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Physical activity levels and counseling by health care providers in cancer survivors☆

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ABSTRACT

Physical activity guidelines for cancer survivors issued by the American Cancer Society and the American College of Sports Medicine emphasize the essential role of a health care provider (HCP) in counseling cancer survivors to achieve healthier lifestyles. However, research has not established whether HCP's recommendations to engage in physical activity are associated with increased physical activity levels of cancer survivors. The study examines this potential association using the 2005 and 2010 National Health Interview Survey data. The final analytic sample consisted of 3320 cancer survivors and 38,955 adults without cancer who reported seeing or talking to a HCP and if or not they had received a physical activity recommendation in the prior year. Consistent with the aforementioned guidelines, physical activity levels were categorized as inactive, insufficiently active, and sufficiently active (i.e., meeting guidelines). Average adjusted predictions and marginal effects were estimated from generalized ordered logit models. Multivariable regressions controlled for socio-demographic and health-related characteristics and survey year. On average, receipt of a HCP's physical activity recommendation was associated with a lower adjusted prevalence of inactivity by 8.3 percentage points and a higher adjusted prevalence of insufficient and sufficient activity by 4.6 and 3.7 percentage points, respectively, regardless of cancer diagnosis (P's < 0.05). A HCP's recommendation is associated with higher levels of leisure-time aerobic physical activity among cancer survivors and adults without cancer. The communication between cancer survivors and their HCPs may act as a 'window' of opportunity to increase physical activity levels among the U.S. cancer survivors.

1. Introduction

Largely due to the societal aging and ongoing improvements in cancer care, the population of cancer survivors has been projected to increase by 31% within the next ten years; 18 million Americans will be cancer survivors (American Association for Cancer Research, 2014). These estimates include any persons with a history of cancer, from the time of diagnosis through the remainder of their life (American Cancer Society, 2016). Despite this positive development, cancer survival is associated with significant physical and psychosocial burdens, including poor health and premature death (Guy et al., 2013).

To extend disease-free survival and enhance quality of life, broadly accessible, nonpharmacologic measures, such as engagement in physical activity (PA), are of great importance (Fong et al., 2012; Lynch et al., 2013; Schmid and Leitzmann, 2014). The growing evidence on beneficial effects of PA on cancer survivors have led the American College of Sports Medicine (ACSM) and American Cancer Society (ACS) to promote PA in this population (US Department of Health and Human Services, 2008). Because PA has been shown to be safe and beneficial during cancer treatment and has several direct (e.g., improving physical functioning) and indirect (e.g., completing chemotherapy) health benefits, (Courneya et al., 2007; Schmitz et al., 2010; Rock et al., 2012) cancer survivors are encouraged to engage in regular PA as soon as possible following diagnosis (Schmitz et al., 2010; Rock et al., 2012).

PA levels are suboptimal in cancer survivors (LeMasters et al., 2014; Nayak et al., 2014; Nayak et al., 2015; Rohan et al., 2015; Tannenbaum et al., 2016). Due to health conditions, such as compromised immune system, comorbidities and negative effects of treatment, cancer survivors may encounter more difficulties and have less motivation for PA than adults without cancer. Despite these challenges to engagement in PA, cancer diagnosis may provide a 'teachable moment' making patients

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more receptive to improving their lifestyle behaviors (Bluethmann et al., 2015; Karvinen et al., 2015; Webb et al., 2016).

Physicians and other health care providers (HCP) have a unique opportunity to guide cancer patients toward optimal lifestyle choices favorably influencing their survivorship outcomes. The key role played by HCPs in guiding this population toward healthy lifestyle choices has been emphasized in the ACSM and ACS PA guidelines for cancer survivors (Schmitz et al., 2010; Rock et al., 2012). Although the unadjusted percentage of cancer survivors receiving exercise recommendations from HCPs increased from 25.5% in 2000 to 35.8% in 2010, a smaller proportion of them received such recommendations than adults with other chronic conditions such as hypertension (44.2%), cardiovascular disease (41.2%), and diabetes (56.3%) in 2010 (Sabatino et al., 2007; Barnes and Schoenborn, 2012).

It remains unclear what factors account for HCPs' and cancer survivors' decisions to engage in discussion of PA and to exercise. Consistent with the Theory of Planned Behavior, HCPs can influence a cancer survivor's behavioral intention and ultimately, affect behavioral engagement in PA (Andrykowski et al., 2006; Husebø et al., 2013). Based on the Transtheoretical Model, the HCPs are encouraged to examine an individual's readiness to change behavior and tailor their recommendation accordingly (Husebø et al., 2013). Social Cognitive Theory (SCT) postulates a reciprocal association between cognition, behavior, and environmental influences, with behavior affected by interactions. Self-efficacy, outcome expectations, and social support – the key constructs of SCT, can be capitalized on by HCPs to influence the PA engagement among cancer survivors (Husebø et al., 2013; Loprinzi and Lee, 2014).

Compared to adults without cancer or those with other chronic conditions, cancer survivors may have more clinical issues demanding attention during HCP visits (Grady et al., 1992; American Cancer Society, 2016), which may necessarily limit health behavior counseling. In a comparison of HCPs' counseling rates of cancer survivors with those of adults without cancer adjusting for comorbid illnesses and other salient characteristics, cancer survivors were less likely to report receiving a PA recommendation. However, in a year past diagnosis and treatment, counseling for PA was not less likely to occur among cancer survivors. This temporal difference in the likelihood of PA counseling suggests cancer patients and providers may be focused on the diagnosis and treatment to the exclusion of most other topics (Sabatino et al., 2007).

Research on PA promotion practices in clinical setting finds oncologists, for example, who had been practicing for 10 or more years, are most likely to recommend PA to their patients. When asked to rate all the potential benefits and barriers of PA for cancer survivors, oncologists rated “reducing the risk of recurrence” the least and “insufficient time” as the greatest barrier (Karvinen et al., 2010). Oncology nurses indicated lack of interest from patients in PA counseling, as well as uncertainty what to recommend and whether PA was safe (Karvinen et al., 2012).

Emerging research on barriers to PA counseling in general population and patients with non-cancerous chronic conditions suggests most HCPs believe in importance of PA counseling and their role in promoting PA among their patients (Hébert et al., 2012). However, providers are uncertain about the effectiveness of counseling and cite lack of time, training, and reimbursement as barriers. Providers are more likely to counsel their patients about PA if they are active themselves, or if they feel their patients' medical condition would benefit from increasing PA (Hébert et al., 2012). Enhancing PA training of future health professionals and cultivating HCPs' and patients' mutual confidence may address these organizational and individual barriers to PA promotion in clinical setting (Vuori et al., 2013; Lobelo et al., 2014; Joyce and O'Tuathaigh, 2014; Stanford et al., 2014; Berry et al., 2014; Stoutenberg et al., 2015).

The importance of a HCP's advice in promoting preventive health behaviors including exercise has been well documented for the general population (Grady et al., 1992; Kreuter et al., 2000; Wee et al., 2005). However, the few studies that have examined the contribution of such advice to engagement in PA among cancer survivors in the U.S. were based on data from smaller clinical trials and/or captured recommendations from an oncologist rather than a HCP (Jones et al., 2004; Vallance et al., 2007; Park et al., 2015). Using the national-level data, we sought to examine whether a HCP's counseling about PA is associated with PA levels of cancer survivors in the U.S. We included adults without cancer as a comparison group to provide a benchmark when considering estimates for cancer survivors.

2. Methods

2.1. Data source

We used the 2005 and 2010 public-use National Health Interview Survey (NHIS) with Cancer Control Modules that contained the latest available data on a PA recommendation among adults aged 18+ years seeing a HCP in the 12 months before the survey (hereinafter, the prior year). The NHIS is an in-person household survey conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. The survey uses multi-stage sampling designed to produce nationally representative estimates of the civilian, non-institutionalized population of the U.S. Socio-demographic information is collected from each household, and one adult is sampled within each household to complete a more in-depth survey. The NHIS final response rates for the Adult Sample Person component were 69.0% and 60.8% for 2005 and 2010, respectively (National Center for Health Statistics, 2006; National Center for Health Statistics, 2011).

2.2. Study population

We combined the 2005 and 2010 NHIS data to ensure a sufficient number of observations for analyses by sub-populations. Cancer diagnosis was assessed using participants' responses on whether they were ever told by a doctor or other health professional they had cancer or a malignancy of any kind. Cancer site was determined based on respondents' reports of what kind of cancer they had. Age at diagnosis and time since diagnosis were calculated using responses on how old respondents were when a given type of cancer was first diagnosed and their reported age at the time of the survey. Fig. 1 highlights the selection of our analytic sample. Because the question on PA recommendation was only asked among adults aged 18+ years who reported seeing or talking to a HCP in the prior year, (National Center for Health Statistics, 2010) we restricted our final analytic sample to the respondents with this information and those who reported if or not they had received a PA recommendation in the prior year. Thus, we analyzed data on 3320 cancer survivors and 38,955 adults without cancer (Fig. 1).

2.3. Variables

The outcome of interest—levels of leisure-time aerobic PA—was assessed via responses to questions on frequency and duration of how often respondents do vigorous and light or moderate leisure-time PA. The original frequencies were captured in different time units and then were recoded as times per week. The PA measures were consistent over the two NHIS cycles. According to the ACS and ACSM recommendations on aerobic PA, (Schmitz et al., 2010; Rock et al., 2012) we categorized the engagement in leisure-time PA into three mutually exclusive levels: inactive (<1 session of aerobic activity per week or no leisure-time aerobic activity that lasted at least 10 min or due to activity limitations); insufficiently active (≥1 sessions of PA per week for 10–150 min), and sufficiently active (meeting leisure-time aerobic recommendations of moderate-intensity PA for ≥150 min, or vigorous-intensity PA for ≥75 min per week, or an equivalent combination). PA levels were examined among all cancer survivors and by subgroups of the most commonly reported cancer types, classified by first diagnosis.

The independent variable of main interest—a HCP's PA recommendation—was assessed using “yes/no” responses to the