

Complex Contribution of Combat-Related Post-Traumatic Stress Disorder to Veteran Suicide: Facing an Increasing Challenge

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The U.S. Army reported 32 veterans committed suicide in June 2010 with 10 of the 21 active duty veterans deployed to Middle East conflict two to four times (Zoroya, 2010). The military rate of suicide (22 per 100,000) now exceeds the general population of the United States (18 per 100,000). No significant difference in suicide existed between middle-aged and elderly U.S. veteran and nonveteran men ($n = 499,356$) during the previous three decades (Miller et al., 2009). However, U.S. Army National Guard suicides increased by 75% in 2009 with the advent of the Iraq and Afghanistan conflict and over half occurred in guardsmen awaiting deployment (Greenhill, 2010). Similarly, U.K. forces in Iraq were placed under suicide watch in March 2009 after the suicide of three soldiers within a 10-week period (Rayment, 2009, March 28). The purpose of this case study is to present the complex contribution of combat-related post-traumatic stress disorder (PTSD) to suicide and current international standards of PTSD treatment recommended to reduce risk among veterans deployed to the Middle East.

Case Example

After two tours in Iraq, Phillip, a 26-year-old veteran, started drinking heavily and his marriage disintegrated. Arrested for

PURPOSE: The purpose of this case study is to present the complex contribution of combat-related post-traumatic stress disorder (PTSD) to suicide and international standards of treatment among veterans deployed to the Middle East.

CONCLUSIONS: PTSD carries increased physical and psychological health risk in combat soldiers. Internationally, guidelines for PTSD promote cognitive behavior therapies, specifically exposure therapy, as first line treatment; however, implementation varies among countries.

PRACTICE IMPLICATIONS: Evidence supports the benefit of exposure-based psychotherapy for combat-related PTSD. Commonly prescribed antidepressants and other psychotherapy treatments may not be as beneficial.

being absent without official leave during an alcohol binge, he attempted suicide, was referred to a psychiatric hospital, and received a selective serotonin reuptake inhibitor (SSRI) for PTSD and depression. Two months later, he emailed his mother asking for God's forgiveness, purchased a handgun, and shot himself in the head in a public bathroom. He lingered several days on life support before succumbing to injuries.

Violent Suicide Trends

Worldwide, the most common method of suicide was hanging with the use of firearms by men, a slightly less frequent form of self-destruction (Ajdacic-Gross et al., 2008). The two most common methods of recent suicide in Operation Iraqi Freedom and Enduring Freedom (OIF/OEF) veterans ($n = 490,346$) were firearms (73%) and hanging (21%), with increased risk for active duty veterans with mental disorders including psychosis, neurosis, substance use disorder, dissociative disorder, depression, and PTSD (Kang & Bullman, 2008). U.S. veterans ($n = 854$) with substance use disorders chose violent (70%) over nonviolent (30%) methods, and violent death occurred more in younger white

Table 1. Risks for Violent Veteran Suicide

Characteristic	Increased Risk	95% CI	Source
White	OR 4.51***	3.42–5.95	Ilgen et al. (2010)
18–44 years old	OR 1.44*	1.06–1.96	Ilgen et al. (2010)
Southern United States	OR 1.45*	1.13–1.85	Ilgen et al. (2010)
Western United States	OR 1.65*	1.27–2.14	Ilgen et al. (2010)
Active duty	SMR 1.33*	1.03–1.69	Kang & Bullman (2008)
Select mental disorders ^a	SMR 1.77*	1.01–2.87	Kang & Bullman (2008)
Major depression	OR 2.09**	1.75–2.50	Ilgen et al. (2010)
Post-traumatic stress	OR 1.33*	1.10–1.62	Ilgen et al. (2010)
Comorbid mental condition	OR 1.93**	1.60–2.34	Ilgen et al. (2010)

* $p < .05$, ** $p < .01$, *** $p < .0001$. ^aAffective psychosis, neurotic disorders, alcohol/drug dependence, acute reactions to stress, adjustment disorder, major and other depressive disorder, and post-traumatic distress disorder.

CI, confidence interval; SMR, standardized mortality ratio; OR, odds ratio.

veterans from Southern or Western states in 2002–2006 (Ilgen, Conner, Valenstein, Austin, & Blow, 2010) (refer to Table 1).

Post-Traumatic Stress

PTSD was the most common mental health diagnosis in OIF/OEF veterans (Seal, Bertenthal, Miner, Saunak, & Marmar, 2007). OIF/OEF veterans with previous anxiety disorders had an expected five times greater odds of developing PTSD, but those without any history of previous anxiety had an astounding 10-fold increase in PTSD shortly after returning from deployment in 2006–2007 (Martin, 2009) (refer to Table 2). Seventy percent of U.S. veterans of Iraq experienced numerous life-threatening situations and reported significantly higher rates of interpersonal conflict, PTSD, depression, and overall mental health risk ($p < .001$) (Milliken, Aushertlonie, & Hoge, 2007). One third of U.S. troops ($n = 18,305$) with low prevalence of PTSD before deployment (3–5%) admitted serious PTSD or depression impairment within 3–12 months of active combat in Iraq and half confessed concomitant alcohol or aggressive behavior problems (Thomas et al., 2010). PTSD was associated with female gender, enlisted rank, and excessive alcohol intake in U.K. military personnel in the Gulf War; alcohol abuse risk

increased number of deployments (Jones, Rona, Hooper, & Wessely, 2006) and duration of deployment (Rona et al., 2007). Presence of PTSD or two or more comorbid mental disorders was highly predictive of suicidal ideation in Iraq and Afghanistan U.S. veterans ($n = 108$) (odds ratio [OR] 4.45, 95% confidence interval [CI] = 2.58–7.67; OR 5.7, 95% CI = 2.09–23.85, respectively) (Jakupcak et al., 2009).

Long-Term Health Issues Associated with Post-Traumatic Stress

Decline in overall health over time may be associated with PTSD. Iraq and Afghanistan veterans of both sexes ($n = 72,567$) with PTSD had increased cardiovascular risk factors including tobacco use, hypertension, dyslipidemia, obesity, and diabetes compared with controls without a mental disorder (Cohen, Marmar, Ren, Bertenthal, & Seal, 2009) (refer to Table 3). Each increase in level of combat-related PTSD symptoms was associated with increased cardiovascular disease for angina, nonfatal myocardial infarction, and fatal coronary heart disease in the Normative Health Study (Kubzansky, Koenen, Spiro, Vokonas, & Sparrow, 2007). U.S. veterans 55 years and older ($n = 181,093$) were twice as likely to develop dementia with PTSD, even without substance use disorders and depression, compared with those without

Table 2. Risks for Combat-Related Post-Traumatic Stress Disorder

Characteristic	Risk	95% CI	Source
Post-deployment (no prior anxiety)	OR 10.24*	9.87–10.62	Martin (2009)
Post-deployment (prior anxiety)	OR 5.84*	4.97–6.86	Martin (2009)
Unexpected prolonged deployment	OR 2.27*	1.21–4.24	Rona et al. (2007)
Deployment ≥ 13 months	OR 1.58*	1.07–2.32	Rona et al. (2007)
Female gender	OR 1.97*	0.71–5.48	Jones et al. (2006)
Enlisted	OR 2.02*	0.42–9.73	Jones et al. (2006)
Excessive alcohol use	OR 2.25*	1.07–4.73	Jones et al. (2006)

* $p < .05$ implied.

CI, confidence interval; OR, odds ratio.

Health Issue	Risk	95% CI	Source
Tobacco use ^c	OR 3.63**	3.54–3.71	Cohen et al. (2009)
Hypertension ^c	OR 2.88**	2.79–2.97	Cohen et al. (2009)
Dyslipidemia ^c	OR 2.70**	2.63–2.78	Cohen et al. (2009)
Obesity ^c	OR 2.35**	2.27–2.43	Cohen et al. (2009)
Diabetes ^c	OR 2.57	2.37–2.78	Cohen et al. (2009)
Angina ^c	1SD ^a ARR 1.16	0.93–1.46	Kubzansky et al. (2007)
Nonfatal MI ^c	1SD ^a ARR 1.23	0.94–1.59	Kubzansky et al. (2007)
Fatal CHD ^c	1SD ^a ARR 130	1.01–1.69	Kubzansky et al. (2007)
Dementia ^c	HR 2.31	2.24–2.39	Yaffe et al. (2010)
Early onset hypertension ^c	HR 1.38*	1.05–1.83	Anderson et al. (2010)
Early onset circulatory disorders ^c	HR 1.29*	1.04–1.06	Anderson et al. (2010)
Early onset digestive disorders ^c	HR 1.34**	1.14–1.57	Anderson et al. (2010)
Early onset nervous disorders ^c	HR 1.98**	1.69–2.32	Anderson et al. (2010)
Early musculoskeletal disorders ^c	HR 1.84**	1.57–2.16	Anderson et al. (2010)
Higher mortality	HR 3.45	1.57–7.60	Ladwig et al. (2008)

* $p < .05$, ** $p < .001$. ^aOne standard deviation (1SD) increase with each increase in level of post-traumatic stress disorder symptoms. ^c = combat-related PTSD health outcome.

CI, confidence interval; OR, odds ratio; ARR, adjusted relative risk; MI, myocardial infarction; CHD, coronary heart disease; HR, hazard ratio.

Table 3. Long-Term Health Issues Associated with Post-Traumatic Stress Disorder

PTSD (Yaffe et al., 2010). Association of PTSD with physical disease is not limited to slowly evolving geriatric manifestations. Early onset of hypertensive, circulatory, digestive, nervous, and musculoskeletal system disease was also documented in young U.S. veterans ($n = 4,416$) with PTSD within the first 5 years post-deployment (Anderson, Wade, Possemato, & Ouimette, 2010).

The negative effect of PTSD on health is supported in civilian studies. Subjects with PTSD after trauma exposure ($n = 62$) had more than double the odds for angina pectoris, heart failure, chronic bronchitis, and bronchial asthma than the general population with no trauma or PTSD (Spitzer et al., 2009). The 5-year prospective Living With an Implanted Cardioverter-Defibrillator-Study ($n = 211$) reported German patients (125 men and 22 women) with PTSD had a higher mortality rate than those without PTSD, even after adjustment for anxiety and depression (Ladwig et al., 2008). Many genes associated with the immune system defense are inactive in those with PTSD ($n = 23$) leaving them more vulnerable to disease development compared with controls without trauma ($n = 97$) (Uddin et al., 2010). Poor health outcomes associated with mental health disorders may also contribute to prolonged suicide risk in veterans despite treatment (Valenstein et al., 2009).

Limitations and Risks of Antidepressants and Antipsychotics

Conflicting findings surround pharmacotherapy for PTSD. A Cochrane systematic review of 35 randomized control trials from 1966 to 2004 ($n = 4,597$) supported SSRIs as most effective in sustained treatment of non-combat-related PTSD

(Stein, Ipser, & Seedat, 2009). Conversely, the Institute of Medicine (IOM) (2008) found inadequate evidence to support efficacy of pharmacotherapy and cited bias from dependence on funding by pharmaceutical manufacturers for most studies. Half of the 14 studies from 1980 to June 2007 demonstrated no benefit for PTSD from SSRIs.

Effectiveness of antidepressants in treating combat-related PTSD is uncertain (Australian Centre for Posttraumatic Mental Health [ACPMH], 2007; Benedek, Friedman, Zatzick, & Ursano, 2009; IOM, 2008). No difference was found between placebo ($n = 26$) and fluoxetine ($n = 26$) in veterans with PTSD (van der Kolk et al., 2007) and placebo ($n = 83$) and sertraline ($n = 86$) in veterans with PTSD (Friedman, Marmar, Baker, Sikes, & Farfel, 2007). Conversely, significant improvement in PTSD was sustained at 24 weeks with the SSRI for all symptoms ($p < .05$) except intrusion and hyperarousal in combat-induced PTSD in Balkan War veterans who received placebo ($n = 34$) or fluoxetine ($n = 110$) (Martenyi & Soldatenkova, 2006).

Antidepressants may not be effective in preventing suicide. Neither antidepressant nor benzodiazepine treatment in civilian Italians was an effective deterrent to attempted suicide ($n = 129$) compared with controls without attempts ($n = 1,233$) ($p < .001$ both) (Raja, Azzoni, & Koukopoulos, 2009). Additionally, use of the serotonin–norepinephrine reuptake inhibitor, venlafaxine, with benzodiazepines in SSRI resistant depression in adolescents ($n = 334$) was associated with a higher rate of suicide and suicide attempts (Brent et al., 2009). Suicide risk in veterans with depression ($n = 226,866$) was reportedly less with SSRI treatment (364 per 100,000) than without an antidepressant (1,057 per 100,000) (Gibbons et al., 2007). However, U.S. veterans maintained a high

prolonged risk of suicide, up to 48 weeks after hospital discharge (114 per 100,000), despite depression treatment (Valenstein et al., 2009). Association between psychotropic medications and suicide risk in combat veterans needs to be better elucidated.

Psychiatric medications may also contribute to adverse cardiac outcomes. A case ($n = 90,307$) control ($n = 186,600$) study of adults using typical ($n = 44,218$) and atypical ($n = 46,089$) antipsychotic drugs reported an increased rate ratio (IRR) risk of ventricular arrhythmias and sudden cardiac death (SCD) in cases (IRR 1.99, 95% CI = 1.68–2.34; IRR 2.26; 95% CI = 1.88–2.72, respectively) compared with controls (Ray, Chung, Murray, Hall, & Stein, 2009). U.S. civilian women ($n = 63,469$) with depression had increased SCD by multivariable models (hazard ratio [HR] 2.33, 95% CI = 1.47–3.70) with higher risk attributed to a specific relationship between antidepressant use and SCD (HR 3.34, 95% CI = 2.03–5.50) (Whang et al., 2009). Distinction needs to be made between suicide and medication-induced death for each case.

Social Strategies to Address Post-Traumatic Stress in Veterans

Strategies are needed to enhance personal resilience to lengthy battle rotations, personal economic challenges, and a reluctance to request emotional support (Greenhill, 2010). All U.S. active ($n = 90,000$) and new recruits ($n = 120,000$) will participate in a National Institute of Mental Health (NIMH) and Army study during 2009–2014 to identify suicide risk factors early and create effective protection strategies (Armstrong, 2010). The United States released a video, *Shoulder to Shoulder: I will never quit on life*, and the United Kingdom distributed posters stating “Never let your mate fight alone. Worried about someone on your team? Be willing to listen. Not all wounds are visible” to combat the surge of suicides (Hemmerly-Brown, 2010; Rayment, 2009).

Self-awareness and openness to seeking help are key elements to suicide prevention. Self-reported rates of PTSD (16.6%) among U.S. veterans ($n = 2,863$) (Hoge, Terhakopian, Castro, Messer, & Engel, 2007) are similar to the 13% diagnosed with PTSD of OIF/OEF veterans ($n = 103,788$) examined by primary care providers, and active duty veterans 18–24 years of age at greatest risk of PTSD (relative risk 1.72, 95% CI = 1.63–1.80) (Seal et al., 2007). Soldiers expressed concern about the stigma of PTSD, and only half of OIF/OEF veterans ($n = 1,965$) with PTSD ($n = 275$) or major depression ($n = 275$) sought mental health care (Tanielian & Jacocks, 2008).

Increased rates of PTSD and risk of suicide can persist after discharge. Surveyed Iraq and Afghanistan U.S. veterans ($n = 1,226$) screened positive for PTSD (41%) and reported difficulty transitioning into civilian life (40%), divorce (35%),

alcohol and drug use (31%), dangerous driving (35%), and anger outbursts (57%) (CI = 93–99%) (Sayer et al., 2010). U.K. military forces deployed to Iraq ≥ 13 months were more likely to develop PTSD and have problems at home during (OR 1.28, 95% CI = 1.06–1.54) and after (OR 1.25, 95% CI = 1.02–1.52) deployment (Rona et al., 2007) (refer to Table 2). U.S. female veterans experience more difficulty obtaining treatment for PTSD even though 11,713 were diagnosed with PTSD and they make up 14% of the military forces (James, 2010). President Obama promised in 2010 to enhance access to care and treatment for all U.S. veterans in response to evidence of the burgeoning PTSD burden (Obama, 2010).

Trauma-Focused Psychological Therapy

A first-line treatment for PTSD, cognitive behavioral therapy (CBT) (ACPMH, 2007; Benedek et al., 2009; IOM, 2008; Kudler & Ruzek, 2010; National Center for Collaborating Centre for Mental Health [NCCCMH], 2005; National Center for Post-Traumatic Stress Disorder and Walter Reed Army Medical Center, 2004) is based on the premise that PTSD symptoms and accompanying emotions can be ameliorated by changing incorrect or negative thoughts about traumatic past events (NIMH, 2010). CBT usually involves prolonged exposure, repeatedly recalling a traumatic event until emotional response tapers to allow cognitive confrontation of the trauma. Two additional forms of CBT commonly used are cognitive restructuring, the process of verbalizing, challenging, and replacing erroneous thoughts with balanced ones; and stress inoculation training, a process of reducing anxiety and enhancing coping skills. Meta-analysis of five randomized control studies with small numbers of participants showed a significant effect size (standardized mean difference $-1.51 < -.08$) with eye movement desensitization reprocessing (EMDR) (Bisson et al., 2007), but success of EMDR in studies including self-diagnosed PTSD in civilian assault and accident victims cannot be generalized to combat veterans without further research evidence (Benedek et al., 2009).

Prolonged exposure is recommended as most beneficial even with variance in frequency and number of sessions for veterans with combat-induced PTSD (Benedek et al., 2009). U.S. female veterans ($n = 277$) and active duty personnel ($n = 7$) treated with 10 sessions of prolonged exposure treatment were more likely to no longer meet PTSD criteria (OR 1.80, 95% CI = 1.10–2.96) and to achieve total remission of PTSD symptoms (OR 2.43, 95% CI = 1.10–5.37) than those treated with present-centered therapy; the present-centered group was also more likely to be taking an antipsychotic at post-treatment ($p = .03$) (Schnurr, Friedman, & Engel, 2007). Significant improvement in PTSD, depression, and Cognitive Distortion Scales for self-criticism, self-blame, helplessness, hopelessness, and preoccupation with danger occurred

following 7 weeks of intensive CPT therapy ($p < .001$ all) in a pretest and posttest study of U.S. veterans ($n = 99$) in a residential PTSD program (Owens, Chard, & Cox, 2008). Compared with U.S. Vietnam veterans ($n = 50$) with similar clinician assessed pretreatment PTSD scores, OIF/OEF veterans ($n = 51$) demonstrated significantly lower clinician assessed posttreatment PTSD scores ($p < .001$), even though they attended significantly fewer CPT sessions ($p < .01$) (Chard, Schumm, Owens, & Cottingham, 2010). Youth and early treatment may make a difference in treatment efficacy. Even more encouraging, 90% of U.S. veterans (6 women, 54 men) assigned to a 12-session cognitive processing therapy (CPT) composed of cognitive and exposure components showed significant improvement despite long-term PTSD-related disability (40% no longer met PTSD criteria and 50% had reliable reduction in PTSD symptoms; $p < .001$ both) (Monson et al., 2006). More research is needed to explore efficacy of CBT in combat-related PTSD.

Comparison of Guidelines

The International Society for Traumatic Stress has been a key force for establishment of evidence-based guidelines (Foa, Kearne, Friedman, & Cohen, 2009). Although increased emphasis is on treatment of children and adolescents, adult PTSD treatment is strongly supported. Early intervention, CBT, pharmacotherapy, treatment of comorbid disease, and family therapy are promoted as important evidence-based treatments for PTSD recovery.

Evaluation of research by the IOM (2008) reported evidence was adequate for the efficacy of exposure-based therapy but inadequate for other psychotherapy or pharmacotherapy treatments. The IOM encouraged future rigorous research comparing psychotherapy or medication, individual and group psychotherapies, and combined psychotherapy and medications. Tracking time of trauma exposure, duration of PTSD diagnosis, and testing of interventions at periodic intervals were also recommended.

According to early Department of Veterans Affairs and Department of Defense (VA/DoD) guidelines for Iraq War, a 12-week trial with a SSRI was strongly recommended as first-line treatment for PTSD, and CBT was only suggested (Kudler & Ruzek, 2010). Currently in practice, U.S. veterans complete self-report tools for screening and monitoring PTSD, primary health providers coordinate care, and mental health services are accessed by consultation. VA/DoD guidelines release in January 2011 recommend psychotherapy with exposure and/or cognitive restructuring for significant benefit and cite pharmacotherapy as proving either unknown (antidepressants, anticonvulsants, atypical antipsychotics, prazosin, propranolol, and imipramine) or no benefit (benzodiazepines and typical antipsychotics) (Management of Post-traumatic Stress Working Group, 2010).

Both U.K. (NCCCMH, 2005) and Australian (ACPMH, 2007) guidelines for PTSD treatment recommended implementing trauma-focused CBT first with mean effect size of 1.49 on all measures of PTSD symptoms. An SSRI should be used if psychological intervention is not sufficient. The United Kingdom recommends using hypnotics short term and antidepressants long term for sleep disturbances with mandatory follow-up 1 week after starting any medications (NCCMH, 2005). Australian guidelines recommend simultaneous substance abuse treatment and treating PTSD before depression, unless the depression is hindering treatment or increasing the risk of suicide (ACPMH, 2007).

The American Psychiatric Association's Guideline Watch was issued in 2009, updating rigorous studies published in 2004–2009 on PTSD treatment (Benedek et al., 2009). Evidence supported the efficacy of exposure-based psychotherapy. Contrary to previous clinical practice, routinely prescribing SSRIs with combat-related PTSD was not recommended.

Implications for Nursing Practice

Existing evidence suggests veterans of recent Iraq and Afghanistan conflict are at higher risk of committing suicide than veterans of previous wars (Fontana & Rosenheck, 2008). More former active duty veterans tend to attempt violent suicide by highly successful methods involving firearms or hanging (Kang & Bullman, 2008), and younger veterans with PTSD and comorbid depression have a higher suicide rate than older veterans (Zivin et al., 2007). More veterans with PTSD were initially diagnosed in a primary care clinic (60%) over any other setting (Seal et al., 2007). Healthcare providers from military and nonmilitary institutions must assume a more active role in early suicide risk detection and prevention intervention. Returning OIF/OEF veterans who screen positive for PTSD may not receive CBT prior to discharge and entry into civilian life (Benedek et al., 2009). CBT with prolonged exposure is only initiated by referral at the request of the veteran through his healthcare provider. Commonly prescribed antidepressants for civilians with PTSD are not as effective for combat-related PTSD, but veterans often choose the less successful "pill" to treat their PTSD symptoms out of fear of being perceived as weak for accepting counseling.

British and Australian guidelines focus on CBT as first-line treatment with addition of pharmacological intervention if needed, but U.S. military guidelines and clinical practices are progressing toward CBT as a first-line treatment more slowly. Shortage of military and civilian therapists trained in trauma-based psychotherapy hinders referral, and stigma surrounding mental health treatment and commitment to attending multiple treatment sessions are additional impediments to veterans accepting needed care (Tanielian & Jacocks, 2008). Families of veterans need counseling to recognize escalating

suicide risk and to establish healthy boundaries for anger outburst symptoms of PTSD. Other comorbid mental health issues, sleep disorders, and substance abuse frequently accompanying PTSD must also be considered in veterans traumatized by combat and treated on an individual basis. Veterans and their families need additional support resources for long-term suicide prevention treatment beyond that currently implemented.

Recovery from PTSD is not returning to an unattainable pretrauma state but being able to function productively in life and maintain healthy relationships. Nurses and other health-care providers need to reinforce that seeking trauma-based psychotherapy is a normal part of recovery from life-threatening combat traumas and explain that treatment makes transition into routine life easier. Encouraging evidence that OIF/OEF veterans are less severely disturbed psychologically and show higher rates of improvement than veterans from earlier wars can also be shared to help veterans overcome fear of being stigmatized for seeking help (Fontana & Rosenheck, 2008). The human cost of war is heavy, but evidence is mounting that suicide prevention and PTSD recovery for combat-trauma survivors is increasingly possible with more aggressive trauma-focused psychological treatments (Jakupcak et al., 2009).

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