

The Pennsylvania State University
The Graduate School
College of Health and Human Development

**MENTAL HEALTH, AMBULATORY MENTAL HEALTH VISITS,
AND PSYCHOTHERAPEUTIC MEDICATIONS OF U.S. CANCER
SURVIVORS AND THEIR SPOUSES**

A Dissertation in
Health Policy and Administration
and
Demography
by
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Abstract

Background: A cancer diagnosis has a great psychological impact on the lives of cancer survivors and their spouses. However, the existing literature fails to provide national estimates of the mental health status and the utilization patterns of psychotherapeutic medications of U.S. cancer survivors. In addition, the current literature the current literature has limited information about the ambulatory mental health visits and the utilization of psychotherapeutic medicines by cancer survivors' spouses.

Objectives: Therefore, the current study aims to: 1) To describe the mental health status, ambulatory mental health visits, and psychotherapeutic medicines utilization of U.S. cancer survivors and their spouses. 2) To compare mental health status, ambulatory mental health visits, and psychotherapeutic medicine utilization between the oncology population (cancer survivors and their spouses) and the general population. 3) To identify the predictors of mental health status, ambulatory mental health visits, and psychotherapeutic medicine utilization within the oncology population.

Data: The primary source of data is six years (2001-2006) of interviews from the Medical Expenditure Panel Survey - Household Component (MEPS-HC) linked to the National Health Interview Survey (NHIS).

Study population: The compiled data set includes 2,636 individuals with a history of cancer and 1,126 spouses of cancer survivors. Out of 2,636 cancer survivors, 381 are incident cancer cases and 2,255 are prevalent cancer cases.

Measures: The unit of analysis is an individual with or without a history of cancer diagnosis, or that person's spouse. Mental health status is measured by the mental component scores (MCS-12) of the Short Form-12 (version 2) Health Survey,

psychological distress is measured by the Kessler Index (K6) scores, and depression is measured by Patient Health Questionnaire. Ambulatory mental health visit is measured by the total annual number of visits made to outpatient department, emergency room, or physician's office due to mental health disorders. Psychotropic drug utilization is measured by the total annual number of psychotropic drug prescriptions.

Analysis: The univariate analysis was conducted using independent t-tests and chi-square to examine statistical differences in mental health status, ambulatory mental health visits and psychotropic drug utilization between the oncology population and the general population. Then, multivariate regression analyses of mental health scores, psychological distress, depression, ambulatory mental health visits, and psychotropic drug utilization was conducted as a function of cancer diagnosis or cancer history, demographic factors, socio-economic factors, and medical factors to determine the relative explanatory power of each set of predictor variables. A separate multivariate regression analyses was conducted for the oncology population, in order to investigate the relative significance of each set of predictor variables within the oncology group.

Results: Cancer survivors have lower mental health status, higher psychological distress, and higher odds of being depressed than the general population. Similar to cancer survivors, cancer survivors' spouses have lower mental health status, higher psychological distress, and higher odds of being depressed compared to spouses of non-cancer adults. The utilization of psychotherapeutic medicines is 1.3-1.4 percentage points higher for the oncology population than the general population, but cancer survivors and their spouses are no more likely to make ambulatory mental health related visits than the general population.

Policy Implications: This study reinforces the argument that cancer care providers need to routinely screen cancer patients and their spouses for mental health problems and assess their psychosocial health needs. Oncologists and primary care providers should make extensive assessment of the psychological needs of cancer survivors or their spouses with low education or chronic conditions and direct them to appropriate psychosocial services. Cancer care providers, if possible, should provide counseling and psychotherapy services in addition to psychopharmacotherapy services or should link cancer patients and their family members to organizations that provide counseling and psychotherapy services. This study suggests that gynecological cancer survivors have an unmet need for psychosocial services and therefore need routine screening, evaluation and treatment for mental health problems.

Limitations: MEPS and NHIS lack information about the stage of cancer and the type of treatment. Consequently, we were unable to investigate the influence of cancer stage and treatment modality on mental health status, mental services utilization and psychotherapeutic medication utilization. MEPS and NHIS also lack information about the mental health status of cancer survivors and their spouses prior to cancer diagnosis. As a result, we were not able to assess the influence of prior psychiatric history (or mental health before cancer diagnosis) on mental health status, mental health visits and psychotherapeutic medication utilization after cancer diagnosis. The data do not have adequate sample sizes to describe the mental health status, mental health related ambulatory visits, and utilization of psychotropic medicines of patients with less prevalent cancer sites such as brain and bone cancers. The utilization of

psychotherapeutic medications and mental health visits is self-reported, not based on medical records or insurance claims.

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English Translation: I bow before my Guru^a (or teacher) who is similar to the god of creation, sustenance, destruction, and omnipresent in us like the supreme knowledge.

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I dedicate my dissertation to my family members, my teachers (who have believed in me), and cancer survivors and their family members.

^a GURU means the one who removes the darkness of illiteracy, unknowing and unawareness about the reality and facts of life and enlighten our life with the wisdom, knowledge, realization of good acts and deeds which will make our life enriching and successful.

Chapter 1: Introduction

In 2009, the Surveillance Epidemiology and End Results (SEER) found that overall cancer death rates between 1990 and 2005 have decreased by 19.2% in men and by 11.4% in women (Jemal et al., 2009). As a result, the number of cancer survivors^b escalated at a higher rate throughout the 1970s and 1980s (Horner MJ, 2008). This increase led to the development of a cancer survivor advocacy community, which identified medical, psychological, economic, and legal issues related to the history of cancer (Hewitt & Greenfield, 2005).

In mid-1970s, the National Cancer Institute (NCI) defined the transitions of cancer survivors and their family members from diagnosis of cancer to period of active oncology treatment, to period of survivorship (short-term and long-term), and to patient's death as "cancer survival trajectory" (Figure 1.1). In 1989, Welch-McCaffery and colleagues (Welch-McCaffrey, Hoffman, Leigh, Loescher, & Meyskens, 1989) further developed potential cancer survival trajectories as follows:

- Live cancer free for many years
- Live long cancer free but die rapidly of late recurrence
- Live cancer free (first cancer) but develop second primary cancer
- Live with intermittent periods of active disease
- Live with persistent disease
- Live after expected death

^b A cancer survivor is defined as anyone who has been diagnosed with cancer, from the time of diagnosis through the balance of his or her life. (Source- National Cancer Institute)

Research studies have shown that cancer diagnosis and its treatment have physiological and psychological impact on cancer survivors and their families (Drabe et al., 2007; Fallowfield & Hall, 1991; Frumovitz et al., 2005; Ganz, 2002). Cancer survivors and their families go through several medical and psychosocial concerns, beginning from cancer diagnosis until the patient's death. In 1985, Fitzhugh Mullan described the concerns of cancer survivors in the form of three "seasons" of survival: acute survival, extended survival, and permanent survival. Acute survival comprises cancer diagnosis and primary oncology treatment. This phase is characterized by the patient's continual fear and anxiety. Extended survival refers to the follow-up period after primary oncology treatment. This phase is dominated by the fear of recurrence, concerns about body image, and physical limitations due to decreased physical strength and fatigue. Permanent survival is mostly experienced by long-term cancer survivors. In this phase, cancer survivors may suffer from the late effects^c and the long-term effects^d of cancer and treatment (Mullan, 1985).

Research studies investigating the mental health status of cancer survivors have yielded mixed results. Some studies found that cancer survivors have lower mental health and higher stress and anxiety than the general population (Bradley, Rose, Lutgendorf, Costanzo, & Anderson, 2006; Fleer et al., 2006; Peuckmann et al., 2007), whereas other studies found that cancer survivors have equal or better mental health compared to their healthy controls (Bardwell et al., 2004; Keating, Nørredam, Landrum, Huskamp, & Meara, 2005; Mols et al., 2006). By contrast, studies comparing mental health status

^c Late effects are absent or at sub-clinical level at the end of therapy and become manifest later.

^d Long-term effects begin during the treatment and continue beyond treatment.

between spousal caregivers of cancer survivors and non-caregivers have consistently found that caregivers have lower mental health than non-caregivers (Edwards & Clarke, 2004; Northouse, 1992; Pitceathly & Maguire, 2003). Studies examining the use of mental services among cancer survivors and their spouses concluded that cancer survivors and their spouses are more likely to use mental health services than healthy controls (Earle, Neville, & Fletcher, 2007; Hewitt & Rowland, 2002; Kadan-Lottick, Vanderwerker, Block, Zhang, & Prigerson, 2005). Studies assessing the use of psychotherapeutic medications among cancer survivors found that psychotherapeutic medications are more commonly prescribed to cancer survivors to manage cancer symptoms (L. Derogatis et al., 1979; Goldberg & Mor, 1985; Stiefel, Kornblith, & Holland, 1990).

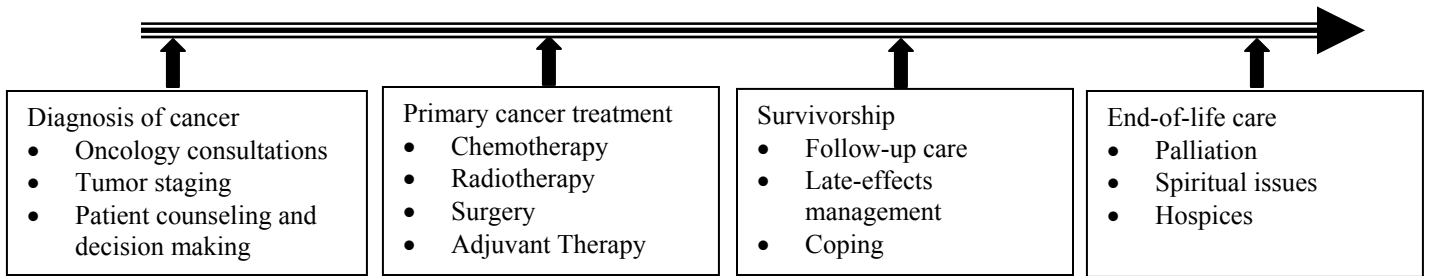
Although the existing literature is a foundation for my doctoral thesis, it has some limitations. Most of the studies assessing mental health status and the use of mental health services and psychotherapeutic medicines among cancer patients have focused on narrowly defined cancer groups. For instance, studies investigating the use of psychotherapeutic medicines among cancer patients have been conducted only among hospitalized cancer patients. As a result, the results obtained from these studies cannot be generalized to the oncology population in the U.S. In addition, there are few if any studies of the use of mental health services and psychotherapeutic medications among cancer survivors' spouses.

To extend the existing literature, this thesis describes mental health status, mental health service utilization, and psychotherapeutic medicines utilization for all cancer survivors and for important subgroups of survivors by cancer type. It evaluates the impact

of cancer diagnosis or survivorship on mental health status, ambulatory mental health visits, and the use of psychotherapeutic medicines by comparing U.S. cancer survivors and their spouses with the general population. This research study will also identify predictors of mental health status, mental health service utilization, and use of psychotherapeutic medicines among cancer survivors and their spouses.

The thesis consists of seven chapters. This chapter is an introduction to cancer survivorship and its importance. It provides an overview of the existing literature on mental health and the use of mental health services and psychotherapeutic medications among cancer survivors and their spouses. The second chapter describes the conceptual frameworks guiding the thesis. The third chapter describes the data used here. The fourth chapter examines the mental health status of U.S. cancer survivors and their spouses, and the fifth chapter examines the ambulatory mental health visits of U.S. cancer survivors and their spouses. The sixth chapter investigates the use of psychotherapeutic medications by U.S. cancer survivors and their spouses, while the seventh chapter summarizes the results and discusses the implications and limitations of the study.

Figure 1.1 Cancer Survival Trajectory



Source: Adapted from National Cancer Institute figure on the “Cancer Control Continuum” (NCI, 2005)

Chapter 2: Conceptual Framework

In the present study, the conceptual framework depicts the “cause-effect” relationship between the history or diagnosis of cancer and mental health status, ambulatory mental health visits, the use of psychotherapeutic medicines for survivors and their spouses. The conceptual model for mental health status is based on Pearlin’s Stress Process Model and the “Biopsychosocial” model of health. The conceptual model for ambulatory mental health visits and psychotherapeutic medicines utilization is based the “Behavioral” model of health services utilization. In the Stress Process Model, primary stressors, such as conditions, experiences, or life events may cause psychological distress and anxiety that can affect an individual’s well-being or physical and/or mental health (Pearlin, Menaghan, Lieberman, & Mullan, 1981). The Biopsychosocial model of health emphasizes that social, psychological, and behavioral factors, in addition to biological factors, influence individual health (Engel, 1980). In the Behavioral model of health services utilization, the utilization of health services is a function of an individual’s predisposing factors, enabling factors and his/her need for medical care (Andersen, 1995).

Mental Health Status

In the conceptual model for mental health status (Figure 2.1), a diagnosis of cancer is a causal factor affecting the mental health status of cancer survivors and their spouses. Based on the stress process model, this “cause-effect” relationship assumes that cancer survivors and their spouses perceive cancer diagnosis as a threat and react to it with negative emotions such as fear of recurrence, fear of death, anxiety about future, and

depression throughout the cancer continuum (Ganz, 2002; Northouse, 1992). Therefore, cancer diagnosis or history of cancer might act as a stressor and have a negative impact on the mental health status of cancer survivors and their spouses. The perception of cancer diagnosis as a threat, as well as the reaction of cancer patients and their spouses to that threat, may be influenced by demographic characteristics, socio-economic characteristics, general health characteristics, cancer-specific characteristics, and social support available to both cancer survivors and their spouses.

Demographic characteristics. In the general population, as the individuals become older, their average mental health status decreases (Gaitz & Scott, 1972; Kay & Bergmann, 1966). However, in the oncology population, as individuals become older, the impact of cancer diagnosis or history on their average mental health status decreases. This is because the negative (physiological and psychological) effects of cancer diagnosis and treatment significantly affect the lives of cancer survivors and their spouses at an early life stage when intimate relationships, starting a family, and making a career are more important than at older ages. As a result, younger cancer patients and their spouses have lower mental health status compared to older cancer patients and age-matched healthy controls (Fleer et al., 2006; Gaugler et al., 2005; Parker, Baile, Moor, & Cohen, 2003). Females, in general, have higher prevalence of psychiatric disorders, such as anxiety and depression, and lower mental health status compared to males (Macintyre, Hunt, & Sweeting, 1996; Petersson, 1998). Due to disadvantaged social position and perceived racial discrimination, African Americans have higher stress levels and lower mental health status compared to whites (Warheit, 1975; David R. Williams, Yan, Jackson, & Anderson, 1997). In keeping with these findings from previous studies, the model

assumes that African Americans and female cancer patients have lower mental health status compared to their controls.

Socio-economic characteristics. Married individuals report better mental health compared to non-married individuals because marriage provides moral, as well as economic, support to individuals (Gove, 1973; Horwitz, 1996). Research studies show that having higher education, being employed, and having better income improve the morale and self-esteem of individuals; as a result, on average, individuals experience lower levels of anxiety and depression (Peuckmann et al., 2007; Parker, Baile, Moor, & Cohen, 2003). Therefore, the model assumes that marriage, education, employment, and income are positively related to the mental health status of cancer survivors and their spouses.

General health characteristics. Research studies investigating the mental health status of cancer survivors and their spouses report that better physical functioning predicts better mental health status (Clough-Gorr, Ganz, & Silliman, 2007). This is because good physical functioning boosts the individual's self-esteem and morale, leading to better mental health (Berkman, 1986; Singer, 1999). On the other hand, chronic conditions have a negative impact on overall functioning and well-being of a person (Stewart, 1989). They also result in adverse events leading to hospitalizations and elevation of psychological stress (Ormel, 1997). Therefore, the presence of chronic conditions is associated with lower mental health status. Based on these research studies, the model assumes that better physical functioning and the absence of chronic disease have positive effects on the mental health status of cancer survivors and their spouses.

Indirect effects of demographic and socio-economic characteristics on mental health status

An individual's demographic and socio-economic characteristics may indirectly affect the individual's mental health through the independent effects on the general health of an individual. Younger individuals have better general health compared to older individuals due to lower incidence rates of chronic conditions among younger individuals (Manton, 1991). Women have lower general health compared to men due to various biological, social, and environmental factors (Gorman, 2006). Ethnic minorities have lower physical health due to lower socio-economic status, higher incidence of chronic conditions, and perceived racial discrimination (D.R. Williams, 1999).

Socio-economic characteristics, such as education, employment, and income, locate individuals in the structure of society and provide economic resources to support a healthy life (Andersen & Newman, 1973). Conversely, healthier individuals are able to have better education, better employment, and better income compared to unhealthy individuals (Marmot, 2002; Ross, 1995a, 1995b). Thus, "two-way causality" relationship exists between socio-economic factors and general health of the population. Based on these studies, the current model assumes a "one way" cause-effect relationship from demographic characteristics of cancer survivors and their spouses to their general health and a "two way" cause-effect relationship between socio-economic characteristics of cancer survivors and their spouses and their general health.

Cancer characteristics. Among cancer survivors, cancer site, stage at diagnosis, type of treatment, age at diagnosis, and time since diagnosed with cancer have a significant effect on the mental health of cancer survivors. Studies show that patients with oropharyngeal, pancreatic, breast, and lung cancers have a higher prevalence of depression, whereas

patients with colon, gynecological, and lymphoma cancers have a lower prevalence of depression (Fleer et al., 2006; Given, Given, & Stommel, 1994; Massie, 2004). There is also evidence that advanced staged cancer patients have increased physical disabilities, which lead to a higher prevalence of depression among advanced cancer patients compared to cancer patients with localized or regional cancers (Degner & Sloan, 1995; Kadan-Lottick, Vanderwerker, Block, Zhang, & Prigerson, 2005). With regard to type of treatment, the current literature suggests that surgical treatment might improve mental health status of breast cancer patients but might worsen the mental health status of prostate cancer patients (Fleer et al., 2006). Studies also illustrate that cancer, if diagnosed in younger patients, has more adverse effects on the mental health status of cancer survivors compared to older cancer patients (Degner & Sloan, 1995). In addition, research studies demonstrate that as the time since diagnosis increases, cancer survivors experience a gradual improvement in their mental health status (Degner & Sloan, 1995). Based on these findings from previous research, the conceptual model assumes that stage of cancer is negatively related to the mental health status of cancer survivors, whereas age at diagnosis and time since diagnosis are positively related to the mental health status of cancer survivors.

Although cancer characteristics, such as cancer site, stage of cancer, type of treatment, age at diagnosis, and time since diagnosis, have a significant impact on the mental health status of cancer survivors, previous research has found no evidence that the effects of cancer on spouses vary along these dimensions (Ferrario, Zotti, Massara, & Nuvolone, 2003; Grunfeld, Coyle, Whelan, Clinch, & et al., 2004). To test the findings from the previous research studies, this model assumes that no relationship exists

between cancer survivors' cancer characteristics and the mental health status of their spouses.

Social support. The current model assumes that external (e.g. support groups for cancer survivors) and internal (e.g. family members and key family relatives) social support positively impact the mental health status of cancer survivors and their spouses.

Investigations into the psychosocial adjustment of cancer survivors and their family members show that cancer support groups and communication within family members of cancer survivors are positively associated with the mental status of cancer survivors and their spouses (Clough-Gorr, Ganz, & Silliman, 2007; Edwards & Clarke, 2004; Gaugler et al., 2005). Cancer support groups create a strong cohesion among cancer survivors, whereas communication networks within family members facilitate the dissemination of oncology information among the family members of cancer survivors. As a result, cancer survivors and their family members with good social network have lower levels of anxiety and depression.

Ambulatory mental health visits and Psychotherapeutic medications

Based on the behavioral model of health services use, the current model assumes that demographic characteristics (predisposing factors), socio-economic characteristics (enabling factors), and general health characteristics (the need for care) determine the use of mental health services (including ambulatory mental health visits and psychotherapeutic medicines) (Figure 2.2).

Demographic characteristics. Demographic characteristics such as age, gender, race and marital status predispose individuals to use mental health services (Andersen, 1995; Andersen & Newman, 1973) through their direct effects on the general health, including

physical and mental health of an individual . In the oncology population, if an individual is diagnosed with cancer at younger age, then the individual is more likely to have lower mental health status, higher anxiety, and depression. As a result, the model predicts that younger cancer survivors are more likely to make ambulatory mental health visits and use psychotherapeutic medicines compared to older cancer survivors or their spouses (Hewitt & Rowland, 2002). Due to higher prevalence of psychiatric disorders, such as anxiety and depression, and higher probability of physicians prescribing psychotherapeutic medicines to women, women use more mental health services compared to men (Green, 1999; Leaf & Bruce, 1987; Petersson, 1998). Studies have shown that blacks use fewer health care services compared to whites (Chow, Jaffee, & Snowden, 2003; Hu, Snowden, Jerrell, & Nguyen, 1991). This may be because blacks tend to have poorer communications with their physicians (Fox, 1991; Gordon, 2006). Blacks also tend to be non-compliant or tend to rely more on nontraditional methods [e.g., faith healing, folk remedies] (Diala, 2000). Married individuals report better mental health compared to single individuals (Gove, 1973; Verbrugge, 1979). As a result, married individuals are less likely to use mental health services (Cafferata, 1987; Morgan, 1980).

Socio-economic characteristics. Socio-economic characteristics, such as employment, income and health insurance coverage, provide access to medical care and enable people to use medical services (Andersen & Newman, 1973). As a result, this model assumes that employment, income, and health insurance coverage are positively related to ambulatory mental health visits and the use of psychotherapeutic medications.

Cancer. Cancer survivors and their spouses have lower mental health status (Bradley, Rose, Lutgendorf, Costanzo, & Anderson, 2006; Fleer et al., 2006; Peuckmann et al.,

2007) and are more likely to make ambulatory mental health visits (Earle, Neville, & Fletcher, 2007; Hewitt & Rowland, 2002) and use psychotherapeutic medications (Cullivan, Crown, & Walsh, 1998; L. Derogatis et al., 1979). Therefore, the current model assumes that cancer diagnosis and cancer specific characteristics have an impact on ambulatory mental health visits and the utilization of psychotherapeutic medications.

Social Support. The social-support system lowers stress and anxiety among cancer survivors and their family members and helps to improve their general mental health status. Therefore, social support lowers the likelihood of using mental health services (Sherbourne, 1988; Sherbourne & Stewart, 1991).

Figure 2.1 Conceptual Framework for Mental Health Status

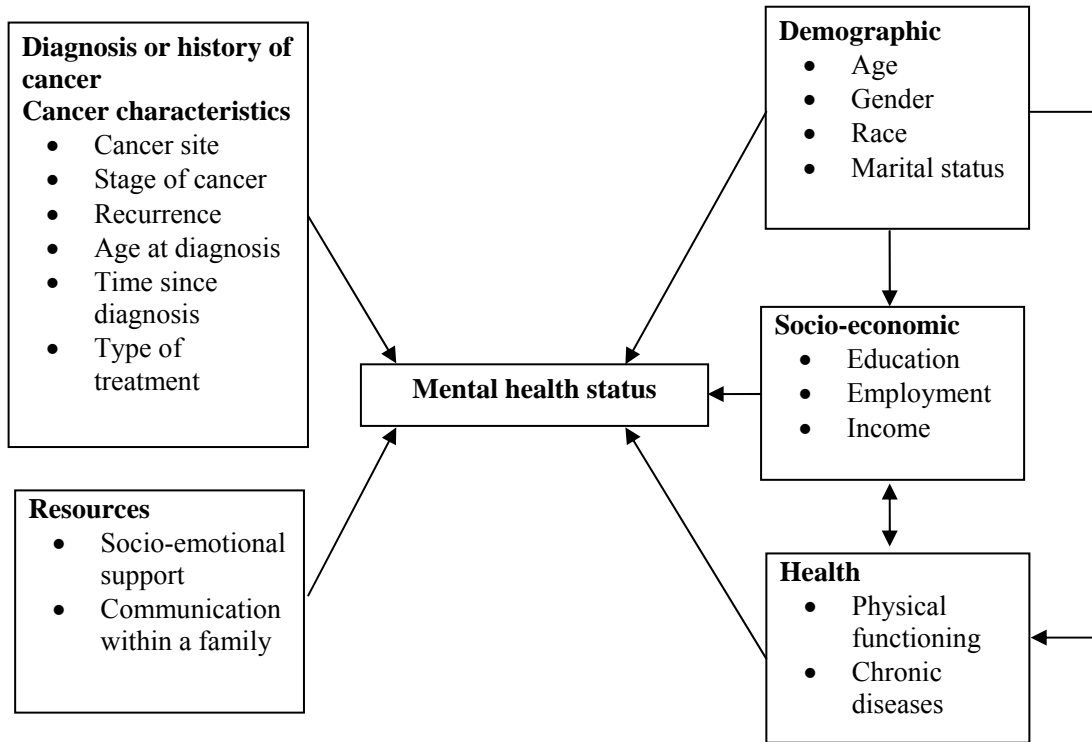
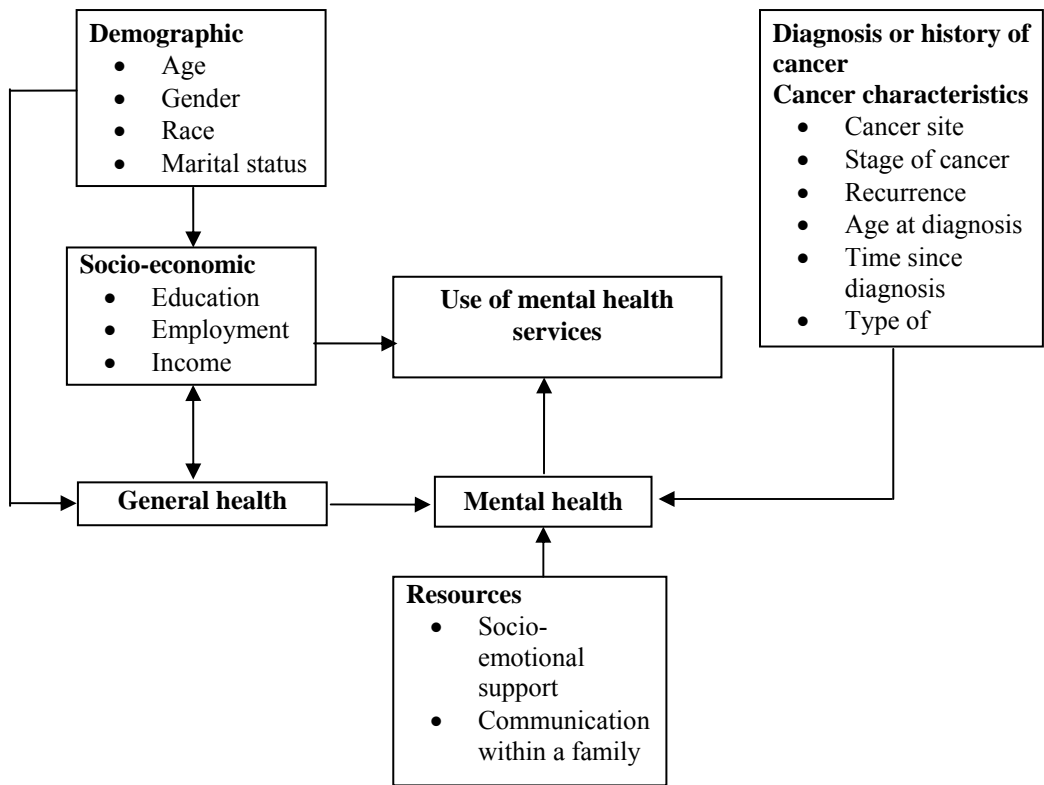


Figure 2.2 Conceptual Framework for Mental Health Services Utilization



Chapter 3: Data

The data for this study come from two large, nationally representative surveys, the Household Component of the Medical Expenditure Panel Survey (MEPS-HC) and the National Health Interview Survey (NHIS). The household component of MEPS provides detailed information about annual health care utilization and expenditures for each person in the sample, including information about the number and types of prescriptions.

Because the NHIS is the sampling frame for MEPS, data collected on individuals in each of these two surveys can be linked across surveys. Importantly for this study, questions systematically identifying cancer survivors who are asked in NHIS (but not in MEPS) are linked to the prescribed medicine data in MEPS to study psychotherapeutic medicine use by people with and without a history of cancer.

The MEPS-HC is a household survey nationally representative of the U.S. civilian non-institutionalized population and is conducted by the Agency for Healthcare Research and Quality (AHRQ). Each year a new sample panel of households is selected from the households responding to the previous year's NHIS (e.g. the 1999 MEPS introduces a new panel from the 1998 NHIS). Using data from NHIS, the MEPS-HC oversamples Hispanics, African Americans, Asians and those in low-income families. Data are collected for the people in each MEPS panel for two calendar years. Consequently, two panels are in the field each year. The annual data are created by combining data from the first year of the new panel with data from the second year of the previous panel. This study pools the MEPS-HC from 2001 to 2006 to produce a large enough sample of cancer survivors for reliable estimates. The overall response rates for MEPS years 2001-

2006 ranges between 58% and 66% (AHRQ, 2001b, 2002c, 2003c, 2004c, 2005c, 2006c).

In MEPS, whenever any event of care is reported, the household respondent is asked, “Was this [visit] for any specific health condition or were any conditions discovered during this visit?” For this study, if the household respondent reported the use of any ambulatory service for a mental health condition, the visits were classified as a “mental health visit.” Mental health conditions were identified with the help of “Clinical Classification Condition Codes” developed by AHRQ and assigned to respondent-reported conditions. The clinical classification condition codes are clinically meaningful categories of similar conditions. These codes are developed from the aggregation of the International Classification of Diseases, Ninth Revision (ICD-9) condition. In this study, we used clinical classification condition codes 65 to 75 (for 2001-2003) and 650 to 662 (for 2004-2006) to identify utilization for mental health conditions (Appendix).(AHRQ, 2001c, 2002d, 2003b, 2004b, 2005b, 2006b)

To investigate the utilization of psychotherapeutic medicines in the study sample, we considered the Prescribed Medicines section of the MEPS-HC. The MEPS Prescribed Medicine Event file provides detailed information on household-reported prescribed medicines for each person in each family surveyed in MEPS. Each record in this event file represents a unique prescribed medicine event and includes selected variables that are derived from the Multum Lexicon database. The Multum Lexicon database provides detailed information about medications, including drug names; drug product information, such as generic names, brand names, and common abbreviations; disease names; and ICD-9 codes. For this study, the psychotherapeutic medicines prescribed to the study

sample were identified from the following Multum Lexicon codes to the psychotherapeutic class (TC1=242) and subclasses: antidepressants (TC1S1=249); antipsychotic (TC1S1=251); anxiolytics, sedatives, and hypnotics (TC1S1=67); CNS stimulants (TC1S1=71) (AHRQ, 2001a, 2002b, 2003a, 2004a, 2005a, 2006a)

The NHIS is a cross-sectional household interview survey of the U.S. civilian non-institutionalized population and is conducted by the National Center for Health Statistics (NCHS). The NHIS uses a stratified multistage probability design that permits a continuous sampling of 358 primary sampling units (PSUs), with over-sampling of African Americans and Hispanics. Every week a sample of households representative of the target population is interviewed using Computer Assisted Personal Interviewing (CAPI) technology. These weekly samples are then added and compiled over time to form annual data.

The NHIS is composed of three parts: the Family Core, the Sample Adult Core, and the Sample Child Core. In the Family component, all members of the household 18 and older who are at home at the time of the interview are interviewed to collect basic information regarding demographics; health status and limitations; injuries; healthcare access and utilization; health insurance; and income and assets. However, for the Sample Adult core, one adult per family is randomly selected and administered the Sample Adult questionnaire to collect detailed information about chronic health conditions, health care services, and health behavior. In the Sample Adult questionnaire, the respondent is asked “Has a doctor or other health provider EVER told you that you have? This question acts as a “condition checklist” and helps researchers to measure the prevalence of chronic conditions such as diabetes, asthma, and cancer in the U.S. population. In

addition, the cancer questions in the Sample Adult questionnaire ask about cancer sites and age when first diagnosed with any cancer. Since this study requires information about cancer history, we restricted the NHIS sample to the Sample Adult component of the NHIS. For this study, we have pooled the Sample Adult section of NHIS from 1999-2005 to correspond with 2001-2006 MEPS-HC. The final response rates of the 1999-2005 Sample Adult section of NHIS range from 69% to 77%. (NCHS, 1999, 2000, 2001, 2002, 2003, 2004)

Subjects

Identification of cancer survivors

The study sample includes adults ages 25 and older with or without a history or diagnosis of cancer, along with the spouses of these individuals. For this study, adults with a history or diagnosis of cancer (i.e. cancer survivors) and their spouses are termed the “oncology population,” and adults without a history or diagnosis of cancer and their spouses are termed the “general population.” Cancer survivors were identified from the Sample Adult section of NHIS with the help of cancer questions in the condition checklist. Individuals who responded “yes” to the cancer diagnosis question were shown flashcards enumerating 29 cancer sites and asked, “What kind of cancer was that?” Each individual was allowed to report up to three different cancer sites. From this cancer site information, we identified people with only non-melanoma skin cancers and excluded them from the sample of cancer survivors. In this way, we identified 1,957 cancer cases from the 1999-2005 Sample Adult NHIS. Individuals with cancer diagnoses were also asked, “How old were you when (this cancer) was diagnosed?” From the responses to

this question, along with each person's age and date of interview, we determined the number of years that had elapsed since the person's first cancer was diagnosed.

Unlike NHIS, MEPS did not include cancer in its condition checklist until 2007. However, even without a cancer question in the MEPS checklist, many cancer survivors can be identified in earlier survey years from the Medical Conditions files of the MEPS-HC. Each record in this file represents one medical condition reported by a household survey respondent. Medical conditions are added to the Medical Conditions files whenever the household respondent reported a condition as:

- A reason for a particular medical event, such as hospital stay, outpatient visit, emergency room visit, home health episode, prescribed medication purchase, or medical provider visit.
- A reason for one or more disability days.
- "Bothering" the person during the reference period.

Conditions reported in these ways by household respondents were assigned "Clinical Classification Condition Codes" developed by AHRQ. We used clinical classification condition codes 11 to 46, excluding code 23 (non-melanoma skin cancer) and code 44 (unclassified neoplasm), to identify conditions that were cancer and people with cancer as a reported condition. In this way, we identified 679 additional cancer survivors or patients in MEPS who were diagnosed with cancer after they were interviewed in the NHIS. Most of these newly diagnosed cases would have been in initial treatment during the period covered by MEPS.

For a limited number of "priority conditions," including cancer, the MEPS Condition File includes the month and year "when the [condition] began" according to

the respondent. Using these dates for cancers identified only in the MEPS, we calculated years since diagnosed by subtracting age at diagnosis from age at interview. On the basis of the sources of cancer cases (MEPS or NHIS) and the timing of the person's first cancer diagnosis, the oncology sample was divided into two categories of (1) incident and (2) prevalent cases. Cancer survivors who were first identified in MEPS were characterized as "incident cases" in the calendar year when their cancer was first diagnosed. Cancer survivors first identified in NHIS or in the calendar year after their cancer was first diagnosed were characterized as "prevalent" cases. With these definitions, we identified 381 incident cancer cases and 2,255 prevalent cancer cases in the linked NHIS-MEPS database for 2001-2006.

Identification of spouses

During every round of MEPS interviews, each person's current marital status is collected or updated. Although marital status changes across rounds, for simplicity we have used marital status at the end of each interview year to identify married individuals in the study sample. Each person's spouse (if applicable) is identified in the person's data record in MEPS by a "spouse identifier" (the person identification number of the spouse). On the basis of marital status and spouse identifiers, we identified 1,126 spouses of cancer survivors and 15,788 spouses of other adults in the MEPS-HC.

Due to the two-year length of the panels in the MEPS-HC, there are two annual observations for 23,672 people in the 2001-2006 samples. The data assembled for this study include 4,287 annual observations from 2,636 cancer survivors and 1,818 annual observations from 1,126 spouses of cancer survivors.

Weights

To produce national estimates for the civilian, non-institutionalized population of the United States, we modified person-level survey weights (provided by AHRQ) on the MEPS public use files. Although these survey weights are adjusted for differential probabilities of selection and non-response in MEPS, the public-use weights do not account for the subsampling of “sample adults” in NHIS and attrition due to non-response of sampled adults from NHIS when linked to MEPS. In other words, the public-use weights were designed to project national estimates from the full MEPS sample, not from the smaller subsample of adults in MEPS with data from the NHIS condition checklist. Consequently, we created new person-level weights for our analytic subset of the MEPS sample.

The first step in the creation of the new weights was to multiply the original survey weights by an adjustment factor reflecting differences in the probability of selection for sampled adults in different sized families in NHIS. In an NHIS household with two adults, for example, each person had a 50-percent chance of being selected for the Sample Adult Questionnaire. By comparison, in an NHIS household with one adult, that person had a 100 percent chance of being selected. For each sampled adult above age 25 years with a positive MEPS survey weights ($i=1$), the adjustment factor was defined as the ratio of the weighted sum of the MEPS public-use weights for (a) all adults 25 years and older ($i=1$ to N) in the sampled adult’s MEPS family (f) to (b) the MEPS public-use weight for the sampled adult.

$$\text{Adjustment factor}_{if} = \sum_i \text{weight}_{if} / \text{weight}_{if}$$

To avoid very large adjustments in the weights of some individuals, we imposed a maximum of 4.25 (the 99 percentile of the initial factors) on the final adjustment factor.

After creating a new weight for each sampled adult in this fashion, we used a raking procedure to post-stratify the new weights for each year to weighted total controls for the U.S. population that we calculated by totaling the survey weights for the full MEPS sample. In raking, the new weights were adjusted so that the marginal totals were equal to the population totals on a specified set of control variables, including age, sex, race/ethnicity, family income or poverty status, region, and residence in a Metropolitan Statistical Area (MSA). Finally, to obtain the 2006 U.S. population as our weighted population from the pooled data, we rescaled our post-stratified person level weights. The scaling factor was defined as the ratio of the sum of post-stratified weights for 2001 to 2006 to the sum of weights for 2006. Each person's weight was multiplied by the scaling factor. When the rescaled, post-stratified person level weights were applied to our sample, the unweighted count of 2,419 cancer survivors represented 14 million cancer survivors and 1,036 spouses of cancer survivors represented 8 million spouses of cancer survivors.

Sample characteristics

Individuals

In the current study, the NHIS –MEPS database has been divided into two age groups: 25-64 and 65 and older because the health insurance arrangements of the two age groups are quite different and because cancer may affect survivors differently at different life stages. Overall, cancer survivors tended to be older compared to the general population. In the population under age 65, cancer survivors had more public (only)

insurance coverage and were less often uninsured compared to the non-cancer group. In the age group 65 and older, cancer survivors were more likely to have private insurance (usually in addition to Medicare). The cancer sample consisted of more females and non-Hispanic whites compared to the non-cancer group (Table 3.2). No significant differences in marital status, education, and family income were found between the cancer and non-cancer groups. Overall, the non-cancer sample was healthier than the cancer group. Higher percentages of cancer survivors suffered from chronic conditions such as arthritis, asthma, diabetes, chronic heart disease, and stroke compared to other adults.

Among cancer survivors between the ages of 25 and 64, 86% were prevalent cancer cases and 14% were incident cancer cases. Within cancer survivors in this age group, 23% were gynecological cancer survivors, 16% were breast cancer survivors, 4% were colorectal cancer survivors, 3% were prostate cancer survivors, and 2% were lung cancer survivors. Among cancer survivors above the ages of 65 years, 90% were prevalent cancer cases, and 10% were incident cancer cases. Within cancer survivors in this age group, 20% were breast cancer survivors, 20% were prostate cancer survivors, 12% were colorectal cancer survivors, 7% were gynecological cancer survivors, and 4% were lung cancer survivors (Table 3.4).

Spouses

Paralleling the differences between cancer survivors and other adults, the spouses of cancer survivors were older and included more non-Hispanic whites compared to the spouses of the non-cancer sample (Table 3.3). The spouses of cancer survivors were economically better off compared to the spouses of the non-cancer group. The spouses of cancer survivors tended to have more private insurance compared to the non-cancer

group. The spouses of cancer survivors were less healthy compared to other spouses. In the younger age group, the spouses of cancer survivors tended to have more chronic conditions such as arthritis, asthma, and heart disease compared to the spouses of the non-cancer group. Among cancer spouses in each age group, 16%-18% were married to someone diagnosed with breast cancer. In the younger age group, 20% were married to someone diagnosed with gynecological cancers. In the older age group, 24% were married to someone diagnosed with prostate cancer.

Table 3.1 List of Clinical Classification Codes

Clinical Classification Codes	Labels
Cancer	
011	Head and Neck Cancer
012	Esophagus Cancer
013	Stomach Cancer
014	Colon Cancer
015	Rectum and Anus Cancer
016	Liver and Intrahepatic Bile Cancer
017	Pancreas Cancer
019	Bronchus, Lung Cancer
021	Bone And Connective Tissue Cancer
022	Skin Melanoma
023	Other Non-Epithelial Skin Cancer
024	Breast Cancer
025	Uterus Cancer
026	Cervix Cancer
027	Ovary Cancer
028	Other Female Genital Organ Cancer
029	Prostate Cancer
030	Testis Cancer
032	Bladder Cancer
033	Kidney and Renal Pelvis Cancer
035	Brain and Nervous System Cancer
036	Thyroid Cancer
037	Hodgkin's Disease
038	Non-Hodgkin's Lymphoma
039	Leukemia
040	Multiple Myeloma
041	Other and unspecified primary cancer
042	Secondary Malignancies
043	Malignant Neoplasm without Specification
045	Maintenance Chemotherapy, and Radiotherapy
Mental Health Disorders (2001-2003)	
65	Mental Retardation
66	Alcohol-Related Mental Disorders
67	Substance-Related Mental Disorders
68	Senility And Organic Mental Disorder
69	Affective Disorders
70	Schizophrenia And Related Disorders
71	Other Psychoses
72	Anxiety, Somatoform, Dissociative Disorders
73	Preadult Disorders

74	Other Mental Conditions
75	Personal History Of Mental Disorders
Mental Health Disorders (2004-2006)	
650	Adjustment Disorders
651	Anxiety Disorders
652	Attention-Deficit, And Conduct Disorders
653	Delirium, Dementia, And Amnesia
654	Developmental Disorders
655	Disorders Usually Diagnosed In Infants
656	Impulse Control Disorders
657	Miscellaneous Mental Disorders
658	Mood Disorders
659	Personality Disorders
660	Schizophrenia And Other Psychotic Disorders
661	Screening And History Of Mental Health
662	Substance-Related Disorders

Table 3.2 Socio-demographic and Health Characteristics of Cancer Survivors and other adults ages 25 and older

Characteristics	25-64		65 and older	
	Cancer 7 million	Non-cancer 146 million	Cancer 7 million	Non-cancer 30 million
Sex ^{a, b}	%	%	%	%
Males	30	49	49	43
Females	70	51	51	57
Age ^{a, b}				
25-34	11	24	----	----
35-44	20	29	----	----
45-54	30	27	----	----
55-64	38	19	----	----
65-74	----	----	45	54
75+	----	----	55	46
Race ^{a, b}				
White	87	82	92	86
Black	8	12	6	9
American Indian/Alaskan Native	1	1	0	0
Asian	2	5	2	3
Native Hawaiian / Pacific Islander	1	0	0	0
Multiple races	1	1	0	1
Ethnicity ^{a, b}				
Hispanic	6	13	3	7
Non-Hispanic	94	87	97	93
Marital status				
Married	61	65	59	55
Education				
LT high school	13	14	25	31
High school	33	31	35	34
Some college	24	23	17	16
College graduate	17	19	12	11
Post graduate	13	13	11	8
Family income as percent of poverty line ^{a, b}				
Poor	11	9	10	10
Near Poor	4	3	6	7
Low income	10	11	19	20
Middle income	28	31	31	30

High income	47	46	34	32
Health insurance^{a, b}				
Any private	77	78	63	59
Only public	13	8	37	41
Uninsured	11	14	0	0
General health^{a, b}				
Excellent	11	18	5	7
Very Good	29	37	20	27
Good	31	28	37	35
Fair	16	9	23	20
Poor	7	2	9	5
Chronic conditions				
Arthritis ^{a, b}	32	17	52	49
Asthma ^{a, b}	15	9	10	10
Diabetes ^{a, b}	8	6	18	18
Heart disease ^{a, b}	12	7	35	30
Stroke ^{a, b}	3	1	11	9

a Cancer and non-cancer individuals, below ages of 65 years, are significantly different at p=0.05 level

b Cancer and non-cancer individuals, 65 and above, are significantly different at p=0.05 level

Table 3.3 Socio-demographic and Health Characteristics of Spouses Ages 25 and older

Characteristics	25-64		65 and older	
	Cancer 4 million	Non-cancer 94 million	Cancer 4 million	Non-cancer 16 million
Sex ^{a, b}	%	%	%	%
Males	31	49	62	57
Females	69	51	38	43
Age ^{a, b}				
25-34	9	22	----	----
35-44	18	30	----	----
45-54	30	28	----	----
55-64	44	20	----	----
65-74	----	----	54	64
75+	----	----	46	36
Race ^{a, b}				
White	91	85	95	89
Black	5	8	2	7
American Indian/Alaskan Native	1	1	0	0
Asian	3	5	2	3
Native Hawaiian / Pacific Islander	0	0	0	0
Multiple races	1	1	0	1
Ethnicity ^{a, b}				
Hispanic	6	13	2	7
Non-Hispanic	94	87	98	93
Education ^b				
LT high school	11	13	19	25
High school	32	31	34	35
Some college	23	23	17	16
College graduate	20	19	15	13
Post graduate	14	14	14	10
Employment ^{a, b}				
Employed	22	11	73	64
Family income as percent of poverty line ^a				
<100	4	5	6	7
100-199	2	3	3	4
200-299	7	10	16	17
300-399	28	30	31	32
400+	59	53	44	41

Health insurance ^{a, b}				
Any private	88	85	71	66
Only public	4	4	29	33
Uninsured	7	11	0	0
General health ^{a, b}				
Excellent	12	20	6	8
Very Good	32	41	23	30
Good	35	29	40	38
Fair	14	8	21	19
Poor	6	2	10	5
Chronic conditions				
Arthritis ^a	30	17	50	46
Asthma ^a	13	8	10	9
Diabetes	7	6	20	17
Heart disease ^{a, b}	11	7	35	30
Stroke	2	1	11	8

a Spouses of cancer and non-cancer individuals, below the ages of 65, are significantly different at p=0.05 level

b Spouses of cancer and non-cancer individuals, 65 and above, are significantly different at p=0.05 level

Table 3.4 Cancer Characteristics of the Oncology Sample

Characteristics	Individuals 14 million		Spouses 8 million	
	25-64	65 and older	25-64	65 and older
	%	%	%	%
Prevalent	86	90	86	90
Incident	14	10	14	10
<i>Cancer sites</i>				
Breast	16	20	18	16
Prostate	3	20	5	24
Colorectal	4	12	4	11
Lung	2	4	2	4
Gynecological	23	7	20	4

Chapter 4: Mental Health Status of U.S. Cancer Survivors and Their Spouses

Introduction

A cancer diagnosis has a great psychological impact on the lives of cancer survivors. Research studies have shown that being diagnosed with cancer leads to negative psychological effects, such as concerns about the future and death, depression, inability to make plans, uncertainty and a heightened sense of vulnerability (Ganz, 2002; Sutherland, 1981). These negative psychological effects may result in persistent anxiety and psychological distress (Lee-Jones, Humphris, Dixon, & Hatcher, 1997). Even after the initial diagnosis, the procedures for treating cancer (such as surgery, chemotherapy, and radiation therapy) may increase anxiety and depression among cancer survivors (M. Massie, 2004; Sutherland & Orbach, 1953).

However, research studies investigating the impact of cancer on the mental health status of cancer survivors have produced mixed results. A recent literature review found that the prevalence of major depressive disorders and clinically significant depressive symptoms among cancer survivors varies between 10% and 25%, which is four times greater than in the general population (AHRQ, 2002a). In 2007, Peuckmann et al. investigated Health-Related Quality of Life (HRQOL) among 2,000 long-term breast cancer survivors and found that breast cancer survivors had worse mental health compared to the normal or general population.(Peuckmann et al., 2007) Similarly, a research study examining the quality of life and mood of 152 long-term cervical and endometrial cancers survivors found that cervical and endometrial cancer survivors have more anxiety, dysphoria, anger, and confusion than their healthy controls (Bradley, Rose, Lutgendorf, Costanzo, & Anderson, 2006). Likewise, a study assessing Quality of Life

(QOL) of 354 long-term testicular cancer survivors by compared to healthy controls found that testicular cancer survivors had lower mental health status (Fleer et al., 2006).

On the other hand, some studies found that cancer survivors have better or equal mental health status compared to their healthy controls. For instance, Bardwell et al. found that early stage breast cancer survivors had higher HRQOL than the general population(Bardwell et al., 2004). A study assessing the physical and mental health status of older long-term cancer survivors also revealed that cancer survivors did not differ from people without cancer in terms of mental health status (Keating, Nørredam, Landrum, Huskamp, & Meara, 2005). A research study investigating HRQOL of long-term prostate cancer survivors showed that long-term prostate cancer survivors reported better mental health scores than an age-matched, normative population (Mols et al., 2006). Thus, the existing literature is ambiguous about the impact of cancer diagnosis or survivorship on the mental health of cancer survivors.

There have been fewer studies of the psychological impact of cancer on spouses, and the findings are more consistent for spouses than survivors. Research studies investigating the mental health status of cancer survivors' spouses consistently show that cancer has a negative psychological impact on spouses. The cancer diagnosis gives rise to fear of losing a loved one among spouses of cancer survivors, and the treatment that follows increases responsibilities and poses a caregiving burden for spouses or partners of cancer survivors. This leads to increased psychological distress and lower mental health status among spouses of cancer survivors (Edwards & Clarke, 2004; Ming, 2002; Northouse, 1992; Pitceathly & Maguire, 2003). Research studies assessing the prevalence of psychiatric disorders among spousal caregivers of cancer survivors have reported that

12% of spouses are depressed, 35% are anxious, and 13% have psychiatric disorders (Grunfeld, Coyle, Whelan, Clinch, & et al., 2004; Vanderwerker, Laff, Kadan-Lottick, McColl, & Prigerson, 2005). Likewise, spousal caregivers of cancer survivors have lower mental health status and higher anxiety compared to their health controls (Ferrario, Zotti, Massara, & Nuvolone, 2003; Wagner, Bigatti, & Storniolo, 2006). Studies have shown that, in general, spousal caregivers of terminally ill survivors are more depressed and have more psychological distress and anxiety compared to non-caregivers (Cochrane, Goering, & Rogers, 1997; Pruchno & Potashnik, 1989).

Although the existing literature guides the present study, it has limitations. Most studies investigating the mental health status of cancer survivors and their spouses have focused on a narrowly defined cancer groups, such as short-term or long-term cancer survivors rather than cancer survivors at all stages of the cancer trajectory. In addition, most studies have examined the mental health status and the prevalence of psychiatric disorders in small convenience samples. As a result, the findings from the existing research studies cannot be generalized to U.S. cancer survivors. To overcome these limitations, the present study investigates general mental health status, non-specific psychological distress, and depression for all cancer survivors at various stages of cancer survival trajectory using a large, nationally representative sample.

The current study will describe general mental health status, psychological distress, and depression for all cancer survivors and for important subgroups of survivors by cancer type. It will evaluate the impact of cancer diagnosis or survivorship on the mental health status of cancer survivors by comparing U.S. cancer survivors and their spouses with the general population. This research study will also identify predictors of

general mental health status, psychological distress, and depression among cancer survivors and their spouses. Oncologists and psycho-oncology service providers can use this information to identify cancer survivors and their spouses with higher risk of developing psychiatric disorders to anticipate service needs of survivor populations and guide screening for mental health problems in individuals.

Measures

The primary outcome measure of this study is the mental health status of individuals in the sample. In MEPS-HC, the mental health status of an individual is measured by the Mental Component Summary (MCS-12) of the Short-Form 12 health survey (SF-12), the Kessler Index (K6) of non-specific psychological distress, and the Patient Health Questionnaire (PHQ-2). The Mental Component Summary of the Short-Form 12 (MCS-12) measures the mental health status of an individual. The MCS-12 scores are derived from six questions (see appendix) on four mental health scales: vitality, role emotional, mental health, and social functioning. The retest-test reliability coefficient of MCS-12 is 0.76 (Ware, Kosinski, & Keller, 1996).

The Kessler Index (K6) scores measure the person's non-specific psychological distress (in the past 30 days). These scores are based on six mental health related questions (see appendix) that measure the person's nervousness, hopelessness, restlessness, sadness, worthlessness, and effortlessness in past 30 days on a scale of 0 to 4, with 0 being none of the time and 4 being all the time. The values on all these questions form K6 scores. The higher the K6 scores, the greater the person's tendency towards mental disability. The internal consistency reliability (Cronbach's alpha) of K6 scores is 0.89 (Kessler et al., 2002).

In addition to MCS-12 and K6 scores, the sample adult questionnaire has two additional mental health questions, Patient Health Questionnaire (PHQ-2), which assess the frequency of the person's depressed mood and decreased interest in usual activities in past two weeks. The answers to these questions are scored between 0 and 6. The higher scores for PHQ-2, the greater the person's tendency toward depression (Kroenke, Spitzer, & Williams, 2003). For this study, we have used a score of 3 as the cut-off point for depression. As a result, those with the score of 3 or below are considered "not depressed," whereas those with the score of 4 or above are considered "depressed."

Analysis

The sample design of the MEPS-HC includes stratification, clustering, multiple stages of selection, and disproportionate sampling. Therefore, to compensate for the complex survey design, we used Taylor-series linearization methods incorporating the sampling strata, associated PSUs that define the MEPS survey design, and post-stratified person-level weights in our analysis. The Taylor Series Linearization approach derives variance estimates and "survey design adjusted" standard errors and confidence intervals through a linear approximation method. (Rust, 1985) The data were processed and analyzed with SAS software version 9. (SAS, 2002)

First, we compared mental health (MCS-12) scores, non-specific physiological distress (K6) scores, and the prevalence of depression between the oncology population and the general population using independent two sample t-tests and chi-square test. We hypothesized that the oncology population would have lower mental health scores and higher non-specific physiological distress (K6) scores. Likewise, we hypothesized that

the oncology population would have higher rates of depression than the general population.

Second, to identify the impact of cancer on the mental health status of an individual, we conducted two regression analyses for each measure. In the first analysis, we examined differences in the general mental health, non-specific physiological distress, and depression between the oncology population and the general population, after controlling for other factors; in the second analysis, we examined differences in the general mental health, non-specific physiological distress, and depression within the oncology population.

In the first regression analysis, the independent variables were the history or diagnosis of cancer, age, sex, race, marital status, education, employment, annual family income, health insurance, and chronic conditions. In the second regression analysis, the sample was restricted to the oncology population and cancer sites and time since diagnosed with cancer were added to the first regression equation. Regression analysis was conducted separately for two age groups: 25-64 and 65 and older. The data were processed and analyzed with SAS software version 9. (SAS, 2002)

Results

Individuals

In descriptive statistics for individuals younger than 65, the mental health scores of cancer survivors were significantly lower than those of other adults (Table 4.1). Cancer survivors had significantly higher non-specific psychological distress scores compared to non-cancer individuals. Similarly, a higher percentage of cancer (10% vs. 5%) survivors were depressed than non-cancer individuals. For individuals 65 and older,

there were no significant differences in mental health scores, non-specific psychological distress scores, and depression between cancer survivors and other individuals.

Consistent with univariate analysis, the multivariate analysis showed that, on average, cancer survivors in the age group of 25-64 had lower mental health scores (Table 4.3) and higher psychological distress scores (Table 4.5) compared to non-cancer adults. In addition, for cancer survivors between 25 and 65 years of age, the odds of being depressed was 1.6 times higher than the general population (Table 4.7). In the age group 65 and older, cancer survivors had higher psychological distress scores, and the odds of depression were 42% higher compared to the general population.

In the full sample, females, whites, Hispanics, and individuals with chronic conditions had lower mental health scores and higher psychological distress scores and were more likely to be depressed compared to their controls. However, married individuals and individuals with high school or better education had higher mental health scores and lower psychological distress scores and were less likely to be depressed than their counterparts.

Within the oncology sample, gynecological cancer survivors between the ages 25 and 64 had significantly lower mental health scores and higher psychological distress scores compared to age-matched breast cancer survivors. In this age group, the odds of gynecological cancer survivors being depressed were 2.7 times higher than breast cancer survivors. In addition, the odds of cancer survivors diagnosed with “other” cancers, such as bone, leukemia, brain, etc. being depressed were 2.4 times higher than breast cancer survivors. Among cancer survivors 65 and older, colorectal cancer survivors had lower psychological distress scores and “other” cancer survivors had lower psychological

distress compared to breast cancer survivors. In both age groups, time since diagnosed with cancer did not affect the mental health scores, psychological distress scores, or odds ratio of depression among cancer survivors.

In addition to cancer characteristics, education and presence of chronic conditions had a significant impact on the mental health status, psychological distress and depression of cancer survivors. Cancer survivors with higher than a high school education had significantly higher mental health scores and lower psychological distress scores compared to cancer survivors with less than a high school education. Cancer survivors with higher than high school education were also less likely to be depressed compared to cancer survivors with less than high school education. Cancer survivors with chronic conditions had significantly lower mental health scores and slightly higher psychological distress compared to cancer survivors with no chronic conditions. The odds of cancer survivors with chronic conditions being depressed were 2-5 times higher than cancer survivors with no chronic conditions.

Spouses

The univariate analysis showed that spouses below age 65 years had significantly lower mental health scores and higher non-specific psychological distress scores than the spouses of non-cancer individuals. In addition, a higher percentage of cancer survivors' spouses (7% vs. 4%) were depressed compared to their controls (Table 4.2). For spouses 65 years and older, there were no significant differences in mental health scores, non-specific psychological distress scores, and depression between cancer survivors' spouses and the spouses of non-cancer individuals.

Similar to univariate analysis, the multivariate analysis showed that, even after controlling for other factors, cancer survivors' spouses in the age group between 25 and 64 had significantly lower mental health scores (Table 4.3) and higher psychological distress scores (Table 4.5) compared to the spouses of non-cancer adults. In the age group of 65 and above, there were no significant differences in mental health scores and psychological distress scores between cancer survivors' spouses and the spouses of non-cancer adults. In both age groups, the odds of being depressed for cancer survivors' spouses were 80%-90% higher than the spouses of non-cancer adults (Table 4.7).

Limited to the spouses of cancer survivors spouses, the multivariate analysis of the age group 25 to 64 years showed that the spouses of cancer survivors who have been diagnosed with cancer between 5 years and 10 years had 90% lesser odds of being depressed than spouses of cancer survivors who have been diagnosed with cancer for more than 45 years (Table 4.8). The odds of being depressed for spouses of "other" cancer survivors were 4.9 times higher compared to the spouses of breast cancer survivors. Among cancer survivors' spouses above age 65, the spouses of "other" cancer survivors had slightly higher psychological distress scores than the spouses of breast cancer survivors. In both age groups, cancer sites and time since diagnosed with cancer did not have a significant effect on the mental health scores of the cancer survivors' spouses.

Besides cancer characteristics, education and chronic conditions have significant influence on the mental health status, psychological distress and likelihood of being depressed among cancer survivor's spouses. Among cancer survivors' spouses between age 25 and 64, cancer survivors' spouses with post graduate education had significantly

higher mental health scores and lower psychological distress and were 93% lesser odds of being depressed compared to cancer survivors' spouses with less than a high school education. In this age group, cancer survivors' spouses with arthritis had significantly lower mental health status and their odds of being depressed were 3.4 times higher than cancer survivors' spouses with no chronic conditions. Among cancer survivors' spouses above 65, cancer survivors' spouses with stroke had (5 units) lower mental health status and their odds of being depressed were 7 times higher than cancer survivors' spouses with no chronic conditions.

Summary

The present study provides evidence that cancer survivors have lower mental health status and higher psychological distress than non-cancer adults and their spouses. Cancer survivors have 2 percentage point higher chances of being depressed than the general population. Thus, this study suggests that cancer survivorship is a significant predictor of the mental health status, psychological distress, and depression of cancer survivors. Although time since diagnosed with cancer does not have a significant influence on the mental health status, psychological distress, and depression of cancer survivors, cancer sites do differ in their mental health effects. For example, gynecological cancer survivors between age 25 and 64 had lower mental health status and higher psychological distress compared to breast cancer survivors. The chances of being depressed for gynecological cancer survivors were 7 percentage points higher than breast and prostate cancer survivors. This may be because of prevalence of sexual morbidity or sexual dysfunction and lower QOL among gynecological cancer survivors (Frumovitz et

al., 2005; Jensen et al., 2003; Kylstra & Leenhouts, 1999; Thranov & Klee, 1994; Wenzel et al., 2005).

As for cancer survivors, cancer diagnosis or survivorship is a significant predictor of mental health status, psychological distress, and depression among cancer survivors' spouses. However, time since diagnosed with cancer and cancer sites do not have an impact on the overall mental health status of cancer survivors' spouses.

Besides cancer sites and time since diagnosed with cancer, education and chronic conditions are the significant predictors of the mental health status, psychological distress, and depression of cancer survivors and their spouses. Higher level of education, especially higher than high school education, results in better mental health status, lower distress, and lesser likelihood of being depressed among cancer survivors and their spouses. The presence of chronic conditions reduces mental health status, increases psychological distress, and also increases the likelihood of being depressed among cancer survivors and their spouses. Among the five most common chronic conditions studied in this study, stroke has the highest significant impact on all the three measures of mental health status of cancer survivors and their spouses.

Based on these findings, I conclude cancer survivors and their spouses have worse mental health compared to the general population. Among cancer survivors, gynecological cancer survivors or cancer survivors with chronic conditions and less than high school education are more likely to have mental health problems compared to their counterparts. Among cancer survivors' spouses, spouses with less than a college education or diagnosed with arthritis, asthma or stroke are at high risk of developing mental health problems than their controls.

Table 4.1 Mental Health Status, Psychological Distress and Depression of Cancer Survivors and Other Adults Ages 25 and older

	25-64		65 and older	
	Cancer	Non-cancer	Cancer	Non-cancer
Mental Component Scores of SF-12 ^a	49	51	52	52
Non-Specific Psychological Distress (K6) Scores ^a	6	4	4	5
	%	%	%	%
Depression ^a	10	5	9	7

a Cancer and non-cancer individuals, below ages of 65 years, are significantly different at p=0.05 level

b Cancer and non-cancer individuals, 65 and older, are significantly different at p=0.05 level

Table 4.2 Mental Health Status, Psychological Distress and Depression of Spouses

	25-64		65 and older	
	Cancer	Non-cancer	Cancer	Non-cancer
Mental Component Scores of SF-12 ^a	50	52	53	53
Non-Specific Psychological Distress (K6) Scores ^a	4	3	3	3
	%	%	%	%
Depression ^{a,b}	7	4	10	6

a Spouses of cancer and non-cancer individuals, below the ages of 65, are significantly different at p=0.05

b Spouses of cancer and non-cancer individuals, 65 and older, are significantly different at p=0.05

Table 4.3 Regression coefficients for Mental Component Scores of SF-12 (Full sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
=1 if cancer survivor	-1.15*	-0.42	-1.12*	-0.31
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	-0.12	----	0.03	----
=1 if age 45-54	0.26	----	0.52*	----
=1 if age 55-64	1.86*	----	2.00*	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	-0.58*	----	-1.19*
=1 if Female	-1.68*	-0.97*	-1.65*	-1.39*
=1 if White	-0.16*	1.01*	-0.11	1.03
=1 if Hispanic	-0.47*	2.68*	-0.22	2.41*
=1 if Married	2.12*	0.64*	----	----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	1.88*	2.11*	1.69*	3.23*
=1 if Some college	1.99*	3.12*	1.67*	4.14*
=1 if College graduate	2.38*	2.33*	1.92*	3.08*
=1 if Post graduate	2.60*	3.43*	2.21*	3.95*
Chronic conditions				
=1 if Arthritis	-1.95*	-1.03*	-1.51*	-0.83*
=1 if Asthma	-1.59*	-1.49*	-1.17*	-1.46*
=1 if Diabetes	-2.18*	-1.87*	-2.34*	-2.49*
=1 if Heart disease	-2.44*	-1.13*	-2.07*	-0.93*
=1 if Stroke	-3.25*	-3.54*	-3.37*	-4.15*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 4.4 Regression coefficients for Mental Component Scores of SF-12 (Oncology sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Time since diagnosed with cancer (TSD)				
=1 if TSD=0	-2.03	-0.20	-2.41	0.02
=1 if TSD between 1 and 5	-1.30	0.14	-2.00	1.08
=1 if TSD between 6 and 10	-0.08	-0.68	-1.42	-0.65
=1 if TSD between 11 and 45	0.61	0.03	-0.58	0.82
=1 if TSD between 46 and 90	0.00	0.00	0.00	0.00
Cancer sites				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	-0.41	0.22	-0.15	-0.12
=1 if Gynecological cancer	-2.33*	-2.25	-1.10	-3.01
=1 if Lung cancer	0.92	0.03	2.96	0.26
=1 if Others cancer	-0.34	-1.25	0.33	-0.94
=1 if Prostate cancer	1.51	-1.28	1.07	-1.66
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	-0.59	----	1.33	----
=1 if age 45-54	-0.12	----	1.58	----
=1 if age 55-64	2.62*	----	4.30*	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	-0.70	----	-1.78*
=1 if Female	-0.12	-0.83	-1.13	-0.86
=1 if White	1.06	0.25	-1.26	-0.47
=1 if Hispanic	1.63	2.33	2.17	0.45
=1 if Married	1.51*	0.64	-----	-----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	2.29*	3.12*	-0.03	2.88*
=1 if Some college	3.39*	3.65*	1.85	3.89*
=1 if College graduate	4.62*	3.42*	2.33	3.70*
=1 if Post graduate	6.27*	4.18*	4.44*	4.04*
Chronic conditions				
=1 if Arthritis	-2.47*	-0.06	-2.07*	0.42
=1 if Asthma	-1.63	-1.49	-0.51	-1.52
=1 if Diabetes	-1.18	-1.56	-2.44	-2.21
=1 if Heart disease	-2.73*	-0.87	-2.77*	-1.16
=1 if Stroke	-5.61*	-4.68*	-5.93	-5.36*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 4.5 Regression coefficients for Psychological Distress (Full sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
=1 if cancer survivor	0.23*	0.15*	0.23*	0.09
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	-0.11*	----	-0.14*	----
=1 if age 45-54	-0.16*	----	-0.17*	----
=1 if age 55-64	-0.41*	----	-0.43*	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	0.03	----	0.20*
=1 if Female	0.40*	0.35*	0.42*	0.51*
=1 if White	0.27*	0.14*	0.24*	0.14
=1 if Hispanic	0.25*	-0.13	0.29*	0.00
=1 if Married	-0.41*	-0.21*	----	----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	-0.21*	-0.21*	-0.23*	-0.34*
=1 if Some college	-0.19*	-0.28*	-0.22*	-0.36*
=1 if College graduate	-0.22*	-0.29*	-0.24*	-0.34*
=1 if Post graduate	-0.22*	-0.42*	-0.23*	-0.39*
Chronic conditions				
=1 if Arthritis	0.52*	0.46*	0.47*	0.43*
=1 if Asthma	0.32*	0.52*	0.24*	0.59*
=1 if Diabetes	0.41*	0.40*	0.42*	0.43*
=1 if Heart disease	0.45*	0.32*	0.41*	0.32*
=1 if Stroke	0.71*	0.39*	0.87*	0.48*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 4.6 Regression coefficients for Psychological Distress (Oncology sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Time since diagnosed with cancer (TSD)				
=1 if TSD=0	0.02	0.05	-0.17	-0.48
=1 if TSD between 1 and 5	0.12	0.03	0.16	-0.38
=1 if TSD between 6 and 10	-0.03	0.01	0.16	-0.36
=1 if TSD between 11 and 45	-0.08	0.09	0.31	-0.55
=1 if TSD between 46 and 90	0.00	0.00	0.00	0.00
Cancer sites				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	-0.16	-0.58*	-0.69	-0.68
=1 if Gynecological cancer	0.45*	0.37	0.32	0.56
=1 if Lung cancer	-0.48	0.46	-1.29	0.51
=1 if Others cancer	-0.09	0.43*	-0.37	0.53*
=1 if Prostate cancer	-0.25	0.24	-0.52	0.41
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	-0.09	----	-0.28	----
=1 if age 45-54	-0.22	----	-0.13	----
=1 if age 55-64	-0.29	----	-0.36	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	0.07	----	0.41
=1 if Female	0.15	0.57*	0.20	0.77*
=1 if White	0.24	0.27	0.59*	0.64
=1 if Hispanic	-0.02	-0.48	-0.20	-0.11
=1 if Married	-0.37*	-0.16	-----	-----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	-0.44*	-0.20	-0.57	-0.15
=1 if Some college	-0.38	-0.37	-0.42	-0.14
=1 if College graduate	-0.64*	-0.35	-0.91*	-0.31
=1 if Post graduate	-0.94*	-0.59*	-1.26*	-0.75*
Chronic conditions				
=1 if Arthritis	0.27	0.59*	0.01	0.71*
=1 if Asthma	0.56*	0.60*	0.77*	0.39
=1 if Diabetes	0.57*	0.34	0.84*	0.18
=1 if Heart disease	0.13	0.32*	0.04	0.26
=1 if Stroke	0.52	0.57*	0.63	0.41

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 4.7 Odds Ratios for Depression (Full sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
=1 if cancer survivor	1.59*	1.42*	1.77*	1.88*
Demographics				
=1 if age 25-34	1.00	----	1.00	---
=1 if age 35-44	1.35*	----	1.44*	----
=1 if age 45-54	1.26	----	1.20	----
=1 if age 55-64	1.00	----	1.07	----
=1 if age 65-74	----	1.00	----	1.00
=1 if age 75-86	----	1.04	----	1.16
=1 if Female	1.12	1.48*	1.12	1.49*
=1 if White	0.78*	0.91	0.67*	0.84
=1 if Hispanic	0.86	0.60*	0.85	0.62
=1 if Married	0.55*	1.24	----	----
Education				
=1 if Less than high school	1.00	1.00	1.00	1.00
=1 if High school	0.65*	0.57*	0.65*	0.52*
=1 if Some college	0.44*	0.35*	0.40*	0.26*
=1 if College graduate	0.25*	0.49*	0.18*	0.36*
=1 if Post graduate	0.24*	0.23*	0.23*	0.18*
Chronic conditions				
=1 if Arthritis	2.57*	1.44*	2.27*	1.21
=1 if Asthma	1.46*	1.49*	1.44*	2.11*
=1 if Diabetes	1.67*	1.67*	1.97*	2.82*
=1 if Heart disease	1.77*	1.31*	1.96*	1.05
=1 if Stroke	1.55*	2.63*	1.51*	3.55*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 4.8 Odds Ratios for Depression (Oncology sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Time since diagnosed with cancer (TSD)				
=1 if TSD=0	0.70	0.95	0.58	0.18
=1 if TSD between 1 and 5	1.14	1.47	1.18	1.13
=1 if TSD between 6 and 10	0.45	1.86	0.10*	1.61
=1 if TSD between 11 and 45	0.56	1.55	0.32	1.39
=1 if TSD between 46 and 90	1.00	1.00	1.00	1.00
Cancer sites				
=1 if Breast cancer	1.00	1.00	1.00	1.00
=1 if Colorectal cancer	0.57	1.44	0.59	1.80
=1 if Gynecological cancer	2.71*	0.67	2.19	0.59
=1 if Lung cancer	0.89	0.61	0.83	0.92
=1 if Others cancer	2.37*	0.81	4.91*	0.87
=1 if Prostate cancer	0.36	0.44	0.38	0.44
Demographics				
=1 if age 25-34	1.00	----	1.00	---
=1 if age 35-44	1.27	----	2.00	----
=1 if age 45-54	2.30	----	1.68	----
=1 if age 55-64	1.19	----	0.88	----
=1 if age 65-74	----	1.00	----	1.00
=1 if age 75-86	----	0.95	----	1.18
=1 if Female	1.42	1.39	2.33	1.68
=1 if White	0.81	2.74*	0.59	3.12*
=1 if Hispanic	0.53	0.53	0.34	0.15
=1 if Married	0.68	2.23*	-----	-----
Education				
=1 if Less than high school	1.00	1.00	1.00	1.00
=1 if High school	0.51*	0.27*	0.50*	0.36
=1 if Some college	0.23*	0.28*	0.07*	0.29
=1 if College graduate	0.08*	0.16*	0.07*	0.15*
=1 if Post graduate	0.05*	0.09*	0.07*	0.18*
Chronic conditions				
=1 if Arthritis	1.99*	1.02	3.48*	0.83
=1 if Asthma	0.87	2.92*	0.48	3.46*
=1 if Diabetes	1.33	2.35*	1.89	5.53*
=1 if Heart disease	1.65	1.44	1.35	1.41
=1 if Stroke	1.63	5.18*	1.73	7.09*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Chapter 5: Ambulatory Mental Health Visits by U.S. Cancer Survivors and Their Spouses

Introduction

The findings from Chapter 4 show that cancer survivors and their spouses have worse mental health compared to the general population. Likewise, the existing literature demonstrates that 3-38% of the oncology population suffers from anxiety and distress (Ballenger et al., 2001; L. R. Derogatis et al., 1983; Portenoy, Thaler, & Kornblith, 1994). However, only three studies investigate the mental health service use of cancer survivors and their spouses. A research study exploring the mental health service use of advanced (terminally ill) cancer patients and their caregivers showed that 28% of cancer patients and 25% of caregivers used mental health services (Kadan-Lottick, Vanderwerker, Block, Zhang, & Prigerson, 2005). Another research study examining the mental health service use of long-term cancer survivors revealed that cancer survivors were more likely to use mental health services compared to the general population (Earle, Neville, & Fletcher, 2007). In 2002, Hewitt and Rowland analyzed 95,615 adults obtained from 1998-2000 National Health Interview Survey (NHIS). Out of 95,615 adults surveyed, 4,878 adults had a personal history of cancer. They found that 7.2% of cancer survivors used mental health services compared to 5.7% of individual without a cancer history (Hewitt & Rowland, 2002).

Although the Hewitt and Rowland study provides national estimates of mental health service use among cancer survivors, it is primarily focused on prevalent cancer cases and the use of designated mental health services. In the other two studies (Earle, Neville, & Fletcher, 2007; Kadan-Lottick, Vanderwerker, Block, Zhang, & Prigerson, 2005), samples are not representative of all patients along the full trajectory of cancer

experiences. Consequently, the results obtained from these studies cannot be generalized to the whole oncology population. Kadan-Lottick et al. provides information on the mental health services use of cancer patients' caregivers including spouses and children of cancer patients, but it does not focus primarily on the spouses of cancer patients.

To overcome the shortcomings of the existing literature, the present study will assess the ambulatory mental health visits made by U.S. cancer survivors and their spouses in a large, nationally representative sample that includes both incident and prevalent cancer cases. This study will provide national estimates for the ambulatory mental health visits made by both cancer survivors and their spouses. It will analyze the influence of cancer survivorship on ambulatory mental health visits by comparing ambulatory mental health visits made by U.S. cancer survivors and their spouses with that of the general population. It will also evaluate the impact of time since diagnosed with cancer and cancer sites on the ambulatory mental health visits of the oncology population. This research study will identify the predictors of ambulatory mental health visits among cancer survivors and their spouses.

Measures

The primary outcome measure was ambulatory mental health visits. For each individual, ambulatory mental health visits was measured by the total annual number of visits made to outpatient department, emergency room, or physician's office due to mental health disorders. For every year, in the MEPS Medical Condition files, medical events, such as outpatient visits, emergency room visits or medical provider visits, related to mental health disorders were summed for each person to obtain the annual number of ambulatory mental health visits. For logistic regression analysis, based on ambulatory

mental health visits, the sample was divided into two categories: users (1+) and non-users (0).

As an alternative approach to defining mental health service utilization, univariate statistics were also examined for mental health service use defined as the total annual number of visits made to psychiatrists, psychologists, or psychotherapists in an outpatient department or a physician's office. For every year, in the MEPS Event files, visits to mental health professional were summed for each person to obtain the annual number of mental health professional visits.

Analysis

For univariate analysis, we compared the percentage of the oncology population having ambulatory mental health visits to the percentage of the general population having ambulatory mental health visits with the help of a chi-square test. We hypothesized that the oncology population are more likely to make ambulatory mental health visits than the general population. To confirm our findings in our first univariate analysis, we also conducted an ad-hoc univariate analysis of ambulatory mental health visits by provider specialty. For the ad-hoc analysis, we compared the percentage of the oncology population visiting psychiatrists, psychologists or psychotherapists in an outpatient department or a physician's office to that of the general population.

For multivariate analysis, we conducted two logistic regression analyses. In the first analysis, we examined differences in the percentage with any mental health visits between the oncology population and the general population, after controlling for other factors; in the second analysis, we examined differences in the percentage with any mental health visits psychotherapeutic medicines utilization within the oncology

population. For both analyses, the dependent variable was the utilization of any mental health visits, which was represented by a binary variable (1=yes; 0=no). In the first logistic regression analysis, the independent variables were the history or diagnosis of cancer (1=yes;0=no), age (measured in years), sex (1= female;0=male), race(1= white;0= non-white), marital status (1= married;0= single or divorced), education (less than high school, high school, some college, college, and post graduate), and chronic conditions (Arthritis, Asthma, Diabetes, Heart disease, and Stroke). In the second logistic regression analysis, the sample was restricted to the oncology population and cancer sites and time since diagnosis of cancer (measured in years) were added to the first regression equation.

Results

Cancer survivors

The first univariate analysis of ambulatory mental health visits showed that a higher percentage of cancer survivors below age 65 (Figure 5.1) made mental health visits compared to other adults (16% vs. 11%). However, in the sample of adults above age of 65, there are no significant differences in ambulatory mental health visits between cancer survivors (Figure 5.2) and the general population. In neither age group were cancer survivors more likely to see specialty mental health providers than other adults.

The logistic regression analysis showed that, for both age groups, there were no significant differences in the likelihood of making mental health visits between cancer survivors and individuals with no cancer history (Table 5.3). In the analyses restricted to cancer survivors, the odds of making ambulatory mental health visits for prostate cancer survivors between age 25 and 64 were 2.4 times higher than breast cancer survivors of the same age group (Table 5.4). Time since diagnosed with cancer did not have a

significant impact on the likelihood of making mental health related visit. The odds of having mental health visits for female cancer survivors or cancer survivors between age 35 and 44 were 2-3 times higher than male survivors and 25-34 year olds, respectively. The odds of having mental health visits for cancer survivors diagnosed with arthritis, asthma, heart disease, and stroke were 2 times higher than cancer survivors without chronic conditions.

Spouses

The chi-square test showed that, for both age groups, there are no significant differences in the likelihood of having mental health visits between the spouses of cancer survivors and the spouses of other adults. Similarly, additional univariate analyses of mental health visits by physician specialty showed that the spouses of cancer survivors were no more or less likely to make mental health visits provided by mental health professionals than other spouses.

The logistic regression showed no significant differences in the likelihood of having ambulatory mental health visits between the spouses of cancer survivors and other spouses in either age group. However, within cancer survivors' spouses, between the ages of 25 and 64, the odds of having ambulatory mental health visits for the spouses of colorectal cancer survivors were 5 times higher than spouses of breast cancer survivors. On the other hand, the spouses of lung cancer survivors and prostate cancer survivors had 10%-20% lesser odds of making mental health related ambulatory visits compared to breast cancer survivors. Time since diagnosis of cancer did not have a significant impact on the ambulatory mental health visits of cancer survivors' spouses. In addition, the odds of having ambulatory mental health visits for wives of cancer survivors were 4-8 times

higher than the husbands of cancer survivors. The odds of having ambulatory mental health visits for cancer survivors' spouses suffering from chronic medical conditions, such as arthritis, asthma, heart disease and stroke, were 2-4 times higher than cancer survivors' spouses with no chronic conditions.

Summary

After controlling for other differences between cancer survivors and other adults, cancer survivors in this study were no more likely to have visits for mental health conditions than other adults. However, the likelihood of mental health visits did vary in the sample by cancer sites. After controlling for other factors, the likelihood of making mental health related ambulatory visits for prostate cancer survivors above age 65 was 4 percentage points higher than that of breast cancer survivors. In addition, female cancer survivors and cancer survivors with chronic conditions were more likely to make mental health related visit than male cancer survivors or survivors without other chronic conditions.

Findings for spouses were similar to findings for cancer survivors. Being married to a cancer survivor is not a significant predictor of the likelihood of making mental health related ambulatory visits. Within cancer survivors' spouses, spouses of colorectal cancer survivors were highly likely to make mental health visit compared to spouses of breast cancer survivors and prostate cancer survivors.

Based on the above mentioned findings, I conclude that, in general, cancer survivors or their spouses are not at higher risk of making mental health related visit because of cancer. However, prostate cancer survivors or female cancer survivors or cancer survivors with arthritis, heart disease, or stroke can be considered as "high risk"

group within cancer survivors for making mental health related visits. Similarly, spouses of colorectal cancer survivors (wives more than husbands) and spouses with arthritis, heart disease or stroke can be considered a “high risk” group of survivors’ spouses for making ambulatory mental health visits.

Figure 5.1 Annual percentage of adults making ambulatory mental health visit (U.S. adults ages 25 to 64, 2001-2006)

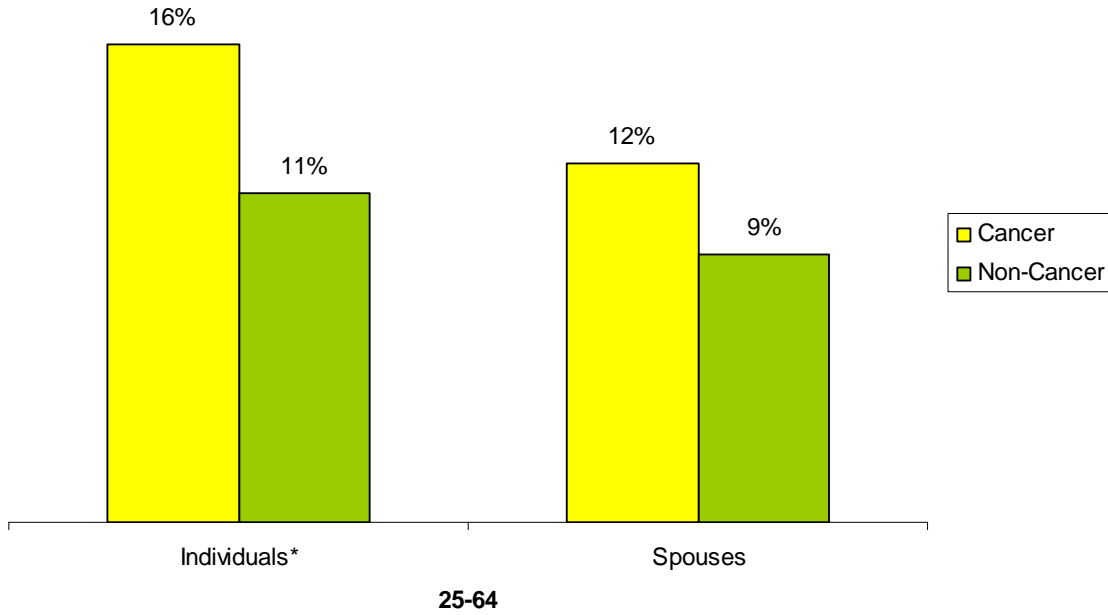


Figure 5.2 Annual percentage of adults making ambulatory mental health visit (U.S. adults ages 65 and older, 2001-2006)

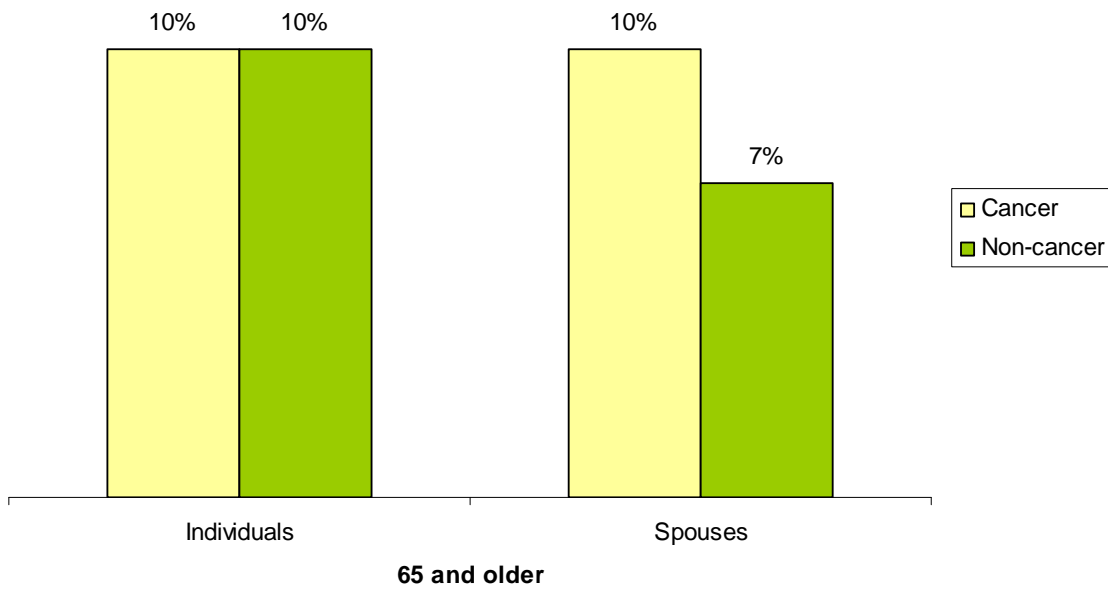


Table 5.1 Percentage of the sample making ambulatory mental health visit provided by mental health professionals, 2001-2006

Mental Health Professionals	Cancer		Non Cancer	
	Individuals			
	25-64	65 and older	25-64	65 and older
Psychiatrists or Psychologists	6%	2%	5%	2%
Psychotherapists	7%	2%	6%	2%
	Spouses			
	25-64	65 and older	25-64	65 and older
Psychiatrists or Psychologists	4%	2%	4%	2%
Psychotherapists	5%	3%	4%	2%

Table 5.2 Percentage of the oncology sample making ambulatory mental health visit, 2001-2006

	Cancer survivors		Spouses	
	25-64	65 and older	25-64	65 and older
	%	%	%	%
Incident	19	8	14	6
Prevalent	16	10	11	10
Cancer sites				
Breast	17	14	13	16
Colorectal	14	9	15	4
Gynecological	24	12	18	12
Lung	14	6	0	4
Prostate	4	11	0	10

Table 5.3 Odds Ratios for ambulatory mental health visit (Full sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
=1 if cancer survivor	1.16	1.04	1.01	1.27
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	1.27*	----	1.14	----
=1 if age 45-54	1.23*	----	1.14	----
=1 if age 55-64	0.87	----	0.76	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	1.06	----	1.22
=1 if Female	2.01*	1.57*	2.08*	2.16*
=1 if White	1.84*	1.29	2.08*	1.12
=1 if Hispanic	1.34*	0.85	1.26*	0.94
=1 if Married	0.59*	0.70*	----	----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	0.91	0.72*	1.03	0.60*
=1 if Some college	0.97	0.68*	1.11	0.55*
=1 if College graduate	0.92	0.73	1.03	0.54
=1 if Post graduate	0.92	0.70	0.94	0.54
Chronic conditions				
=1 if Arthritis	1.98*	1.42*	2.02*	1.38*
=1 if Asthma	1.69*	1.16	1.80*	0.98
=1 if Diabetes	1.59*	1.26	1.75*	1.20
=1 if Heart disease	1.48*	1.38*	1.54*	1.51*
=1 if Stroke	1.42*	2.01*	1.19	2.64*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 5.4 Odds Ratios for ambulatory mental health visit (within oncology sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Time since diagnosed with cancer (TSD)				
=1 if TSD=0	1.20	1.29	3.73	0.87
=1 if TSD between 1 and 5	0.98	1.09	3.71	0.76
=1 if TSD between 6 and 10	1.00	1.24	3.09	1.36
=1 if TSD between 11 and 45	0.86	1.71	2.27	1.22
=1 if TSD between 46 and 90	1.00	1.00	1.00	1.00
Cancer sites				
=1 if Breast cancer	1.00	1.00	1.00	1.00
=1 if Colorectal cancer	1.07	0.81	4.73*	0.30
=1 if Gynecological cancer	1.07	0.72	1.01	0.94
=1 if Lung cancer	0.82	0.62	0.89*	0.27
=1 if Others cancer	0.67	1.10	0.61	1.28
=1 if Prostate cancer	0.73	2.42*	0.79*	2.47
Demographics				
=1 if age 25-34	1.00	----	1.00	---
=1 if age 35-44	2.27*	----	1.78	----
=1 if age 45-54	1.51	----	0.89	----
=1 if age 55-64	0.92	----	0.44	----
=1 if age 65-74	----	1.00	----	1.00
=1 if age 75-86	----	0.82	----	0.83
=1 if Female	2.99*	2.86*	7.52*	4.44*
=1 if White	1.45	0.98	1.52	1.09
=1 if Hispanic	1.12	0.42*	0.78	0.49
=1 if Married	0.54*	0.97	----	----
Education				
=1 if Less than high school	1.00	1.00	1.00	1.00
=1 if High school	0.67	0.83	0.56	0.96
=1 if Some college	0.77	0.90	0.53	1.27
=1 if College graduate	0.65	0.82	0.86	1.21
=1 if Post graduate	0.55	0.67	0.37	1.47
Chronic conditions				
=1 if Arthritis	1.52*	1.08	1.78*	0.76
=1 if Asthma	2.05*	1.68	1.88	3.30*
=1 if Diabetes	1.35	1.20	2.39	0.69
=1 if Heart disease	2.13*	1.36	3.64*	1.95
=1 if Stroke	1.80	2.39*	0.31	4.22*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Chapter 6: Use of Psychotherapeutic Medications by U.S. Cancer Survivors and Their Spouses

Introduction

During active oncology treatment such as chemotherapy and radiotherapy, cancer patients may suffer from fatigue, nausea, vomiting, weight loss, and loss of physical performance (Lee-Jones, Humphris, Dixon, & Hatcher, 1997; Schnell, 2003; Smets, Garssen, Schuster-Uitterhoeve, & de Haes, 1993). After active oncology treatment, some patients experience persistent anxiety and psychological distress due to the fear of recurrence, concerns about the future, and a heightened sense of vulnerability due to uncertainty and inability to make future plans (Ganz, 2002). As a result, fatigue, depression, and anxiety become the most common consequences of cancer (Bruera, 1990; Richardson, 1995).

Studies have shown that psychopharmacological agents are helpful in managing fatigue, nausea, vomiting, anxiety, and depression among cancer patients (Bruera & Neumann, 1998; Jordan, 2005; Portenoy & Itri, 1999). Studies investigating the utilization of psychotherapeutic medicines in the oncology population have found that psychotherapeutic medicines are commonly prescribed to cancer patients to address the psychological sequelae of cancer. In 1979, the first study investigating the prescription of psychotherapeutic medicines for cancer patients was conducted in five major oncology centers over a 6- month period. In this study, 51% of the study sample was prescribed at least one psychotherapeutic medication. The most commonly prescribed psychotherapeutic medicines were hypnotics (48%), anti-psychotics (26%), and anti-anxiety drugs (25%) (L. Derogatis et al., 1979). Similarly, Goldberg and Mor examined

the use of psychotherapeutic medications among terminal cancer patients and found that 32% had been prescribed at least one psychotherapeutic drug (Goldberg & Mor, 1985).

Studies have also examined trends in the prescribing of psychotherapeutic medicines in the oncology population, for example, in response to the development of new psychotherapeutic agents and clinical interventions. In 1990, a study examining trends in psychotherapeutic prescription practices in a medical oncology unit from 1977 to 1987 concluded that prescribing rates for psychotherapeutic medicines among cancer patients increased from 51% to 81%. The authors found that psychotherapeutic medication use by drug class did not change significantly, but individual drug choices and the rationale for prescribing psychotherapeutic medicines changed during the 10-year period (Stiefel, Kornblith, & Holland, 1990). Another study assessing the impact of referral to psycho-oncology services on the prescription patterns of psychotherapeutic medicines among cancer patients found that prescription of psychotherapeutic medicines increased from 56% (pre-referral) to 79% after referral to psycho-oncology services (Cullivan, Crown, & Walsh, 1998).

Thus, the existing literature shows that psychotherapeutic medicines are frequently prescribed to the oncology population, and that the prescription patterns of psychotherapeutic medications change over time due to external factors. However, there has been little recent research on psychotherapeutic medication use among survivors of cancer. The present study aims to assess the utilization of psychotherapeutic medication among U.S. cancer survivors and their spouses. This study addresses three major limitations of the existing research on the use of psychotherapeutic medicines in the oncology population. While most studies have examined the prescription rates of

psychotherapeutic medicines in small convenience samples, this study assesses utilization among U.S. cancer survivors in a large, nationally representative sample. While none of the studies in the literature compare the utilization of psychotherapeutic medicines between the oncology population and the general population, this study makes those comparisons within the context of a major national survey in which utilization is measured for survivors and other adults with identical questionnaires and data collection procedures. Moreover, although none of the studies in the literature provide information about the use of psychotherapeutic medicines by cancer survivors' spouses, this study also examines medication utilization among spouses.

The current study will describe the utilization patterns of psychotherapeutic medicines for all cancer survivors, taken together, and for important subgroups of survivors by cancer type. The present study will evaluate the impact of cancer diagnosis or survivorship on psychotherapeutic medic utilization through comparing U.S. cancer survivors and their spouses with the general population. This research study will identify predictors of psychotherapeutic medicines use among cancer survivors and their spouses. Oncologists and psycho-oncology service providers can use this information as a benchmark for comparing prescribing patterns for their patients, for planning services and medications to meet the needs of survivors, and for identifying types of cancer patients at increased risk for needing psycho-therapeutic medications.

Measures

The primary outcome measure was the utilization of psychotherapeutic medication. For each individual, psychotherapeutic medicine use was measured by the number of psychotherapeutic medication prescriptions per year. For every year, events in

the MEPS Prescribed Medicines Event files related to psychotherapeutic medicines were counted for each person to obtain the total number of psychotherapeutic medicine events for each individual that year. Then, based on the utilization of psychotherapeutic medicines, the sample was divided into two categories: users (1 or more prescribed medicine events) and non-users (0 prescribed medicine events).

Analysis

For univariate analysis, we compared with the help of a chi-square test the percentage of the oncology population using psychotherapeutic medicines to the percentage of the general population using psychotherapeutic medicines. We hypothesized that the oncology population is more likely to use psychotherapeutic medicines than the general population.

For multivariate analysis, we conducted two logistic regression analyses. In the first analysis, we examined differences in the psychotherapeutic medicine utilization between the oncology population and the general population, after controlling for other factors; in the second analysis, we examined differences in the psychotherapeutic medicines utilization within the oncology population. For both analyses, the dependent variable was the utilization of psychotherapeutic medicines, which was represented by a binary variable (1=yes; 0=no). In the first logistic regression analysis, the independent variables were the history or diagnosis of cancer (1=yes;0=no), age (measured in years), sex (1= female;0=male), race(1= white;0= non-white), marital status (1= married;0= single or divorced), education (less than high school, high school, some college, college, and post graduate), and chronic conditions (arthritis, asthma, diabetes, heart disease, and stroke). In the second logistic regression analysis, the sample was restricted to the

oncology population. Cancer sites and time since being diagnosed with cancer (measured in years) were added to the first regression equation.

Results

Individuals

Consistent with our hypothesis, the chi-square test showed that the cancer group was more likely to use prescribed psychotherapeutic medicines than the non-cancer groups (Figure 6.1). In both the age groups, antidepressants and anxiolytics, hypnotics and sedatives were more often prescribed to the cancer group than the non-cancer group. Within the cancer group, in the age group below 65, 17% of adults with breast cancer and 28% of adults with gynecological cancers (28%) were prescribed psychotherapeutic medicines (Table 6.1). In the age group of above 65, 25% of adults with breast cancer, 14% of adults with prostate cancer, and 12% of adults with colorectal cancer were prescribed psychotherapeutic medicines.

In terms of the number of prescriptions, 3% of the sample had been prescribed psychotherapeutic medicines once, 1-2% had two prescriptions, and 12-16% had three or more prescriptions. For those with any prescriptions, the overall number of psychotherapeutic medicines prescriptions was 1.93 per patient. Antidepressants (13%) accounted for the largest proportion of psychotherapeutic prescriptions, followed by anxiolytics, sedatives and hypnotics (5%), antipsychotic (2%) and CNS stimulants (1%).

The logistic regression analysis (Table 6.2) showed that, even after controlling for other factors, cancer survivors had 20%-30% higher odds of using prescribed psychotherapeutic medications than the general population. Within cancer survivors, time since diagnosis significantly affects the utilization of psychotherapeutic medicines within

the oncology population. Among cancer survivors below age 65, the odds of using psychotherapeutic medicines for cancer survivors who have been diagnosed within the last 1 to 15 years were 2 times higher than cancer survivors who have been diagnosed of cancer for more than 45 years before (Table 6.3). Cancer sites did not have any significant impact on the likelihood of psychotherapeutic medicines in either age group. Wives and cancer survivors' spouses in the age group of 45 and 54 were twice more likely to use psychotherapeutic medicines than males or the age group from 25 to 34. The odds of using psychotherapeutic medicines for cancer survivors suffering from chronic comorbidities, such as arthritis, heart disease, and stroke, were 2 times higher than cancer survivors with no chronic conditions.

Spouses

The univariate analysis of psychotherapeutic medicines utilization showed that the spouses of cancer survivors were significantly more likely to use psychotherapeutic medicines compared to the spouses of the non-cancer group (Figure 6.2). Among spouses using psychotherapeutic medicines, the spouses of the cancer group were more likely to use antidepressants (20% vs. 13%) than other spouses. Among spouses below the age of 65, 26% of the spouses of gynecological cancer survivors, and 20% of the spouses of breast cancer survivors were using prescribed psychotherapeutic medicines (Table 6.1). Among spouses above the age of 65, 27% of the spouses of breast cancer survivors and 19% of the spouses of prostate cancer survivors were using psychotherapeutic medicines.

Two percent of spouses were prescribed psychotherapeutic medicines once; 1% were prescribed psychotherapeutic medicines twice; and 11% were prescribed psychotherapeutic medicines three or more times (data not shown in table). For those

with any psychotherapeutic medications, the average number of psychotherapeutic prescription was 1.68 per patient. Antidepressants accounted for the largest proportion of psychotherapeutic medicines prescriptions (13%), followed by anxiolytics, sedatives and hypnotics (5%), antipsychotic (1%) and CNS stimulants (1%).

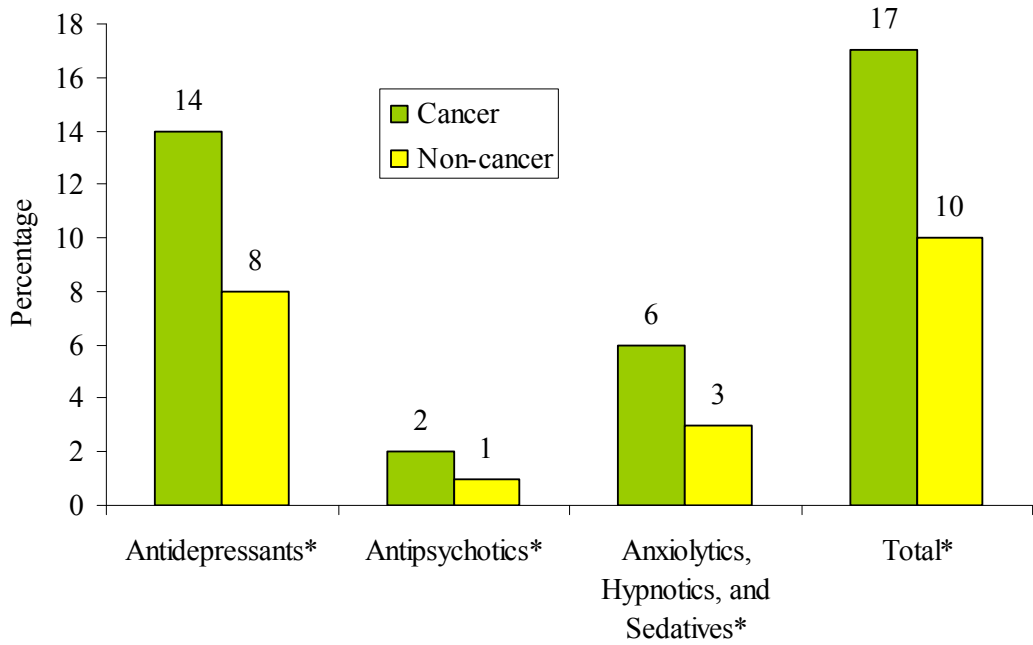
Similar to cancer survivors, the logistic regression analysis showed that the spouses of cancer survivors, in both age groups, had 30% higher odds of using psychotherapeutic medicines than the spouses of non-cancer adults (Table 6.2). Within cancer survivors' spouses, there are no significant differences in the utilization of psychotherapeutic medicines on the basis of cancer sites and time since being diagnosed with cancer (Table 6.3). The odds of using psychotherapeutic medicines for white cancer survivors' spouses were 2-3 times higher than non-white cancer survivors' spouses. The odds of using psychotherapeutic medicines for cancer survivors' spouses suffering from arthritis, heart disease, and stroke were 3-4 times higher than cancer survivors' spouses with no chronic conditions.

Summary

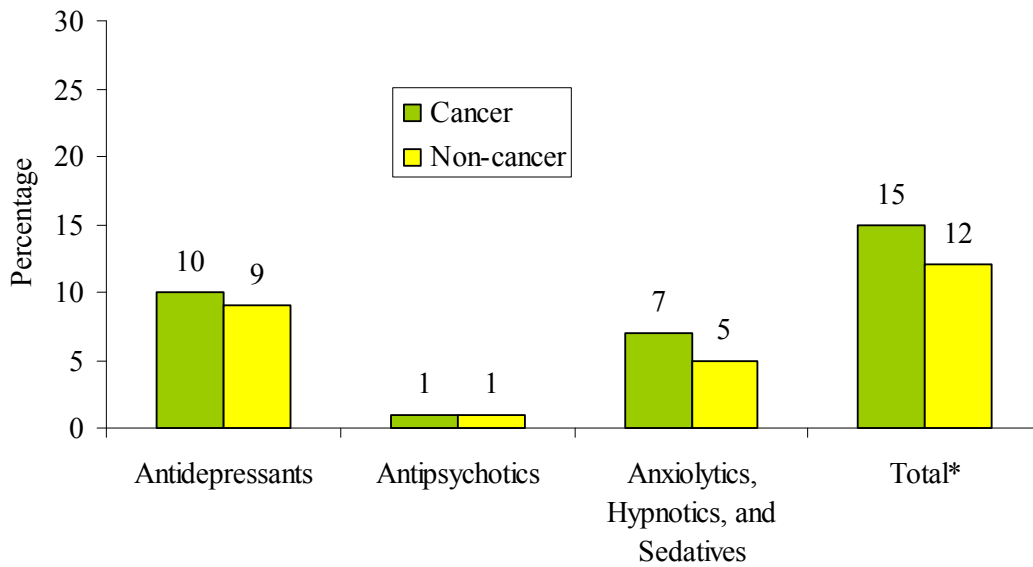
The present study shows that cancer survivors and their spouses were significantly more likely to use psychotherapeutic medicines than other adults, with 1 percentage point higher than the general population. Within the oncology population, the likelihood of using psychotherapeutic medicines is not significantly affected by time since diagnosis or cancer site. However, the usage of psychotherapeutic medicines is significantly affected by gender and presence of chronic conditions. Since female cancer survivors, wives of cancer survivors, cancer survivors and their spouses with arthritis, heart disease, and stroke are highly likely to use psychotherapeutic medicines compared

to their controls, they should be considered as “high risk” groups among cancer survivor’s spouses.

Figure 6.1 Annual percentage of adults using prescribed psychotherapeutic medicines (U.S. adults ages 25 to 85, 2001-2006)

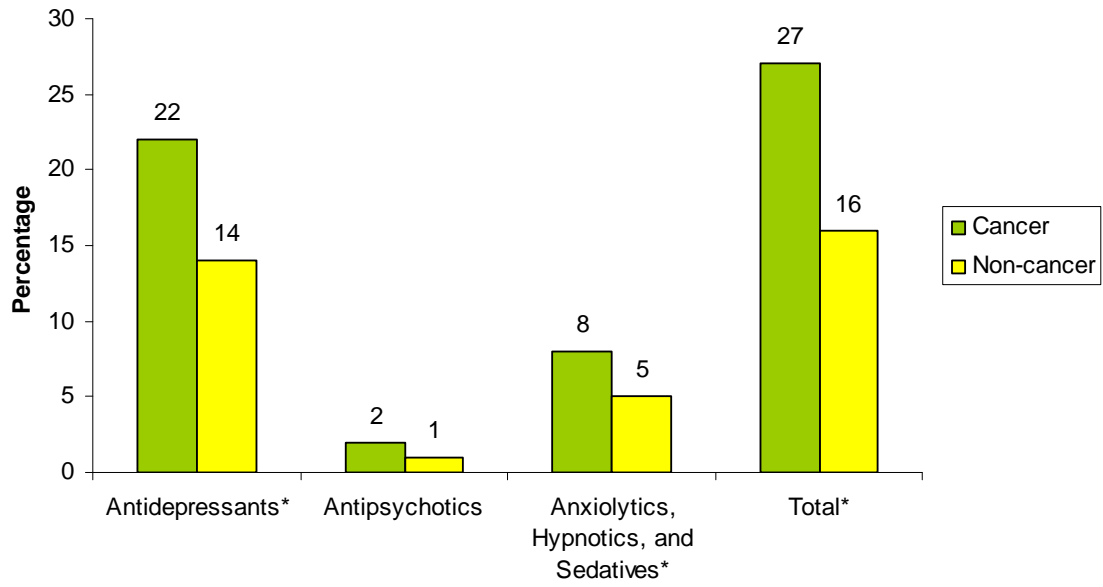


Below 65

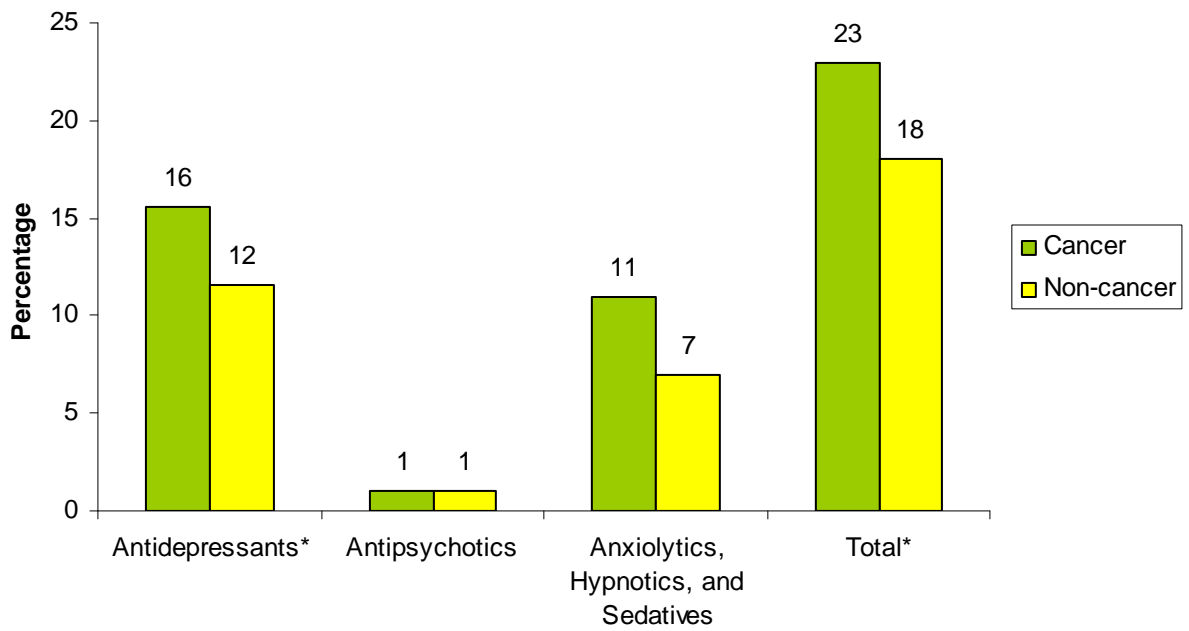


65 and above

Figure 6.2 Annual percentage of spouses using prescribed psychotherapeutic medicines (U.S. adults ages 25 to 85, 2001-2006)



Below 65



65 and Above

Table 6.1 Percentage of the oncology sample using prescribed psychotherapeutic medicines, 2001-2006

	Cancer survivors		Spouses	
	25-64	65 and older	25-64	65 and older
	%	%	%	%
Incident	15	12	27	27
Prevalent	17	15	27	23
Cancer sites				
Breast	17	25	20	23
Colorectal	4	12	4	10
Gynecological	28	9	26	4
Lung	2	3	1	3
Prostate	1	14	1	18

Table 6.2 Odds Ratios for prescribed psychotherapeutic medicines utilization (Full sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
=1 if cancer survivor	1.33*	1.23*	1.34*	1.31*
Demographics				
=1 if age 25-34	0.00	----	0.00	---
=1 if age 35-44	1.25*	----	1.27*	----
=1 if age 45-54	1.41*	----	1.45*	----
=1 if age 55-64	1.20*	----	1.14	----
=1 if age 65-74	----	0.00	----	0.00
=1 if age 75-86	----	0.96	----	0.94
=1 if Female	2.03*	1.83*	2.44*	2.19*
=1 if White	1.95*	1.57*	2.35*	1.99*
=1 if Hispanic	1.88*	1.16	1.90*	1.07
=1 if Married	0.80*	0.86*	----	----
Education				
=1 if Less than high school	0.00	0.00	0.00	0.00
=1 if High school	0.92	0.83*	0.95	0.72*
=1 if Some college	0.97	0.88	1.02	0.79
=1 if College graduate	0.90	0.94	0.91	1.07
=1 if Post graduate	0.87	0.85	0.82	0.85
Chronic conditions				
=1 if Arthritis	1.97*	1.45*	2.15*	1.59*
=1 if Asthma	1.38*	1.44*	1.52*	1.28
=1 if Diabetes	1.57*	1.29*	1.65*	1.42*
=1 if Heart disease	1.61*	1.38*	1.86*	1.45*
=1 if Stroke	1.81*	1.66	2.47*	2.66*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Table 6.3 Odds Ratios for prescribed psychotherapeutic medicines utilization (Oncology sample)

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Time since diagnosed with cancer (TSD)				
=1 if TSD=0	1.42	0.75	1.66	1.89
=1 if TSD between 1 and 5	2.24*	0.83	2.30	0.78
=1 if TSD between 6 and 10	1.50	0.86	1.49	1.32
=1 if TSD between 11 and 45	1.33	0.95	1.05	1.57
=1 if TSD between 46 and 90	1.00	1.00	1.00	1.00
Cancer sites				
=1 if Breast cancer	1.00	1.00	1.00	1.00
=1 if Colorectal cancer	1.03	0.86	1.86	0.82
=1 if Gynecological cancer	1.11	0.92	1.26	0.43
=1 if Lung cancer	0.95	0.67	0.42	0.54
=1 if Others cancer	0.85	1.01	0.85	1.16
=1 if Prostate cancer	0.55	0.84	0.31	1.07
Demographics				
=1 if age 25-34	1.00	----	1.00	---
=1 if age 35-44	1.50	----	1.56	----
=1 if age 45-54	1.76*	----	1.41	----
=1 if age 55-64	1.06	----	0.68	----
=1 if age 65-74	----	1.00	----	1.00
=1 if age 75-86	----	0.70*	----	0.52*
=1 if Female	1.47*	1.49	1.56*	2.76*
=1 if White	1.28	0.98	1.41	1.14
=1 if Hispanic	1.28	1.08	0.68	1.25
=1 if Married	0.81	0.84	----	----
Education				
=1 if Less than high school	1.00	1.00	1.00	1.00
=1 if High school	1.03	0.96	1.19	0.98
=1 if Some college	0.93	0.95	0.64	1.30
=1 if College graduate	0.91	1.19	1.13	1.85
=1 if Post graduate	0.85	1.01	0.88	0.96
Chronic conditions				
=1 if Arthritis	1.82*	1.16	2.59*	1.21
=1 if Asthma	1.38	1.37	1.52	1.86
=1 if Diabetes	1.34	1.24	1.64	1.32
=1 if Heart disease	1.54*	1.31*	2.87*	1.62
=1 if Stroke	1.85	2.36*	1.17	3.65*

Reference group: Unemployed, Non-white, non-Hispanic and single males.

*Significant at p=0.05 level

Chapter 7: Conclusion

The present study is the first to produce national estimates of mental health status, psychological distress, depression and psychotherapeutic medicine utilization among U.S. cancer survivors and their spouses. The current study shows that cancer survivors have lower mental health status, higher psychological distress, and higher odds of being depressed than the general population. Similar to cancer survivors, cancer survivors' spouses have lower mental health status, higher psychological distress, and higher odds of being depressed compared to spouses of non-cancer adults (Table 7.1). Thus, the current finding, similar to existing literature, suggests that cancer diagnosis has a significant psychological impact on the lives of cancer survivors as well as their spouses. Despite research studies demonstrating the psychological burden placed on cancer survivors and their spouses, 33% of oncologists reported that they did not routinely screen their patients for distress (Jacobsen & Ransom, 2007). This study reinforces the argument that cancer care providers need to routinely screen cancer patients and their spouses for mental health problems and assess their psychosocial health needs.

This study also shows that the utilization of psychotherapeutic medicines is 1.3-1.4 percentage points higher for the oncology population than the general population, but cancer survivors and their spouses are no more likely to make ambulatory mental health related visits than the general population. The contrast suggests that the psychological needs of cancer survivors and their spouses are addressed mainly through psychopharmacotherapy (i.e. reducing anxiety, depression, and other mental health symptoms with the help of psychotropic medicines) than counseling and psychotherapy. Although psychotropic medications are very effective in treating mental health

symptoms, patients' adherence to psychopharmacotherapy is low because psychotropic medications are often regarded as addictive. Moreover, patients prefer psychotherapy to psychopharmacotherapy (Digna et al., 2004). Therefore, cancer care providers, if possible, should provide counseling and psychotherapy services in addition to psychopharmacotherapy services or should link cancer patients and their family members to organizations that provide counseling and psychotherapy services. The higher utilization of psychotherapeutic medicines, with no significant differences in ambulatory mental health visits among cancer survivors and their spouses, may be due to four reasons. First, cancer survivors and their spouses might be getting prescriptions for psychotropic medications from their primary care physicians or oncologists. There are research studies which suggest that most of the primary care patients visit primary care physicians with somatic symptoms such as gastrointestinal or cardiovascular complaints, but end up getting prescriptions for psychotropic medications since they exhibit the signs and symptoms of mental health problems, such as depression, anxiety etc (Barkin, 2000; Kisely, 2000; Linden, 1999). Second, oncologists and primary care physicians might be aware of the psychological burden imposed by cancer diagnosis on cancer survivors and their family members and as a result prescribe psychotherapeutic medications more often to the oncology population. Third, because of stigma and embarrassment attached to the utilization of mental health services (Steinberg, 1998), MEPS respondents probably don't acknowledge that visits were "because of [a mental health problem]". Finally, there might be lack of access to mental health professionals due to limited number of mental health providers in a geographic area (Givens, 2002).

Among cancer survivors, gynecological cancer survivors have lower mental health status, higher psychological distress and had higher odds of being depressed (Table 7.2). However, gynecological cancer survivors were not more likely to make mental health related visits or use psychotropic medications. This finding suggests that gynecological cancer survivors have an unmet need for psychosocial services and therefore need routine screening, evaluation and treatment for mental health problems (Ell et al., 2005).

Among socio-demographic variables, education is a significant predictor of mental health status. This study suggests that having higher than high school education improves the mental health status, and lowers psychological distress and depression of cancer survivors and their spouse. The study also points out that as the level of education increases, the magnitude of its impact on mental health status and psychological distress increases, but the magnitude of its impact on the likelihood of being depressed decreases.

In addition to education, the presence of chronic conditions is a significant predictor of mental health status. The presence of chronic conditions negatively affects the mental health status, psychological distress and depression of cancer survivors and their spouses. As a result, cancer survivors and their spouses with chronic conditions have lower mental health and are more likely to make mental health visits and use psychotropic medications.

In this study, gender is a significant predictor of mental health related visits and the usage of psychotropic medications. Female cancer survivors and wives of cancer survivors had 3-8 times higher odds of making mental health visit compared to male cancer survivors or husbands of cancer survivors. Similarly, the odds of using

psychotropic medications for female cancer survivors and wives of cancer survivors were 2-3 times higher than their counterparts.

Based on these findings, oncologists, and primary care providers should make extensive assessment of the psychological needs of cancer survivors or their spouses with low education or chronic conditions and direct them to appropriate psychosocial services. In addition, cancer care providers should monitor the utilization of psychosocial services by female cancer survivors or wives of cancer survivors.

The current study has some limitations. Since MEPS and NHIS are surveys of population-based cohorts and not treatment-based cohorts, they lack information about the stage of cancer and the type of treatment. Consequently, we were unable to investigate the influence of cancer stage and treatment modality on mental health status, mental services utilization and psychotherapeutic medication utilization. MEPS and NHIS also lack information about the mental health status of cancer survivors and their spouses prior to cancer diagnosis. As a result, we were not able to assess the influence of prior psychiatric history (or mental health before cancer diagnosis) on mental health status, mental health visits and psychotherapeutic medication utilization after cancer diagnosis. The data do not have adequate sample sizes to describe utilization of these medicines by patients with less prevalent cancer sites such as brain and bone cancers. The utilization of psychotherapeutic medications and mental health visits is self-reported, not based on medical records or insurance claims. Ideally, self-reported events of psychotherapeutic medicines utilization would be matched and verified with medical records or claims to reduce the under or over reporting.

Despite its limitations, the present study has significant health policy implications. The study shows that cancer survivors have compromised mental health status. Therefore, all parties involved in providing cancer care should include psychosocial services in the standard cancer care and deliver complete cancer care to the oncology population. Cancer care providers can use the model recommended by the Committee on Psychosocial Services to Cancer Patients/Families in the Institute of Medicine (IOM) report “Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs.” This model is based on following processes:

- Identifying of psychosocial health needs
- Linking patients and families to needed psychosocial services
- Supporting patients and families in managing the illness
- Coordinating psychosocial and biomedical health care
- Conducting follow up on care delivery to monitor the effectiveness of services and making modifications if needed

This model is completely dependent on effective patient-provider communication and coordination between psychosocial and biomedical healthcare providers. However, current reimbursement policies do not reward effective communication between patient and provider and do not reimburse for the coordination efforts (Adler & Page, 2007). As a result, payment or reimbursement policies become barriers in the effective delivery of psychosocial services to cancer patients and their spouses. So, private and public health insurance programs should reward and reimburse coordination efforts of primary care providers, specialists and associated healthcare personnel.

The study also shows that the oncology population is more likely to use psychotherapeutic medicines than the general population. This finding should alert oncologists and primary care providers to the importance of counseling newly diagnosed cancer patients about the psychosocial challenges associated with cancer survivorship. This finding should also prompt health insurance companies to subsidize the prices of psychotherapeutic medicines, especially for cancer survivors and their spouses.

Table 7.1 Regression coefficients and Marginal Effects for the outcome of interests in full sample

Outcomes	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
MCS-12	-1.15*	-0.42	-1.12*	-0.31
Psychological distress	0.23*	0.15*	0.23*	0.09
Depression (ME)	2.16*	1.91*	2.22*	2.79*
Ambulatory Mental Health Visits (ME)	1.23	1.22	1.04	1.41
Psychotherapeutic medicines utilization (ME)	1.36*	1.33*	1.37*	1.46*

* Significant at p=0.05 level

Table 7.2 Regression coefficients and Marginal Effects for outcomes of interests in oncology sample

Predictors	Individuals		Spouses	
	25-64	65 and older	25-64	65 and older
Regression coefficients				
MCS-12				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	-0.41	0.22	-0.15	-0.12
=1 if Gynecological cancer	-2.33*	-2.25	-1.10	-3.01
=1 if Lung cancer	0.92	0.03	2.96	0.26
=1 if Prostate cancer	1.51	-1.28	1.07	-1.66
Distress				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	-0.16	-0.58*	-0.69	-0.68
=1 if Gynecological cancer	0.45*	0.37	0.32	0.56
=1 if Lung cancer	-0.48	0.46	-1.29	0.51
=1 if Prostate cancer	-0.25	0.24	-0.52	0.41
Marginal Effects				
Depression				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	1.02	1.69	1.94	2.39
=1 if Gynecological cancer	7.93*	0.75	8.90	0.70
=1 if Lung cancer	1.76	0.68	2.86	1.13
=1 if Prostate cancer	0.61	0.48	1.18	0.51
Ambulatory Mental Health Visits				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	1.17	1.10	4.89*	2.16
=1 if Gynecological cancer	1.18	0.96	1.03	0.68
=1 if Lung cancer	0.90	0.81	0.91*	1.08
=1 if Prostate cancer	0.80	4.02*	0.81*	0.50
Psychotherapeutic medicines utilization				
=1 if Breast cancer	0.00	0.00	0.00	0.00
=1 if Colorectal cancer	1.09	1.08	2.22	0.91
=1 if Gynecological cancer	1.18	1.15	1.45	0.46
=1 if Lung cancer	1.01	0.82	0.45	0.59
=1 if Prostate cancer	0.58	1.04	0.33	1.20

* Significant at p=0.05 level

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Appendix

SF-12 Mental Component Summary questions

1. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?
 - a. Accomplished less than you would like: Yes/No
 - b. Didn't do work or other activities as carefully as usual: Yes/No
2. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside your home and the housework)? Not at all/ A little bit/Moderately/Quite a bit/Extremely
3. During the past 4 weeks, have you felt clam and peaceful? All of then time/Most of the time/ A good bit of the time/ Some of the time/A little of the time/None of the time
4. During the past 4 weeks, did you have a lot of energy? All of then time/Most of the time/ A good bit of the time/ Some of the time/A little of the time/None of the time
5. During the past 4 weeks, have you felt downhearted and blue? All of then time/Most of the time/ A good bit of the time/ Some of the time/A little of the time/None of the time
6. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives etc.)? All of then time/Most of the time/ A good bit of the time/ Some of the time/A little of the time/None of the time

Non-specific Psychological Distress (Kessler) Index

1. During the last 30 days, about how often did you feel nervous? All of then time/Most of the time/Some of the time/A little of the time/None of the time
2. During the last 30 days, about how often did you feel hopeless? All of then time/Most of the time/Some of the time/A little of the time/None of the time
3. During the last 30 days, about how often did you feel restless or fidgety? All of then time/Most of the time/Some of the time/A little of the time/None of the time

4. During the last 30 days, about how often did you feel so sad that nothing could cheer you up? All of the time/Most of the time/Some of the time/A little of the time/None of the time
5. During the last 30 days, about how often did you feel that everything was an effort? All of the time/Most of the time/Some of the time/A little of the time/None of the time
6. During the last 30 days, about how often did you feel worthless? All of the time/Most of the time/Some of the time/A little of the time/None of the time

Patient Health Questionnaire (PHQ-2)

1. During the past two weeks, bothered by having little interest or pleasure in doing things
2. During the past two weeks, bothered by feeling down, depressed, or hopeless

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Number 2, May 2009, pp. 507-523)
- Short, P.F., Moran, J., and Punekar, R.S. Medical Expenditure of Cancer Survivors (in
preparation).
- Punekar, R.S., Short, P.F., and Moran, J. Use of Psychotherapeutic Medication by U.S.
Cancer Survivors and Their Spouses (in preparation).