



# Current depression as a potential barrier to health care utilization in adult cancer survivors



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## ABSTRACT

**Background:** Depression in cancer survivors is a major concern and is associated with poor health related quality of life (HRQOL). Delaying or forgoing care due to depression may further augment poor HRQOL. Although several studies have documented depression as a barrier to health care utilization in non-cancer populations, the impact of current depression on health care utilization among adult cancer survivors (ACS) has not been fully elucidated. The objective of this study was to examine the association between current depression and health care utilization among ACS.

**Methods:** Data from the 2010 Behavioral Risk Factor Surveillance System involving ACS were used in this study. The Patient Health Questionnaire 8 (PHQ-8) item scale was used to measure current depression. Two indicators of health care utilization were examined as outcomes of interest: cost as a barrier to medical care and not having a routine care. Logistic regression models were used to examine the association between current depression and health care utilization.

**Results:** Overall, 13.0% of ACS reported symptoms of current depression. Despite no differences in having access to care, current depression in ACS was a significant barrier to health care utilization: cost as a barrier to medical care (AOR: 5.3 [95% CI: 3.1–9.1]), and not having a routine care (AOR: 2.0 [95% CI: 1.2–3.3]).

**Conclusions:** Our findings have implications for future studies to further understand the association between depression and health care utilization among ACS, its impact on their overall wellbeing, and efforts to detect and treat depression in ACS. Routine assessment of depression in ACS and effective treatment interventions may aid in seeking timely and appropriate medical care.

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## 1. Introduction

Advances in early stage diagnosis and improvements in targeted cancer treatment in the United States (U.S.) resulted in a steady decline in the overall cancer death rate since the early 1990s. The 5-year cancer survival rate during 2004–2010 is 68.3%, up from 48.9% in the 1970s [1]. As of January 1, 2014, an estimated 14.5 million cancer survivors lived in the U.S. and this number is expected to increase to almost 19 million by 2024. Among those currently living in the U.S., majority of them (64%) were diagnosed 5 or more years ago [2].

As cancer is changing from a life-threatening disease into a chronic condition [3], adult cancer survivors (ACS) are at increased risk for developing various comorbid conditions and having poor

health related quality of life (HRQOL) when compared to adults with no history of cancer [4–9]. As such, there has been a growing interest in assessing the long-term health consequences due to cancer survivorship and the impact of cancer treatment on their functioning and overall well-being.

The recognition of cancer-related health issues, long-term health consequences, and their management is important in improving the quality of life and overall well-being of ACS. Therefore having access to and utilizing healthcare is critical for ACS to minimize cancer-related health issues and improve their HRQOL. Findings from studies comparing ACS to individuals without a history of cancer in terms of health care utilization are mixed [10–15]. Some of these findings could be explained by lack of or low access to health care and thereby less utilization of health care in general and/or as a result of not having adequate health insurance or being uninsured [14–18]. Also, low rates of health care utilization are associated with poor health outcomes [18–20].

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Depression in ACS is a major health concern and it has been shown to be associated with poor HRQOL [21–26]. Depression is estimated to be three to five times greater in ACS than in the general population [27]. A recent study of ACS estimated the prevalence of current depression to be around 14% [28] but that prevalence varies by cancer type [22]. Although several studies have documented depression as a barrier to health care utilization in non-cancer populations [29–33], to the best of our knowledge, the impact of current depression on health care utilization among ACS has not been fully elucidated.

Therefore, the primary goal of this study was to determine if current depression among ACS could be a potential barrier to health care utilization, compared to ACS without current depression. Specific aims of this study were: (1) to investigate if ACS with depression are equally likely, if not greater, to have health care access compared to ACS without current depression. This aim would address if access to health care acts as a potential confounder in understanding the association between depression and health care utilization; (2) to investigate the impact of depression on health care utilization in ACS compared to those without depression, controlling for health care access and other socio-demographic variables; and (3) to determine if gender modified the association between depression and health care utilization in ACS. Data from the 2010 Behavioral Risk Factor Surveillance System (BRFSS) was used to address the present study aims.

Results from this study may have important implications for the health care sector in understanding the burden of depression in ACS and developing strategies to address their mental health care needs. Reducing psychological distress can potentially improve adherence to recommended follow up and preventive care guidelines and as a result can beneficially impact their overall wellbeing.

## 2. Methods

### 2.1. General study design and population

The BRFSS is a federally funded telephone survey designed and conducted annually by the Centers for Disease Control and Prevention (CDC) in collaboration with state health departments in all 50 states, Washington, DC; Puerto Rico; the US Virgin Islands; and Guam. The survey collects data on health conditions, preventive health practices and risk behaviors of the adults' selected [34]. The BRFSS methods, sample selection, including the weighting procedure and technical information, are described elsewhere [35]. All BRFSS questionnaires, data and reports are available at <http://www.cdc.gov/brfss/>. Data for this study were obtained from the 2010 BRFSS. Six states administered the optional BRFSS "Cancer Survivorship" as well as the "Anxiety and Depression" Modules: Indiana, Massachusetts, Missouri, New Jersey, Ohio, and Wisconsin. The cooperation/response rates according to the Council of American Survey Research Organizations (CASRO) are reported elsewhere [36].

### 2.2. Cancer survivors

In the 2010 BRFSS, 38,646 respondents from all 6 states were asked a question designed to identify cancer survivors: "Have you ever been told by a doctor, nurse, or other health professional that you had cancer?" A total of 4885 respondents who responded "Yes" were identified as cancer survivors.

### 2.3. Current depression: primary exposure of interest

Current Depression is defined based on the responses to the eight-item Patient Health Questionnaire (PHQ-8) depression scale.

The scores for each item, ranging from 0 to 3, are summed to produce a total score between 0 and 24 points. Current depression is defined as a PHQ-8 score  $\geq 10$  [37]. The PHQ-8 consists of eight of the nine DSM-IV criteria for depressive disorders [38].

### 2.4. Health care access: potential confounder of interest

Two indicators of health care access were examined as potential confounders: having a "Health Plan (insured)", and "Primary Care Provider (PCP)". Respondents were asked the following questions, in the order mentioned, to assess their access to health care: "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?"; "Do you have one person you think of as your personal doctor or health care provider". Those who said "Yes" to the first question were classified as having a health plan and those who responded having one or more providers to the second question were classified as having a PCP.

### 2.5. Health care utilization: outcome of interest

Two indicators of health care utilization were examined as outcomes of interest: indicating "Cost as a barrier to access medical care" and not having a "Routine care". Respondents were asked the following questions, in the order mentioned, to assess their health care utilization: "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?"; and "About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition". Those who said "Yes" to the first question were classified as indicating cost as a barrier to medical care and those who responded visiting a doctor more than a year ago to the second question were classified as not having a routine care.

### 2.6. Covariates of interest

Socio-demographic variables: age, gender, ethnicity, marital status, education, employment, and general health; Comorbidities: heart attack, coronary heart disease, stroke, diabetes, asthma, and arthritis; and number of years since cancer diagnosis, were considered as covariates of interest in this study. We did not consider income as one of the covariates due to 17% missing data.

### 2.7. Statistical analysis

Statistical analysis was conducted on a sample size of 3964 ACS who reported having cancer at the age of 18 or older with complete data on all variables considered in this study. Sampling weights provided in the 2010 BRFSS public-use data that adjust for unequal selection probabilities, survey non-response, and oversampling were used to account for the complex sampling design and to obtain population-based estimates which reflect US non-institutionalized ACS. Weighted prevalence estimates, and corresponding 95% confidence intervals (CI) were computed to describe the characteristics of the study population. We first modeled the association between current depression and health care access to examine if it was a potential confounder and then modeled the association between current depression and health care utilization using multivariable logistic regression models. Finally, since income was not included as one of the covariates, we performed a sensitivity analysis to assess changes in the study results ( $n = 3964$ ) when compared to results with income included as one of the covariates ( $n = 3385$ ) in the logistic regression models.

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