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Post-Traumatic Stress Disorder in Cancer Survivors: Recognising and Acknowledging the Symptoms

Author(s):Dr. Simon B Thompson, Ms. Louise Eccleston, Prof. Tamas Hickish

Corresponding Author:
Dr. Simon B Thompson,
Associate Professor, Psychology Research Centre, Bournemouth University, BH12 5BB - United Kingdom

Submitting Author:
Dr. Simon B Thompson,
Associate Professor, Psychology Research Centre, Bournemouth University, BH12 5BB - United Kingdom

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Abstract

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (APA, 1994) was revised in 1994 to include the diagnosis of a life threatening illness as a traumatic stressor constituting Post Traumatic Stress Disorder (PTSD). This inclusion prompted further research into PTSD in survivors of cancer. Understanding the prevalence of PTSD in breast cancer survivors is complicated due to the lack of generalisation of studies, small sample sizes and variance in methodology. This review highlights the need for psychological support for breast cancer patients at every stage, from diagnosis to treatment and post-treatment. The importance of clinical psychology within oncology departments is paramount.

Introduction

Breast cancer is the most common type of cancer in the UK (Cancer Research UK, 2011). In recent years, advances in treatments such as hormone treatments and mammography screening for breast cancer, has increased the survival rate of breast cancer (Autier, et al., 2010). According to the National Cancer Institute (2011a) “An individual is considered a cancer survivor from the time of cancer diagnosis, through the balance of his or her life”. The increase of breast cancer survivors consequently leads to the need to investigate the psychological long-term effects of breast cancer and the effects of the treatments used to cure or prolong life (Mehnert, et al., 2009). Since DSM-IV inclusion of a life threatening illness as a possible stressor to initiate the diagnosis of Post Traumatic Stress Disorder (PTSD) (APA, 1994), research has begun to investigate PTSD following breast cancer.

Within the diagnosis of PTSD are 17 potential symptoms that are characterised by three clusters of symptoms: re-experiencing the trauma, avoidance or numbing in response to trauma reminders, and increased arousal (Cordova, et al., 2000). The person has to be exposed to a traumatic event in which both Criterion A1 and A2 are present. Criterion A1 denotes the stressor. Criterion A2 denotes that the person’s response involves intense fear, helplessness or horror and Criterion B relates to the intrusive recollection of the event. The traumatic event is persistently re-experienced in one or more of the following ways: recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions; recurrent distressing dreams of the event; and acting or feeling as if the traumatic event were recurring including a sense of reliving the experience. The sufferer experiences intense psychological distress and physiological reactivity at exposure to cues that symbolise or resemble an aspect of the traumatic event. Criterion C relates to persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness as indicated by efforts to avoid activities, places, people, thoughts and conversations. Feelings of detachment and restricted range of affect may also be experienced (APA, 2000).

Criterion D states that the sufferer experiences persistent symptoms of increased arousal (not present before the trauma) as indicated by difficulty falling or staying asleep, irritability or outbursts of anger, difficulty concentrating, hypervigilence and exaggerated startle response. Criterion E denotes that the duration of the disturbance (symptoms in B, C, and D) is more than one month. Criterion F states that the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (APA, 2000).It is important to diagnose whether the disorder is lifetime, chronic, acute, and is current or in subsyndromal form. Delayed onset can be up to 6 months or more and in some cases, anecdotal evidence from Japanese prisoner of war survivors, may be many decades before symptoms are identified (Thompson, 2011). Acute PTSD is diagnosed if the duration of symptoms is less than 3 months. Chronic PTSD is diagnosed if the duration of symptoms is 3 months or more, and delayed onset is when symptoms are at least 6 months after the stressor. Subsyndromal PTSD does not yet have a specified diagnostic criterion (Shelby & Golden-Kreutz, 2008).Some have defined subsyndromal PTSD as having at least one symptom from each one of the three PTSD symptom clusters

though others have defined it as meeting criteria from any two of the three clusters (Blanchard, et al., 1996).

Cancer as a life trauma

Cancer differs significantly from other PTSD traumas in that it is not a discrete event and consists of a potential range of traumatic experiences that can occur during the course of the illness (Smith, et al., 1999). The new stressor criterion in DSM-IV includes a more subjective perceptive of trauma associated with the threat to physical integrity, including perceptions of fear, helplessness and horror (McGrath, 1999).The National Institute of Cancer (2011a) defines breast cancer as a "cancer that forms in tissues of the breast, usually the ducts (tubes that carry milk to the nipple) and lobules (glands that make milk)". The main treatments for breast cancer are surgery, chemotherapy, radiotherapy, hormone therapy and biological treatments. The type of treatment is dependent on the stage of tumour growth and it may be necessary for patients to have more than one type of treatment (Kangas, Henry & Bryant, 2002). Individuals may experience many undesirable side-effects due to their treatment, which can include fatigue, nausea, hair loss and concentration deficits. All of these experiences could be subjectively interpreted as traumatic events. Gurevich, Devins and Rodin (2002) discuss how cancer is different from other traumatic stressors: chronicity of threat, uncertainty, intangibility, anticipatory nature of threat and internality of threat.

Epidemiology

Epidemiology is the occurrence and distribution of health-related states in specified populations, including the study of the determinants influencing such states. It is also the application of knowledge to control health problems. Saracci (2010) argues that studies of epidemiology involve individuals living in societies that are exposed to many different variables and they cannot be carried out in remote and entirely controlled conditions, yet they are a quantitative study of human populations. This highlights the difficulty of analysing the determinants influencing the development of PTSD in breast cancer survivors as there are many confounding factors that are difficult to control for, for instance, the number of past traumas.

Prevalence is the proportion of people in a population that have a given disorder at a given time (Gradus, 2007). It is derived by dividing the number of people who have the disorder by the amount of people in the sample (Saracci, 2010). Prevalence will include the incidence of the population, as well as people who have been diagnosed for some time. If the study is of a recent year, it is of current interest and carries practical implications therefore the point in time needs to be reported (Saracci, 2010).

Kangas, Henry and Bryant (2002) carried out a conceptual and empirical review of PTSD following cancer, including the prevalence of PTSD in breast cancer survivors. However, the reasons for the variability in the findings of the prevalence were not reviewed in-depth. The authors highlighted the need to assess the impact of the diagnosis of varying stages of breast cancer and different forms of treatment on the development of PTSD.

Prevalence of PTSD in breast cancer

Literature on this topic is listed in Illustrations 1-6. It is interesting that the study by Mundy and colleagues (2000) found no current PTSD in the sample of breast cancer survivors, yet 35% of the sample was diagnosed with lifetime PTSD. This could be due to the fact that at the time of the study participants were at least 100 days post treatment.

Some studies have reported the prevalence of current subsyndromal PTSD as 5% (Andrykowski & Cordova, 1998); 13% (Andrykowski, et al., 1998), and 20% (Shelby & Golden-Kreutz, 2008). However, in Andrykowski and colelagues' (1998) study, half of their sample had participated in an earlier study of PTSD symptoms and therefore, this may have meant that the women were sensitive to PTSD symptoms and this could inflate estimates of the prevalence of PTSD. Also, this was only concerning subsyndromal PTSD, not full PTSD, as for full current PTSD, only 6% of the sample met the criteria used (PCL-C & SCID-NP). There was only a small sample of 82 breast cancer survivors used in this study; with a larger sample there would be more confidence in the sensitivity of PTSD, especially when there is such a small prevalence of PTSD found.

Andrykowski and colleagues (1998) comment the prevalence of cancer-related PTSD across studies is complex due to the differences in study procedures and sample populations. Unless the studies are similar in this respect, comparison of the prevalence of PTSD can be challenging. It is also important to evaluate the validity of the prevalence rates found and then the reasons to account for their variability. Understanding the prevalence of PTSD in breast cancer survivors can assist in providing the most effective interventions and psychological support during this distressing time. The studies range in the samples they used: type of treatments experienced, stage of breast cancer experienced, country of study, and measures used to assess PTSD.

The majority of the studies reviewed used the Structured Clinical Interview for DSM-IV (SCID) and/or the PTSD Checklist Civilian Version (PCL-C) to assess the prevalence of PTSD in breast cancer

survivors. The PCL-C appears to be the most frequently used self-report measure of PTSD symptoms and as a clinical screening test for PTSD (McDonald & Calhoun, 2010). The PCL-C was developed to assess PTSD in non combat veterans (Weathers, Huska & Keane, 1991) and consists of 17 items that correspond to the symptoms of PTSD existing in the DSM (McDonald & Calhoun, 2010). Participants indicate on a 5-point scale, ranging from not at all (1) to extremely (5) how much they have been bothered by each symptom in the last month. The PCL-C yields a total score and sub-scale scores for intrusive, avoidant cognitions, numbing and arousal. Participants are likely to merit a formal diagnosis of PTSD if they obtain a score of 50 or above (cut-off score method) or if they meet at least one intrusion, three avoidance and two arousal symptoms (rated as 'moderately' or above) (symptom cluster method) (Jacobsen, et al., 1998). Most of the research uses a cut-off score of 50 or above; however, this value of cut-off is recommended for veterans whereas a cut-off score of 44 is recommended for civilians (McDonald & Calhoun, 2010).

From the studies reviewed, the findings for the prevalence of cancer-related PTSD for those that used the system cluster method ranged from 6% (Andrykowski, et al., 1998; Andrykowski & Cordova, 1998) to 26% (Levine, Eckhardt & Targ, 2005). Yet, the prevalence of PTSD ranged from 1.9% (Morrill, et al., 2008) to 17% (Levine, Eckhardt & Targ, 2005) using the cut-off method. The system cluster method appears to overestimate the prevalence of PTSD found in the women with breast cancer. However, there appears to be some discrepancy in the score that should be used to warrant a likely diagnosis of PTSD for the cut-off method. Some researchers have argued the use of the cut-off score of 44 for Civilians (Weathers, Huska & Keane, 1991). Yet other researchers have documented that they have used the score of 50 as the cut-off for a likely diagnosis of PTSD. This could explain some reports appear to have found the high prevalence of PTSD when using the PCL-C cut-off method.The other assessment measure frequently used to assess the prevalence of PTSD is the Structured Clinical Interview for the DSM-IV (SCID). This is a semi-structured interview that allows for identification of psychiatric morbidity, yet due to it having a modular construction it can be modified to be used for diagnosis of PTSD (Palmer, et al., 2004). There are various versions of the SCID and studies vary in which edition of the SCID they use, for instance, SCID-NP-PTSD (Non-patient Edition) (Andykowski, et al., 1998). Some use the SCID for DSM-IV and SCID for DSM III (Okamura et al., 2005). For studies that used the SCID, the prevalence of cancer-related current PTSD ranged from 0% (Mundy, et al., 2000) to 16% (Shelby & Golden-Kreutz, 2008). Compared to the PCL-C, prevalence of PTSD appears to be lower when using the SCID, particularly compared to the symptom cluster method for the PCL-C.

The discrepancy between self-report and clinical administered ratings in relation to prevalence estimates have been reported (Mehnert & Koch, 2007). The PCL-C tends to overestimate the prevalence of PTSD and the SCID tends to underestimate the prevalence of PTSD (Mehnert & Koch, 2007). Mehnert and Koch (2007) argue that the SCID may lack sensitivity, especially in physically ill patients and as a result underestimate the prevalence of PTSD. However, Andrykowski and colelagues (1998) found that the PCL-C (symptom cluster method) and the SCID-NP-PTSD both equated a prevalence of current PTSD to be 6% for breast cancer survivors in their sample.

The Clinician Administered PTSD Scale-Structured Interview Form 1 (CAPS-I) was used in two studies. Pitman and colleagues (2001) found 14% current cancer related PTSD and 16% lifetime cancer related PTSD. Naidich and Motta (2000) found 32% current cancer related PTSD and 14% lifetime PTSD. The prevalence of PTSD appears to be inflated when using the CAPS-I, especially for Naidich and Motta (2000); however, the CAPS-1 was not previously used to assess PTSD in breast cancer survivors and also 9.7 % of the sample in the Naidich and Motta (2000) study had a bone marrow transplant. Additionally, 63.3% of the sample had treatment side-effects and therefore, this could inflate the prevalence of PTSD and not the measure used.

O'Connor and colleagues (2007) argue that there may be variance in the findings of prevalence of PTSD as a result of using less specific DSM-IV criteria for PTSD or a different diagnostic criteria, eg DSM III-R. The significant changes in the DSM criteria from 1980-1994 must be considered when comparing results from the various studies on the prevalence of PTSD (O'Connor, et al., 2007). The majority of the studies used assessment tools that correspond with the DSM-IV; however, a few used assessment tools that corresponded with the DSM- III-R, eg Gandubert, et al., 2009. Amir and Ramati (2002) used the PTSD Inventory-self report scale based on the DSM-III-R and found that 18% of the 39 early-to-middle stage breast cancer survivors had full current PTSD and only 3% of the control group had a full diagnosis of PTSD. Gandubert and colleagues (2009) used the Watson Post Traumatic Stress Disorder Inventory (PTSD-I) for

the DSM-III-R (the validated hetero-questionnaire version) and found the prevalence of current PTSD in the sample of 125 breast cancer survivors to be 4.9% which seems to be consistent with the current PTSD rates found when using other assessment tools.

Some of the studies diagnose PTSD based on meeting all the six specific diagnostic criteria (A-F) to qualify for the diagnosis of PTSD yet others use less stringent criteria for the diagnosis of PTSD. The study by Green and colleagues (1998) showed how the percentage of individuals who are found to have PTSD is dependent on the specific diagnostic criteria used and whether it is stringent or not. When allowing any repetitive intrusive thoughts to qualify for the "B" criterion, 5% of the sample (n=8) had a diagnosis of lifetime PTSD and 2.5% (n= 4) had a diagnosis of current PTSD. However, when applying a more stringent criteria and only allowing symptoms of re-experiencing to meet criterion "B", 3% of the women met criteria for lifetime PTSD and 1.9% of the women interviewed had current cancer related PTSD.

Duration of breast cancer

The prevalence of PTSD in breast cancer survivors appears to vary according to a number of variables: nature of exposure to; duration; type of treatment; stage of disease; time since treatment (Kangas, et al., 2002). Exposure variables regarding breast cancer survivors is immense: radiation, surgery and chemotherapy; different stages of treatment (point of diagnosis, treatment and post-treatment); and different stages of disease development (stage 0, I, II, III or IV). Degree of life threat posed by the traumatic event has been argued as a risk factor for PTSD (Andrykowski & Cordova, 1998).

The evidence suggests that PTSD symptoms vary over the course of an individual's experience with cancer. Prevalence of PTSD appears to vary dependent upon whether the patient is post diagnosis or post treatment. It is important to study the prevalence of PTSD in breast cancer survivors at different points in their cancer journey from diagnosis to post-treatment to understand where psychological intervention is most needed. It could be that the accumulation of the perceived traumatic events is related to the prevalence of PTSD (O'Connor, et al., 2007). O'Connor and colleagues (2007) found that among participants with PTSD compared to individuals without PTSD, the average amount of experienced events was higher. Yet, it is the individual's reaction to the event in terms of coping that determines if they develop PTSD or not (Thompson, 2011).

Luecken and colleagues (2004) assessed the prevalence of PTSD pre-surgery. Women were newly diagnosed with early stage breast cancer. Only 3% of the sample met criteria for PTSD due to breast cancer. Green and colleagues (1998) found the prevalence to be 1.9%. with the stringent criteria for PTSD, yet the was 4-12 months post medical treatment for breast cancer and therefore at a different stage of the breast cancer experience. Yet, the samples were both diagnosed with early stage breast cancer and this could affect the prevalence of PTSD in the sample. Green and colleagues (1998) and Luecken and cooleagues (2004) both used the SCID and this could explain the similar low prevalence of PTSD found. Hegel and colleagues (2006) argued that the prevalence of PTSD found in post surgical studies is not generalisable to pre-surgery situations. They found a current PTSD prevalence of 10% in a sample of 236 newly diagnosed breast cancer survivors at the time of their pre-surgical consultation. However, Hegel and colleagues (2006) argue that it is likely that this maybe an underestimation of the true prevalence, as patients may not declare their distress as they may not want to distract the oncologist from curing their cancer. Additionally it may be that distress may be considered a "normal" reaction to treatment both by the patient and carers.

Stage of breast cancer

Within the studies the participants differ on the stage of breast cancer that they have experienced, making comparisons or conclusions complicated. Patients who have stage II/III disease are potentially vulnerable to a PTSD diagnosis as a cure is not certain and there is only an 80% estimated 5 year survival rate as reported by the American Cancer Association in 2007 (Shelby & Golden-Kreutz, 2008). However, stage IV breast cancer, although responsive to therapy, is rarely curative at this stage (National Cancer Institute, 2010) and therefore, a higher percentage of PTSD diagnosis in this population is expected due to threat to life.

Mehnert and Koch (2007) argue that studies on prevalence of PTSD in adult cancer patients focus mainly on patients with early and mixed tumour stages of breast cancer; this appears to be true of the studies reviewed. There appears to be less research carried out at stage IV of the disease, perhaps due to the threat to life; though Jacobsen and colleagues (1998) and Mundy and colleagues (2000) investigated the prevalence of PTSD in breast cancer survivors at stage IV. Women who are diagnosed with early stage breast cancer are not as traumatised by illness due to prognosis and hence the perceived threat to life is less (Green, et al., 1998). Green and colleagues (1998) found a low prevalence of current PTSD (1.9%) in a sample of women with early stage node negative breast cancer, compared with Jacobsen and colleagues (1998) who found 12%-19% prevalence of

PTSD in women with middle-to-advance stage breast cancer. Yet the Jacobsen and colleagues (1998) study investigated autologous bone marrow transplant (ABMT) which could make the prevalence of PTSD high in this sample.

Treatment of breast cancer

Jacobsen and collegaues (1998) studied PTSD in women who had undergone ABMT for breast cancer. This procedure involves subtraction of the bone marrow or peripheral stem cells from the patient and storing them. The patient then undergoes high doses of chemotherapy to kill the cancer cells which rigorously breaks the bone marrow in the process. Following the chemotherapy, the stored marrow or stem cells are reinfused into the patient to re-establish the damaged bone marrow (Mundy, et al., 2000). Although this treatment is potentially life-saving, it is extremely invasive and stressful and there may be a high mortality from the treatment. For the 43 women who had undergone ABMT for breast cancer over on average 19 months previously, between 12% (cut-off method) and 19% (symptom method) were likely to meet diagnostic criteria for PTSD. It appears that the prevalence of PTSD in this sample is considerably higher than previous studies that have assessed PTSD in women with breast cancer who have not undergone ABMT.

Jacobsen and colleagues (1998) argue that the prevalence of PTSD is higher in this sample due to the more intensive form of treatment. Patients who underwent the procedure were informed that they may have 5% to 10% mortality rate. This could lead the patients to perceive the procedure as more life threatening possibly than other procedures. Patients who undergo this procedure experience severe side-effects such as pain, vomiting and mucositis – the latter being a complication in which the lining of the digestive system becomes inflamed and is often seen as sores in the mouth (National Cancer Institute, 2011b). These side-effects are speculated by Jacobsen and colleagues (1998) to be perceived by patients to be a threat to their physical integrity and contribute considerably to the extent of the traumatic experience. However, the small sample size of 43 participants makes it difficult to make these conclusions.

With respect to other types of breast cancer treatment, the studies are complicated by the variability in the types of treatment and the variability in the amount of participants who have had the treatments. It is also not clear if some participants have had more than one type of treatment and which treatments they are; therefore, it is difficult to make comparisons between the different treatments and the variable effect they have on the development of PTSD. In the sample of 1083 breast cancer survivors of Mehnert and Koch (2008), 65% had breast conserving surgery, 35% had a mastectomy, 10.9% had chemotherapy, 41% had radiotherapy and 34.3 % had both chemotherapy and radiotherapy. Cordova and colleagues (2007) found that post traumatic stress was not significantly related to receipt of chemotherapy, radiation therapy, or hormonal therapy.

Discussion

O'Connor and colleagues (2007) assert that although the World Health Organisation (1993) includes the diagnosis of PTSD in the ICD-10, the empirical studies that investigate the prevalence of PTSD almost entirely utilise the DSM-IVcriteria in their research. However, clinical diagnosis and practice in a lot of countries is based on the ICD-10. Yet, the application of evidence-based treatment is reliant onevidence that uses the DSM-IV criteria (O'Connor, et al., 2007).

A problem with using measures that correspond to the DSM to assess PTSD in breast cancer survivors is that psychiatric di agnostic instruments for anxiety disorders do not generally relate to individuals who are chronically and physically unwell (Herschbach, et al., 2005). Therefore, psychiatric diagnostic categories may not apply to breast cancer survivors. Another limitation of using the DSM criteria is that DSM diagnoses originated in Western psychiatry, and is inherently biased and may not apply tothe diagnosis of PTSD in non-Western countries (Norris & Slone, 2007). The diagnosis of PTSD is further complicated by co-morbidity of PTSD with other disorders such as major depression and other anxiety disorders such as generalized anxiety and panic disorder (Thompson, 2011). Mehnert and Koch (2007) found that women diagnosed with cancer-related PTSD were more likely to have a comorbid disorder. Therefore, it is imperative to determine what is at the core of PTSD. Mehnert and Koch (2007) state that not everyone who has had cancer perceive it as a threat to their life since this could depend on the tumour type and the applied therapy. Furthermore, breast cancer may not necessarily be a threat of death anymore due to the advances in treatments and mammography screening (Autier, et al., 2010). Green andcolleagues (1998) assert that PTSD is not a possible outcome of the diagnosis of breast cancer as the breast cancer stressor does not fit the PTSD model due to it nothaving an immediacy of threat to life or bodily

integrity usually associated with the external trauma.

PTSD symptoms reported by survivors of breast cancer may merely reflect general distress that is expected for diagnosis and treatment of a malignant disease. Additionally, these individuals may have to deal with a continual and genuine threat to their lives and their reactions are possibly not inappropriate or unrealistic (Herschbach, et al., 2005).

McHugh and Triesman (2007) support this argument; PTSD is in fact normal distress following a trauma and not a medical or mental health condition. However, the counterargument is that when the distress significantly interferes with functioning and involves impairment of occupational and social functioning then the distress is clinicallysignificant (APA, 2000).

Critique of studies

There is variance in terminology, study design, sample and assessment tools across the literature. Savitz, Poole and Miller (1999) suggest there are a host of variables that can influence the reporting of PTSD and it is not the case that adequately strong epidemiological evidence results in immediate predictable public health response as economics, culture, politics and ethics are critical components of public health decisions.In 2008, at the Royal Bournemouth Hospital, Professor Roger Baker, Dr. Tamas Hickish and Lin Purandare set up a clinic for cancer survivors who are assessed, diagnosed andtreated for PTSD (Thompson, 2011). The team led by Associate Professor Simon Thompson, Professor Tamas Hickish and Gareth Abbey continue to investigate thetreatment of cancer survivors with PTSD.

Kwekkeboom and Seng (2002) support the notion that oncology nurses are possibly the first to provide therapeutic support and intervention to patients with breast cancer who have symptoms of PTSD and can take action based on the knowledge of the prevalenceof PTSD in breast cancer patients. They can have a considerable role in preventing trauma, minimising re-exposure to triggering events and make possible diagnosis and referral for more extensive treatment.

Referral to a clinical psychologist may need to be made due to the evidence that those with PTSD symptoms following cancer maybe be complex to diagnose, due to exposure to possibly a number of traumas (Thompson, 2011). Additionally, oncologists are not always skilled or trained to discuss emotional problems (Mager & Andrykowski, 2002).Therefore it is important to have trained clinical psychologists for assessment and intervention. Due to the variance in findings of PTSD in breast cancer survivors according to stage of breast cancer it is important to have psychological assessment atdifferent stages of breast cancer.

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Illustrations

Illustration 1

Prevalence of PTSD in breast cancer survivors (adapted from Kangas, Henry, & Bryant, 2002)

STUDY	SAMPLE Size Country	ASSESSMENT TOOL FOR PTSD	DISEASE SETTING Stage of breast cancer or bone marrow transplant (BMT)	ESTIMATED PREVALENCE OF PTSD
Andrykowski & Cordova (1998)	N=82 USA	PCL-C	Early to middle Stage (I-III)	5% (PCL-C, cut-off method); 6% (PCL-C, symptom method)
Green et al (1998)	N=160 USA	SCID-DSM-IV	Early stage (I-II)	Stringent Criteria: 1.9% current cancer related PTSD; 3% lifetime cancer related PTSD. Standard criteria: 2.5% current cancer related PTSD; 5% lifetime cancer related PTSD
Jacobsen et al (1998)	N=43 USA	PCL-C	Middle to advanced stage (II-IV) BMT	12% (PCL-C, cut-off method); 19% (PCL-C, symptom method)

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Illustration 2

Prevalence...(continued)

STUDY	**SAMPLE Size Country**	**ASSESSMENT TOOL FOR PTSD**	**DISEASE SETTING Stage of breast cancer or bone marrow transplant (BMT)**	**ESTIMATED PREVALENCE OF PTSD**
Andrykowski et al (2000)	n=46 USA	PCL-C	Early to middle stage (I-III)	6.5% (PCL-C, cut off method)
Cordova et al (2000)	n=142 USA	PCL-C	Early to advanced stage (I-IV)	8.5% (PCL-C, cut off method) 12.7% (PCL-C, symptom method)
Mundy et al (2000)	n=37 USA	SCID-DSM-IV	Early to advanced stage (I-IV)BMT	0% current cancer-related PTSD. Standard criteria: 35.1% lifetime cancer related PTSD. Stringent criteria:24.3% lifetime PTSD
Naidich & Motta (2000)	n=31 USA	CAPS-I	Early to middle stage (I-III)	32% current cancer related PTSD, 14% lifetime cancer-related PTSD

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Illustration 3

Prevalence...(continued)

STUDY	**SAMPLE Size Country**	**ASSESSMENT TOOL FOR PTSD**	**DISEASE SETTING Stage of breast cancer or bone marrow transplant (BMT)**	**ESTIMATED PREVALENCE OF PTSD**
Pitman et al (2001)	n= 87 USA	CAPS-I & PCL-C & SCID-DSM-IV	Early to middle stage (I-III)	14% current cancer-related PTSD 16% lifetime cancer related PTSD(CAPS-I) 2.7% current cancer-related PTSD, 3.5% lifetime cancer related PTSD (PCL-C) 9% current related PTSD ,15% lifetime cancer related PTSD(combined CAPS-I and PCL-C.
Amir &Ramati (2002)	n= 39 Israel	PTSD-I	Early to middle stage (I-III)	18% current cancer-related PTSD
Lueken et al (2004)	n=71 USA	SCID-DSM-IV	Newly diagnosed & early to middle stage(0-III)	3% current cancer related PTSD.

Prevalence…(continued)

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Illustration 4

Prevalence...(continued)

STUDY	**SAMPLE Size Country**	**ASSESSMENT TOOL FOR PTSD**	**DISEASE SETTING Stage of breast cancer or bone marrow transplant (BMT)**	**ESTIMATED PREVALENCE OF PTSD**
Palmer et al (2004)	n=115 USA	SCID-I/NP	Early to advanced stage (I-IV).	4% cancer-related PTSD
Levine et al (2005)	n=181 USA	PCL-C	Early to advanced stage (I-IV)	17% (PCL-C, cut off method) 26% (PCL-C, symptom method)
Matsuoka et al (2005)	n=155 Japan	SCID	Early to middle stage (I-III)	3.9% current cancer related PTSD
Okamura et al (2005)	n=50 Japan	SCID –DSM-III &DSM-IV	Recurrent diagnosis.	2% current cancer-related PTSD
Hegel et al (2006)	n=236 USA	PC-PTSD	Early to middle stage (I-III)	10% cancer-related PTSD.

Prevalence…(continued)

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Illustration 5

Prevalence...(continued)

STUDY	**SAMPLE** **Size** **Country**	**ASSESSMENT TOOL FOR PTSD**	**DISEASE SETTING** **Stage of breast cancer or bone marrow transplant (BMT)**	**ESTIMATED PREVALENCE OF PTSD**
Morrill et al (2008)	n=161 USA	PCL-C	Early stage (I-II)	1.9% (PCL-C, cut off method)
Mehnert& Koch (2008)	n=1086 Germany	PCL-C	Early to advanced stage(I-IV)	12% current cancer related PTSD.
Shelby et al (2008)	n=74 USA	SCID-NP	Middle stage (II-III)	16% cancer-related PTSD
Mehnert et al (2009)	n=1083 Germany	PCL-C	Early to advanced stage(I-IV)	12% (PCL-C, symptom method)

Prevalence…(continued)

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Illustration 6

Prevalence...(continued)

STUDY	SAMPLE Size Country	ASSESSMENT TOOL FOR PTSD	DISEASE SETTING Stage of breast cancer or bone marrow transplant (BMT)	ESTIMATED PREVALENCE OF PTSD
Gandubert et al (2009)	n=144 France	PTSD-I (DSM-IIIR)	Early to middle stage (I-III)	4.9% current cancer-related PTSD.
Elklit & Blum (2010)	n=64 USA	Harvard Trauma Questionnaire DSM-IV-TR	Early stage (I-II)	7% current cancer-related PTSD (6 weeks after diagnosis), 13% current cancer-related PTSD (1year later).

CAPS-I= Clinical Administered PTSD Structured Interview; PCL-C =PTSD Checklist Civilian Version; SCID-DSM-IV = Structured Clinical Interview for DSM-IV; PTSD-I = The Watson's PTSD Inventory; PC-PTSD =4-Item Primary care PTSD screen

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