Post-traumatic stress disorder and suicidal behavior: A narrative review

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A B S T R A C T

There is a large literature investigating the underlying mechanisms, risk factors and demographics of suicidal thoughts and behaviors across a number of psychiatric disorders, such as, major depression, anxiety and schizophrenia. However, less research has focused on the relationship between Post-Traumatic Stress Disorder (PTSD) and suicide. There were two broad aims of this review. The first was to assess the extent to which PTSD is associated with suicide, and the second was to determine the effects of co-morbid disorders on this relationship. Overall, there was a clear relationship between PTSD and suicidal thoughts and behaviors irrespective of the type of trauma experienced. Very few studies directly examined whether depression was a mediating factor in the relationships reported. However, where this was investigated, the presence of co-morbid depression appeared to boost the effect of PTSD on suicidality. It was noteworthy that hardly any studies had investigated concepts thought to be key in other domains of research into suicidality, such as, feelings of entrapment, defeat and hopelessness.

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1. Introduction

Suicidal behavior is considered a major clinical and social problem especially in developed countries (Haukka, Suominen, Partonen, &
Accurate information reflecting suicide rates is not always available, however where it is, suicide is included in the ten leading causes of death across different age groups (Bertolote & Fleischmann, 2005). Previous research has estimated the lifetime prevalence of suicidal ideation to range from 4.8% (Paykel, Myers, Lindenthal, & Tanner, 1974) to 18.5% (Weissman et al., 1999) and the lifetime prevalence of suicide attempts to range from 1.1% (Paykel et al., 1974) to 5.9% (Weissman et al., 1999). Recently, a 7.8% lifetime prevalence of suicidal ideation and a 1.3% lifetime prevalence of suicide attempts was reported in a large epidemiological community study in Europe (Bernal et al., 2007). Sociodemographic factors have been identified as significant predictors of suicidal behavior including female gender, being of younger age, and being divorced or widowed (Bernal et al., 2007) and some work indicates that these predictors apply to both Western and Asian cultures (e.g., Thanh, Tran, Jiang, Leenaars, & Wasserman, 2006). Psychiatric diagnoses have also been strongly related to suicidality with major depression, dysthymia, substance use disorders, general anxiety disorders (GAD) and PTSD having a strong association with suicidal behavior (Bernal et al., 2007; Weissman et al., 1999). Of these disorders, the impact of PTSD on suicidal behavior has received the least attention in the literature. The overall aim of this review is to redress this by examining the impact of PTSD on suicidal acts, behaviors and thoughts.

PTSD is commonly conceptualized as an anxiety disorder occurring subsequent to a traumatic event which is perceived as highly threatening. An individual does not have to experience the traumatic event directly, but can develop the disorder after witnessing such an event (APA, 2000; Yehuda, 2002). PTSD is multi-faceted, comprising three distinct symptom clusters: a) repeated and persistent intrusive memories related to the experienced trauma (thoughts, dreams/nightmares), b) avoidance of situations that are reminders of the trauma and psychological numbing, and c) hyper-arousal, such as, irritability, reduced concentration, exaggerated startle response (DSM-IV-TR; American Psychiatric Association, 2000). Estimates from general population samples indicate that PTSD is a common disorder with a lifetime prevalence ranging from 8% to 9%, with the incidence of the disorder being twice as common in women than men (Breslau, 2002; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Seedat & Stein, 2001). The prevalence rate of PTSD is influenced by severity, duration and proximity of the experienced trauma. Specific types of trauma such as sexual/physical abuse and combat exposure appear to be more robustly associated with the subsequent development of PTSD (Adams & Lehnert, 1997). Other risk factors related to the development of PTSD include pre-existing anxiety disorders, depression and somatoform disorders (Frans, Rimmó, Åberg, & Fredrikson, 2005; Hapke, Schumann, Rumpf, John, & Meyer, 2006).

PTSD is associated with severe emotional disturbances such as intense feelings of anger and irritability, feelings of being alienated, guilt, shame or mistrust and frequent co-morbid psychiatric disorders. Higher prevalence or incidence rates of suicidal behavior have been documented in individuals with PTSD (Bullman & Kang, 1994; Davidson, Kudler, Saunders, & Smith, 1990; Ferrada-Noli, Asberg, Ormstad, Lundin, & Sundbom, 1998; Kramer, Lindy, Green, Grace, & Leonard, 1994). In a study examining suicidal behavior after severe trauma, Ferrada-Noli et al. (1998) reported that 57% of the PTSD participants reported suicidal behavior compared with 29% of the participants with other psychiatric diagnoses (e.g., depressive disorders, anxiety disorders, personality disorders). Co-morbidity of PTSD with other psychiatric disorders heightens the risk of suicide. In one study, which assessed co-morbidity patterns in a large sample of young people (aged 14–24) with a history of previous suicide attempts, the highest risk for a suicide attempt was found among those suffering from PTSD, followed by dysthymia and simple phobias (Wunderlich, Bronisch, & Wittchen, 1998).

Explanations of suicidal behavior have been mainly derived from identifying psychologically relevant correlates of suicide rather than from a theoretical perspective. It has been noted that the generic nature and the weak theoretical foundation of the proposed correlates hamper their applicability across a wide range of different clinical populations and limit their efficiency in generating clear and testable predictions (Westefeld et al., 2000). Consequently, it can be argued that there is a paucity of theoretically driven, clearly defined, empirically testable models of the psychological pathways leading to suicide in general (O’Connor & Sheehy, 2001) and to suicide in PTSD in particular.

A recent paper suggested three broad theoretical alternatives in understanding suicidal behavior (Bolton, Gooding, Kapur, Barrowclough, & Tarrier, 2007).

First, suicidal behavior may occur as a consequence of the enactment of a unitary transdiagnostic, albeit multi-factorial, causal mechanism which operates across a number of diagnoses and disorders and is, therefore, common across a range of mental illnesses.

Second, suicidal behavior may result from factors which are specific to particular diagnoses implying non-unitary, diagnosis-specific mechanisms which underlie suicidal behavior.

Third, in contrast to the first alternative, a cluster of symptoms, apparent in one type of disorder may account for the presence of suicidal behavior. For example, high rates of major depression have been observed in individuals diagnosed with PTSD (Kessler et al., 1995) and this has been found to compound the risk for suicide (Tarrier & Gregg, 2004; Freeman, Roca, & Moore, 2000). Therefore, an increased incidence or prevalence of suicidal behavior in persons with a PTSD diagnosis may be due to co-morbid depression and not to PTSD per se.

A combination of any of the three theoretical possibilities proposed above may also apply. For instance, a fourth possibility is that there may be factors which are part of a transdiagnostic general mechanism that are common to a range of psychological disorders, but they are moderated by specific features of a particular disorder. For example, appraisals of an individual’s future may be devoid of any positive factors in those who are suicidal but it is amplified in PTSD by feelings that previously experienced traumas will re-occur, that this is inevitable, and that there is no escape. Clarifying the above alternatives is essential from both theoretical and clinical perspectives. Treatment implications will differ according to whether suicidal behavior in PTSD is evoked by a transdiagnostic set of factors, and/or by factors specific to PTSD.

Although the research evidence for heightened rates of suicidal behavior among individuals diagnosed with PTSD has increased recently, reviews assessing the association between PTSD and suicidal behavior are absent from the literature. This is surprising taking into account the great burden suicidal behavior constitutes for individuals, communities and society in general. Thus, the main goal of the present paper is to provide a comprehensive account of the available research findings in the area of PTSD and suicidal behavior. The particular objectives of the present review are:

1. To determine if there is a significant association between PTSD and suicidal behavior, and if so, to investigate whether this association is direct or whether it is influenced by other factors.
2. To examine the possible effects of co-morbid psychiatric disorders on the relationship between PTSD and suicidal behaviors, with a focus on co-morbid depression.

2. Methods

2.1. Eligibility Criteria of the studies included in the review

Studies were selected for inclusion in this review if they met the following criteria:

1. They were published in a peer reviewed journal in the English language.

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Footnote:

1 Studies were identified by the first author, MP. For all studies it was obvious whether the articles should or should not be included in the review. Hence, no rater-reliability was considered necessary for the inclusion of studies.
2. They included any measure of PTSD (e.g., self report, clinician rated) and any measure of suicidality.
3. The sample comprised participants aged 15 years and older. This was to optimize inclusivity and also because of differences between studies in terms of age inclusion criteria.

2.2. Search strategy for the identification of relevant studies

A broad search strategy for potential articles was used in order to include all relevant studies. Electronic searches of Medline (1966 to October 2008), EMBASE (1966 to October 2008), PsycINFO (1966 to October 2008) and Web of Science (1966 to October 2008) were made with subject headings including PTSD, POSTTRAUMATIC, POST TRAUMATIC, SUICIDE, SUICIDAL, SUICIDALITY and text words including SUICID*, POSTTRAUMATIC, POST TRAUMATIC, PTSD.

3. Results

A total of 65 studies were identified and reviewed in terms of i) the type of trauma experienced (combat veterans, individuals exposed to physical or sexual victimization or intimate partner violence, individuals exposed to natural disasters and participants whose PTSD diagnosis resulted from a mixture of different traumas); ii) community-based surveys which have examined links between PTSD and suicide; iii) the presence of other Axis I or Axis II psychiatric diagnoses, in particular, major depression, substance use disorders, psychoses and borderline personality disorder (BPD); and iv) PTSD and suicide in specific populations, such as, refugees, HIV patients and police officers.

3.1. The types of trauma experienced, PTSD and suicidal behavior

3.1.1. Combat trauma, PTSD, Suicidal behavior

It has been noted by numerous sources that military personnel returning from conflict zones are at a much greater risk of developing serious psychological problems, such as PTSD and suicidality, than civilians (e.g., Friedman, 2004; Friedman, 2005). The multiple and unrelenting stressors faced during combat are clear factors implicated in the development of such disorders. Furthermore, an important factor in explaining suicides is access to a means of suicide and knowledge of how to attempt suicide (Williams, 1997). It has been noted that war veterans with PTSD have access to a large range of weapons, including guns and knives, compared to other groups of psychiatric patients, e.g., those with schizophrenia and substance abuse disorders (Freeman, Roca, & Kimberl, 2003) and that they report suicidal ideation involving such weapons (e.g., Freeman, Clothier, Thornton, & Keese, 1994). Ready access to weapons as a means of suicide, and training in the use of those weapons, differentiates veterans with PTSD from those suffering from PTSD resulting from non-combat related traumas.

3.1.1.1. Successful suicides. The majority of studies investigating mortality rates among male war veterans report significantly heightened suicide rates in PTSD cases compared with non-PTSD cases (e.g., Boscari, 2006; Drescher, Rosen, Burling, & Fo, 2003). Farberow, Kang, and Bullman (1990) investigated risk factors for suicide among deceased war veterans and concluded that although suicide cases did not differ substantially from non-suicide cases with respect to known socio-demographic risk factors and psychological profiles, PTSD symptoms were observed more frequently among suicide cases than those in whom accident was the cause of death.

Increased rates of co-morbid psychiatric disorders such as depression and substance use disorders have been repeatedly observed among war veterans (e.g., Lehmann, McCormick, & McCracken, 1995; Waller, Lyons, & Costantini-Eerrando, 1994). There is also evidence that PTSD patients with co-morbid disorders exhibit a substantially greater frequency of suicides compared with PTSD patients without co-morbid psychiatric morbidities. For example, veterans with co-morbid psychiatric disorders had an almost 10-fold excess of suicides compared with the U.S population, whilst PTSD veterans without concurrent disorders had a 6-fold excess of suicides compared with the U.S population (Bullman & Kang, 1994). Similar results were found when factors affecting survival rates between 1992–2002 were examined in World War II survivors in the Netherlands (Bramsen, Deeg, Van der Ploeg, & Fransman, 2007). A probable PTSD diagnosis as well as suicidal thoughts were significantly associated with risk of death, and this was found to be mediated, to some extent, by levels of depression.

One study, however, reported results which seemed completely contrary to these findings. Zivin et al. (2007), in a sample of deceased war veterans with a primary diagnosis of depression, not only failed to demonstrate a positive correlation between PTSD and suicide rates but, even more surprisingly, reported a lower rate of suicides among depressed veterans with co-morbid PTSD compared to those without PTSD (Zivin et al., 2007). However, the inverse association of a PTSD diagnosis with suicide rates was more prominent among older veterans such that older depressed veterans with co-morbid PTSD had a lower rate of suicide than did younger depressed veterans with co-morbid PTSD. One explanation offered by the authors is that older veterans may have had better access to psychological services for a longer period of time than younger veterans. Clearly, youth in combat veterans is a serious risk factor for suicidal behaviors.

3.1.1.2. Suicide attempts. In addition to the findings relating PTSD to completed suicides, a diagnosis of PTSD has been associated with an increased probability of unsuccessful suicide attempts in war veterans. The incidence of suicide attempts in war veterans with PTSD across different studies ranges from 24% to 40% (Freeman, Keeese, Thornton, Gillette, & Young, 1995; Freeman et al., 2000; Krammer et al., 1994; Nad, Marcinco, Vukcan-Eusa, Jakovlevic, & Jakovlevic, 2008). A number of factors have been identified as predicting heightened suicide risk including: higher IQ scores, more severe symptoms of depression and PTSD, current suicidal ideation, high levels of combat-related guilt as well as higher levels of anxiety and alexithymia (Freeman et al., 2000; Hendin & Haas, 1991; Nad et al., 2008). High rates of dissociation have been also implicated in elevated suicidal risk although the findings are contradictory. Even though Freeman et al. (1995) indicated that current dissociative symptoms was the only significant difference between PTSD veterans with a previous history of suicide attempts compared to PTSD veterans without a previous suicide attempt, a subsequent study conducted by the same team of researchers failed to detect any significant correlation between levels of dissociation and risk for suicide attempts (Freeman et al., 2000).

In a sample of veterans with chronic PTSD who had attempted suicide, almost half of the sample had a history of previous suicide attempts, ranging in lethality from intentional drug overdose to self-inflicted gun shot wounds, (Hyer, McCranie, Woods, & Boudewyns, 1990) which is in accord with a history of suicide attempts being a strong predictor of completed suicides in the non-combat literature (e.g., Caldwell & Gottesman, 1990; De Hert & Peuskens, 2000; Hawton, Sutton, Hawn, Sinclair, & Deeks, 2005; Joiner & Rudd, 2000; Pinikahana, Happp, & Keks, 2003; Sher, 2006; Sinclair, Muelle, King, & Baldwin, 2004; Tandon & Jibson, 2003; Tremoua et al., 2005; Vérdoux et al., 1999). Furthermore, there was some indication that PTSD veterans in this sample who were white, younger, had been exposed to greater inconsistency of love from the father, experienced more intense feelings of survivor guilt and expressed themselves by crying, were more likely to report previous suicide attempts (Hyer et al., 1990).

Lifetime suicide attempts have been related to low levels of spiritual well-being as measured by the Spiritual Well-Being scale (SWB) in Croatian war veterans (Nad et al., 2008). The strongest association was found with the existential subscale of the SWB which...
measures feelings of life satisfaction and purpose in life. It is noteworthy that the content of the existential scale of the SWB resembles a lack of future positive thinking, a key facet of the concept of hopelessness (O’Connor, O’Connor, O’Connor, Smallwood, & Miles, 2004), which has been associated with suicidal behavior in other disorders, such as schizophrenia (Tarrier, Barrowclough, Andrews, & Gregg, 2004). Thus, it can be speculated that feelings of having no personal future perspective are associated with suicidal behavior in war veterans with PTSD in a similar manner to psychotic and depressed patients who are suicidal. A caveat of this speculation is that a feeling of having no personal future overlaps with PTSD symptoms (e.g., a sense of a foreshortened future), and it may be impossible to distil a lack of positive future outlook from such symptoms.

3.1.1.4. Effects of different types of combat exposure. Finally, there is some evidence that different types of combat exposure and different experiences during conflict may be associated with different patterns of findings regarding suicidality among war veterans with PTSD. Research focusing on the characteristics of subsamples of war veterans suggests that Vietnam veterans displayed a more severe and impaired symptom profile compared with other subgroups of war veterans. For instance, Vietnam veterans were found to have more severe PTSD symptoms and depression as well as higher rates of suicidal ideation and suicide attempts compared with World War II veterans (29% in World War II veterans versus 75% in Vietnam veterans) (Davidson et al., 1990). It was found that having been a target of others’ attempts to kill or injure was related more robustly than any other role to a PTSD diagnosis but not to suicidal behaviors, while having been an agent of killing and failing to prevent death/injury was related to both subsequent suicide attempts and to PTSD. High levels of perceived personal responsibility (interpreted as including feelings of guilt) appeared to be differentially associated with PTSD and suicidal behaviors. Although interesting, these findings are tempered by a number of caveats some of which were noted by the authors. First, clinicians provided the data rather than the war veterans themselves. Second, the veterans were in treatment and were remembering experiences which occurred around 20 years ago. Third, the analysis was correlational and based on a large sample (approximately 1,700), hence although findings were significant the variance accounted for was small.

In summary, despite the complexity of the findings, there is a strong relationship between PTSD as a consequence of combat trauma and subsequent suicidal behavior. This relationship has been confirmed across different studies examining completed suicides, suicide attempts and suicidal ideation. The majority of studies in the area with few exceptions suggest that co-morbid psychiatric disorders in veterans with a PTSD diagnosis are associated with an increased probability of suicidal behavior.

3.1.2. Interpersonal Victimization, PTSD, Suicidal Behavior

An increasing body of literature has focused on the role of PTSD in the relationship between various types of childhood/adult maltreatment and suicidal thoughts and behaviors (Ullman, 2003). Data are mainly derived from studies conducted on populations reporting childhood or adulthood physical and sexual abuse and victims of domestic violence.

3.1.2.1. Effects of childhood or adult sexual and physical abuse. There is evidence that in adult samples reporting various types of childhood maltreatment, a PTSD diagnosis is one of the strongest predictors of both recent and lifetime suicide attempts (Evren, Kural, & Cakmak, 2006; Gil-Rivas, Fiorentine, & Anglin, 1996; Joiner et al., 2007; Krakow et al., 2000; Roy, 2001; Thompson, Kaslow, Lane, & Kingree, 2000; Ullman & Brecklin, 2002). In a sample of women who were sexually abused as children, PTSD was significantly associated with suicidal ideation, as was depression and symptoms of alcohol dependency (Ullman & Brecklin, 2002). The probability of suicide attempts in this study was associated with the frequency of additional lifetime traumatic events and depression. Longitudinal analyses have attempted to determine the temporal factors which lead to suicide attempts in those who have suffered abuse. In one 17 year follow-up study, childhood sexual and physical abuse was found to be linked to suicidal thoughts and behaviors in a sample of young adults, and there was some indication that PTSD and depression were mediating factors (Giacoma et al., 1995; Silverman, Reinherz, & Giacoma, 1996).

It should be noted, however, that current research indicates that a history of childhood abuse (primarily sexual or physical abuse) is significantly associated with increased incidence of later suicide attempts even in the absence of PTSD (Joiner et al., 2007). Nevertheless, co-morbid PTSD is associated with a higher frequency of suicidal behavior (Thompson et al., 2000). In other words, although both PTSD and childhood maltreatment are independently related to the frequency of non-fatal suicide attempts, PTSD in combination with a form of childhood maltreatment significantly increases the likelihood of making a suicide attempt. A recent extension of the above findings demonstrated that adult participants with both a lifetime history and recent sexual / physical abuse were more likely, than those who had not experienced such abuse, to have recently
attempted suicide (Tiet, Finney, & Moos, 2006). In accord with the findings of Thompson et al. (2000), a PTSD diagnosis was independently associated with an increased likelihood of recent suicide attempts. An additional interesting finding from the study of Thompson et al. (2000) was that PTSD, even in the absence of abuse, is more predictive of suicide attempts than maltreatment in the absence of PTSD.

3.1.2.2. Intimate partner violence (IPV). There is a large body of literature documenting the relationship between intimate partner violence and suicidal thoughts and behaviors (Golding, 1999). There is also a high prevalence of PTSD among battered women with a history of attempted suicide within the year prior to the measurements being taken, which range between 35% and 81%, compared to battered women without such a history (Bradley, Schwartz, & Kaslow, 2005; Thompson et al., 1999).

However, the underlying pathways through which a PTSD diagnosis is associated with increased rates of suicide attempts in battered women remain unclear. There is some evidence that PTSD is directly associated with more suicide attempts and that this mediates the link between partner violence and suicide attempts. For instance, Thompson et al. (1999) demonstrated that PTSD mediated the association between partner physical abuse and suicide attempts. After adjusting for the impact of PTSD, the relationship between partner physical abuse and suicide attempts did not remain statistically significant.

In contrast, it has also been shown that factors such as hopelessness, psychological distress, drug abuse and relationship discord but not PTSD were independently and robustly associated with suicide attempts (Kaslow et al., 2000). Although not yet tested, the last finding provides some support for the hypothesis that aspects of PTSD may be associated with factors which increase the likelihood of suicide attempts not directly but through exaggerating feelings of hopelessness and possibly defeat and entrapment which in turn are associated with more suicide attempts in people who have suffered abuse.

Unsurprisingly, the association between domestic violence, PTSD and suicide applies not only to suicide attempts but also to suicidal ideation (e.g., Sharhabani-Arzy, Amir, Kotler, & Liran, 2003). Focusing on intimate partner rape, recent work has found that symptoms of PTSD and depression mediate the relationship between intimate partner rape and suicidal ideation (Weaver et al., 2007). Weaver et al. (2007) suggest that suicidal thoughts are indicative of the need to escape unbearable psychological pain and that it is the severity of this distress which is important, regardless of whether expressed via depression or PTSD. Leiner and colleagues extended this work in a large study which sampled 323 African American women at a hospital emergency department (Leiner, Comptom, Houry, & Kaslow, 2008). It was the first study to demonstrate a link between IPV and suicidal ideation in African American women, which was further investigated with path analysis. A model was supported in which IPV led to the development of PTSD symptoms resulting in greater levels of depression, which then led to suicidal ideation. The role of helplessness and hopelessness (as components of depression) were highlighted by this study as important factors to consider in investigating the mechanisms underlying IPV, PTSD and suicidality.

Overall, it can be argued that research on samples exposed to physical/sexual victimization or intimate partner violence indicates that PTSD is strongly associated with heightened rates of suicidal behavior. Among those who have been physically or sexually abused in childhood or adulthood the vast majority of findings suggest an independent and direct positive relationship between a PTSD diagnosis and suicidal behavior. Among women exposed to intimate partner violence, PTSD and depression both play a role in the mechanism leading from violence to suicidality. That said, future work should concentrate on determining whether the route from PTSD to suicidality is direct or whether PTSD increases the risk of suicidality via hopelessness and other markers of distress.

3.1.3. Natural disasters, PTSD, Suicidal Behavior

Only one study in the current literature search has linked a PTSD diagnosis after exposure to a natural disaster and subsequent suicidality. Caldera, Palma, Penayo, and Kullgren (2001) explored the prevalence of PTSD among people in four communities exposed to hurricane Mitch in Nicaragua, four months after the disaster. Hurricane Mitch occurred in 1998 and left 11,000 dead and a similar number missing with 2.7 million made homeless. The prevalence of a PTSD diagnosis varied between 9% in the most damaged area of Quezalguaque, and 4.5% in the less damaged areas of La Paz Centro and Las Mercedes. Fifty-two (10.5%) participants reported suicidal thoughts during one month prior to data collection. Those with a PTSD diagnosis reported significantly higher levels of suicidal ideation (37.9%) compared to those without a PTSD diagnosis (9.0%). Research into this area is extremely difficult, opportunistic, and vulnerable to many design flaws. That said, as with research examining the relationships between PTSD and suicide in other domains of trauma, data in this area are also sparse.

3.1.4. Mixed Trauma, PTSD, Suicidal Behavior

A series of studies have examined suicidal behavior in civilian populations with PTSD resulting from a variety of different types of trauma, such as, accidents and criminal assaults. Across all of these studies, a strong and reliable relationship between a PTSD diagnosis and suicide ideation/planning/attempts has been documented. For example, Tarrier and Gregg (2004), in a sample of patients with chronic PTSD, found that as many as 56.4% of the participants reported experiencing some aspect of suicidal thoughts and/or behaviors. In particular, 38.3% of the total sample reported suicidal thoughts, 8.5% reported suicide plans and 9.6% had attempted suicide since the trauma. This finding is consistent with the results of other studies suggesting a high prevalence of suicidal behavior (40%) in similar PTSD samples (Amir, Kaplan, Efroni, & Kotler, 1999; Kotler, Iancu, Efroni, & Amir, 2001).

Furthermore, a number of factors additional to PTSD have been investigated across the different studies in an attempt to clarify the relationship between PTSD and suicide behavior. Amir et al. (1999) examined the association between suicide ideation/attempts and coping styles in PTSD patients. The findings revealed that suppression was the only coping mechanism which was significantly associated with elevated risk for suicide among participants with PTSD. The obverse side of this result was also found in that the coping mechanisms of mapping (the ability to collect information for planning and to consider alternative solutions), minimization (the ability to underrate the importance or seriousness of the negative experiences), and replacement (the ability to overcome negative life events by initiating alternative actions) were negatively associated with the risk for suicide. Thus, according to the results of Amir et al. (1999), suicidal individuals are characterized by a reduced capacity to consider and generate alternative solutions; they constantly monitor their interpersonal environment for signs of danger; and they are more likely to adopt maladaptive thought suppression strategies as ways to deal with their anxious thoughts or feelings.

Finally, there is evidence that suicidal behavior predicts treatment outcome. In a treatment trial of imaginal exposure and cognitive therapy, high suicidality scores (ideation, planning, and attempts) were associated with less successful treatment outcomes in civilian PTSD patients (Tarrier, Sommerfield, Pilgrim, & Faragher, 2000). It should be noted that depression was not associated with treatment outcome in this study.

In summary, suicidal behavior is highly prevalent in populations with a PTSD diagnosis resulting from various types of civilian trauma. The way in which different coping styles influence the impact of PTSD...
on suicidal thoughts and behaviors is a route worthy of further investigation in which a focus on resilience to developing both PTSD and suicidality should be investigated. As with all studies in this area, serious, co-morbid psychopathological disorders are likely to impact negatively on suicidality, and attempts should be made to delineate the points at which such disorders escalate the route from PTSD to suicide.

3.2. Community-based surveys, PTSD, Suicidal Behavior

Research focusing on clinical samples has been expanded by a series of community-based surveys which have investigated the relationship between PTSD and suicide risk. Recent estimates of suicidal behavior in the general population of Europe are around eight percent (7.8%) for the incidence of suicidal ideation and two percent (1.8%) for the incidence of suicide attempts (Sareen, Houlahan, Cox, & Asmundson, 2005). When a diagnosis of PTSD has been included among the Axis I psychiatric diagnoses it has been more robustly associated with suicidal behavior (Davidson, Hughes, Blazer, & George, 1991). PTSD has also been shown to be the only anxiety disorder which independently predicts suicidal ideation and suicide attempts even after controlling for the effects of co-morbid psychiatric diagnoses (Bernal et al., 2007; Sareen et al., 2005). Similar to clinical samples, Marshall and co-workers, drawing on data from a National Anxiety Disorders Screening Day, demonstrated that the percentage of participants who reported suicidal thoughts in the past month increased proportionally with the number of PTSD symptoms. Among those with no PTSD symptoms, only 6% reported suicidal ideation, whilst among those with four PTSD symptoms, as high as 33% reported suicidal thoughts (Marshall et al., 2001). The relationship between the number of PTSD symptoms and the presence of suicidal ideation remained even after adjusting for the impact of co-morbid major depression. However, Sareen et al. (2007) reported that after controlling for socio-demographic factors, disorders such as depression, mania, panic attacks, agoraphobia, social phobia, alcohol dependence and drug dependence, as well as for the severity of physical disorders, a PTSD diagnosis remained significantly associated with suicide attempts but not with suicidal ideation (Sareen et al., 2007).

A number of studies have investigated PTSD and suicidality patterns in less expanded community samples. Ben-Ya’acov and Amir (2004) demonstrated that PTSD symptoms predicted suicide risk in an Israeli community sample of 103 men attending an outpatient clinic. Specifically, arousal symptoms were positively correlated with suicide risk whilst avoidance symptoms were negatively correlated with suicide risk. Giaconia et al. (1995) examined the way in which exposure to traumatic life events and PTSD influenced the psychosocial functioning of older adolescents in the community. Their findings revealed that by the age of 18 years, adolescents with PTSD were characterized by more interpersonal and emotional-behavioral difficulties, elevated risk for other psychiatric disorders and significantly higher rates of suicidal ideation and suicidal attempts compared with the no-trauma group. Smith, Poschman, Cavaleri, Howell, and Yonkers (2006) investigated the prevalence of PTSD symptoms among low-income pregnant women in the community. The results showed that 11.5% of individuals who experienced a traumatic event qualified for a PTSD diagnosis during pregnancy and 33% of the pregnant women with PTSD had thoughts of self-harm. Finally, Prigerson and Slimack (1999) investigated risk factors for suicidality (suicide ideation/attempt(s) among young adult friends of suicide victims who were traumatized by the event. Aggression was the only significant predictor of suicidality among men, whereas depression and posttraumatic stress disorder independently contributed to suicidality among women. This suggests that gender issues should be systematically investigated in all relevant studies.

In conclusion, studies which have been based on community samples have yielded results which are in accordance with those from studies investigating the effects of specific traumas, such as those suffered by, combat veterans, those who have experienced sexual or physical abuse, and those who have experienced trauma from someone who is emotionally and physically close to them. In short, PTSD is a significant predictor of suicidality. Factors which differentiate suicidal ideation from suicidal plans and acts in those with PTSD would benefit from further research in this area, as would the mechanisms underlying reported gender differences.

3.3. PTSD, Suicidal behavior and co-morbid Axis I Psychiatric disorders

PTSD is often co-morbid with other Axis I psychiatric disorders and it is accompanied by a widespread impairment in psychosocial functioning. The National Co-morbidity Survey reported that 88% of men and 79% of women with lifetime PTSD had at least one co-morbid psychiatric disorder with major depression being the most frequent. It has been reported as being present in 48% of men and in 49% of women with PTSD (Kessler et al., 1995).

3.3.1. PTSD, Depression and Suicidal behavior

Depression has been robustly linked to a greater frequency of suicidal behavior. Lifetime prevalence of suicide attempts in major depressive episodes is approximately 16% (Chen & Dilsaver, 1996). The relationship between depression and PTSD is reciprocal in that depression appears to exaggerate the effects of traumatic events (Fullerton et al., 2000) and PTSD increases susceptibility to major depression (Breslau, Davis, Peterson, & Schultz, 1997; Kendler et al., 1995). A key issue is the extent to which depression exaggerates or facilitates the relationship between PTSD and suicidality. A further issue is whether depression has these effects regardless of whether it was identified as the primary or secondary diagnosis.

3.3.1.1. PTSD as the primary diagnosis. Numerous studies including patients with a primary diagnosis of PTSD have identified major depression as being one of the most significant predictors of suicidal behavior (Bullman & Kang, 1994; Clover, Carter, & Whyte, 2004; Drescher et al., 2003; Freeman et al., 2000; Tarrier & Gregg, 2004). As indicated in section 3.1.2.2 it was demonstrated that depression mediated the relationship between PTSD and suicidal ideation, at least in victims of IPV (Leiner et al., 2008). In contrast, a number of studies have found that the association of PTSD with elevated levels of suicidal behavior remains significant even after controlling for the effects of major depression (Clum & Weaver, 1997; Lewis, 2005; Marshall et al., 2001). One study has shown a potentially different role for depression in the link between PTSD and suicide depending on whether previous suicide attempts, thoughts or plans were being considered (Ferrada-Noli et al., 1998). A sample of 117 refugees were recruited who had a principal diagnosis of PTSD. Twice the number had a history of suicide attempts in the non-depressed group (19 cases) compared to the depressed group (8 Cases). Suicidal thoughts however were more frequent in the depressed group (15) compared to the non-depressed group (6). The frequencies of suicidal plans were found not to differ between the two groups.

3.3.1.2. Depression as the primary diagnosis. One of the first studies to examine the effects of PTSD on patients with a primary diagnosis of depression found that a) more patients attempted suicide who were depressed and had past PTSD experiences (75%) than those who were depressed and had no such PTSD history (54%) and b) more patients attempted suicide who were depressed and had current PTSD experiences (80%) than those who were depressed and had no current PTSD (54%) and c) major depression and PTSD was associated with greater levels of suicidal ideation than major depression alone (Oquendo et al., 2003). Consistent with this, a recent study by
Campbell, and co-workers found that suicidal ideation was significantly more likely to be prevalent among depressed patients with co-morbid PTSD than in depressed patients without co-morbid PTSD (Campbell et al., 2007). Severity of depression and lack of social support was also greater in the depressed sub-group with co-morbid PTSD in this study.

However, not all studies have produced consistent results, with some studies failing to find evidence that a PTSD diagnosis was a significant predictor of suicide attempts in primary depressed samples (e.g., Fordwood, Asarnow, Huizar, & Reise, 2007; Holtzheimber, Roussou, Zatzick, Bundy, & Roy-Byrne, 2005; Zlotnick, Mattia, & Zimmerman, 2001). Suicide attempt status was more accurately predicted from factors, such as, the presence of co-morbid cluster B personality disorders (Oquendo et al., 2005) or externalizing behaviors and depression severity but not PTSD (Fordwood et al., 2007).

In conclusion, primary PTSD samples who also have co-morbid depression have an increased frequency of suicidal behavior, with depression appearing to be a mediating factor. That said, the role of depression may vary depending on the types of suicidal thoughts and behaviors being expressed, i.e., thoughts, plans and attempts. Primary depressed samples with co-morbid PTSD are also more likely to attempt and think about suicide. This is qualified to some extent by evidence showing that some factors, such as, severity of depression or externalizing behaviors, have been more robustly associated with suicidal behavior compared to PTSD. No simple explanation is available for the above findings, but it could be hypothesized that PTSD in primary depressed subjects does not affect suicidality rates directly but indirectly through, for example, exaggerating the severity of depressive symptoms or through intensifying feelings of hopelessness.

### 3.3.2. PTSD, Substance Use Disorders and Suicidal Behavior

The co-occurrence of PTSD with substance use disorders has been well documented in the literature. Two large epidemiological studies, conducted in the United States, have shown a frequent co-morbidity of PTSD with substance use disorders. The prevalence of drug abuse or dependence was 5 times more likely among men with PTSD and 1.4 times more likely among women with PTSD compared to responders without a diagnosis of PTSD (Regier et al., 1990). In addition, Kessler et al. (1995) demonstrated that among respondents who met criteria for lifetime PTSD, as many as half (51.9%) of men and 27.9% of women also qualified for a diagnosis of lifetime alcohol abuse or dependence. Furthermore, studies on individuals with drug or alcohol abuse have indicated an extraordinarily high prevalence of PTSD, ranging from 36% to 50% for lifetime PTSD, and from 25% to 42% for current PTSD (Jacobsen, Southwick, & Kosten, 2001).

#### 3.3.2.1. PTSD as the primary diagnosis

Substance use disorders are highly prevalent in people with a primary PTSD diagnosis and these disorders, in tandem, are also associated with increases in suicidal behavior (Bullman & Kang, 1994; Drescher et al., 2003; Kaslow et al., 2000; Sareen et al., 2007; Smith et al., 2006; Zimmerman & Mattia, 1999). However, in the majority of these studies no attempt has been made to further compare PTSD participants with co-morbid substance use disorders with PTSD participants without co-morbid substance abuse disorders in terms of suicidal behavior. Nevertheless, a substantial number of studies on primary PTSD patients have demonstrated that substance abuse is a significant predictor of suicidal behavior. In particular, Bullman and Kang (1994) and Drescher et al. (2003) reported a significantly higher incidence of co-morbid substance use disorder in veterans who committed suicide. Kaslow et al. (2000) also showed that PTSD participants, with a history of previous suicide attempts, were significantly more likely to report substance abuse than PTSD participants without a history of previous suicide attempts. Some studies, however, have failed to identify any significant differences between PTSD participants with suicidal behavior and PTSD participants without suicidal behavior with respect to the presence or absence of substance use disorders (Butterfield et al., 2005; Clover et al., 2004; Freeman et al., 1995).

#### 3.3.2.2. Substance abuse disorder as the primary diagnosis

Studies examining suicidality among heroin users have demonstrated that the lifetime prevalence of suicidal ideas ranges from 52% to 60% (Rossow & Lauritzen, 1999; Vingoe, Welch, Farrell, & Strang, 1999) while the lifetime prevalence of suicide attempts has been estimated to range from 17% to 40% (Darke, Ross, Lynskey, & Teesson, 2004; Mills, Teeson, Ross, & Peters, 2006; Rossow & Lauritzen, 1999). The presence of PTSD as a co-morbid disorder in patients with primary substance use disorders and the impact of their co-occurrence on the rates of suicidal behavior have received growing attention. For example, Villagomez, Meyer, Lin, and Brown (1995), in a sample of methadone maintenance patients, found that the proportion of men and women who reported lifetime PTSD was more than 10% and almost 20%, respectively. Lifetime PTSD was highly associated with lifetime suicidal ideation (36.5% of patients with lifetime PTSD reported having had suicidal thoughts, compared with 16.3% without PTSD), lifetime suicide attempts (26.9% in PTSD patients versus 9.9% in those without PTSD) as well as with a lifetime diagnosis of major depression. Additional studies investigating risk factors for suicidal behavior in patients with substance use disorders showed that PTSD was a significant predictor of elevated suicidal ideation (Harned, Najavits, & Weiss, 2006) and suicide attempts (Darke et al., 2004; Maloney, Degenhardt, Darke, Mattick, & Nelson, 2007; Moylan, Jones, Haug, Kissin, & Svikis, 2001). Across the above studies, other factors which were associated with a higher frequency of suicide attempts included screening positive for borderline personality disorder, major depression and female gender.

Overall, findings suggest that in individuals with substance use disorders, co-morbid PTSD increases the risk for suicidal behavior. However, the impact of co-morbid substance use disorders in samples with a primary diagnosis of PTSD in terms of suicidal behavior is vague and occasionally contradictory. Some studies report a higher incidence of suicidal behavior in PTSD patients with co-morbid substance use disorders while others fail to demonstrate such an association. As a consequence, it can be hypothesized that suicidal behavior in samples with co-morbid PTSD and substance use disorders is more robustly predicted by features specific to PTSD than features specific to substance use disorders.

#### 3.3.3. PTSD, Psychosis and Suicidal Behavior

Estimates of co-morbid PTSD in first episode psychotic patients range from 10% (Neria, Bromet, Sievers, Lavelle, & Fochtman, 2002) to 38% (Tarrier, Khan, Catter, & Picken, 2007). Consequently, the prevalence of PTSD exceeds that of the general population where lifetime prevalence of PTSD is approximately 6% to 8% (Breslau et al., 1998; Frans et al., 2005). However, controversy exists as to the reliability and accuracy of self-reports of past events in people who suffer a disorder that distorts perceptions, thoughts and behaviors (Seedat, Stein, Oosthuizen, Emsley, & Stein, 2003). Some studies have been able to negate such doubts to some extent by demonstrating that the psychometric properties of assessments developed for general population samples are comparable to individuals with severe mental illnesses (Mueser et al., 2001; Blake et al., 1990; Goodman et al., 1999; Resnick, Bond, & Mueser, 2003). Thus, it appears that when reporting specific events and post traumatic symptoms related to them, individuals with schizophrenia are as reliable as individuals in the general population.

People with schizophrenia are at heightened risk for suicide with recent estimates indicating that approximately 5% to 10% die from suicide (Palmer, Frankratz, & Bostwick, 2005). Suicidal ideation and planning (Kontaxakis et al., 2004) or attempts increase susceptibility for later successful suicides (Hawton et al., 2005). Recent investigations
suggest that as many as half of all patients with schizophrenia experience suicidal ideation at some point in their lives or have a history of suicide attempts (Fenton, 2000; Torriero et al., 2004).

3.3.3.1. PTSD as the primary diagnosis. Investigations of the effects of psychosis as a secondary diagnosis to PTSD are sparse. There is, nevertheless, some initial evidence of more suicidal behavior in individuals with PTSD as a primary diagnosis who also have psychotic symptoms. Sareen and colleagues examined the relationship between PTSD and positive psychotic symptoms as well as their effects on suicidality (Sareen, Cox, Goodwin, & Asmundson, 2005). The outcomes indicated that participants with PTSD plus co-morbid positive psychotic symptoms were significantly more likely to report lifetime suicidal ideation and lifetime suicide attempts. However, after adjusting for total number of PTSD symptoms, socio-demographics, mental disorders, and general medical co-morbidity, the association between a PTSD diagnosis plus psychotic symptoms with suicidal ideation and suicide attempts was insignificant.

3.3.3.2. Psychosis as the primary diagnosis. There is evidence that co-morbid PTSD further aggravates the already high risk for suicide in psychotic patients. Schizophrenic patients with co-morbid PTSD were significantly more likely to report suicidal ideation compared to those without co-morbid PTSD, and the incidence of suicide attempts was also increased, but not statistically significantly so, in patients with co-morbid PTSD (Strauss et al., 2006). Furthermore, Torriero and colleagues (2007) reported that symptomatic-PTSD in first episode psychotic patients was associated with greater suicidality rates although this association was not significant. Suicidal behavior was significantly associated with the experience of trauma, but not the severity of that trauma, prior to the onset of their psychosis (Torriero et al., 2007). Additional work from this group has shown, in a sample of dual diagnosis patients (schizophrenia co-morbid with substance and/or alcohol abuse) that patients suffering from co-morbid PTSD had significantly higher scores of suicidal behavior compared to those not suffering co-morbid PTSD (Picken, 2009).

In conclusion, although the existing literature on the impact of PTSD plus psychosis in suicidal behavior is limited, current data suggest that among psychotic patients, symptomatic PTSD is accompanied by heightened rates of suicidality. In patients with pre-existing psychotic disorders, co-morbid PTSD appears to increase the risk for suicidal behavior.

3.3.4. PTSD, Other Axis I and II Co-morbid Psychiatric Disorders, Suicidal Behavior

PTSD as a co-morbid diagnosis has been associated with a greater frequency of suicide attempts in populations with a range of other Axis I primary psychiatric diagnoses. For example, Warshaw and colleagues reported that at intake, lifetime or current PTSD was among the most significant clinical predictors of a previous suicide attempt or previous suicidal behavior, in a sample of panic disordered patients (Warshaw, Massion, Peterson, Pratt, & Keller, 1995). All prospectively recorded suicidal behavior occurred in participants with depressive disorders while certain disorders such as PTSD and substance use substantially increased the risk of suicide attempts/behaviors. Furthermore, Phillips et al. (2005) demonstrated that a PTSD diagnosis, a substance use disorder and a greater lifetime impairment due to Body Dismorphic Disorder (BDD) were the only significant contributors to greater incidence rates of suicide attempts among patients with a principal diagnosis of BDD.

Only two studies have explored the impact of PTSD and borderline personality disorder (BPD) on suicide risk. The first study examined diagnostic predictors of prospectively observed suicide attempts in a personality disordered sample. It was found that prospective suicide attempts were significantly associated with baseline BPD and substance use disorders but not PTSD (Yen et al., 2004). In addition, worsening depression and substance abuse were significant predictors of suicide attempts, but worsening PTSD and panic disorder were not significant predictors. The second study compared the suicidal behavior of females with a history of childhood sexual abuse with BPD plus PTSD and with PTSD alone. The BPD criteria relevant to suicidality (attempt or threat) was endorsed by 58% of the sample diagnosed with both BPD and PTSD, and by 33% of the sample diagnosed with PTSD only, a difference which was significant (Heffernan & Cloitre, 2000).

In a sample of psychiatric in-patients with a range of Axis I and Axis II disorders, suicidal ideation was found to be positively associated with a number of different types of trauma, namely, incest or sexual molestation, being a witness to a severe injury or a fatality, and other infrequent terrifying experiences which were not listed in the interview protocol. A history of suicide attempts was associated with rape and being threatened with a knife, and a greater frequency of suicidal ideation in the month prior to admission to hospital was associated with PTSD. (It should be noted that suicidal ideation in the past month was also associated with bipolar disorder, BPD and anxiety disorders.) Previous suicide attempts, rather than ideation, were not associated with PTSD, but were associated with schizoaffective disorder, borderline personality disorder and anxiety disorders (Floen & Elklit, 2007). A limitation of this work was that the sample of participants with PTSD was small (N = 9).

A study carried out to examine the effects of PTSD and victimization in those with a serious mental illnesses found that suicide attempts were higher in patients with PTSD who had been victimized (80.8%) compared to those with PTSD who did not report victimization (54%). Again the sample included individuals with a range of Axis I and Axis II disorders, psychosis being the most frequent (50%). It was interesting that although there was a high rate of PTSD found in this sample using the Composite International Diagnostic Interview (40%), this was recorded in only 5.4% of the case notes (McFarlane, Schrader, Bookless, & Browne, 2006).

In conclusion, serious mental illness when combined with PTSD escalates suicidal ideation and the risk of suicide attempts. A point high-lighted by these studies is that symptoms of PTSD may be missed by clinicians possibly because of avoidance, the overlap of symptoms between PTSD and different disorders, and inadequate exploration of traumatic experiences or victimization (Floen & Elklit, 2007; McFarlane et al., 2006).

3.4. PTSD and suicide in specific populations

3.4.1. HIV, PTSD and Suicidal Behavior

There appears to be a high prevalence rate of PTSD in individuals diagnosed with HIV or AIDS (Tedstone & Torriero, 2003) with ranges of between 12% to 60% being reported (e.g., Botha, 1996; Israelski et al., 2007; Kelly et al., 1998; Martinez, Israelksi, Walker, & Koopman, 2002; Olley, Seedat, & Stein, 2006). Suicidal thoughts and behaviors are also more frequent in such individuals. For example, in a sample of participants with recently diagnosed HIV who met the criteria for current PTSD, suicidal ideation was significantly elevated (54%) compared to those without a diagnosis of PTSD (11%) (Olley, Zeer, Seedat & Stein, 2005).

In a study which examined the lifetime prevalence of PTSD in a sample of HIV-positive incarcerated women, lifetime PTSD was the most common diagnosis in this population. Women with lifetime PTSD were also more likely to report a previous suicide attempt (Lewis, 2005). Additional analyses showed that a diagnosis of lifetime PTSD was the only factor that continued to be significantly correlated with a history of previous suicide attempt. Lifetime PTSD was further associated with elevated lifetime prevalence of major depression and lifetime cannabis abuse/dependence. However no significant association was identified between major depression or cannabis abuse/dependence and past suicide attempts, suggesting a direct link.
between PTSD and suicidality in this sample. Overall, these initial findings support the association between PTSD and suicidal behavior in persons diagnosed with HIV or AIDS. Furthermore, this relationship appeared to remain significant even after controlling for the effects of other covariates, such as, major depression.

3.4.2. PTSD and Suicidal Behavior in Refugees

High rates of PTSD have been reported among refugees, although rates do vary dependent on the sampling frames used. For example, a prevalence rate of 79% was reported in a sample from a number of different countries (Ferrada-Noli et al., 1998) whilst a prevalence rate of 14% was reported from a sample of Somali asylum seekers in London (Bhui et al., 2006).

Data on the association of PTSD with suicidal behavior in refugees are limited and mainly derived from the work of Ferrada-Noli and colleagues. A 1996 study found that 64% of refugees with PTSD reported suicide ideation and detailed suicide plans, and 46% had a history of previous suicide attempts (Ferrada-Noli & Sundbom, 1996). Consistent with this, Ferrada-Noli et al. (1998) reported a 57% prevalence rate of suicidal behavior (suicide ideation and suicide attempts) in a similar population. In an additional study conducted by Ferrada-Noli, Asberg, and Ormstad (1998) significant associations were found between the preferred methods for suicide and the torture methods to which refugees with PTSD had been previously subjected. Torture that included blunt force to the head and body was related to jumping from heights or in front of trains; torture involving water was associated with drowning; and sharp force torture was associated with self-inflicted stabbing or cutting.

Overall, although the available evidence on the relationship between suicidal behavior and PTSD in refugees is limited, the consistency of the above findings suggests that PTSD in refugees is accompanied by elevated levels of suicidal behavior. Suicide behavior in this group may be high due to fear of being returned to the country of origin and potentially dangerous consequences.

3.4.3. PTSD and Suicidal Behavior in Police Officers

High rates of PTSD have been reported among police officers and there is also some indication that PTSD in police officers is associated with higher rates of suicidality. For instance, a recent study demonstrated that the prevalence rates of a PTSD diagnosis and sub-threshold PTSD among 157 Brazilian police officers were 8.9% and 16%, respectively. Furthermore, police officers with a PTSD diagnosis were significantly more likely to report lifetime suicide ideation compared to those without a PTSD diagnosis or PTSD symptoms (Maia et al., 2007). Similarly, Violanti (2004) showed that among police officers who reported PTSD symptoms, the proportion of those reporting suicidal ideation increased by 13% with every 10-unit increase in the percentage of hours worked on afternoon shifts.

4. Clinical implications

There has been considerable evaluation of the treatment of PTSD with strong evidence for the efficacy of trauma-focused cognitive behavior therapy (Harvey, Bryant & Tarrier, 2003). However, there has been little attention in the treatment literature to reducing suicide risk in PTSD patients. Thus any recommendations for treatment will be largely speculative. A recent systematic review and meta-analysis concluded that overall there was a highly significant effect for CBT in reducing suicide behavior irrespective of diagnostic group (Tarrier, Taylor, & Gooding, 2008). This was in spite of considerable heterogeneity in the target populations, the types and delivery of treatments, and outcomes assessed. Sub-group analyses indicated a significant treatment effect for adult but not adolescent samples, and for individual but not group treatments. Both Dialectic Behavior Therapy and other forms of CBT demonstrated significant treatments effects although the latter were usually briefer and less intense. There was evidence for treatment effects, albeit reduced, over the medium term. Thus integration of CBT for reduction of suicide risk into the conventional CBT treatment programmes for PTSD could be recommended in patients experiencing hopelessness or suicidal ideation. The exact nature of this integrated treatment, which should be based upon a sound theoretical understanding of the psychological architecture underlying suicide risk, has yet to be developed.

5. Conclusions, implications and recommendations

The majority of the research discussed in the present paper clearly demonstrates an important relationship between PTSD and suicidal behavior. These findings have been replicated both in clinical and in general population samples. There is evidence that the association between PTSD and suicidal behavior pertains, irrespective of the type of trauma that led to PTSD. For example, high rates of suicidal behavior have been consistently reported among PTSD patients exposed to combat trauma, physical/sexual abuse, intimate partner violence, natural disasters or a mixture of different traumatic events. A number of Axis I and Axis II disorders, (including depression, substance abuse, psychosis, and personality disorder) in association with PTSD led to more suicidal thoughts and behaviors. A high incidence of PTSD and suicidal behavior as well as a significant association between these two variables has also been observed in specific populations such as HIV patients, refugees and police officers.

The bulk of studies included in this review reported a significant positive association between PTSD and at least one measure of suicidality, i.e., suicidal ideation, behaviors, plans, attempts or completed suicides. The only exception to this was the study by Zivin et al. (2007) whose results demonstrated that among deceased veterans with a primary diagnosis of major depression, co-morbid PTSD was associated with a decreased risk for suicide. This overall result may have been accounted for by different patterns in the association between PTSD and suicide depending on age.

Four key of issues emerge from this review.

The first issue is whether aspects of PTSD are associated with a direct route to suicidal thoughts and behaviors or whether the path is indirect, being mediated by depression. The number of studies to test this explicitly using path analyses were few and results were often contradictory. Nevertheless, on balance, there was some evidence across the different categories explored that depression was a mediating factor (e.g., studies investigating combat veterans, child abuse, intimate partner violence). One exception is presented in the investigation of Ferrada-Noli et al. (1998) who demonstrated that among refugees with PTSD, major depression was not substantially associated with heightened levels of suicidal behavior. However, it should be remembered that there are very few studies focusing on PTSD, suicide and depression in refugees, with most of the work being generated by one laboratory. Although depression was often cited as a mediator in the pathway from PTSD to suicidality, other disorders such as schizophrenia also seemed to escalate suicidal thoughts and behaviors, especially in combat veterans.

The second issue is whether there are stronger relationships between any one of the three symptom clusters and suicidality compared to the rest. In combat veterans, the cluster of symptoms involving re-experiencing the trauma, or aspects of the trauma, was the most important predictor of suicide compared to the other two (avoidance/numbing and arousal). In community based surveys the arousal symptom cluster was positively associated with suicidality, but avoidance/numbing was negatively correlated with this variable. This ties-in, to some extent, with work showing that emotional withdrawal was negatively associated with suicidality in schizophrenia as it potentially represented restricted potential for the development of suicide related schema (Tarrier, Gooding, Gregg, Johnson, & Drake, 2007).
The third issue is that across all the studies there was only a mattering which either directly investigated or made reference to processes which are already accepted as important in the suicide literature. For example, entrapment, defeat and helplessness/hopelessness together with appraisals of the future are considered key to psychological explanations of suicide (Bolton et al., 2007; Johnson, Gooding, & Tarrier, 2008; Williams, 1997; Williams, Crane, Barhofer, & Duggan, 2005). Yet, they have received sparse attention in the PTSD and suicide literature. Similarly, different types of emotional regulation strategy, such as suppression, were barely investigated. Although guilt and personal responsibility were relevant constructs in some studies of war veterans, they appeared not to be investigated in the remainder of the studies.

Research into PTSD and suicidality would clearly benefit from focusing on psychological models of suicide and considering which models can be most usefully adapted to the area.

Fourth, the treatment implications are as of yet at a rudimentary stage. Further understanding of the psychological architecture underlying suicidal risk is important in identifying patients at risk and for the development of treatment strategies to reduce this risk. How such treatment strategies can be developed and integrated into treatments of PTSD that are supported by a strong evidence base will also require investigation and should be a priority for future research.

References


Bolton, C., Gooding, P., Kapur, N., Barrowclough, C., & Tarrier, N. (2007). Developing treatment strategies to reduce this risk. How such treatment strategies can be developed and integrated into treatments of PTSD that are supported by a strong evidence base will also require investigation and should be a priority for future research.


