baseline demographic variables and post-surgery outcome variables measuring **emotional** and **physical health** in this sample of patients undergoing short-stay surgery for breast cancer?

A. Mean Post-Surgery Outcome Scores (Table 3)

The six outcome variables (anxiety, physical functioning, physical QOL, functional QOL, family/social QOL, and emotional QOL) were each scored on a

0 to 100 scale where 0 equaled worst functioning and 100 equaled best functioning. Mean outcome scores were then calculated based on each of the baseline demographic variables.

Significant Findings (p < .05 or p < .001): Significant findings were identified as *p*-values less than .05 or .001. Older women (55 to 86 years) had significantly better outcomes than younger women (23 to 54 years) in the areas of anxiety, functional QOL, and emotional QOL. Women in the highest income category (\$75,000+) faired significantly better than women with lower incomes in the areas of physical functioning and family/social QOL. Women who underwent a lumpectomy had better physical functioning than those who had other surgery (i.e., simple mastectomy or mastectomy with lymph node removal). Women who were hospitalized for 24 hours or less faired significantly better on physical functioning and physical QOL than those with a longer stay. Those who were not employed prior to surgery showed significantly better outcomes in the areas of anxiety, functional QOL and emotional QOL than women who were employed.

Trends in Findings (p < .15): Trends in the data were identified as findings with a *p*-value less than .15. Older women (55 to 86 years) showed a trend toward higher physical QOL. Women in the highest income category (\$75,000+) had a trend toward better anxiety levels. Married women showed a trend toward higher functional QOL, while women undergoing lumpectomy had higher family/social QOL. Women were hospitalized 24 hours or less showed a trend toward higher functional and family/social QOL. Those who were employed

had a trend toward higher physical functioning. Finally, women in the intervention group showed a trend toward better levels of anxiety.

B. Pre and Post-Surgery Outcome Variable Correlations (Table 4)

All pre-surgery outcome variables (anxiety, physical functioning, physical QOL, functional QOL, family/social QOL, and emotional QOL) had significant positive correlations with their corresponding post-surgery outcome variables.

III. Research Question #3

Which individual baseline demographic variables were predictive of postsurgery **emotional** and **physical health** in women undergoing short-stay surgery for breast cancer?

A. Binary Logistic Regression (Table 5)

Binary logistic regression was used to determine the predictive role of each independent baseline demographic variable on each of the dependent postsurgery outcome variables. Before conducting the logistic regression analysis, the post-surgery outcome variables were converted to dichotomous scores. This was completed by first determining quartile scores for the pre-surgery outcome variables, and then basing quartiles for the post-surgery outcome variables on these pre-surgery quartiles. Post-surgery quartiles were then converted to a dichotomous score where "1" equaled "best functioning quartile" and "0" equaled the "other three quartiles." The SF-36 post-surgery outcome variable was the only exception to this. Quartiles three and four were both a perfect score, thus for the dichotomous score "1" equaled "quartiles three and four" and "0" equaled

"quartiles one and two." Each independent predictor (baseline demographic) variable was analyzed individually to determine its relationship with the dependent (outcome) variable.

Significant Findings (p < .05 or p < .001): Compared to younger women, older women reported less anxiety and better emotional QOL. In comparison with the highest income category (\$75000+), all other income categories reported lower family/social QOL. Women who were hospitalized more than 24 hours reported poorer physical functioning than those who stayed less than 24 hours. Compared to women who were not employed prior to their surgery, those who were employed reported poorer emotional QOL. Women with a caregiver reported worse physical QOL compared to women with no caregiver. Compared to women with graduate school education, women with high school education or some college reported higher emotional QOL.

Trends in Findings (p < .15): Compared to younger women, older women showed a trend toward higher functioning in the area of physical QOL. Compared to women who underwent "other surgery" (i.e., simple mastectomy or mastectomy with lymph node dissection), women who had a lumpectomy reported higher physical functioning. Women who were hospitalized 24 hours or less reported higher functional QOL compared to women who were hospitalized greater than 24 hours. Women who did not have a caregiver reported higher functional QOL compared to women who had a caregiver. Women who had some high school education or completed college reported higher emotional QOL compared to those who had graduate school education.

B. Binary Logistic Regression Controlling for Pre-Surgery Outcome Variables (Table 6)

Logistic regression was also conducted controlling for the pre-surgery outcome variables. The post-surgery outcome variable dichotomous scores described above were used as the dependent variable. Pre-surgery outcome variable quartile scores were used in the first block of covariates. For the second block, each predictor baseline demographic variable was evaluated individually.

Significant Findings (p < .05 or p < .001): By controlling for the presurgery outcome variables, significant findings dropped from ten areas to four areas. The findings that remained significant were in the areas of physical QOL, family/social QOL, and emotional QOL. Compared with younger women, older women reported higher emotional QOL. In comparison with women who were in the highest income category (\$75000+), those in the \$45000-\$74999 reported the worst family/social QOL. Compared to women who had no caregiver, those with a caregiver reported worse physical QOL. Compared to women with graduate school education, women who had at least some college faired the best in the area of emotional QOL.

Trends in Findings (p < .15): Compared to younger women, older women showed a trend toward higher physical QOL. Women who were in the highest income category (\$75000+) showed a trend toward higher family/social QOL compared to those in the lowest income category (\$0 to \$25499). Married women had higher emotional QOL compared to unmarried women. In comparison with the "other surgery" category, women who had a lumpectomy

reported higher physical functioning. Women who were hospitalized 24 hours or less showed a trend toward higher physical functioning and functional QOL compared to women who were hospitalized more than 24 hours. Compared to women who had no caregiver, women with a caregiver reported poorer functioning in the areas of anxiety and functional QOL. Women who had some college education showed a trend toward higher physical functioning, while those who completed high school showed a trend toward higher emotional QOL when compared to women who had graduate school education.

IV. Research Question #4

Which combinations of baseline demographic variables were predictive of post-surgery **emotional** and **physical health** in women undergoing short-stay surgery for breast cancer?

A. Multiple Logistic Regression (Table 7)

Multiple logistic regression was modeled for each of the six outcome variables, and pre-surgery scores for these outcome variables were controlled for in the analysis. Strength of association was measured using Nagelkerke R². The highest R² values were found when all nine predictor variables (age, income, marital status, surgery type, hospital stay, employment, caregiver help, education, and study group) were included in the model. R² values ranged from 0.25 (physical QOL as the outcome) to 0.49 (anxiety as the outcome).

Significant Findings (p < .05 or p < .001): Each of the six outcome models had one significant predictor variable. Having a caregiver was predictive

of poorer anxiety; hospital stay greater than 24 hours was predictive of lower physical functioning; older age was predictive of better physical QOL; having a caregiver was predictive of lower functional QOL; income level of \$0-25,499 or \$45,000-74,999 was predictive of lower family/social QOL; and being married was predictive of better emotional QOL.

Trends in Findings (p < .15):

Model 1- Anxiety Outcome: There were no trends in this model.

<u>Model 2 - Physical Functioning Outcome</u>: Women in the \$45,000 to \$74,999 income category showed a trend toward poorer physical functioning, while women with some college education showed a trend toward better physical functioning.

<u>Model 3 - Physical QOL Outcome</u>: Women with some college education showed a trend toward better physical QOL.

<u>Model 4 - Functional QOL Outcome</u>: Women in the \$45,000 to \$74,999 income category showed a trend toward poorer functional QOL, while married women and those with some high school education showed a trend toward better functional QOL.

<u>Model 5 - Family/Social QOL Outcome</u>: Women in the \$25,500 to \$44,999 income category showed a trend toward poorer family/social QOL, while women with grade school or some high school education showed a trend toward better family/social QOL.

<u>Model 6 - Emotional QOL Outcome</u>: Women in the \$0 to \$25,499 income category showed a trend toward better emotional QOL.

CHAPTER 4 DISCUSSION

The results of this study of women following short-stay surgery for breast cancer confirmed some currently published findings and contribute a comprehensive view of the predictive relationship between baseline demographic variables and post-surgery emotional and physical health outcomes.

I. Research Question #1

What were the baseline demographic characteristics of this sample of patients undergoing short-stay surgery for breast cancer?

A. Baseline Demographic Data (Table 2)

From a demographic perspective, this sample was similar to women who generally participate in psychosocial research. The majority were Caucasian, in their mid-fifties, middle to upper-middle class income level, and married (Glanz & Lerman, 1992). Randomization of participants to intervention and control groups was successful in producing comparable groups and there were no significant differences between these groups on demographic variables.

II. Research Question #2

What was the relationship between the baseline demographic variables and post-surgery outcome variables measuring **emotional** and **physical health** in this sample of patients undergoing short-stay surgery for breast cancer?

A. Mean Post-Surgery Outcome Scores (Table 3)

In looking at findings of mean outcome scores for the different demographic categories, the results were similar to many of the findings in the published literature.

In this study, we found that older women did better than younger women on anxiety and several areas of QOL. This is consistent with the findings by Ardnt et al. (2004) where young women did worse on emotional, social, and several QOL dimensions. The one area in these data where younger women faired slightly (but not significantly) better was in physical functioning. This finding is consistent with the study by Cimprich et al. (2002).

In regards to income level, these data showed that women with higher income (\$75,000+) did significantly better or showed a trend toward better functioning than those with lower income on three of the six outcome variables. This is consistent with the study by Casso et al., (2004) which found that women with a combined family income below \$35,000 per year were more likely to have poorer QOL than women with income levels over \$75,000 per year.

Married women showed a trend toward better functional QOL than those who were not married. This is similar to findings by King et al. (2000) in which married women had better outcomes in several areas. King and colleagues proposed that a close relationship may help offset the negative effects that can be caused by early breast cancer treatment.

The finding that women who underwent a lumpectomy did significantly better on physical functioning and showed a trend toward better results in the area of family/social QOL compared to those who had another type of surgery (i.e., simple mastectomy or mastectomy with lymph node dissection) is not surprising since lumpectomy is much less invasive than mastectomy. This is similar to findings in the meta-analysis by Moyer (1997) which showed that women who had breast conserving surgery did better than those with mastectomy on many outcomes.

The finding that women who were hospitalized for 24 hours or less faired significantly better on physical functioning (SF-36) and physical QOL than those with a longer stay, and showed a trend toward better functioning in the areas of functional QOL and family/social QOL, is interesting because literature evaluated for this project based short-stay outcomes on a hospital stay of 48 hours or less (Bundred et al., 1998; Chapman & Purushotham, 2001). The longer a patient is hospitalized, the greater the likelihood of infection or other complication and the greater the financial cost (Oncology Nursing Society, 1998; Pedersen et al., 1994). If further decreasing length of stay to 24 hours or less can be shown to be more beneficial to the health of patients and reduce cost of care, this could be of importance in the area of health care policy. It is absolutely necessary, however, to determine which patients early discharge may be applicable to before this type of conclusion can be safely made. In this study, 59% of lumpectomy patients and 16% of mastectomy patients had a hospital stay of 24 hours or less. Further

studies are needed to determine the characteristics these patients have (e.g., overall health status, co-morbids, etc.) that make them good candidates for a successful early discharge.

Participants who were not employed prior to surgery showed significantly better outcomes in the areas of anxiety, functional QOL and emotional QOL than women who were employed. This is understandable considering the findings by Bradley et al. (2002) and Chirikos et al. (2002) who both described the negative impact on earnings for those who were employed at the time of their breast cancer diagnosis. In addition to worrying about a decrease in income, women who are employed also have to worry about the number of days they are missing due to their illness and some may have concerns about job security. This added dimension of worry may help explain why they have poorer outcomes in the areas of anxiety and QOL than women who are not employed. In contrast, women who were employed showed a trend toward better physical functioning than those who were not employed. A possible explanation for this may be that women who are employed feel a sense of progress in their recovery when they are able to return to work and thus may not consider their physical functioning as limited. This study, however, did not look at whether women returned to work after surgery. It only assessed whether or not women were employed prior to surgery.

Women in the intervention group (targeted home nursing care protocol from a study nurse) showed a trend toward better levels of anxiety compared to the control group (agency nursing care or no nursing care). This finding may

indicate a benefit to providing a targeted protocol of in-home nursing care in the two weeks following surgery. Further evaluation of the impact on reducing anxiety may be warranted.

B. Pre and Post-Surgery Outcome Variable Correlations (Table 4)

All six pre- and post-surgery variables were significantly correlated and each of the correlations was positive. Thus if a women had a high score presurgery, she was likely to have a high score post-surgery on the same outcome variable.

III. Research Question #3

Which individual baseline demographic variables were predictive of postsurgery **emotional** and **physical health** in women undergoing short-stay surgery for breast cancer?

A. Binary Logistic Regression (Tables 5 and 6)

While the significant findings and trends found in the mean outcome results above had many similarities to what has been reported in the published literature, the actual predictive role evaluated by the binary logistic regression analyses changes the picture somewhat. When the predictive relationship between each individual demographic variable and outcome variable was assessed, the number of significant findings was reduced from eleven categories in the mean scores (Table 3) to seven categories in the first binary logistic analysis (Table 5), to four categories in the second binary logistic analysis (Table 6). The final binary logistic analysis (Table 6) incorporated the added component

of controlling for how participants rated their pre-surgery functioning on the outcome variables of anxiety, physical functioning, physical QOL, functional QOL, family/social QOL, and emotional QOL, thus hopefully providing the most accurate estimate of the predictive effect of demographic variables on the emotional and physical health outcomes.

Based on the significant results of the first binary logistic regression analysis (Table 5), the type of patient who may be in need of supportive emotional and physical health services following surgery would have at least one of the following characteristics: younger in age, income less than \$75,000, hospital stay greater than 24 hours, employed, with caregiver support, and graduate school education. If one considers the non-significant trends in the results, we might also want to include women who had a mastectomy.

By controlling for how participants rated their emotional and physical health outcomes pre-surgery (Table 6) the type of patient who may be in need of additional supportive emotional and physical health services would be someone who is younger in age, in the \$45,000 to \$74,999 income level, with caregiver support, and graduate school education. Again, if we consider the non-significant trends in the findings, it would also be advisable to include women who are in the \$0 to \$25,499 income category, are not married, have undergone a mastectomy, and are hospitalized over 24 hours.

IV. Research Question #4

Which combinations of baseline demographic variables were predictive of post-surgery **emotional** and **physical health** in women undergoing short-stay surgery for breast cancer?

A. Multiple Logistic Regression (Table 7)

To obtain a more comprehensive picture of what combinations of demographic variables are predictive of post-surgery emotional and physical health, the use of multiple logistic regression was necessary. For this analysis six models were evaluated, that is, one model for each of the post-surgery outcome variables. Pre-surgery scores on the outcome variables were controlled for in the analysis.

R-Square results were obtained to measure the strength of the association between variables in each of the models. This is the proportion of variance in the dependent variable (outcome) which can be predicted from the combination of independent variables (baseline demographic) (UCLA Academic Technology Services, 2005). The R² values for this sample ranged from 0.25 (physical QOL as the outcome) to 0.49 (anxiety as the outcome). This indicates that between 25% and 49% of the variance in the outcome variable scores can be predicted from the baseline demographic variables in the models.

While it was informative to look at each of the models individually in the results section, it now seems most useful to look at these models as a whole and develop a profile of the patient who may need supportive emotional and physical health services post-surgery. If we look at it in this manner and base the profile

on significant findings only, the patient who would most likely need services would be younger in age, income less than \$75,000, not married, hospitalized greater than 24 hours, and with caregiver support. If we look at trends across all of the models, the profile would also include women who had graduate school education.

Another approach would be to categorize the need for supportive resources based on an Emotional Health Risk Profile (those who were at risk of anxiety, poor family/social QOL and poor emotional QOL) and Physical Health Risk Profile (those at risk of physical functioning difficulties, poor physical QOL, and poor functional QOL). Those who would fit the Emotional Health Risk Profile would have an income less than \$75000, not be married, and have a caregiver. Women who would fit the Physical Health Risk Profile would be younger, with a hospital stay greater than 24 hours, and have a caregiver. Through the use of these profiles, health care providers could potentially better identify at-risk patients prior to surgery or discharge from the hospital and provide resources targeted at improving their outcomes.

V. Study Strengths

The strengths of the study include the large sample size (n=240), effective randomization which produced no significant baseline demographic differences between groups, and well-established and tested outcome measures. Another strength is that participants rated their emotional and physical health both pre-and post-surgery, thus differences could be evaluated across time.

This study aimed to expand the literature related to predictors of postsurgical emotional and physical health in women with breast cancer by conducting an in-depth analysis of a comprehensive group of demographic variables. This was accomplished in that we now have a better idea of how eight specific demographic factors act alone and in combination to impact how women rate their post-surgical health. In addition, there is a clearer understanding of how these predictors impact specific components of emotional and physical health including anxiety, family/social QOL, emotional QOL, physical functioning, physical QOL, and functional QOL.

Gaps in the literature, specifically related to the role of income, length of hospital stay, and employment, were addressed through this comprehensive evaluation. Income is a difficult variable to measure as study participants are not always willing to share financial information. This study obtained financial data for approximately 70% of the sample. While this is the majority of the sample, there may still be concerns related to whether the income data reported is accurate and what the financial picture is for the other 30% of the sample. Thus, there is still more progress that could be made in this area of the research.

In regards to gaps in the literature related to length of stay, this study went beyond what much of the literature has defined as a short-stay (48 hours or less) and evaluated stays of 24 hours or less. Findings showed improved outcomes in several areas for women who had this shorter length of stay. Further studies are essential, however, to determine what types of patients could potentially be candidates for a successful early discharge.

In the area of employment, this study went beyond what is currently in the literature by evaluating its predictive role on post-surgical emotional and physical health. However, the findings are somewhat limited due to the fact that this study only assessed whether participants were employed prior to surgery. Further information on whether women were able to return to work would be helpful in evaluating the role of this variable.

VI. Study Limitations

There are a few limitations regarding the data for this study. For the caregiver results, findings might be clearer if we knew more about who was the true caregiver. The question asked in the post-surgery telephone interview was as follows: "Is there someone who lives with you or visits you on a regular basis and helps with care of any type including bathing, dressing, cooking, housekeeping or medications?" We do not know if this relationship is different since the cancer diagnosis, if there is more than one person who serves in this role, how much of an emotional impact they have on the patient (i.e., is it a supportive or non-supportive relationship), and whether this is a paid care-giving service. There seem to be many unknowns associated with this variable that could confound the results.

The findings related to education in this study were somewhat different than the literature. Rather than higher education being predictive of better results as was found in the literature review, this study showed that the highest level of education (graduate school) was predictive of poorer functioning in some areas.

The literature reviewed for this study varied slightly in how education was measured. The study by King, et al. (2000) looked at "secondary" (high school) and "vocational/tertiary" (post-secondary training and university) education in Australia; Uzon, et al. (2004) included the four categories of "literate without a diploma", "primary school", "high school", and "college"; and Schover, et al. (1995) included the five categories of "less than high school", "high school", "some college", "four year college degree", and "graduate degree". This thesis study evaluated six categories including "grade school", "some high school", "completed high school", "some college", "some college", "some college", "completed college", and "graduate school", "the majority of women in this study were highly educated, with 68.3% reporting that they had at least some college education. Due to the variation in categories, results could be somewhat difficult to compare with existing literature.

CHAPTER 5 CONCLUSION

Breast cancer is the most common form of carcinoma in women in the U.S., survival rates are quite high for early stage disease (98% for localized breast cancer) (American Cancer Society, 2005), and over 13% of women in the U.S. will develop the disease at some point during their lifetime (Ries et al., 2005). Thus it is essential that the emotional and physical health of these women be well understood and addressed by researchers and clinicians. The aim of this thesis project was to determine potential baseline demographic predictors for emotional and physical health outcomes following surgery, thereby adding to the literature and potentially helping to establish a profile by which to identify patients who may need additional emotional and physical supportive services during their recovery from surgery and preparation for the next phase of treatment.

A plethora of information on the relationship between baseline demographic predictor variables and post-surgery emotional and physical health outcomes was explored in this thesis project. Findings show that there is evidence that many of these demographic variables are related to the outcomes, and many appear to play a significant predictive role. Among these findings are two components which potentially could be translated to clinical practice and health policy.

First is the idea of the Emotional and Physical Health Risk Profiles. If we know that patients who have an income less than \$75,000, are not married, and have a caregiver fit the Emotional Health Risk Profile and patients who are younger, hospitalized greater than 24 hours, and have a caregiver fit the Physical

Health Risk Profile, we can identify them prior to surgery or to their discharge from the hospital and provide resources targeted at improving their outcomes. Further research could be undertaken to evaluate the effectiveness of these profiles.

A second finding that warrants further evaluation is that of improved outcomes in several areas for women who had a hospital stay of 24 hours or less. If this decreased length of stay can be shown to be more beneficial to the health of patients and reduce cost of care, this could be of importance in the area of health care policy. It is essential, however, to first determine which patients could benefit from early discharge. Further studies are needed to evaluate the health-related characteristics that allow patients to be candidates for a successful early discharge.

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Demographic Variables		Interven	tion		Contro	-		Total	
Continuous	=	M	SD	-	W	SD	=	W	SD
Age	121	56.27	12.33	119	55.68	10.88	240	55.98	11.61
Income (missing n=71)	74	\$48,502.01	32,110.99	95	\$70,298.95	104,294.15	169	\$60,754.73	81,558.41
Categorical		-	%			%		-	%
Race									
Caucasian/White		112	92.5		109	91.6		221	92.0
African American/Black		3	2.5		6	7.6		12	5.0
Mexican American		-	0.8		0	0.0		1	0.4
Asian/Pacific Islander		2	1.7		1	0.8		3	1.3
Other		3	2.5		0	0.0		3	1.3
Marital Status									
Married		75	62.0		75	63.0		150	62.5
Other		46	38.0		44	37.0		06	37.5
Surgery Type									
Lumpectomy		66	81.8		85	71.4		184	76.7
Other		22	18.2		34	28.6		56	23.3
Hospital Stay									
<24 hours		63	52.1		54	45.4		117	48.8
>24 hours		58	47.9		65	54.6		123	51.2
Employ (missing n=17)									
Employed		57	47.1		79	66.4		136	56.6
Not Employed		47	38.8		40	33.6		87	36.3
Caregiver (missing n=2)									
Caregiver		69	57.0		62	52.1		131	54.5
No caregiver		50	41.3		57	47.9	-	107	44.5
Education			10.22		\$2.80 L	AL MAN	2	100 100	
Grade School		2	1.7	-	3	2.5	1	5	2.1
Some High School		6	7.4		4	3.4	3	13	5.4
Completed High School		28	23.1	-	30	25.2	100	58	24.2
Some College	1	43	35.5		45	37.8	101	88	36.7
Completed College		17	14.1	0	15	12.6	110	32	13.3
Completed Grad School		22	18.2		22	18.5		44	18.3

	Spie	Iberger	SF-36	Physical	Cella	Physical F	lealth Su	Ibscales	Cella	Emotional P	Health S	ubscales
Baseline	A	rxiety	Fnx.	Subscale	Phys	ical QOL	Functi	onal QOL	Family	/Soc QOL	Emoti	ional QOL
Variables	(†sco	=24U) re=lanx)	(1sec	=223) hre=t finc)	(1scor	=240) m=100L)	(†Scor	=239) e=100L)	(1scor	=240) n=1001)	(TSCO	=238) re=100L)
	-	W	-	W	=	W	-	W	-	W	-	W
Age: 23-54 years	120	69.31	108	70.92	120	79.86	120	69.56	120	85.82	120	75.37
55-86 years	120	77.22*	115	68.18	120	83.74	119	75.44*	120	87.83	120	83.73**
\$ 0-\$ 25499	42	71.94	42	59.90	42	78.43	41	69.46	42	83.07	42	80.52
\$25500-\$ 44999	40	71.21	40	71.13	40	81.10	40	70.90	40	83.08	40	78.83
\$45000-\$ 74999	40	67.17	40	71.30	40	80.70	40	70.38	40	87.00	40	74.38
\$75000+ Income	47	78.01	47	77.55*	47	83.72	47	75.11	47	91.11*	47	80.47
Married	150	74 70	125	80 7A	150	07.65	150	72 067	150	07 79	150	00 60
Other	6	70.87	88	69.15	06	80.38	68	70.17	6	85.30	80	77.82
Lumpectomy	184	73.54	167	71.79*	184	82.30	183	73.31	184	87.64	184	79.73
Other Surgery	56	72.35	56	62.70	56	80.16	56	69.80	56	84.14	56	78.96
> 24 hrs hospital	123	72.64	117	65.02	123	79.67	123	70.44	123	85.47	123	79.34
≤ 24 hrs hospital	117	73.92	106	74.46**	117	84.03*	116	74.66	117	88.24	117	79.77
Employed	136	70.80	136	71.77	136	81.30	136	70.36	136	86.77	136	76.34
Not Employed missing (n=17)	87	76.42*	87	65.97	87	82.87	86	75.66*	87	86.77	87	84.20**
Careaiver	131	72.95	117	67.62	131	81.34	130	71.59	131	87.37	131	79.31
No Caregiver missing (n=2)	107	73.57	106	71.58	107	82.25	107	73.46	107	86.16	107	79.77
Grade School	5	79.67	5	60.20	5	78.40	2	80.60	5	86.40	2	86.80
Some H.S.	13	75.51	13	65.08	13	84.00	13	81.38	13	92.00	13	84.00
Completed H.S.	58	71.78	56	65.27	58	82.69	57	74.30	58	87.26	58	80.48
Some College	88	74.36	81	70.19	88	80.67	88	72.31	88	85.38	88	80.30
Comp. College	32	73.59	28	70.54	32	85.03	32	68.28	32	87.84	32	79.28
Graduate School	44	71.40	40	75.95	44	80.27	44	70.00	44	86.91	44	74.89
Intervention	121	75.30 [†]	104	68.13	121	82.93	120	74.01	121	86.51	121	80.88
Control	119	71.19	119	70.71	119	80.65	119	70.95	119	87.13	119	78.20

Table 3: Mean Post-Surgery Outcome Scores

I able 4: Pre-Surgery and Pre-Surgery Outcome Variables	rostaugery ou		Post-Surgery Ou	icome Variables			
	Anxlety	SF-36	Physical QOL	Functional QOL	Family/Social QOL	Emotional QOL	
Anxiety	0.59*						
SF-36		0.54*					
Physical QOL			0.41*				
Functional QOL				0.59*			
Family/Social QOL					0.46*		
Emotional QOL						0.62*	

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*Spearman Correlations p < .01

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			Post-Surgery Out	come Variables		
	Spielberger	SF-36 Physical	Cella Physical H	ealth Subscales	Cella Emotional I	Health Subscales
Baseline	Anxiety	Fnx. Subscale	Physical QOL	Functional QOL	Family/Soc QOL	Emotional QOL
Demographic	(n=240)	(n=223)	(n=240)	(n=239)	(n=240)	(n=238)
Variables	(†score=janx)	(†score=tfmx)	(1score=1QOL)	(1score=1QOL)	(1score=1QOL)	(†score=†QOL)
Age	1.02 (1.00-1.05)*	0.99 (0.95-1.03)	1.04 (0.99-1.08)	1.02 (0.99-1.05)	0.99 (0.97-1.01)	1.05 (1.03-1.08)**
\$ 0-\$ 25499	0.63 (0.27-1.48)	0.65 (0.15-2.89)	0.72 (0.19-2.75)	0.96 (0.37-2.46)	0.30 (0.12-0.72)*	1.17 (0.51-2.71)
\$25500-\$ 44999	0.68 (0.29-1.61)	1.48 (0.42-5.28)	0.76 (0.20-2.91)	0.65 (0.24-1.79)	0.36 (0.15-0.86)*	1.19 (0.51-2.78)
\$45000-\$ 74999	0.76 (0.32-1.78)	0.22 (0.02-1.93)	0.55 (0.13-2.38)	0.65 (0.24-1.79)	0.40 (0.17-0.95)*	0.80 (0.34-1.85)
\$75000+ Income missing (n=71)						
Married	1.24 (0.73-2.10)	1.03 (0.38-2.76)	0.93 (0.38-2.24)	1.29 (0.69-2.42)	1.05 (0.61-1.79)	1.29 (0.76-2.17)
Lumpectomy Other Surgery	1.28 (0.69-2.37)	6.23 (0.81-47.95) [†]	1.50 (0.49-4.60)	1.64 (0.77-3.49)	1.52 (0.81-2.86)	0.98 (0.54-1.79)
> 24 hrs hospital≤ 24 hrs hospital	0.89 (0.53-1.48)	0.32 (0.11-0.93)*	1.27 (0.53-3.01)	0.59 (0.32-1.06) [†]	0.72 (0.43-1.21)	1.17 (0.70-1.95)
Employed Not Employed missing (n=17)	0.73 (0.42-1.26)	1.31 (0.47-3.62)	0.67 (0.28-1.59)	0.81 (0.43-1.51)	1.41 (0.81-2.47)	0.54 (0.31-0.93)*
Caregiver No Caregiver missing (n=2)	0.70 (0.42-1.18)	0.90 (0.34-2.36)	0.40 (0.16-0.98)*	0.61 (0.34-1.12)*	1.13 (0.67-1.90)	0.93 (0.56-1.55)
Grade School	0.88 (0.13-5.78)	N/A	2.50 (0.22-28.13)	0.75 (0.08-7.44)	0.40 (0.04-3.86)	2.38 (0.36-15.76)
Some H.S.	1.13 (0.33-3.91)	1.58 (0.13-19.03)	N/A	1.33 (0.34-5.20)	1.85 (0.53-6.45)	2.54 (0.71-9.06)
Completed H.S.	0.69 (0.31-1.55)	0.70 (0.10-5.22)	0.94 (0.24-3.74)	1.28 (0.53-3.10)	1.04 (0.47-2.33)	2.25 (1.01-5.01)*
Some College	1.15 (0.55-2.38)	2.99 (0.63-14.17)	1.28 (0.38-4.35)	0.94 (0.41-2.18)	1.00 (0.48-2.10)	2.19 (1.05-4.59)*
Comp. College Graduate School	0.90 (0.36-2.27)	1.46 (0.19-11.05)	1.03 (0.22-4.98)	0.43 (0.12-1.50)	1.09 (0.43-2.76)	2.32 (0.92-5.89) [†]
Intervention Control	1.32 (0.79-2.21)	1.48 (0.56-3.89)	1.31 (0.55-3.12)	1.19 (0.66-2.15)	1.01 (0.60-1.69)	1.18 (0.71-1.96)

Table 5: Binary Logistic Regression (Odds Ratios and 95% Confidence Intervals)

* p<.05 ** p<.001 / p<.15

Table 6: Binary Lo	ogistic Regression	Controlling for Pre-	Surgery Outcomes	(Odds Ratios and	95% Confidence Int	ervals)
			Post-Surgery Ou	tcome Variables		
	Spielberger	SF-36 Physical	Cella Physical H	ealth Subscales	Cella Emotional H	lealth Subscales
Baseline	Anxiety	Fnx. Subscale	Physical QOL	Functional QOL	Family/Soc QOL	Emotional QOL
Demographic	(n=240)	(n=223)	(n=240)	(n=239)	(n=240)	(n=238)
Variables	(†score=janx)	(†score=t/nx)	(†score=†QOL)	(1score=1QOL)	(†score=†QOL)	(1score=1QOL)
Age	1.02 (0.99 - 1.05)	1.03 (0.98 - 1.08)	1.03(0.99 - 1.07)*	1.01 (0.98 - 1.04)	0.98 (0.96 - 1.01)	1.03(1.00 - 1.06)*
\$ 0-\$25499	0.99 (0.35 - 2.76)	1.35 (0.28 - 6.59)	0.83 (0.21 - 3.31)	1.13 (0.39 - 3.31)	0.45(0.17 - 1.20)*	1.68 (0.63 - 4.49)
\$25500-\$44999	0.96 (0.34 - 2.74)	2.16 (0.56 - 8.28)	0.74 (0.19 - 2.94)	0.94 (0.31 - 2.89)	0.52 (0.20 - 1.37)	1.55 (0.58 - 4.19)
\$45000-\$74999	0.91 (0.33 - 2.56)	0.23 (0.03 - 2.06)	0.52 (0.12 - 2.30)	0.61 (0.21 - 1.81)	0.36(0.14 - 0.92)*	0.81 (0.30 - 2.16)
\$75000+ Income						
	100 100 01 1	100 1 100,000	101 0 10 10 10 0	100 00 0 141	0 04 10 45 4 451	A PE/0 00 2441
Married Other	1.13 (0.61 - 2.07)	0.69 (0.24 - 1.96)	0.85 (0.34 - 2.10)	1.08 (0.82 - 3.44)	(0.81 (0.45 - 1.45)	1.00(0.66 - 3.11)
Lumpectomy	1.17 (0.58 - 2.36)	4.82(0.61-38.39)*	1.33 (0.42 - 4.19)	1.52 (0.65 - 3.52)	1.57 (0.79 - 3.11)	0.87 (0.43 - 1.78)
Other Surgery						
> 24 hrs hospital < 24 hrs hospital	0.78 (0.43 - 1.41)	0.41(0.14 - 1.24)	1.48 (0.60 - 3.61)	0.60(0.30 - 1.18)	0.75 (0.43 - 1.31)	1.24 (0.68 - 2.27)
Emploved	0.73 (0.39 - 1.39)	0.68 (0.23 - 2.00)	0.86 (0.35 - 2.10)	0.85 (0.42 - 1.72)	1.41 (0.77 - 2.59)	0.84 (0.44 - 1.61)
Not Employed						
missing (n=17)						
Caregiver	0.63(0.35 - 1.16)*	0.86 (0.32 - 2.36)	0.38(0.15 - 0.95)*	0.57(0.29 - 1.13)*	0.91 (0.51 - 1.61)	0.99 (0.54 - 1.83)
No Caregiver						
missing (n=2)						
Grade School	1.58 (0.21-11.82)	N/A	2.67 (0.22-32.80)	1.29 (0.10-16.85)	0.62 (0.05 - 7.25)	1.40 (0.13-15.14)
Some H.S.	1.21 (0.29 - 4.97)	5.00 (0.30-82.74)	N/A	2.63 (0.46-14.92)	1.43 (0.37 - 5.48)	1.43 (0.31 - 6.66)
Completed H.S.	0.82 (0.33 - 2.07)	0.77 (0.10 - 5.94)	0.87 (0.21 - 3.57)	1.54 (0.56 - 4.23)	0.86 (0.36 - 2.04)	2.39(0.94 - 6.12)
Some College	1.18 (0.50 - 2.77)	3.55(0.71-17.72)*	1.43 (0.41 - 5.02)	1.55 (0.59 - 4.07)	1.02 (0.46 - 2.26)	2.39(1.00 - 5.71)*
Comp. College	0.63 (0.22 - 1.85)	1.25 (0.16 - 9.88)	0.86 (0.17 - 4.29)	0.46 (0.12 - 1.76)	0.82 (0.30 - 2.24)	1.67 (0.57 - 4.92)
Graduate School						
Intervention Control	1.35 (0.74 – 2.44)	1.88 (0.68 - 5.18)	1.29 (0.53 - 3.12)	1.23 (0.63 - 2.42)	1.08 (0.62 - 1.89)	1.18 (0.65 - 2.16)

p<.15 * p<.05 ** p<.001 *

Table 7: Multiple	Logistic Regression	1 Controlling for Pre-	Surgery Outcomes	(Odds Ratios and 95	% Confidence Interv	als)
			Post-Surgery 0	utcome Variables		
	Spielberger	SF-36 Physical	Cella Physical I	Health Subscales	Cella Emotional H	ealth Subscales
Baseline	Anxiety	Fnx. Subscale	Physical QOL	Functional QOL	Family/Soc QOL	Emotional QOL
Demographic	(n=240)	(n=223)	(n=240)	(n=239)	(n=240)	(n=238)
Variables	(†score=↓anx)	(†score=[fnx)	(†score=†QOL)	(†score=†QOL)	(1score=1QOL)	(1score=1QOL)
Age	1.02(0.97 - 1.07)	1.03(0.95 - 1.12)	1.07(1.00 - 1.15)*	1.01(0.96 - 1.06)	0.99(0.95 - 1.03)	1.02 (0.98 - 1.06)
\$ 0-\$25499	1.42(0.32 - 6.30)	0.41(0.03 - 5.08)	0.38(0.05 - 3.02)	1.04(0.24 - 4.50)	0.26(0.07 - 0.98)*	2.90(0.77-10.96)
\$25500-\$44999	0.69(0.19 - 2.46)	0.65(0.09 - 4.81)	0.29(0.05 - 1.77)	0.47(0.12 - 1.96)	0.33(0.10 - 1.07)*	1.91(0.59 - 6.22)
\$45000-\$74999	0.94(0.29 - 3.00)	0.12(0.01 - 1.61)*	0.58(0.11 - 3.09)	0.39(0.11 - 1.39)*	0.24(0.08 - 0.73)*	1.10(0.37 - 3.31)
\$75000+ Income missing (n=71)						
Married	2.00(0.71 - 5.62)	0.71(0.12 - 4.35)	0.73(0.17 - 3.21)	2.87(0.90 - 9.15) [†]	0.72(0.29 - 1.79)	2.92(1.15 -7.39)*
Other						
Lumpectomy Other Surgery	1.18(0.40 - 3.47)	1.36(0.12 - 15.73)	1.17(0.27 - 5.15)	1.52(0.46 - 5.05)	1.17(0.44 - 3.17)	1.21(0.44 - 3.36)
 24 hours hosp. 24 hours hosp. 	0.53(0.21 - 1.33)	0.15(0.03 - 0.75)*	1.20(0.36 - 4.02)	0.81(0.31 - 2.12)	0.95(0.42 - 2.14)	1.58(0.67 - 3.71)
Employed Not Employed missing (n=17)	0.95(0.34 - 2.61)	0.87(0.16 - 4.84)	1.53(0.38 - 6.21)	2.02(0.65 - 6.33)	1.54(0.60 - 3.95)	1.16(0.45 - 3.01)
Caregiver	0.41(0.17 - 0.97)*	0.48(0.12 - 1.97)	0.43(0.12 - 1.55)	0.32(0.12 - 0.85)*	0.85(0.40 - 1.84)	1.01(0.46 - 2.18)
No Caregiver						
Grade School	5.00(0.11-237.57)	1.71(0.00 - 0.00)	N/A	N/A	24.20(0.9-603.67)	0.65(0.02-21.84)
Some H.S.	1.95(0.20 - 18.66)	7.86(0.13-477.03)	N/A	11.33(0.9-131.99)*	5.85(0.7 - 44.73)	0.84(0.10 - 7.04)
Completed H.S.	0.56(0.14 - 2.29)	3.30(0.16 - 68.15)	2.00(0.25-16.07)	2.37(0.53 - 10.58)	1.54(0.45 - 5.31)	1.51(0.44 - 5.16)
Some College	2.40(0.67 - 8.56)	8.41(0.69-102.53)*	4.38(0.63-30.54)	2.49(0.62 - 9.97)	1.33(0.42 - 4.18)	1.69(0.54 - 5.28)
Comp. College Graduate School	0.98(0.22 - 4.36)	1.01(0.04 - 24.71)	1.10(0.11-10.54)	0.35(0.05 - 2.42)	0.48(0.12 - 1.92)	2.01(0.50 - 7.99)
Intervention Control	1.41(0.62 - 3.21)	1.82(0.46 - 7.20)	1.77(0.56 - 5.64)	1.70(0.69 - 4.16)	0.94(0.44 - 2.00)	1.30(0.61 - 2.77)
Nagelkerke R ²	0.49	0.47	0.25	0.40	0.33	0.39
* p<.05 ** p<.	001 1 0<.15					

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* p<.05 ** p<.001 / p<.15

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