U.S. Department of Veterans Affairs

Public Access Author manuscript

Psychol Trauma. Author manuscript; available in PMC 2015 March 02.

Published in final edited form as:

Psychol Trauma. 2014 ; 6(Suppl 1): S73–S81. doi:10.1037/a0033721.

Cancer as a Criterion A Traumatic Stressor for Veterans: Prevalence and Correlates

Elizabeth A. Mulligan,

VA Boston Health Care System, Boston, Massachusetts and Harvard Medical School

Jennifer Schuster Wachen,

VA Boston Health Care System, Boston, Massachusetts and Boston University School of Medicine

Aanand D. Naik,

Health Services Research and Development, Michael E. DeBakey VAMC, Houston, Texas, and Baylor College of Medicine

Jeffrey Gosian, and

VA Boston Health Care System, Boston, Massachusetts

Jennifer Moye

VA Boston Health Care System, Boston, Massachusetts and Harvard Medical School

Abstract

The diagnosis of cancer is an uncontrollable stressor posing the threat of death and disfigurement, often followed by repeated exposure to aversive reminders in the form of noxious treatments, persisting side effects, reengagement at times of surveillance, and the threat of recurrence. The phenomenon of cancer as a traumatic stressor is explored in this study, with a focus on the prevalence and correlates of posttraumatic stress disorder (PTSD) Criterion A in a sample of 170 mostly male adults who received health care at VA Medical Centers in Boston or Houston. Participants were interviewed 6 months after diagnosis with head and neck, gastro-esophageal, or colorectal cancers. Approximately half—42.9% to 65.9% depending on cut-score used—perceived cancer to be a traumatic stressor involving actual/threatened death or injury or threat to physical integrity as well as fear, helplessness, or horror. Younger veterans and those with current combat PTSD symptoms were more likely to perceive cancer as a traumatic stressor, as were those who perceived their prognosis as uncertain; 12% had PTSD symptoms above a PCLC cut score of 50, which is similar to incidence rates of PTSD associated with other traumatic stressors. Cancer, therefore, appears to be a serious and for some, traumatic stressor, suggesting the importance of screening for cancer related PTSD in cancer survivors, particularly those most at risk.

Correspondence concerning this article should be addressed to Jennifer Moye, VA Boston Healthcare System, Brockton Division, 940 Belmont Street, Brockton, MA 02301. jennifer.moye@va.gov.

Elizabeth A. Mulligan, VA Boston Health Care System, Boston, Massachusetts and Department of Psychiatry, Harvard Medical School; Jennifer Schuster Wachen, VA Boston Health Care System and Department of Psychiatry, Boston University School of Medicine; Aanand D. Naik, Health Services Research and Development, Michael E. DeBakey VAMC, Houston, Texas, and Department of Medicine, Baylor College of Medicine; Jeffrey Gosian, VA Boston Health Care System; Jennifer Moye, VA Boston Health Care System and Department of Psychiatry, Harvard Medical School.

The authors have no conflict of interest relating to this study or this article. This article has not been published elsewhere and has not been submitted simultaneously for publication elsewhere.

Keywords

cancer; PTSD; Criterion A

One in two adults will be diagnosed with cancer in their lifetime; 1,638,910 individuals will have been diagnosed with cancer in 2012, and 577,190 will have died (American Cancer Society, 2012). Although the 5-year relative survival rate for all cancer has increased to 67% (American Cancer Society, 2012), some who are diagnosed will die, while others undergo significant surgical procedures such as removal of body parts (e.g., breasts, testicles, uterus, lung, colon) and toxic treatments (e.g., stem cell transplant). For these reasons, cancer is arguably a significant stressor for many, but is cancer a “traumatic stressor?”

According to *DSM-IV-TR*, a traumatic stressor has two parts, “Criterion A1” for “experiencing, witnessing, or being confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others,” and “Criterion A2” for a response involving “intense fear, helplessness, and horror” (*DSM-IV-TR*; American Psychiatric Association, 2000). *DSM-IV-TR* lists “being diagnosed with a life threatening illness” as a potential traumatic stressor. In contrast, the *DSM-5* proposal for posttraumatic stress disorder (PTSD) does not list illness as a potential stressor and does not include Criterion A2 (American Psychiatric Association, 2012). In this article we aim to further address the nature of cancer as a traumatic stressor by discussing features of cancer that are similar and dissimilar from traumatic stress, describing the literature on the prevalence and correlates of PTSD symptoms in cancer survivors, and reporting the prevalence rates of Criterion A and its relationship to posttraumatic stress disorder (PTSD) symptomatology and predictor variables in a sample of mostly male military veterans.

Cancer has features that are consistent with as well as distinct from recognized traumatic stressors such as combat or rape. The diagnosis and treatment of cancer is an uncontrollable, negative, and often sudden life threatening event, features shared with other traumatic experience (Carlson & Dalenberg, 2000; French-Rosas, Moye, & Naik, 2011; Smith, Redda, Peyserb, & Vool, 1999). Cancer is a stressor that is occurring within the body and, therefore, is inescapable. The initial diagnosis of cancer can be sudden, but awaiting the final diagnosis may be protracted, involving periods of waiting for results or surgery that foster a sense of uncertainty and helplessness (Boyes, Girgis, D’Este, & Zucca, 2011; Montgomery & McCrone, 2010). Additionally, cancer may involve repeated exposure to aversive reminders, such as observable and tactile signals of the stressor (e.g., colostomy bag), forced engagement with triggers during treatments and later surveillance (Burish & Tope, 1992; Dale, Bilir, Han, & Meltzer, 2005; Glanz & Lerman, 1992; Thompson et al., 2010), and hypervigilance for signs of recurrence (Vickberg, 2003). These features contribute to the notion of cancer as a traumatic experience.

However, there are important differences. First, the cancer diagnosis and treatment occurs within a context of health care—with the goal to provide care and when possible cure. Thus, unlike rape or combat, there is no individual or set of individuals who are malevolent perpetrators of cancer, but rather a set of individuals offering care. Second, the appraisal of the threat of cancer may vary widely. Cancer is, unfortunately, not outside the range of usual

experience. Cancer is prevalent and the second leading cause of death, causing 1,500 deaths per day (American Cancer Society, 2012). Thus, by the time of diagnosis most adults will have known another who has died from cancer; and others will know those who have survived. Additionally, cancer survival rates vary by cancer type and stage; 5-year survival rates range between 6% (pancreas) and 100% (prostate; American Cancer Society, 2012). Therefore, the appraisal of the threat of cancer likely varies based on characteristics of the cancer, the extent to which statistical information is absorbed and relevant to the individual, and the life experiences of the individual. In sum, any number of these variables—the experience of care, previous experiences with cancer, stage, and type of cancer—may potentially alter the appraisal of cancer as trauma.

PTSD Criterion A in Cancer Survivors

Empirical studies to clarify the issue of cancer as a traumatic stressor are scant and have focused primarily on assessing PTSD symptoms of reexperiencing, avoidance/numbing, and hyper-arousal. In the few studies that have evaluated Criterion A, endorsement varies from 41% to 67%. Specifically, in 65 women (M age = 52.3) interviewed 1–27 months post breast cancer diagnosis, 66% endorsed A1, assessed by asking “Did you perceive this experience as a threat to your life or a threat to your physical well-being?” and 59% endorsed A2, assessed by asking “Did your response to this experience involve intense fear, helplessness, or horror?”. Together, these provided a total Criterion A endorsement rate of 52% (Cordova et al., 2007). Similarly, in 98 women with initial and 27 women with recurrent diagnosis of breast cancer (M age = 54.8) interviewed with the SCID (Spitzer, Williams, Gibbon, & First, 1992) 0–67 days post diagnosis, 91% described at least one traumatic event related to the breast cancer disease or treatment, with 54% endorsing A2 Criterion (Mehnert & Koch, 2007). In another sample of 115 women (M age = 55.6) also interviewed with the SCID ranging from less than 1 to more than 5 years post diagnosis of breast cancer, 41% endorsed A2 (with A1 assumed; Palmer, Kagee, Coyne, & DeMichele, 2004). Finally, in 195 patients (M age = 64.4) with stage II–IV cancers of various types interviewed with the SCID in a pain and palliative clinic, 67% reported that their cancer diagnosis was the traumatic event for them, and they responded with intense fear, helplessness, and horror (Mystakidou et al., 2012).

PTSD in Cancer Survivors

Although *DSM-5* does not list medical illness as a potentially traumatic stressor, reports of PTSD symptoms in cancer survivors would seem *prima facie* evidence that cancer is a traumatic stressor for some. Rates of cancer related PTSD range from 0%–35%, most often in the range of 10% (Guglietti et al., 2010; Mundy et al., 2000), similar to rates of PTSD among individuals who have experienced other traumatic stressors (Carlson & Dalenberg, 2000). An even greater proportion of survivors endorse partial symptoms of PTSD (16%–56%), which is typically defined as at least two of the B–D symptom clusters (Amir & Ramati, 2002; Kangas, Henry, & Bryant, 2005).

Numerous studies have characterized factors that may increase the risk of stress responses in cancer survivors, which can be usefully characterized as residual, current, and anticipated

stressors (Butler et al., 2005; Cella & Tross, 1986). Residual stressors are previous stressors and traumas that may increase sensitivity to developing cancer related PTSD, such as prior negative life stressors and traumatic events (e.g., Andrykowski et al., 2000; Green et al., 2000), and a history of psychiatric disorders prior to cancer (Widows, Jacobsen, & Fields, 2000). Current stressors are concurrent or comorbid experiences that may increase risk for cancer PTSD, such as more intense treatments or poorer social support (Andrykowski, Cordova, Studts, & Miller, 1998; Jacobsen et al., 2002; Kornblith et al., 2003), although some studies failed to find a relationship between these factors and PTSD symptoms (Green et al., 1998; Kangas, Henry, & Bryant, 2005). Anticipatory stressors consist of uncertainty or fears about the future which may be related to PTSD (Amir & Ramati, 2002; Andrykowski et al., 1998) although mixed results have been found for the role of cancer stage and recurrence in predicting PTSD (e.g., (Amir & Ramati, 2002; Andrykowski et al., 1998; Butler, Koopman, Classen, & Spiegel, 1999; Green et al., 1998; Jacobsen et al., 2002). In addition, demographic characteristics including younger age (Cordova et al., 1995; Green et al., 1998; Koopman et al., 2002), female gender (Hampton & Frombach, 2000), and lower education (Jacobsen et al., 1998) have been found to be related to higher incidence of PTSD from cancer.

In this article we return to the question of cancer as a traumatic stressor by describing rates and correlates of Criterion A endorsement in mostly male military veterans. There are now half a million veterans that receive VA care who are cancer survivors (Moye, Schuster, Latini, & Naik, 2010). Veterans have unique risk factors for some cancers (e.g., Agent Orange). Furthermore, some veterans diagnosed with cancer will have experienced combat trauma, bringing specific risk and resilience factors to bear on their cancer experience (Jahn, Herman, Schuster, Naik, & Moye, 2012). The purpose of this article is to describe the prevalence and correlates of PTSD Criterion A in a veteran sample due to the large number of veterans at risk for cancer, the potentially unique features of this population (e.g., mostly male, combat trauma), and the recognized need to identify and treat psychosocial problems after cancer treatment (Institute of Medicine, 2005). Following the work of Cella and Tross (1986), we investigate Criterion A endorsement as it relates to residual and concurrent stressors, including combat and combat related PTSD. We report our results in the context of these factors, the literature, and the proposed changes to PTSD Criterion A in *DSM-5*.

Method

Recruitment

We recruited participants from the tumor registries from VA Medical Centers in Boston and Houston for a prospective longitudinal study of cancer rehabilitation needs in veterans. To be eligible for inclusion in the study, participants must have received a diagnosis of and treatment for: head and neck (HN), gastroesophageal (GI), or colorectal (CRC) cancer. In selecting cancer types for inclusion we sought to balance our goal of providing an understanding of rehabilitation issues across a range of less well-studied cancers (e.g., vs. breast, prostate, and blood), without introducing too great of a degree of heterogeneity. We chose to focus on these oral-digestive cancers as they are relatively prevalent in the veteran population (i.e., excluding prostate and skin cancer, these account for 35% of the cancers

within VHA), not associated with highly terminal prognoses yet may be perceived as life threatening and, therefore, stressful, have commonalities in risk factors and long term side effects (e.g., difficulties eating, nausea, decreased appetite, constipation, and diarrhea). Additional inclusion criteria were: 6 months post diagnosis, age 18 years or older, ability to read and speak English, not in hospice care, and no evidence of psychotic disorder or dementia. As described elsewhere, 170 of 416 eligible participants agreed to be interviewed; the remaining 246 declined to be interviewed, could not be reached by phone, or could not be scheduled within the study time period window, for an overall recruitment rate of 40.9% (Naik et al., 2013).

Procedure

Participants were interviewed 6 months following their cancer diagnosis (median = 195 days post diagnosis, range 157–268; 85% were interviewed within 30 days of the target date). They completed a mixed-method structured individual interview with a trained member of the research team. The interviewer read each question to the participant and recorded the participant's responses. For items with a Likert scale response format, participants were given a copy of the scale to reference. Most interviews were conducted in person at a location convenient for the participant, usually at the local VA medical center or the patient's home. This study was approved by the Institutional Review Boards of the VA Boston Health Care System and the Houston VA Medical Center.

Measures

Demographics—Participants reported their age, gender, and whether they had a spouse or partner. Level of education was recorded as *grade school* (1), *some high school* (2), *high school graduate* (3), *some college or college degree* (4), and *some graduate school or graduate degree* (5). Ethnic identity (Hispanic or Latino) and racial identity were collected following NIH policy for collecting race and ethnicity data (National Institutes of Health, 2001). Only seven individuals identified their race as other than African American or White, creating expected cell counts for this category of less than five. Therefore, in subsequent data analyses we examined the race variable as African American and other versus White.

Cancer information—Information about the cancer diagnosis, including cancer organ site and stage, was obtained from the participants' medical records. For the purposes of data analyses, we collapsed stage into "early" (Stages I–II) and "advanced" (Stages III–IV). Participants reported if they received surgery, chemotherapy, and/or radiation and the date of their last treatment which were verified in the medical record. To obtain information on possible residual stressors related to previous cancer experience, participants also reported if they had a personal history of nonskin cancer and if they had a history of a parent dying from cancer. To obtain information on possible anticipatory stressors, participants described their prognosis as "cured," "active," "in remission," or "not sure." Because of previous studies regarding the role of uncertainty in cancer related PTSD (e.g., Boyes et al., 2011), we dichotomized the prognosis variable into two categories of "certain" (active or cured) and "uncertain" (in remission or not sure).

Combat experience and combat PTSD—To obtain information on possible residual stressors related to previous combat, participants reported “When you were in the military, were you in a combat area?” In our clinical experience, because older veterans sometimes minimize their exposure to combat related traumatic stressors if they were not involved in close range armed combat, we probed “By combat I mean firearms, shelling, and mortar.”

To obtain information on possible concurrent stressors related to the ongoing experience of combat related PTSD, we administered the Primary Care PTSD Screen (PC-PTSD; Prins et al., 2004). This 4-item measure uses a yes/no response format to assess the occurrence of nightmares or intrusive thoughts about the military, avoidance of thoughts or situations that are reminders of the military, feeling on guard or easily startled, and feeling numb or detached from others in the past month. This scale demonstrated good internal consistency reliability in this sample ($\alpha = .88$).

We created two summary variables considering both combat and combat-PTSD reports. In the first, participants were divided into three groups—combat with current combat-PTSD, combat without combat-PTSD, and no combat. In the second, participants were divided into two groups—combat-PTSD and no combat-PTSD (including both those who had and had not experienced combat). To further explore the role of combat with cancer we asked two additional questions based on prior focus groups (Hilgeman et al., 2012) “During cancer were you reminded at all of your military experience?” and “Did memories or dreams of the military become more frequent?”

Cancer related PTSD Criteria A1 and A2—Participants responded if, when they were first told they had cancer, they thought they might die, be injured, or less physically whole, and felt fear, helplessness, or horror. Exact wording appears in Table 2. We developed these items to directly correspond to criteria A1 and A2 in the *DSM-IV-TR* (American Psychiatric Association, 2000) diagnosis for PTSD (the most current version of DSM at the time of the study). Participants responded to each item as *not at all* (0), *a little* (1), *moderately* (2), *a lot* (3), *extremely* (4).

We scored Criterion A using three methods. First, we used a “simple dichotomy” method where participants met the cutoff for criteria A1 if they endorsed any of the items related to death, injury or loss of physical integrity due to cancer at a level of 1 (*a little likely*) or higher. Similarly, participants met the cutoff for criteria A2 if they endorsed any of the items related to experiencing feelings of fear, helplessness, and horror regarding their cancer diagnosis at a level of 1 (*a little likely*) or higher. Participants met the cutoff for overall Criterion A if they met the cutoff for both Criterion A1 and Criterion A2. Second, we used a more “conservative dichotomy” method following the scoring above but only if the participant rated the item at the “moderate” or higher level. Third, we determined a Criterion A intensity score by summing the ratings for all six items ($\alpha = .90$). The resulting score was z-transformed and used in subsequent analyses.

Cancer related PTSD symptoms for Criteria B, C, D—The Posttraumatic Check List-Civilian version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993) was used to assess cancer related PTSD symptoms. This 17-item questionnaire was used to assess

symptoms of PTSD related to cancer by amending each item to refer to cancer (e.g., “Repeated, disturbing memories, thoughts, or images of cancer, your diagnosis or treatment?”) as in previous studies (Andrykowski et al., 1998; Cordova et al., 1995). Participants indicated how much they have been bothered by each symptom over the past 4 weeks using a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*).

Item responses were summed to create a total score ($\alpha = .94$) and four subscales scores (Reexperiencing, $\alpha = .88$; Avoidance, $\alpha = .70$; Numbing, $\alpha = .82$; and Hyperarousal, $\alpha = .83$). A cutoff score of 50 was used in these analyses to indicate cancer related PTSD (Andrykowski et al., 1998). This method has been shown to have a diagnostic sensitivity and specificity of .60 and .99 in a sample of breast cancer survivors (Andrykowski et al., 1998) and .20 and .95 in a sample of cancer patients who had undergone bone marrow transplants (Widows et al., 2000).

Statistical analyses—We first examined Criterion A prevalence through descriptive statistics. In subsequent analyses, we used only the Criterion A conservative scoring to simplify the exposition of findings, choosing the conservative method as it is more moderate or cautious. We determined cancer related PTSD through descriptive statistics. We compared cancer related PTSD mean scores in groups who did and did not meet Criterion A through *t* tests. We then investigated the univariate relationships between Criterion A endorsement and demographic, disease, and stressor variables using chi-square analyses. For independent variables with two levels we determined the unadjusted odds ratio with 95% confidence intervals. To obtain adjusted odds ratio we used multivariate binary logistic regression. Finally, we further investigated the relationship between cancer related PTSD and combat PTSD through point-biserial correlation, and between Criterion A and combat PTSD with a one-way between subjects ANOVA to compare the effect of group status (combat-PTSD, combat but no PTSD, no combat) on Criterion A intensity ratings. We conducted analyses in SPSS 21.0.

Results

Participants

A total of 170 participants (167 men, three women; *M* age 64.66, *SD* = 9.40, range 27–88) were interviewed. Most (62%) reported they had a spouse or partner. Nine percent (*n* = 15) described their ethnicity as Hispanic or Latino. Fifteen percent (*n* = 25) identified themselves as Black or African American, one person identified as American Indian, one person identified as Asian, and six as “more than one race;” the remaining 138 (81%) identified as White. Within the Hispanic or Latino group, most (*n* = 12) identified as White, and three participants identified as more than one race. Most (*n* = 141; 83%) were high school graduates; 86 (50%) had some college education or were college graduates.

Participants had head and neck cancer (*n* = 68; 40%), gastroesophageal cancer (*n* = 18; 11%), or colorectal cancer (*n* = 84; 49%) of AJCC Stage I (24%), II (28%), III (22%) or IV (26%) as shown in Table 1. There were more individuals with Stage IV cancer within the head and neck and gastro-esophageal cancers than within the colorectal cancer group $\chi^2 = 17.89$, $p < .01$ (see Table 1). With regard to types of treatment, 73% (*n* = 122) received

surgery, 60% ($n = 102$) received chemotherapy, and 41% ($n = 69$) received radiation. About half (45.2%) were still in treatment at the interview point, whereas the remainder were finished with treatment. About one fifth ($n = 33$; 19%) reported a personal history of cancer other than skin, most often prostate ($n = 12$) and lung ($n = 6$); and 11% ($n = 18$) had a parent who died from cancer. Of note, personal history of cancer was associated with older age ($r = .21, p < .01$), yet having had a parent who died of cancer was modestly associated with younger age ($r = -.15, p < .05$).

Forty-five participants (27%) reported current combat-PTSD symptoms, 38 (22.4%) saw combat but did not endorse current combat related PTSD symptoms and 87 (51%) did not see combat. Thirty participants (18%) said that they were reminded of combat during their cancer experience; 17 (10%) said memories and dreams of the military became more frequent during their cancer experience.

Prevalence of Criterion A

Using the simple dichotomy scoring method 85% of the sample met A1 and 71% met A2 criteria (see Table 2). Using the conservative dichotomy scoring method, 64% met A1 and 51% met A2 (see Table 2). Overall, 66% met both A1 and A2 using the simple dichotomy method and 43% met both A1 and A2 using the conservative dichotomy method. As noted in the statistical analyses section, the remainder of the results reported below rely only on the conservative scoring method.

Prevalence of Cancer Related PTSD

Over the entire 170 participants, 21 (12.4%) had PCL scores above 50. Almost all ($n = 19$) fulfilled Criterion A and two did not ($\chi^2 = 22.09, p < .001$). Participants who met Criterion A had higher levels of cancer related PTSD symptoms of reexperiencing, avoidance, numbing, and hyperarousal as shown in Table 3.

Associations Between Criterion A and Demographic, Disease, and Stressor Variables

Univariate analyses of demographic and disease variables—Younger age was associated with Criterion A endorsement ($r = -.21, p < .001$); however, no other demographic variables (education, race, partner status) were associated with Criterion A endorsement. Criterion A endorsement was not associated with cancer type with (HN = 44.1%, GI = 44.4%, CRC = 41.8%; $\chi^2 = 0.11, p = .95$), similarly no other disease or treatment variables were associated with Criterion A endorsement (see Table 4).

Univariate analyses of stressors—Residual stressors, namely having had cancer before, having a parent who died from cancer, or having been in combat, were unrelated to Criterion A endorsement as shown in Table 4. However, concurrent presence of combat related PTSD symptoms ($\chi^2 = 5.50, p < .05$) and uncertainly about prognostic status ($\chi^2 = 4.43, p < .05$) were associated with Criterion A endorsement.

Multivariate analyses—In logistic regression, 65.9% of the sample was correctly classified, (omnibus $\chi^2 = 20.01, p < .001$; Nagelkerke $R^2 = .15$). As shown in Table 5,

younger age predicted Criterion A endorsement, with combat PTSD and uncertain prognosis approaching significance.

Additional Analyses of Associations With Combat PTSD

Cancer related PTSD and combat PTSD symptoms were modestly correlated ($r = .39, p < .001$). Cancer Criterion A intensity was highest in those with a history of combat trauma and current combat related PTSD symptoms ($M = 0.39, SD = 1.02$), versus those with no combat experience ($M = 0.00, SD = 1.07$) and those with combat experience and no current combat related PTSD symptoms ($M = -0.46, SD = 0.77$), $F(2, 169) = 7.97; p < .001$. Post hoc comparisons indicated that the mean score for those with combat and current PTSD symptoms was significantly different than those with combat but no current PTSD, but did not significantly differ from those with no combat.

Discussion

In this article we describe the prevalence of PTSD Criterion A endorsement among 170 mostly male patients approximately 6 months after diagnosis of oral-digestive cancers. Nearly all participants (85%) perceived cancer to involve actual or threatened death or injury or threat to physical integrity at least a little bit. This high rate of endorsement appears to signify that it is normal to be concerned about death, injury, or integrity in the face of cancer. About half of the participants fully met PTSD Criterion A—66% when scored using a more lenient method and 43% when scored using a more conservative method. The rate of Criterion A endorsement did not vary in our sample by cancer organ site or stage. This rate is similar to previous studies of women following breast cancer, which range from 41%–67% (Cordova et al., 2007; Mehnert & Koch, 2007; Mystakidou et al., 2012; Palmer et al., 2004). These findings provide preliminary support that cancer may be experienced as a traumatic stressor in different disease groups, although further study in more diverse samples is needed.

The number of veterans who met criteria for cancer related PTSD in our sample further underscores this point. The rate of cancer related PTSD above a clinical cut-score (12%) in our sample is similar to that found in other studies of cancer (10%), and reported rates following rape and combat (Carlson & Dalenberg, 2000; Kessler, Chiu, Demler, Merikangas, & Walters, 2005) and natural disasters (Kilpatrick, Resnick, & Asiero, 2009). The reports of PTSD Criterion A endorsement in this and other studies, together with the reports of PTSD symptoms of reexperiencing, avoidance, and hyperarousal, argue that for some, cancer may be a traumatic event. These endorsement rates appear to potentially be at odds with *DSM-5* definitions of a traumatic stressor and warrant additional study.

In this study we also sought to identify potential correlates of Criterion A endorsement, including demographic, disease, and stressor variables (residual, current, and anticipated). Age was the only variable examined in this study that was significantly related to Criterion A endorsement at both the bivariate and the multivariate levels. This finding is consistent with previous research (Cordova et al., 1995; Green et al., 1998; Koopman et al., 2002). It is possible that older adults meet the experience of cancer with more resilience given their more frequent experience facing medical illness, an idea that is supported by the fact that

older adults were more likely to have previously been diagnosed with cancer in our sample. In contrast to our expectations, residual stressors including a personal history of cancer, a history of parental death from cancer, and prior exposure to combat were not significantly related to Criterion A endorsement.

However, as we hypothesized, veterans who endorsed current combat related PTSD were especially likely to view their cancer as traumatic. This finding is consistent with previous research in nonveteran populations that demonstrated relationships between cancer related PTSD symptoms and other current stressors, although these studies have examined concurrent experiences such as more intense treatments and poorer social support rather than comorbid mental health conditions (Andrykowski et al., 1998; Jacobsen et al., 2002; Kornblith et al., 2003). It is possible that the endorsement of cancer related PTSD was contaminated by the co-occurring combat-PTSD in our sample. We directed the participants to answer the questions in reference to cancer, particularly when asking about Criterion A (e.g., dreams of cancer), but also B and C symptoms. However, it is likely not possible for participants to accurately distinguish the etiology of symptoms. Nevertheless, it is conceivable that combat related PTSD may put some individuals at risk for anxious reactions when confronted with subsequent life threatening events. For this reason it appears especially important to assess individuals with combat-PTSD for emotional distress after cancer diagnosis, particularly as some veterans stated they were reminded of combat during their cancer diagnosis and treatment, and that dreams of combat worsened during cancer experience. These veterans may be targeted for treatment of both combat and cancer related PTSD. In contrast, individuals who had experienced combat but did not endorse current combat related PTSD symptomatology had the lowest levels of Criterion A endorsement. This finding suggests that the experience of previous life traumas without ongoing psychological distress may reduce the perception of cancer as a traumatic event, and may offer resilience when navigating the potentially life-threatening diagnosis of cancer (Jahn et al., 2012).

Finally, uncertainty about prognosis emerged as a potential anticipatory stressor, as it was significantly related to Criterion A at the bivariate level and approached significance at the multivariate level. Although this finding is largely exploratory and requires replication in other studies, it adds to the mixed evidence that anticipatory stressors related to uncertainty or fears about the future may place people at risk for cancer related PTSD (Amir & Ramati, 2002; Andrykowski et al., 1998; Butler et al., 1999; Green et al., 1998; Jacobsen et al., 2002).

There are numerous limitations to our methodology. Our sample has issues of both heterogeneity and homogeneity. We included participants across a range of cancer types and stages in order to gain some comparison of the potential role of cancer type and stage in subsequent adjustment. Although we did not find specific associates between cancer type and stage in our analyses, our sample was not adequately powered to test all sample characteristics. This heterogeneity may have added complexity which suppressed outcome analyses. At the same time, our sample was homogenous in respect to gender. Our study of oral digestive cancers in a mostly male population therefore adds to the existing cancer survivor literature which tends to focus on women after breast cancer, but limits the

generalizability of this study. Although some racial groups are underrepresented, the overall non-White population in this sample mirrors national rates within this age cohort and the sample was drawn from two distinct geographic regions. However, we were not able to adequately test race and ethnicity differences.

Additional limitations relate to our study design and assessment methods. We did not use structured diagnostic interviews to assess combat or cancer related PTSD, rather we used rating scales. Furthermore, we asked our participants to recall their experience of the cancer diagnosis 6 months afterward. In addition to problems in retrospective accounts, participants' perceptions may be clouded by the stress of cancer treatment. Although cancer treatment type and status were not associated with outcome variables, the heterogeneity of treatments type and stage again added complexity to our sample. It is possible that the evolving and accumulating nature of both the diagnostic and treatment experiences both likely contribute to the overall sense of cancer as trauma, but our methodology could not test this. We initially sought to recruit individuals at a specific point following treatment, but found this was difficult given the wide range of treatments and sometimes uncertainty of treatment end dates. Therefore, we recruited individuals at 6 months post diagnosis. Thus, we can report Criterion A endorsement at 6 months post diagnosis, but not at a specific point posttreatment. In order to better understand the experience of cancer as an evolving traumatic stressor, future studies may wish to more fully investigate the nature of the cancer experience from diagnosis to treatment as well as how various components of this process contribute to experiencing cancer as traumatic. As noted earlier in the article, ongoing reminders of the cancer—disfigurement, dysfunction, and needed surveillance may result in repeated aversive exposure and it may be this character that defines cancer as traumatic. Research focused on the development of cancer related PTSD and its symptom structure over time may provide a fuller understanding of the ways in which the cancer experience may lead to PTSD for some, and how it may be different in character.

Some argue that it may not be possible to distinguish traumatic from nontraumatic stressors (see Friedman, Resick, Bryant, & Brewin, 2011 for a review) and further argue that the assessment of PTSD should focus on the presence of specific current symptoms rather than consider the occurrence of a specific traumatic event (e.g., cancer diagnosis; Brewin, Lanius, Novac, Schnyder, & Galea, 2009). However, the designation of cancer as a potentially traumatic event is important to cue clinicians to consider screening for PTSD after cancer treatment (French-Rosas et al., 2011). The goal of such consideration is not to pathologize those who may be having a common reaction to the stress of cancer, but to offer intervention that may reduce distress and assist in recovery. This consideration is especially important as the gap in mental health care following cancer treatment is identified as a significant public health concern (IOM, 2005). Our findings together with others suggest it is reasonable to allow that cancer may be a traumatic stressor for some, and to consider screening for potential cancer related PTSD, especially in those with risk factors such as younger age and current combat PTSD. The successful identification and treatment of PTSD could likely support more successful recovery from the rigors of cancer treatment, potentially reduce the risk for other mental health outcomes including depression, and hopefully improve overall health outcomes during cancer survivorship.

Acknowledgments

This material is the result of work supported with resources and the use of facilities at the Boston VA Medical Center and the Houston VA Health Services Research & Development Center of Excellence (HFP90-020) at the Michael E DeBakey Medical Center. We thank the members of the Veterans Cancer Rehabilitation Study (Vetcares) Research team. We are indebted to the veterans who have participated in our research studies and allow us to contribute to their health care. Funding for this study was provided by the Department of Veterans Affairs Rehabilitation Research and Development Service.

References

- American Cancer Society. Cancer Facts and Figures 2012. Atlanta, GA: American Cancer Society; 2012.
- American Psychiatric Association. DSM-5: The future of psychiatric diagnosis. 2012 from <http://www.dsm5.org/Pages/Default.aspx>.
- Amir M, Ramati A. Post-traumatic symptoms, emotional distress and quality of life in long-term survivors of breast cancer: A preliminary research. *Journal of Anxiety Disorders*. 2002; 16:191–206.
- Andrykowski MA, Cordova MJ, Patrick C, McGrath MJ, Sloan DA, Kenady DE. Stability and change in posttraumatic stress disorder symptoms following breast cancer treatment: A 1-year follow-up. *Psycho-Oncology*. 2000; 9:69–78. doi:10.1002/(SICI)1099-1611(200001/02)9:1<69::AID-PON439>3.0.CO;2-R. [PubMed: 10668061]
- Andrykowski MA, Cordova MJ, Studts JL, Miller TW. Posttraumatic stress disorder after treatment for breast cancer: Prevalence of diagnosis and use of the PTSD checklist-civilian version (PCL-C) as a screening instrument. *Journal of Consulting and Clinical Psychology*. 1998; 66:586–590. [PubMed: 9642900]
- Boyes AW, Girgis A, D'Este C, Zucca AC. Flourishing or floundering? Prevalence and correlates of anxiety and depression among a population-based sample of adult cancer survivors months after diagnosis. *Journal of Affective Disorders*. 2011; 135:184–192. [PubMed: 21864913]
- Brewin CR, Lanius RA, Novac A, Schnyder U, Galea S. Reformulating PTSD for DSM-V: Life after Criterion A. *Journal of Traumatic Stress*. 2009; 22:366–373. [PubMed: 19743480]
- Burish TG, Tope DM. Psychological techniques for controlling the adverse side effects of cancer chemotherapy: Findings from a decade of research. *Journal of Pain and Symptom Management*. 1992; 7:287–301. [PubMed: 1624814]
- Butler LD, Field NP, Busch AL, Seplaki JC, Hastings TA, Spiegel D. Anticipating loss and other temporal stressors predict traumatic stress symptoms among partners of metastatic/recurrent breast cancer patients. *Psycho-Oncology*. 2005; 14:492–502. [PubMed: 15452896]
- Butler LD, Koopman C, Classen C, Spiegel D. Traumatic stress, life events, and emotional support in women with metastatic breast cancer: Cancer related traumatic stress symptoms associated with past and current stressors. *Health Psychology*. 1999; 18:555–560. [PubMed: 10619528]
- Carlson EB, Dalenberg CJ. A conceptual framework for the impact of traumatic experiences. *Trauma, Violence, and Abuse*. 2000; 1:4–28.
- Cella DF, Tross S. Psychological adjustment to survival from Hodgkin's disease. *Journal of Consulting and Clinical Psychology*. 1986; 54:616–622. [PubMed: 3771879]
- Cordova MJ, Andrykowski MA, Kenady DE, McGrath PC, Sloan DA, Redd WH. Frequency and correlates of posttraumatic-stress-disorder-like symptoms after treatment for breast cancer. *Journal of Consulting and Clinical Psychology*. 1995; 63:981–986. [PubMed: 8543720]
- Cordova MJ, Giese-Davis J, Golant M, Kronenwetter C, Chang V, Spiegel D. Breast cancer as trauma: Posttraumatic stress and posttraumatic growth. *Journal of Clinical Psychology in Medical Settings*. 2007; 14:308–319.
- Dale W, Bilir P, Han M, Meltzer D. The role of anxiety in prostate carcinoma. *Cancer*. 2005; 104:467–478. [PubMed: 15959911]
- French-Rosas L, Moye J, Naik A. Improving the recognition and treatment of cancer-related posttraumatic stress disorder. *Journal of Psychiatric Practice*. 2011; 17:270–276. [PubMed: 21775828]

- Friedman MJ, Resick PA, Bryant RA, Brewin CR. Considering PTSD for DSM-5. *Depression and Anxiety*. 2011; 28:750–769. [PubMed: 21910184]
- Glanz K, Lerman C. Psychosocial impact of breast cancer: A critical review. *Annals of Behavioral Medicine*. 1992; 14:204–212.
- Green BL, Krupnick JL, Rowland JH, Epstein SA, Stockton P, Spertus I, Stern NM. Trauma history as a predictor of psychologic symptoms in women with breast cancer. *Journal of Clinical Oncology*. 2000; 18:1084–1093. [PubMed: 10694561]
- Green BL, Rowland JH, Krupnick JL, Epstein SA, Stockton P, Stern NM, Spertus IL. Prevalence of posttraumatic stress disorder in women with breast cancer. *Psychosomatics*. 1998; 39:102–111. [PubMed: 9584535]
- Guglietti CL, Rosen B, Murphy KJ, Laframboise S, Dodge J, Ferguson S, Naik AD. Prevalence and predictors of posttraumatic stress in women undergoing an ovarian cancer investigation. *Psychological Services*. 2010; 7:266–274.
- Hampton MR, Frombach I. Women's experience of traumatic stress in cancer treatment. *Health Care for Women International*. 2000; 21:67–76. [PubMed: 11022450]
- Hilgeman M, Moye J, Archambault E, Billings R, Karel MJ, Gosian J, Naik AD. In the veterans voice. *Federal Practitioner*. 2012; 29:51S–59S.
- Institute of Medicine. From cancer patient to cancer survivor: Lost in transition. Washington, DC: National Academies Press; 2005.
- Jacobsen PB, Sadler IJ, Booth-Jones M, Soety E, Weitzner MA, Fields KK. Predictors of posttraumatic stress disorder symptomatology following bone marrow transplantation for cancer. *Journal of Consulting and Clinical Psychology*. 2002; 70:235–240. [PubMed: 11860050]
- Jacobsen PB, Widows MR, Hann DM, Andrykowski MA, Kronish LE, Fields KK. Posttraumatic stress disorder symptoms after bone marrow transplantation for breast cancer. *Psychosomatic Medicine*. 1998; 60:366–371. [PubMed: 9625227]
- Jahn A, Herman L, Schuster J, Naik A, Moye J. Distress and resilience after cancer in military veterans. *Research in Human Development*. 2012; 9:229–247.
- Kangas M, Henry JL, Bryant RA. The relationship between acute stress disorder and posttraumatic stress disorder following cancer. *Journal of Consulting and Clinical Psychology*. 2005; 73:360–364. [PubMed: 15796646]
- Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*. 2005; 62:617–627. [PubMed: 15939839]
- Kilpatrick DG, Resnick HS, Asiero R. Should PTSD Criterion A be retained? *Journal of Traumatic Stress*. 2009; 22:374–383. [PubMed: 19743478]
- Koopman C, Butler LD, Classen C, Giese-Davis J, Morrow GR, Westendorf J, Spiegel D. Traumatic stress symptoms among women with recently diagnosed primary breast cancer. *Journal of Traumatic Stress*. 2002; 15:277–287. [PubMed: 12224799]
- Kornblith AB, Herndon JE, Weiss RB, Zhang C, Zuckerman EL, Rosenberg S, Holland JC. Long-term adjustment of survivors of early-stage breast carcinoma 20 years after adjuvant chemotherapy. *Cancer*. 2003; 98:679–689. [PubMed: 12910510]
- Mehnert A, Koch U. Prevalence of acute and post-traumatic stress disorder and comorbid mental disorders in breast cancer patients during primary cancer care: A prospective study. *Psycho-Oncology*. 2007; 16:181–188. [PubMed: 16856147]
- Montgomery M, McCrone SH. Psychological distress associated with the diagnostic phase for suspected breast cancer: Systematic review. *Journal of Advanced Nursing*. 2010; 66:2372–2390. [PubMed: 21039773]
- Moye J, Schuster J, Latini DM, Naik A. The future of cancer survivorship care for veterans. *Federal Practitioner*. 2010; 27:36–43. [PubMed: 21318051]
- Mundy EA, Blanchard EB, Cirenza E, Gargiulo J, Maloy B, Blanchard CG. Posttraumatic stress disorder in breast cancer patients following autologous bone marrow transplantation or conventional cancer treatments. *Behaviour Research and Therapy*. 2000; 38:1015–1027. [PubMed: 11004740]

- Mystakidou K, Parpa E, Tsilika E, Panagiotou I, Roumeliotou A, Galanos A, Gouliamos A. Traumatic experiences of patients with advanced cancer. *Journal of Loss and Trauma*. 2012; 17:125–136.
- Naik AD, Martin LA, Karel MJ, Wachen JS, Mulligan E, Gosian JS, Moyer J. Cancer survivor rehabilitation and recovery: Protocol for the Veterans Cancer Rehabilitation Study (Vet-CaRes). *BMC Health Services Research*. 2013; 13:93. [PubMed: 23497430]
- National Institutes of Health. NIH policy on reporting race and ethnicity data: Subjects in clinical research. Washington, DC: National Institutes of Health; 2001. (Vol. NOTICE: NOT-OD-01–053).
- Palmer SC, Kagee A, Coyne JC, DeMichele A. Experience of trauma, distress, and posttraumatic stress disorder among breast cancer patients. *Psychosomatic Medicine*. 2004; 66:258–264. [PubMed: 15039512]
- Prins A, Ouimette P, Kimerling R, Cameron RP, Hugelshofer DS, Shaw-Hegwer J, Sheikh JI. The primary care PTSD screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry*. 2004; 9:9–14.
- Smith MY, Redda WH, Peyserb C, Wool D. Posttraumatic stress disorder in cancer: A review. *Psycho-Oncology*. 1999; 8:521–537. doi:10.1002/(SICI)1099-1611(199911/12)8:6<521::AID-PON423>3.0.CO;2-X. [PubMed: 10607985]
- Spitzer RL, Williams JB, Gibbon M, First MB. The structured clinical interview for *DSM-III-R* (SCID) I: History, rationale, and description. *Archives of General Psychiatry*. 1992; 49:624–629. [PubMed: 1637252]
- Thompson CA, Charlson ME, Schenkein E, Wells MT, Furman RR, Elstrom R, Leonard JP. Surveillance ct scans are a source of anxiety and fear of recurrence in long-term lymphoma survivors. *Annals of Oncology*. 2010; 21:2262–2266. [PubMed: 20423914]
- Vickberg SMJ. The concerns about recurrence scale (cars): a systematic measure of women's fears about the possibility of breast cancer recurrence. *Annals of Behavioral Medicine*. 2003; 25:16–24. [PubMed: 12581932]
- Weathers, FW.; Litz, BT.; Herman, DS.; Huska, JA.; Keane, TM. The PTSD checklist (PCL-C): Reliability, validity, and diagnostic utility; Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies; 1993 Oct.
- Widows MR, Jacobsen PB, Fields KK. Relation of psychological vulnerability factors to posttraumatic stress disorder symptomatology in bone marrow transplant recipients. *Psychosomatic Medicine*. 2000; 62:873–882. [PubMed: 11139008]

Table 1

Cancer Type by Stage Endorsement

	Stage I	Stage II	Stage III	Stage IV
Head and neck				
<i>n</i>	12	21	9	26
%	17.6	30.9	13.2	38.2
Colorectal				
<i>n</i>	25	24	24	11
%	29.8	28.6	28.6	13.1
Gastro-				
<i>n</i>	4	3	4	7
%	22.2	16.7	22.2	38.9
Total				
<i>n</i>	41	48	37	44
	24.1	28.2	21.8	25.9

Note. Stage by type $\chi^2 = 17.89$, $p = .006$.

Table 2

Prevalence (Percent) of A1, A2, and Total Criterion A Endorsement

	Not at all %	A little %	Moderately %	A lot %	Extremely %
A1: When you were first told you had cancer, how much did you think:					
1. You might die?	38.2	22.9	17.6	13.5	7.6
2. The cancer might injure or damage your body?	26.5	17.6	22.9	23.5	9.4
3. The cancer might leave you less physically whole?	37.1	17.6	15.3	20.6	9.4
Any A1 item "A little" or more					84.7
Any A1 item "Moderately" or more					63.5
A2: When you were first told you had cancer, how much did you feel:					
4. Fear?	35.3	22.9	13.5	17.6	10.6
5. Helplessness? Probe: Did you feel like you could not do anything to change the situation?	45.9	18.8	13.5	12.9	8.8
6. Horror? Probe: Did you feel horrified, awful, or like you can't believe it is happening?	53.5	14.7	13.5	7.1	11.2
Any A2 item "A little" or more					70.6
Any A2 item "Moderately" or more					51.2
Full Criterion A					
"A little" or more					65.9
"Moderately" or more					42.9

Table 3

Cancer-Related PTSD (PCL-C) Mean Scores Within Criterion A Groups

	Total sample	Met <i>n</i> = 73	Not met <i>n</i> = 97	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>t</i>
Total score	30.05 (14.12)	24.47 (8.69)	37.45 (16.43)	6.65
Re-experiencing	8.25 (4.42)	6.51 (2.54)	10.56 (5.27)	6.63
Avoidance	2.83 (1.54)	2.28 (0.63)	3.56 (2.08)	5.88
Numbing	9.04 (4.79)	7.34 (3.47)	11.29 (5.37)	5.81
Hyperarousal	9.94 (4.97)	8.35 (3.61)	12.04 (5.71)	5.14

Note. All *t* values are significant at $p < .001$.

Table 4
Association of Demographic, Disease, and Stressor Variables With Criterion A Endorsement

Variable	Category	Total sample %	Criterion A %	χ^2	p	Unadjusted odds ratio (95% CI)
Race	African American and other	18.8	56.3	2.95	.09	0.52 (0.24–1.12)
	White	81.2	39.9			
Social	Has spouse/partner	61.8	60.6	0.16	.72	1.15 (0.57–2.35)
Cancer stage	Early (I–II)	52.4	40.4	0.47	.54	1.24 (0.67–2.28)
	Advanced (III–IV)	47.6	45.7			
Treatment	Surgery	72.9	44.4	0.37	.54	1.24 (0.62–2.49)
	Chemotherapy	60.6	46.6	1.43	.23	1.47 (0.78–2.75)
	Radiation therapy	41.8	45.8	0.22	.64	1.16 (0.63–2.15)
	In treatment still	44.7	38.2	1.28	.26	0.70 (0.38–1.30)
Residual stressors	Cancer self	25.3	37.2	0.77	.48	0.73 (0.36–1.48)
	Cancer parent	10.6	44.4	0.02	.89	1.07 (0.40–2.86)
	Combat	43.5	40.5	0.31	.58	0.84 (0.46–1.55)
Concurrent stressor	Combat PTSD	26.5	35.6	5.50	.02	2.27 (1.14–4.54)
Anticipatory stressor	Uncertain prognosis	52.4	50.6	4.43	.04	1.94 (1.04–3.59)

Table 5

Logistic Regression Predicting Criterion A

	B	SE	Wald	p	Adjusted odds ratio (95% CI)
Constant	3.90	1.30	8.96	.03	49.58
Age	-.06	.02	10.10	.01	.95 (.90-.98)
Combat PTSD	-.67	.37	3.23	.07	.51 (.25-1.06)
Uncertain Prognosis	.50	.33	2.94	.09	1.77 (.92-3.40)