Clinical Psychology Review 29 (2009) 727–735

Contents lists available at ScienceDirect

Clinical Psychology Review

Posttraumatic stress disorder and quality of life: Extension of findings to veterans of the wars in Iraq and Afghanistan

Paula P. Schnurr [a,b,*], Carole A. Lunney [a], Michelle J. Bovin [c,d], Brian P. Marx [c,d,e]

[a] National Center for PTSD, Executive Division, United States
[b] Dartmouth Medical School, United States
[c] National Center for PTSD, Behavioral Science Division, United States
[d] VA Boston Healthcare System, United States
[e] Boston University School of Medicine, United States

ARTICLE INFO

Keywords:
Posttraumatic stress disorder
Quality of life
Veterans
Military personnel
OEF/OIF

ABSTRACT

The wars in Iraq and Afghanistan—Operation Iraqi Freedom and Operation Enduring Freedom, or OEF/OIF—have created unique conditions for promoting the development of psychological difficulties such as posttraumatic stress disorder (PTSD). PTSD is an important outcome because it can affect quality of life, impairing psychosocial and occupational functioning and overall well-being. The literature on PTSD and quality of life in OEF/OIF Veterans is at an early stage, but the consistency of the evidence is striking. Our review indicates that the findings on PTSD and quality of life in OEF/OIF veterans are comparable to findings obtained from other war cohorts and from nonveterans as well. Even though the duration of PTSD in OEF/OIF Veterans is much shorter than in Vietnam Veterans, for example, those with PTSD in both cohorts are likely to experience poorer functioning and lower objective living conditions and satisfaction. The review ends with discussion of the implications of the evidence for research and clinical practice.

Published by Elsevier Ltd

Contents

Serving in the military can be a life-changing experience. A popular advertising campaign launched in the 1980s capitalized on this fact, telling potential recruits that joining the Army was a way to "be all that you can be." Military service can be a pathway to education, a better job, and long-term economic benefits as well as personal growth (e.g., Sampson & Laub, 1996; Schnurr, Rosenberg, & Friedman, 1993). However, military service, particularly in times of conflict, can result in exposure to extremely dangerous and traumatic situations that can cause physical and psychological injuries. In turn, these injuries can adversely affect quality of life, which the World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (1948, p. 1).

* Corresponding author. National Center for PTSD, Executive Division, United States.
E-mail address: paula.schnurr@dartmouth.edu (P.P. Schnurr).

0272-7358/$ – see front matter. Published by Elsevier Ltd
doi:10.1016/j.cpr.2009.08.006

The wars in Iraq and Afghanistan—Operations Iraqi Freedom and Enduring Freedom, or OEF/OIF—have created unique conditions for promoting the development of posttraumatic psychological difficulties. A report by the Rand Corporation notes that deployments are longer and more frequent than in conflicts such as the Vietnam and Persian Gulf Wars and there are now shorter intervals between deployments (Tanelian & Jaycox, 2008). Advances in military medicine have increased the rate of survival from battle wounds, and blast injuries have caused a high rate of traumatic brain injury. As a result, many service members are returning home to cope with serious physical impairments along with the psychological consequences of exposure. Furthermore, the demographics of the fighting forces have changed, with a high proportion of National Guard and Reserve troops serving in roles that many did not anticipate when joining the military. These individuals are older than their active duty counterparts, with established careers and families. Female service members, represented in higher numbers than ever before, have a high amount of exposure to direct combat and life-threatening situations. This mix of factors—both the wars and the people fighting them—increases the importance of understanding how posttraumatic distress relates to quality of life in OEF/OIF personnel.

The wars in Iraq and Afghanistan also have permitted an unprecedented opportunity to study the consequences of being deployed to a warzone. Through this work we have gained much greater understanding of the effects of traumatic military stressors on mental health, including the development of posttraumatic stress disorder (PTSD). Evidence is mounting that the prevalence of PTSD among the men and women who served in Iraq and Afghanistan is substantial. A recent study by the Rand Corporation estimated that 14% of the men and women who served in OEF/OIF currently have PTSD (Schell & Marshall, 2008). As a context for understanding these numbers, consider that the current prevalence of PTSD in US adults is 4% (National Comorbidity Survey Replication, 2007). PTSD is an important outcome because it can affect the whole person, impairing psychosocial and occupational functioning and overall well-being (e.g., Kuhn, Blanchard, & Hickling, 2003; Schnurr, Hayes, Lunney, McFall, & Uddo, 2006; Stein, Walker, Hazen, & Forde, 1997). Even simple tasks such as going to a supermarket may be affected if an individual avoids these activities because they trigger traumatic reminders.

In keeping with the focus of this special issue, we review the literature on how PTSD relates to quality of life in OEF/OIF Veterans. The literature provides a unique perspective on PTSD and quality of life because so much of what is known about the topic comes from cross-sectional, retrospective studies of chronic PTSD populations. Studies of OEF/OIF Veterans soon after traumatic exposure offer the opportunity to understand the effects of PTSD on quality of life before the effects become chronic. In their comparison of OEF/OIF and Persian Gulf War Veterans, Fontana and Rosenheck (2008) found that contemporaneous comparisons showed relative adaptive advantages of OEF/OIF Veterans in terms of "social assets" such as social support and social integration. However non-contemporaneous comparisons (comparing both groups at a similar timepoint after deployment) suggested that these resources become depleted over time, which could increase the risk of chronic problems such as PTSD.

The focus on OEF/OIF Veterans also is important because of the substantial efforts by the Departments of Defense and Veterans Affairs to identify and treat PTSD and other deployment-related mental disorders, and to promote Veterans' successful reintegration into society, improve their quality of life, and prevent disability (e.g., as listed on www.oefoif.va.gov). Veterans of prior wars have not had such concentrated programmatic support, nor have civilians, with the exception of those exposed to recent large-scale traumas such as Hurricane Katrina and the 9/11 attacks. Studies of OEF/OIF Veterans thus offer an opportunity to look at what happens in a cohort that might be expected to experience relatively minimal effects of PTSD on quality of life.

We begin by discussing the construct of quality of life in order to provide a context for our review. Next we briefly summarize what is known about quality of life and PTSD from studies of both civilians and Veterans of prior wars, and examine findings on OEF/OIF Veterans. Our review is based a multicomponent model of quality of life (Gladis, Gosch, Dishuk, & Crits-Christoph, 1999) that has not previously been used to organize the findings on PTSD and quality of life. We end by discussing implications of the evidence for clinical practice and research.

1. What is quality of life?

Quality of life is defined as physical, mental, and social well-being (World Health Organization, 1948). Over the past few decades, quality of life has gained recognition as an important component of health (e.g., Gladis et al., 1999; Kaplan, 2003; Katschnig, 2006). In contrast with the traditional biomedical model, the outcomes model of healthcare places value not only on increasing life expectancy (or *quantity* of life), but also helping patients to feel better about the *quality* of their lives (e.g., Kaplan, 2003; Patrick & Erickson, 1993).

There has been a similar rise in recognition of how mental disorders can affect quality of life. Since 2000, there have been no fewer than 6 reviews of quality of life in anxiety disorders (Mendlowicz & Stein, 2000; Mogotsi, Kaminer, & Stein, 2000; Olatunji, Cisler, & Tolin, 2007; Quilty, Van Amerigen, Mancini, Oakman, & Farvolden, 2003; Schneier & Pantol, 2006; Seedat, Lochner, Vythilingum, & Stein, 2006). The studies reviewed reveal the diversity of measures that fall under the umbrella of the term "quality of life." Some studies included objective measures, such as work status and income, while others assessed self-reported occupational or social role functioning using measures such as the Medical Outcomes Survey Short Form-36 (SF-36; Ware & Sherbourne, 1992) or the Sheehan Disability Scale (Sheehan, 1983). Although the SF-36 and its various versions are often referred to as measures of "health-related quality of life," the physical and mental component scales include indicators of physical and mental health *symptoms* in addition to functional measures. Still other studies have used purely subjective measures of well-being or life satisfaction, such as the Quality of Life Inventory (QOLI; Frisch, 1994) or the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985).

Despite the variety of ways in which quality of life has been assessed and the lack of an agreed-upon definition, there is some consensus that an individual's subjective well-being or satisfaction is a central component of quality of life (e.g., Gladis et al., 1999; Mendlowicz & Stein, 2000; Mogotsi et al., 2000). Yet Katschnig (2006) argues that although subjective measures may be necessary to assess the quality of life among individuals with mental disorders, these measures may not be sufficient. For instance, he points out that relying solely on measures of well-being or life satisfaction runs the risk of distortions due to temporary psychological states, such as mood, or psychological conditions such as depression or mania which may color the way an individual perceives his or her living conditions and role functioning.

For the purposes of this paper, we adopt a broader conceptualization of quality of life, as described by Gladis et al. (1999), according to which quality of life consists of social–material conditions, functioning (role performance), and satisfaction (well-being) (Table 1). Katschnig (2006), Mogotsi et al. (2000), and Mendlowicz and Stein (2000) have put forth similar conceptualizations. This approach captures the breadth of the concept as articulated the World Health Organization (WHOQOL Group, 1996, p. 5): "individuals' perception of their position in life in the context of the culture and the value system in which they live and in relation to their goals, expectations, standards and concerns." For example, work-related quality of life could be captured by employment status and earnings (social–material conditions), job performance and absenteeism

Table 1
The three components of quality of life.

Component	Indicators	Measures
Social–material conditions	Material wealth	Employment, income
	Social network	Marital status
	Living arrangements	Homelessness
Functioning	Role performance	SF-36 (Ware & Sherbourne, 1992)
		Sheehan Disability Scale (Sheehan, 1983)
Satisfaction	Satisfaction	Quality of Life Inventory (Frisch, 1994)
	Well-being	Quality of Well-Being Scale (Diener et al., 1985)

Note. For more details about the three components of quality of life, see Gladis et al. (1999).

(functioning), and satisfaction with work. These constructs can be measured using self-report; social–material conditions and functioning also can be measured using objective records, and functioning also can be observer-rated, as in a supervisor's rating of an employee's work performance. This example illustrates the value of understanding quality of life from these multiple perspectives. Regardless of the method of measurement, no single measure or even single component fully reflects all aspects of the construct.

2. The impact of PTSD on the three components of quality of life

PTSD is associated with impaired quality of life among both Veterans and nonveterans. A recent meta-analysis of quality of life in anxiety disorders (Olatunji et al., 2007) found large effect sizes for PTSD across multiple domains. In order to examine the effects of PTSD on quality of life in OEF/OIF Veterans, we searched the Published International Literature on Traumatic Stress database (PILOTS), an electronic index of literature on traumatic stress that indexes articles using a controlled vocabulary of descriptors (DE), using the following search: DE = ((Afghan War) or (Afghanistan War) or (Iraq War)) and DE = PTSD and DE = ((quality of life) or (occupational functioning) or (interpersonal interaction)). We also searched PSYCINFO and MEDLINE using the following keywords: "OIF," "OEF," "Iraq," "Afghanistan," "posttraumatic stress disorder," "SF-36," "quality of life," "functioning," "functional impairment," "well-being," and "satisfaction." Additionally, we conducted an Internet search for information about homelessness and unemployment in OEF/OIF Veterans.

In each section below, we first illustrate the findings on nonveterans and on Veterans who served prior to OEF/OIF. We then review the existing findings on the OEF/OIF cohort, which are summarized in Table 2.

2.1. PTSD and social–material conditions

Although there have been relatively few studies of objective indicators of quality of life in PTSD, the existing studies paint a consistent, negative picture. Studies of Veterans who served before OEF/OIF show that PTSD is related to increased likelihood of unemployment (Magruder et al., 2004; Savoca & Rosenheck, 2000; Smith, Schnurr, & Rosenheck, 2005; Zatzick, Weiss et al., 1997; Zatzick, Marmar et al., 1997). For example, in a sample of over 5000 Veterans enrolled in Compensated Work Therapy (less than 3% of whom served in Iraq or Afghanistan), PTSD was associated with decreased amount and likelihood of work at the end of therapy (Resnick & Rosenheck, 2008). PTSD also is related to homelessness. A study of formerly homeless Veterans found that PTSD was associated with an 85% greater risk of becoming homeless again (O'Connell, Kasprow, & Rosenheck, 2008). In addition, PTSD is related to marital instability. The National Vietnam Veterans Readjustment Study (Jordan et al., 1992; Kulka et al., 1990) found that divorce rates were elevated among male and female Vietnam Veterans with PTSD. Riggs, Byrne, Weathers, and Litz (1998) found that couples in which the male Vietnam Veteran had PTSD were more likely to be considering separation or divorce.

The effect of PTSD on social–material conditions is not limited to Veterans, however. In a nationally representative sample of US adults, a diagnosis of PTSD was associated with a 150% increase in the likelihood being unemployed (Kessler, 2000). Data from Australia (Taylor & Sharpe, 2008) show that the prevalence of PTSD is much higher in the homeless (41%) than in the Australian general population (1.5%). In 3 out of 5 cases, onset of PTSD occurred before the first episode of homelessness, which suggests that PTSD was part of the circumstances leading to homelessness. Also, having PTSD symptoms also was associated with a higher likelihood of divorce or separation in a nonveteran community sample (Amaya-Jackson et al., 1999).

2.1.1. Findings in OEF/OIF Veterans

As shown in Table 2, we found only two studies of social–material conditions and PTSD in OEF/OIF Veterans. A recent report by the Healthcare for Homeless Veterans Program (HCHV, 2008) found that the percentage of program participants with OEF/OIF service increased from 1.4% in 2005 to 3.5% in 2008. Program participants with OEF/OIF service were more likely to have a diagnosis of PTSD (43.1%) than non-OEF/OIF participants (8.0%). Rona et al. (2009) found that UK Armed Forces personnel who served in Iraq or were serving in the military during that time were more likely to have discussed divorce with their spouse in the past year if they had PTSD than if they did not.

It is reasonable to expect that evidence about the negative association between PTSD on social–material conditions will increase given findings on the effects of deployment in the OEF/OIF cohort. For example, starting in 2006, the Current Population Study, conducted for the Bureau of Labor Statistics, has collected information about the employment status of OEF/OIF-era Veterans (those who have served since September 2001) separately from Veterans of other eras. In 2006, OEF/OIF-era Veterans between the ages of 18 and 54 had a higher rate of unemployment (6.5%) than nonveterans (4.7%) (Walker, 2008). The trend has continued. In 2008, the Bureau of Labor Statistics estimated that the unemployment rate among OEF/OIF-era Veterans was 7.3%, as compared with the overall jobless rate of 4.6% for Veterans of all eras, and 5.6% for non-veterans (Bureau of Labor Statistics, 2008). In light of the problems with unemployment among OEF/OIF Veterans, it is no surprise that the Advisory Committee on Homeless Veterans (2007, 2008) has noted an increase in the numbers of OEF/OIF Veterans who are at risk for homelessness.

2.2. PTSD and functioning

There have been relatively more studies of how PTSD affects functioning, which is often operationalized as self-reported difficulties in role performance. PTSD is associated with problems across a variety of domains, including social and interpersonal functioning (e.g., Amaya-Jackson et al., 1999; Norman, Stein, & Davidson, 2007; Stein et al., 1997), marital functioning (e.g., Dekel & Solomon, 2006; Riggs et al., 1998), parental and family functioning (e.g., Cohen, Hien, & Batchelder, 2008; Jordan et al., 1992), and occupational functioning (e.g., Norman et al., 2007; Stein et al., 1997; Taylor, Wald, & Asmundson, 2006). Some studies of occupational functioning in nonveterans have operationalized functioning in more detail than overall role performance. Stein, McQuaid, Pedrelli, Lenox, and McCahill (2000) found that primary care patients with PTSD were more likely to have missed work days or report reduced productivity due to emotional problems relative to patients without an emotional disorder. Similarly, Breslau, Lucia, and Davis (2004) found that PTSD was associated with increased work loss and work cutback days.

Even individuals who do not meet full criteria for PTSD may experience functional impairment (Breslau et al., 2004; Schnurr et al., 2000; Stein et al., 1997). For example, using data from a community

Table 2
Summary of findings on quality of life in OEF/OIF Veterans.

	Social–material conditions	Functioning	S
Engelhard et al. (2007)		Relative to noncases, PTSD cases had more functional impairment at work, home, or in interpersonal relationships	
Erbes et al. (2007)		Relative to noncases, PTSD cases reported more role limitations due to physical and emotional problems, and poorer social functioning	
Healthcare for Homeless Veterans (2008)	Higher rates of PTSD in homeless OEF/OIF Veterans than non-OEF/OIF Veterans		
Hoge et al. (2007)		PTSD cases more likely than noncases to have more sick calls or to have missed work days in the past month	
Hoge et al. (2008)		PTSD and major depression mediated the relationship between missed work days due to illness and mild TBI	
Jakupcak et al. (2008)		Higher PTSD symptoms associated with poorer physical function and role functioning due to physical problems	
Lapierre et al. (2007)			H li
Nelson Goff et al. (2007)		Higher PTSD symptoms associated with poorer relationship functioning	
Ouimette et al. (2008)		Higher PTSD symptoms associated with poorer mental (psychosocial) but not physical functioning	
Pietrzak et al. (in press)		Higher PTSD symptoms associated with more psychosocial difficulties	
Renshaw et al. (2008, 2009)			H n
Rona et al. (2009)	PTSD cases more likely than noncases to have discussed divorce	PTSD caseness and higher PTSD symptoms associated with more social and work impairments	P n
Sayers et al. (2009)		PTSD cases more likely than noncases to have at least one role-related family adjustment problem	
Vasterling et al. (2008)		Higher PTSD symptoms associated with poorer physical function	

sample, Stein et al. (1997) found that full and partial PTSD groups had significantly higher social and work impairment than a group of individuals who had trauma exposure only. Work or school impairment was higher for the full PTSD group than the partial group, but the groups did not differ in impairments in home and social functioning.

Researchers have begun to examine how PTSD symptoms or symptom clusters affect different aspects of functioning. The avoidance/numbing cluster, and in particular, emotional numbing symptoms, are uniquely associated with reduced psychosocial functioning (e.g., Riggs et al., 1998; Samper, Taft, King, & King, 2004; Taylor et al., 2006). A suggested explanation for these findings is that emotional numbing leads to withdrawal and difficulties expressing emotion (Riggs et al., 1998; Samper et al., 2004). Some data indicate that other symptom clusters are important as well (Norman et al., 2007; Taylor et al., 2006), and Kuhn et al. (2003) found that effects of different clusters varied according to sample characteristics; hyperarousal symptoms were uniquely associated with poorer role functioning in a treatment-seeking sample of accident survivors, but avoidance and numbing were uniquely predictive in survivors with lower PTSD severity.

2.2.1. Studies in OEF/OIF Veterans

In contrast with the few studies of objective indicators of quality of life in OEF/OIF Veterans, there have been more studies of functioning (see Table 2). All have found that PTSD is related to lower functioning. Rona et al. (2009) found that work functioning (accomplishing less, limited in type of work, and difficulty performing work) was more impaired for UK Iraq War Veterans and Iraq-era Veterans with PTSD than for those without PTSD; additionally, the odds of impairment increased with symptom severity. Symptoms of avoidance and numbing, followed by hyperarousal symptoms, were most strongly and consistently associated with work impairment. Two studies investigated productivity and absenteeism. Three to four months post-deployment, OIF Veterans who had experienced an injury with loss of consciousness were also more likely to have more than 2 missed workdays due to illness than those with other injuries, but PTSD and depression mediated the relationship between injury and work loss (Hoge et al., 2008). Such effects can persist. A year following their return from Iraq, combat Veterans with PTSD had higher rates of sick call visits, and were more likely to have missed two or more work days in the past month, even when the effects of physical injury were taken into account (Hoge, Terhakopian, Castro, Messer, & Engel, 2007).

A study of Dutch soldiers who served in Iraq found higher levels of self-reported impairment in work, home, or interpersonal relationships for those with PTSD than for those who did not have PTSD (Engelhard et al., 2007). In a sample from the UK Armed Forces, 71% of personnel with PTSD, versus only 15% of personnel without PTSD, reported at least moderate impairment in social activities due to physical or emotional problems (Rona et al., 2009). The odds of high impairment were almost 4 times greater for those with high PTSD severity relative to those with lower severity. Sayers, Farrow, Ross, and Oslin (2009) found PTSD was associated with a higher likelihood of impairment in family functioning in a sample of OEF/OIF Veterans. Veterans who screened positive for PTSD were more likely to have one or more role-related family readjustment problems (e.g., feeling like a guest at home, being unsure or having conflict about family responsibilities). Two of these studies specifically examined the effects of PTSD symptom clusters (Rona et al., 2009; Sayers et al., 2009), finding that avoidance and numbing had the strongest relationship with impaired functioning.

Two studies examined the relationship between functioning and PTSD symptom severity (rather than PTSD diagnosis). Pietrzak et al. (in press) found that severity was associated with psychosocial difficulties at home, work, and school in a survey of Veterans who served in the Connecticut National Guard. In a small sample of US Soldiers, higher PTSD severity was correlated with poorer relationship functioning (Nelson Goff, Crow, Reisbig, & Hamilton, 2007).

Several studies used the SF-36 to measure functioning. Erbes, Westermeyer, Engdahl, and Johnsen (2007) studied OIF/OEF Veterans approximately 6 months after return from deployment. Relative to Veterans without PTSD, those with PTSD had poorer role functioning due to emotional problems, role functioning due to physical problems, and social functioning. When Erbes et al. controlled for symptoms of depression, only social functioning was significantly lower in the Veterans with PTSD. This suggests that depression mediated the relationship between PTSD and role functioning. Ouimette et al. (2008), in a small pilot study of National Guard Veterans, found that PTSD severity was associated with lower scores on the mental component, which taps psychosocial function but also includes mental health symptoms; PTSD was not correlated with the physical component score. Two other studies used the SF-36 to examine how PTSD relates to physical functioning only. Vasterling et al. (2008) found small but significant correlations between PTSD and physical component scores both before and after deployment in a non-treatment-seeking sample of OIF Soldiers. Jakupcak, Luterek, Hunt, Conybeare, and McFall (2008) also found that PTSD symptom severity was related to poorer physical function and role functioning due to physical problems in a treatment-seeking sample that consisted mostly of OEF/OIF Veterans who had served in the Army Reservists or National Guard.

2.3. PTSD and satisfaction

PTSD is associated with lower life satisfaction and well-being (e.g., Gudmundsdottir, Beck, Coffey, Miller, & Palyo, 2004; Jordan et al., 1992). One study found that almost 6 in 10 treatment-seeking nonveterans with PTSD had clinically severe reductions in overall life satisfaction, which was comparable to that of those with major depression (Rapaport, Clary, Fayyad, & Endicott, 2005).

Studies that have examined satisfaction in specific domains show that PTSD is associated with lower satisfaction with relationships (e.g., Gold et al., 2007; Koenen, Stellman, Sommer, & Stellman, 2008) and parenting (e.g., Gold et al., 2007; Ruscio, Weathers, King, & King, 2002; Samper et al., 2004), for example. However, the effects of PTSD are even broader. Rapaport et al. (2005) found that PTSD, like depression, was related to a more general pattern of lower satisfaction with multiple domains. A crosscultural validation study of a Swedish version of the QOLI (Frisch, 1994), comparing crime victims with PTSD to gender- and age-matched controls, found that the PTSD group had lower importance-weighted satisfaction with 13 of the 16 items (all except helping, relationships with children, and home) (Paunovic & Öst, 2004).

Findings on how PTSD symptom clusters are related to life satisfaction show a somewhat clearer pattern than the findings on how the clusters relate to functioning. Reexperiencing seems unrelated, or less strongly related, than the other symptoms, to satisfaction; avoidance and numbing seem most strongly related (Lunney & Schnurr, 2007; Paunovic & Öst, 2004; Ruscio et al., 2002; Samper et al., 2004; Schnurr & Lunney, 2008). In the one exception to this pattern, Berz, Taft, Watkins, and Monson (2008) found that although avoidance/numbing and hyperarousal symptoms were correlated with lower parenting satisfaction in female Vietnam Veterans, only hyperarousal had a unique association.

2.3.1. Findings in OEF/OIF Veterans

To our knowledge, there has been only a single published study of overall life satisfaction in OEF/OIF Veterans (see Table 2). Lapierre, Schwegler, and LaBauve (2007) assessed PTSD symptoms and life satisfaction in a large sample of OEF/OIF Veterans who were participating in a reintegration training program. Veterans with clinically significant PTSD symptoms had lower life satisfaction, as measured by

the Satisfaction With Life Scale (Diener et al., 1985). The symptomatic group had average satisfaction scores that were at or slightly below the midpoint of the scale, whereas a nonsymptomatic group had average scores that were similar to those found in normative samples. Both symptoms of depression and symptoms of PTSD were negatively correlated with satisfaction.

Table 2 also show that marital function is the only specific domain of life satisfaction that has been investigated in OEF/OIF Veterans. Rona et al. (2009) found that UK Iraq war and era Veterans with PTSD were less satisfied with their marriages than those without PTSD. Renshaw, Rodrigues, and Jones (2008, 2009) found that marital distress was relatively low in a group of National Guard Soldiers (14%), similar to that of community samples. However, Soldiers' marital satisfaction was negatively correlated with PTSD symptoms.

2.4. Longitudinal associations between PTSD and quality of life

One implication of the association between PTSD and quality of life is that changes in one domain would result in corresponding changes in the other. There is ample evidence from longitudinal studies showing that PTSD (or acute stress disorder in samples assessed within 30 days of traumatic exposure) predicts poor quality of life at some later date (e.g., Golden-Kreuz et al., 2005; Koenen et al., 2008; Solomon & Mikulincer, 2007). We identified only one such study in OEF/OIF Veterans. Vasterling et al. (2008) examined PTSD and physical function before and after deployment in a group of OIF soldiers. Higher predeployment PTSD severity was correlated with lower postdeployment physical functioning, but lower predeployment physical functioning also was correlated with higher postdeployment PTSD severity. The correlations were almost identical: $r = -.12$ versus $r = -.13$, respectively.

Although most longitudinal studies have used measures of total PTSD severity, two studies examined how change in specific types of symptoms relates to change in quality of life. Taylor et al. (2006) found differential patterns of relationships between decreases in symptoms and improvements in functioning. Decreased reexperiencing was related to improved occupational, social, and family functioning. Avoidance was related only to social functioning, and numbing and hyperarousal were related only to occupational functioning. There also were differential patterns of relationships for depression and PTSD, which suggests that the effects of PTSD on functioning are not merely due to comorbid depression. Lunney and Schnurr (2007) examined how change in PTSD symptom clusters was related to change in satisfaction with domains of quality of life on the QOLI (Frisch, 1994): achievement (e.g., work, money), self-expression (e.g., play, creativity), relationships (e.g., friends, family), and surroundings (e.g., neighborhood, home). Improvements in each cluster were related to improvements in all domains, except change in avoidance was unrelated to change in surroundings. However, only numbing had unique effects on each domain.

Most of the evidence on temporal relationships between PTSD and quality of life is grounded in a conceptualization in which impaired quality of life is a consequence of PTSD, but both directions are plausible and likely, as illustrated in the study by Vasterling et al. (2008). Consider the case of an individual who develops PTSD and then has difficulty at work due to irritability and impaired concentration. Conflicts with supervisors and colleagues and poor work performance could then result in the individual being reprimanded or even being fired, and the stress of job loss and economic difficulties could in turn exacerbate PTSD symptoms.

Two studies investigated how symptoms and quality of life interact over time. Schnurr et al. (2006) examined synchronous and lagged effects of change in PTSD symptoms on change in psychosocial and physical health-related quality of life, using data from the clinical trial for male Vietnam veterans mentioned above (Schnurr et al., 2003). Synchronous effects were defined as occurring within the same time period. Lagged effects were defined as change from one period to a subsequent period. As symptoms improved, so did quality of life, but the effects were synchronous and not lagged, with one exception. Change in physical quality of life from 0 to 7 months predicted change in PTSD symptoms from 7 to 12 months (beyond the change explained by change in quality of life from 0 to 7 months). Ramchand, Marshall, Schell, and Jaycox (2008) examined the relationship between PTSD and physical health-related quality of life in injured survivors of community violence who were assessed within 1 week of injury, and then 3 and 12 months later. The direction of the relationship between symptoms and quality of life changed over time. Higher PTSD symptoms at 1 week predicted lower quality of life at 3 months, but symptoms at 3 months did not predict quality of life at 12 months. In contrast, quality of life (retrospectively-rated) prior to injury did not predict PTSD symptoms at 3 months, but lower quality of life at 3 months predicted higher symptoms at 12 months.

2.5. Summary

There have been relatively few studies of PTSD and quality of life in OIF/OEF Veterans, especially of social–material conditions and life satisfaction. Only two studies (Rona et al., 2009; Sayers et al., 2009), both on functioning, examined whether there are differential patterns of relationships between the symptom clusters of PTSD and quality of life. Furthermore, there have been very few attempts to disentangle the effects of PTSD from the effects of depression and other comorbidities, and only one study that examined the longitudinal association between PTSD and quality of life (Vasterling et al., 2008). Nevertheless, the findings in this cohort mirror the findings obtained from studies of civilians and other military cohorts. PTSD is associated with reduced quality of life in OEF/OIF Veterans—despite the relatively new onset of PTSD due to deployment in Iraq or Afghanistan and efforts by VA and DoD to identify and treat PTSD in returnees.

3. Clinical implications for treating OEF/OIF Veterans

The growing evidence showing that PTSD is related to impaired quality of life in OEF/OIF Veterans has implications for clinical practice. One question is whether treating PTSD can improve quality of life. There have been no randomized clinical trials of treatment in OEF/OIF Veterans, but evidence from other cohorts supports this assumption. With few exceptions (Glynn et al., 1999; Schnurr et al., 2003), studies have shown that both psychotherapy (e.g., Cloitre, Koenen, Cohen, & Han, 2002; Ehlers et al., 2003; Foa et al., 2005) and pharmacotherapy (e.g., Brady et al., 2000; Davidson et al., 2006; Rapaport, Endicott, & Clary, 2002) can improve psychosocial quality of life. Several studies have included measures of both psychosocial and physical health-related quality of life; one found that treatment improved psychosocial but not physical functioning (Malik et al., 1999), another found the opposite (Mueser et al., 2008), and one found no effect on either domain (Schnurr et al., 2003).

Another question concerns the effectiveness of interventions for psychosocial and occupational problems in PTSD patients. There have been few investigations of this question in any cohort, and the evidence is inconclusive. Rosenheck, Stolar, and Fontana (2000) found that Compensated Work Therapy not only improved employment outcomes symptoms in a sample of Veterans with chronic war-related PTSD, but also resulted in a reduction in PTSD symptoms. However, these improvements did not differ from improvements in a (propensity-score) matched sample receiving standard treatment for PTSD. It may be especially difficult to address work-related problems in Veterans with chronic PTSD. Resnick and Rosenheck (2008) reported that Veterans with PTSD were 19% *less* likely than other Veterans to work after receiving Compensated Work Therapy, and that Vietnam Veterans with PTSD were even less likely to work. Yet it is important to keep in mind that these results may not

generalize to OEF/OIF Veterans, first of all, because their PTSD is so much more recent, and second, because older Guard and Reserve troops typically had long-established work histories before deploying. This does not mean that these individuals can simply resume their jobs—PTSD can cause difficulties even for previously successful men and women—but it does at least indicate that there is a history of skill and competence that a clinician can build upon in treatment.

Two treatment studies targeted relationship problems in PTSD patients. Glynn and colleagues (1999) examined whether adding Behavioral Family Therapy could enhance the effectiveness of exposure therapy. Unfortunately, although Veterans who received either exposure alone or exposure with family therapy had better PTSD outcomes than Veterans assigned to a waiting list, none of the 3 groups differed in social adjustment after treatment, and in fact, did not even improve from baseline levels. Monson, Stevens, and Schnurr (2004) reported more encouraging results in an open trial of PTSD treatment presented in couple's format, Cognitive-Behavioral Conjoint Therapy. After treatment, Veterans had improved family and couples functioning, although social functioning did not improve. Monson, Fredman, and Adair (2008) illustrated the treatment in a case presentation of a male OEF/OIF Veteran that highlights the issues likely to be encountered when treating these Veterans. One is that many tend to be married or living with a significant other and also tend to have children, which means that clinicians are likely to need to address family and interpersonal functioning problems.

Another question is how to use the evidence on PTSD and quality of life to formulate a treatment plan. Careful psychosocial assessment can provide a basis for determining the patient's needs and how to address those needs in light of the patient's strengths and weaknesses. For many patients, adequately treating their PTSD symptoms may be sufficient to resolve their functional problems. In patients for whom functional difficulties are especially prominent, additional intervention focused on these problems should be considered jointly with, or after an adequate course of, treatment for PTSD. Family or couples therapy may be indicated; at the very least, clinicians should consider including family members in care to enhance the Veteran's functioning or to prevent future functional difficulties. When treating functional problems in OEF/OIF Veterans, it is necessary to consider the possible presence of traumatic brain injury (TBI). Depending upon level of severity, TBI may be associated with difficulties that could further impair functioning in individuals with PTSD. Clinicians may need to work with a team that includes rehabilitation specialists, social workers, and others and ensure that PTSD treatment is delivered in coordination with the services delivered by these professionals. Another potentially important clinical consideration is that some returning Veterans may be redeployed to Iraq or Afghanistan. The clinician may need to address the stress and tension that such circumstances can create in relation to employment status and interpersonal relationships.

4. Knowledge gaps

There is a need for more research on the relationship between PTSD and quality of life in OEF/OIF Veterans. Most studies of quality of life in this cohort have focused on functioning, so there is a particular need for investigations of how PTSD relates to social–material conditions and life satisfaction. Other priorities are longitudinal studies and clinical trials to determine whether PTSD treatment improves quality of life.

Population surveys can help us understand the breadth of the impact of PTSD on quality of life (i.e., how many Veterans with PTSD report moderate impairments in quality of life). Studies of treatment-seeking samples or at-risk groups may give us a better sense of the depth of the problem. Although there have been several investigations of risk and resilience factors associated with PTSD in OEF/OIF Veterans (e.g., Iverson et al., 2008; Riddle, Sanders, Jones, & Webb, 2008), it is not known whether the predictors of risk and resilience for quality of life impairment the same as those for PTSD itself.

Given the demographic differences between OEF/OIF Veterans relative to other conflicts in terms of gender, ethnicity, age, and proportion of National Guard/Reservists, there is a unique opportunity to examine how PTSD relates to quality of life in these different subgroups of Veterans. For example, most of the research on OEF/OIF Veterans up to this point has been focused on men; the possibility of gender differences in the impact of PTSD on quality of life deserves further investigation. Some past research has suggested that the effect of PTSD on quality of life may be stronger for male than for female Veterans (e.g., Zatzick, Marmar et al., 1997; Zatzick, Weiss et al., 1997) but other research suggest no difference between male and female Veterans (e.g., Magruder et al., 2004; Schnurr & Lunney, 2008).

More research is needed to understand how the unique pre-, during, and post-deployment experiences affect the relationship between PTSD and quality of life in National Guard and Reservists, who are at elevated risk of negative outcomes (e.g., Browne et al., 2007; Rundell, 2006). Upon return from deployment, National Guard and Reservists must readjust to their civilian roles and responsibilities, which may cause adjustment difficulties (Renshaw et al., 2009). It also may be more difficult for National Guard and Reservists to access VA or installation-based support programs and behavioral health care (APA Presidential Task Force on Military Deployment Services for Youth, Families and Service Members, 2007).

PTSD and depression are highly comorbid in OEF/OIF Veterans (e.g., Grieger et al., 2006; Lapierre et al., 2007; Tanelian & Jaycox, 2008), and depression also can have negative effects on quality of life (e.g., Rapaport et al., 2005). Untangling the unique effects of PTSD is further complicated by the overlap in symptoms between the two disorders. Some studies have found that the effect of PTSD is on aspects of functioning is mediated by depression (Erbes et al., 2007; Gudmundsdottir et al., 2004). Understanding the shared and unique impacts of these two disorders on quality of life has important implications for treatment planning.

There are assessment and methodological issues to consider if we regard quality of life as an important outcome in understanding how PTSD affects the lives of OEF/OIF Veterans. First, some instruments used to assess quality of life, including the widely-used component scales from the SF-36, also include measures of symptoms. Such measures blur the distinction between a problem such as PTSD and its relationship with quality of life. Second, it is important to look at the impact of PTSD (and treatment of PTSD) on all three components of quality of life (objective life circumstances, role functioning, and subjective life satisfaction); few studies have assessed more than one of the three components. Katschnig (2006) points out that the different components of quality of life may have different rates of change. In their model of the consequences of postdeployment mental health, Karney et al. (2008) propose that resources and vulnerabilities can influence the short-term effects of mental health conditions such as PTSD. These short-term effects may in turn lead to negative long-term outcomes. A similar framework could apply to quality of life outcomes, as each component may interact mutually over time. Quality of life indices might function as predisposing risk or resilience factors, or as short- or long-term consequences of PTSD. For example, being married might function as a resilience factor by buffering the effects of warzone deployment, but PTSD might lead to poor relationship functioning, and ultimately, to divorce. Finally, including assessments of each component from multiple perspectives (e.g., spouses, co-workers) addresses not only the potential "psychopathological fallacies" of relying solely on subjective satisfaction (Katschnig, 2006), but also gives a broader picture of the indirect effect that PTSD has on others.

Although many important research questions can be answered with cross-sectional designs, there is a need for longitudinal research to help us understand the dynamic interplay between PTSD and

quality of life over time. This information is important to advance scientific understanding and to support treatment. We need more conclusive knowledge about how components of quality of life respond to PTSD treatment and how to optimize treatment to ensure that it results in improved quality of life. We also need to know how treatment focused specifically on quality of life, such as work therapy or couples therapy, affects PTSD.

5. Conclusions

Our review indicates that the findings on PTSD and quality of life in OEF/OIF Veterans are comparable with findings obtained from other war cohorts and from nonveterans. This literature on is at an early stage, but the consistency of the evidence is striking. Even though the duration of PTSD in OEF/OIF Veterans is much shorter than in Vietnam Veterans, for example, those with PTSD in both cohorts are likely to experience poorer functioning and lower objective living conditions and satisfaction.

However, the similarity of findings on PTSD and quality of life across cohorts and samples obscures an important consideration. Because PTSD onset in many OEF/OIF Veterans has been relatively recent, it may be possible to reverse or even prevent a downward spiral of interaction between poor quality of life and PTSD by effectively treating PTSD. But improved quality of life should be prioritized as a goal of treatment. In their review of the literature on quality of life, Gladis et al. (1999) posed an important question: "Should clinicians and their patients feel that the job is not done (or not done well) if symptoms are alleviated but other areas of the patient's life are not fully satisfying?" (p. 328). This question should guide the approach to treating PTSD in OEF/OIF Veterans as well as Veterans of all eras.

References

Advisory Committee on Homeless Veterans. (2007). 2007 Annual report of the Advisory Committee on Homeless Veterans Retrieved March 23, 2009 from http://www1.va.gov/advisory/docs/ReportHomeless2007.pdf

Advisory Committee on Homeless Veterans. (2008). Annual report of the Advisory Committee on Homeless Veterans Retrieved March 23, 2009 from http://www1.va.gov/advisory/docs/ReportHomeless2008Annual6-13-2008.pdf

Amaya-Jackson, L., Davidson, J. R., Hughes, D. C, Swartz, M., Reynolds, V., George, L. K., et al. (1999). Functional impairment and utilization of services associated with posttraumatic stress in the community. *Journal of Traumatic Stress*, *12*, 709– 723.

American Psychological Association Presidential Task Force on Military Deployment for Youth, Families and Service Members. (2007). The psychological needs of US Military service members and their families: A preliminary report Retrieved March 16, 2009, from http://www.apa.org/releases/MilitaryDeploymentTaskForceReport.pdf

Berz, J. B., Taft, C. T., Watkins, L. E., & Monson, C. M. (2008). Associations between PTSD symptoms and parenting satisfaction in a female veteran sample. *Journal of Psychological Trauma*, *7*, 37– 45.

Brady, K., Pearlstein, T., Asnis, G. M., Baker, D., Rothbaum, B., Sikes, C. R., et al. (2000). Efficacy and safety of sertraline treatment of posttraumatic stress disorder. *Journal of the American Medical Association*, *283*, 1837– 1844.

Breslau, N., Lucia, V. C., & Davis, G. C. (2004). Partial PTSD versus full PTSD: An empirical examination of associated impairment. *Psychological Medicine*, *34*, 1205– 1214.

Browne, T., Hull, L., Horn, O., Jones, M., Murphy, D., Fear, N. T., et al. (2007). Explanations for the increase in mental health problems in UK reserve forces who have served in Iraq. *British Journal of Psychiatry*, *190*, 484– 489.

Bureau of Labor Statistics. (2008). Employment situation of veterans: 2008 Retrieved August12, 2009 from http://www.bls.gov/news.release/pdf/vet.pdf

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, *70*, 1067– 1074.

Cohen, L. R., Hien, D. A., & Batchelder, S. (2008). The impact of cumulative maternal trauma and diagnosis on parenting behavior. *Child Maltreatment*, *13*, 27– 38.

Davidson, J. R. T., Rothbaum, B. O., Tucker, P., Asnis, G., Benattia, I., & Musgnung, M. T. (2006). Venlafaxine extended release in posttraumatic stress disorder: A sertraline and placebo-controlled study. *Journal of Clinical Psychopharmacology*, *26*, 259– 267.

Dekel, R., & Solomon, Z. (2006). Marital relations among former prisoners of war: Contribution of posttraumatic stress disorder, aggression, and sexual satisfaction. *Journal of Family Psychology*, *20*, 709– 712.

Diener, E., Emmons, R., Larsen, J., & Griffin, S. (1985). The satisfaction with Life Scale. *Journal of Personality Assessment*, *49*, 71– 75.

Ehlers, A., Clark, D. M., Hackmann, A., McManus, F., Fennell, M., Herbert, C., et al. (2003). A randomized controlled trial of cognitive therapy, a self-help booklet, and repeated assessments as early interventions for posttraumatic stress disorder. *Archives of General Psychiatry*, *60*, 1024– 1032.

Engelhard, I. M., Van Den Hout, M. A., Weerts, J., Arntz, A., Hox, J. J. C. M., & McNally, R. J. (2007). Deployment-related stress and trauma in Dutch soldiers returning from Iraq. *British Journal of Psychiatry*, *191*, 140– 145.

Erbes, C., Westermeyer, J., Engdahl, B., & Johnsen, E. (2007). Post-traumatic stress disorder and service utilization in a sample of service members from Iraq and Afghanistan. *Military Medicine*, *172*, 359– 363.

Foa, E. B., Hembree, E. A., Cahill, S. P., Rauch, S. A. M., Riggs, D. S., Feeny, N. C., et al. (2005). Randomized trial of prolonged exposure for PTSD with and without cognitive restructuring: Outcome at academic and community clinics. *Journal of Consulting and Clinical Psychology*, *73*, 953– 964.

Fontana, A., & Rosenheck, R. (2008). Treatment-seeking veterans of Iraq and Afghanistan: Comparison with veterans of previous wars. *Journal of Nervous and Mental Disease*, *196*, 513– 521.

Frisch, M. B. (1994). *QOLI or Quality of Life Inventory*. Minneapolis, MN: Pearson Assessments.

Gladis, M. M., Gosch, E. A., Dishuk, N. M., & Crits-Christoph, P. (1999). Quality of life: Expanding the scope of clinical significance. *Journal of Consulting and Clinical Psychology*, *67*, 320– 331.

Glynn, S. M., Eth, S., Randolph, E. T., Foy, D. W., Urbaitis, M., Boxer, L., et al. (1999). A test of behavioral family therapy to augment exposure for combat-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, *67*, 243– 251.

Gold, J. I., Taft, C. T., Keehn, M. G., King, D. W., King, L. A., & Samper, R. E. (2007). PTSD symptom severity and family adjustment among female Vietnam veterans. *Military Psychology*, *19*, 71– 81.

Golden-Kreuz, D. M., Thornton, L. M., Wells-Di Gregorio, S., Frierson, G. M., Jim, H. S., Carpenter, K. M., et al. (2005). Traumatic stress, perceived global stress, and life events: Prospectively predicting quality of life in breast cancer patients. *Health Psychology*, *24*, 288– 296.

Grieger, T. A., Cozza, S. J., Ursano, R. J., Martinez, P. E., Wain, H. J., Engel, C. C., et al. (2006). Posttraumatic stress disorder and depression in battle-injured soldiers. *American Journal of Psychiatry*, *163*, 1777– 1783.

Gudmundsdottir, B., Beck, J. G., Coffey, S. F., Miller, L., & Palyo, S. A. (2004). Quality of life and post trauma symptomatology in motor vehicle accident survivors: The mediating effects of depression and anxiety. *Depression and Anxiety*, *20*, 187– 189.

Healthcare for Homeless Veterans Program. (2008). HCHV Program contacts who reported service in Operations Enduring Freedom and Iraqi Freedom (OEF/OIF) theatre of operations, FY 2005–2008 Washington, DC: Department of Veterans Affairs.

Hoge, C. W., McGurk, D., Thomas, J. L., Cox, A. L, Engel, C. C., & Castro, C. A. (2008). Mild traumatic brain injury in U.S. soldiers returning from Iraq. *New England Journal of Medicine*, *358*, 453– 463.

Hoge, C. W., Terhakopian, A., Castro, C. A., Messer, S. C., & Engel, C. C. (2007). Association of posttraumatic stress disorder with somatic symptoms, health care visits, and absenteeism among Iraq War Veterans. *American Journal of Psychiatry*, *164*, 150– 153.

Iverson, A. C., Fear, N. T., Ehlers, A., Hacker Hughes, J., Hull, M. E., Greenberg, N., et al. (2008). Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. *Psychological Medicine*, *38*, 511– 522.

Jakupcak, M., Luterek, J., Hunt, S., Conybeare, D., & McFall, M. (2008). Posttraumatic stress and its relationship to physical health functioning in a sample of Iraq and Afghanistan war veterans seeking postdeployment VA health care. *Journal of Nervous and Mental Disease*, *196*, 425– 428.

Jordan, B. K., Marmar, C. R., Fairbank, J. A., Schlenger, W. E., Kulka, R. A, Hough, R. L., et al. (1992). Problems in families of male Vietnam veterans with posttraumatic stress syndrome. *Journal of Consulting and Clinical Psychology*, *60*, 916– 926.

Kaplan, R. M. (2003). The significance of quality of life in health care. *Quality of Life Research*, *12*(Suppl. 1), 3– 16.

Karney, B. R., Ramchand, R., Osilla, K. C., Caldarone, L. B., & Burns, R. M. (2008). Predicting the immediate and long-term consequences of post-traumatic stress disorder, depression, and traumatic brain injury in veterans of Operation Enduring Freedom and Operation Iraqi Freedom. In T. Tanelian & L.H. Jaycox (Eds.), Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery (pp. 119–166). Santa Monica, CA: Rand.

Katschnig, H. (2006). How useful is the concept of quality of life in psychiatry? In H. Katschnig, H. Freedman, & N. Sartorius (Eds.), *Quality of life in mental disorders* (pp. 3– 17). Chichester, England: John Wiley & Sons.

Kessler, R. C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. *Journal of Clinical Psychiatry*, *61*(suppl. 5), 5– 12.

Koenen, K. C., Stellman, S. D., Sommer, J. F., & Stellman, J. M. (2008). Persisting posttraumatic stress disorder symptoms and their relationship to functioning in Vietnam veterans: A 14-year follow-up. *Journal of Traumatic Stress*, *21*, 49– 57.

Kuhn, E., Blanchard, E. B., & Hickling, E. J. (2003). Posttraumatic stress disorder and psychosocial functioning within two samples of MVA survivors. *Behaviour Research and Therapy*, *41*, 1105– 1112.

Kulka, R. A., Schlenger, W. E., Fairbank, J. A., Hough, R. L, Jordan, B. K, Marmar, C. R., et al. (1990). Trauma and the Vietnam War Generation: Report of Findings from the National Vietnam Veterans Readjustment Study New York: Brunner/Mazel.

Lapierre, C. B., Schwegler, A. F., & LaBauve, B. J. (2007). Posttraumatic stress and depression symptoms in soldiers returning from combat operations in Iraq and Afghanistan. *Journal of Traumatic Stress*, *20*, 933– 943.

Lunney, C. A., & Schnurr, P. P. (2007). Domains of quality of life in male veterans treated for PTSD. *Journal of Traumatic Stress*, *20*, 955– 964.

Magruder, K. M., Frueh, B. C., Knapp, R. G., Johnson, M. R., Vaughan, J. A., III, Carson, T. C., et al. (2004). PTSD symptoms, demographic characteristics, and functional status among veterans treated in VA primary care clinics. *Journal of Traumatic Stress*, *17*, 293– 301.

Malik, M., Connor, K., Sutherland, S., Smith, R., Davison, R., & Davidson, J. (1999). Quality of life and posttraumatic stress disorder: A pilot study assessing changes in SF-36 scores before and after treatment in a placebo-controlled trial of fluoxetine. *Journal of Traumatic Stress*, *12*, 387– 393.

Mendlowicz, M. V., & Stein, M. B. (2000). Quality of life in individuals with anxiety disorders. *American Journal of Psychiatry*, *157*, 669– 682.
Mogotsi, M., Kaminer, D., & Stein, D. J. (2000). Quality of life in the anxiety disorders. *Harvard Review of Psychiatry*, *8*, 273– 282.
Monson, C. M., Fredman, S. J., & Adair, K. C. (2008). Cognitive–behavioral conjoint therapy for posttraumatic stress disorder: Application to Operation Enduring and Iraqi Freedom veterans. *Journal of Clinical Psychology*, *64*, 958– 971.
Monson, C. M., Stevens, S. P., & Schnurr, P. P. (2004). Cognitive–behavioral couple's treatment for posttraumatic stress disorder. In T. A. Corales (Ed.), *Focus on posttraumatic stress disorder research* (pp. 251– 280). Hauppauge, NY: Nova Science.
Mueser, K. T., Rosenberg, S. D., Xie, H., Jankowski, M. K., Bolton, E. E., Lu, W., et al. (2008). A randomized controlled trial of cognitive–behavioral treatment for posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology*, *76*, 259– 271.
National Comorbidity Study Replication. (2007). 12-month prevalence of DSM-IV/WMH-CIDI disorders by sex and cohort Retrieved March 23, 2009 from http://www.hcp.med.harvard.edu/ncs/ftpdir/table_ncsr_12monthprevgenderxage.pdf
Nelson Goff, B. S., Crow, J. R., Reisbig, A. M. J, & Hamilton, S. (2007). The impact of individual trauma symptoms of deployed soldiers on relationship satisfaction. *Journal of Family Psychology*, *21*, 344– 353.
Norman, S. B., Stein, M. B., & Davidson, J. R. T. (2007). Profiling posttraumatic functional impairment. *Journal of Nervous and Mental Disease*, *195*, 48– 53.
O'Connell, M. J., Kasprow, W., & Rosenheck, R. A. (2008). Rates and risk factors for homelessness after successful housing in a sample of formerly homeless veterans. *Psychiatric Services*, *59*, 268– 275.
Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review*, *27*, 572– 581.
Ouimette, P., Coolhart, D., Sugarman, D., Funderburk, J. S., Zelman, R. H., & Dornau, C. (2008). A pilot study of posttraumatic stress and associated functioning of Army National Guard following exposure to Iraq warzone trauma. *Traumatology*, *14*, 51– 56.
Patrick, D. L., & Erickson, P. (1993). *Health status and health policy: Quality of life in health care evaluation and resource allocation.* New York: Oxford University Press.
Paunovic, N., & Öst, L. -G. (2004). Clinical validation of the Swedish version of the Quality of Life Inventory in crime victims with posttraumatic stress disorder and a nonclinical sample. *Journal of Psychopathology and Behavioral Assessment*, *26*, 15– 21.
Pietrzak, R.H, Johnson, D.C., Goldstein, M.B., Malley, J.C., Rivers, A.J., Morgan, C.A., et al. (in press). Psychosocial buffers of traumatic stress, depressive symptoms, and psychosocial difficulties in veterans of Operations Enduring Freedom and Iraqi Freedom: The role of resilience, unit support, and postdeployment social support. Journal of Affective Disorders.
Quilty, L. C., Van Amerigen, M., Mancini, C., Oakman, J., & Farvolden, P. (2003). Quality of life and the anxiety disorders. *Journal of Anxiety Disorders*, *17*, 405– 426.
Ramchand, R., Marshall, G. N., Schell, T. L., & Jaycox, L. H. (2008). Posttraumatic distress and physical functioning: A longitudinal study of injured survivors of community violence. *Journal of Consulting and Clinical Psychology*, *76*, 668– 676.
Rapaport, M. H., Clary, C., Fayyad, R., & Endicott, J. (2005). Quality-of-life impairment in depressive and anxiety disorders. *American Journal of Psychiatry*, *162*, 1171– 1178.
Rapaport, M. H., Endicott, J., & Clary, C. (2002). Posttraumatic stress disorder and quality of life: Results from 64 weeks of sertraline treatment. *Journal of Clinical Psychiatry*, *63*, 59– 65.
Renshaw, K. D., Rodrigues, C. S., & Jones, D. M. (2008). Psychological symptoms and marital satisfaction in spouses of Operation Iraqi Freedom Veterans: Relationships with spouses' perceptions of veterans' experiences and symptoms. *Journal of Family Psychology*, *22*, 586– 594.
Renshaw, K. D., Rodrigues, C. S., & Jones, D. M. (2009). Combat exposure, psychological symptoms, and marital satisfaction in National Guard soldiers who served in Operation Iraqi Freedom from 2005 to 2006. *Anxiety, Stress & Coping*, *22*, 101– 115.
Resnick, S. G., & Rosenheck, R. A. (2008). Posttraumatic stress disorder and employment in veterans participating in Veterans Health Administration Compensated Work Therapy. *Journal of Rehabilitation Research & Development*, *45*, 427– 436.
Riddle, M. S., Sanders, J. W., Jones, J. J., & Webb, S. C. (2008). Self-reported combat stress indicators among troops deployed to Iraq and Afghanistan: An epidemiological study. *Comprehensive Psychiatry*, *49*, 340– 345.
Riggs, D. S., Byrne, C. A., Weathers, F. W., & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: Problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress*, *11*, 87– 101.
Rona, R. J., Jones, M., Iverson, A., Hull, L., Greenberg, N., Fear, N. T., et al. (2009). The impact of posttraumatic stress disorder on impairment in the UK military at the time of the Iraq war. *Journal of Psychiatric Research*, *43*, 649– 655.
Rosenheck, R., Stolar, M., & Fontana, A. (2000). Outcomes monitoring and the testing of new psychiatric treatments: Work therapy in the treatment of chronic post-traumatic stress disorder. *Health Services Research*, *35*, 133– 151.
Rundell, J. R. (2006). Demographics of and diagnoses in Operation Enduring Freedom and Operation Iraqi Freedom personnel who were psychiatrically evacuated from theater of operations. *General Hospital Psychiatry*, *28*, 352– 356.
Ruscio, A. M., Weathers, F. W., King, L. A., & King, D. W. (2002). Male war-zone veterans' perceived relationships with their children: The importance of emotional numbing. *Journal of Traumatic Stress*, *15*, 351– 357.
Samper, R. E., Taft, C. T., King, D. W., & King, L. A. (2004). Posttraumatic stress disorder symptoms and parenting satisfaction among a national sample of male Vietnam veterans. *Journal of Traumatic Stress*, *17*, 311– 315.
Sampson, R. J., & Laub, J. H. (1996). Socioeconomic achievement in the life course of disadvantaged men: Military service as a turning point, circa 1940–1965. *American Sociological Review*, *61*, 347– 367.
Savoca, E., & Rosenheck, R. (2000). The civilian labor market experiences of Vietnam-era veterans: The influence of psychiatric disorders. *Journal of Mental Health Policy and Economics*, *3*, 199– 207.
Sayers, S. L., Farrow, V. A., Ross, J., & Oslin, D. W. (2009). Family problems among recently returned military veterans referred for a mental health evaluation. *Journal of Clinical Psychiatry*, *70*, 163– 170.
Schell, T. L., & Marshall, G. N. (2008). Survey of individuals previously deployed for OEF/OIF. In T. Tanelian, & L. H. Jaycox (Eds.), *Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery* (pp. 87– 115). Santa Monica, CA: Rand Corporation.
Schneier, F. R., & Pantol, G. (2006). Quality of life in anxiety disorders. In H. Katschnig, H. Freedman, & N. Sartorius (Eds.), *Quality of life in mental disorders* (pp. 141– 152)., 2nd ed. Chichester, England: John Wiley & Sons.
Schnurr, P. P., Ford, J. D., Friedman, M. J., Green, B. L., Dain, B. J., & Sengupta, A. (2000). Predictors and outcomes of posttraumatic stress disorder in World War II veterans exposed to mustard gas. *Journal of Consulting and Clinical Psychology*, *68*, 258– 268.
Schnurr, P. P., Friedman, M. J., Foy, D. W., Shea, M. T., Hsieh, F. Y., Lavori, P. W., et al. (2003). Randomized trial of trauma-focused group therapy for posttraumatic stress disorder: Results from a Department of Veterans Affairs Cooperative Study. *Archives of General Psychiatry*, *60*, 481– 489.
Schnurr, P. P., Hayes, A. F., Lunney, C. A., McFall, M., & Uddo, M. (2006). Longitudinal analysis of the relationship between symptoms and quality of life in veterans treated for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, *74*, 707– 713.
Schnurr, P. P., & Lunney, C. A. (2008). An exploration of gender differences in the relationship between quality of Life and posttraumatic stress disorder in male and female veterans. *Journal of Rehabilitation Research and Development*.
Schnurr, P. P., Rosenberg, S. D., & Friedman, M. J. (1993). Change in MMPI scores from college to adulthood as a function of military service. *Journal of Abnormal Psychology*, *102*, 288– 296.
Seedat, S., Lochner, C., Vythilingum, B., & Stein, D. J. (2006). Disability and quality of life in post-traumatic stress disorder: Impact of drug treatment. *Pharmacoeconomics*, *24*, 989– 998.
Sheehan, D. V. (1983). *The anxiety disease.* New York: Charles Scribner's Sons.
Smith, M. W., Schnurr, P. P., & Rosenheck, R. M. (2005). Employment outcomes and PTSD symptom severity. *Mental Health Services Research*, *7*, 89– 101.
Solomon, Z., & Mikulincer, M. (2007). Posttraumatic intrusion, avoidance, and social functioning: A 20-year longitudinal study. *Journal of Consulting and Clinical Psychology*, *75*, 316– 324.
Stein, M. B., McQuaid, J. R., Pedrelli, P., Lenox, R., & McCahill, M. E. (2000). Posttraumatic stress disorder in the primary care medical setting. *General Hospital Psychiatry*, *22*, 261– 269.
Stein, M. B., Walker, J. R., Hazen, A. L., & Forde, D. R. (1997). Full and partial posttraumatic disorder: Findings from a community survey. *American Journal of Psychiatry*, *154*, 1114– 1119.
Tanelian, T., & Jaycox, L. H. (Eds.). (2008). *Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery* Santa Monica, CA: Rand.
Taylor, K. M., & Sharpe, L. (2008). Trauma and post-traumatic stress disorder among homeless adults in Sydney. *Australian and New Zealand Journal of Psychiatry*, *42*, 206– 213.
Taylor, S., Wald, J., & Asmundson, G. J. G. (2006). Factors associated with occupational impairment in people seeking treatment for posttraumatic stress disorder. *Canadian Journal of Community Mental Health*, *25*, 289– 301.
Vasterling, J. J., Schumm, J., Proctor, S. P., Gentry, E., King, D. W., & King, L. A. (2008). Posttraumatic stress disorder and health functioning in a non-treatment-seeking sample of Iraq war veterans: A prospective analysis. *Journal of Rehabilitation Research & Development*, *45*, 347– 358.
Walker, J. A. (2008). Employment characteristics of Gulf War-era II veterans in 2006: A visual essay. *Monthly Labor Review*, *131*, 3– 13.
Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): I. *Conceptual framework and item selection. Medical Care*, *30*, 473– 483.
WHOQOL Group. (1996). WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment Geneva: World Health Organization.
World Health Organization. (1948). Constitution of the World Health Organization Geneva: World Health Organization.
Zatzick, D. F., Marmar, C. R., Weiss, D. S., Browner, W. S., Metzler, T. J., Golding, J. M., et al. (1997). Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *American Journal of Psychiatry*, *154*, 1690– 1695.
Zatzick, D. F., Weiss, D. S., Marmar, C. R., Metzler, T. J., Wells, K., Golding, J. M., et al. (1997). Posttraumatic stress disorder and functioning and quality of life outcomes in female Vietnam veterans. *Military Medicine*, *162*, 661– 665.