

Prevalence of posttraumatic stress disorder in Veterans Affairs primary care clinics

Kathryn M. Magruder, M.P.H., Ph.D.^{a,b,*}, B. Christopher Frueh, Ph.D.^{a,b},
Rebecca G. Knapp, Ph.D.^c, Lori Davis, M.D.^{d,e}, Mark B. Hamner, M.D.^{a,b},
Renée Hebert Martin, Ph.D.^c, Paul B. Gold, Ph.D.^b, George W. Arana, M.D.^{a,b}

^aMental Health Service, Ralph H. Johnson Veterans Affairs Medical Center, 109 Bee Street, Charleston, SC 29401-5799, USA

^bDepartment of Psychiatry and Behavioral Sciences, Medical University of South Carolina, Charleston, SC 29425, USA

^cDepartment of Biostatistics, Bioinformatics and Epidemiology, Medical University of South Carolina, Charleston, SC 29425, USA

^dVeterans Affairs Medical Center, Tuscaloosa, AL 35404, USA

^eVeterans Affairs Medical Center, Birmingham, AL 35233, USA

Received 10 May 2004; accepted 11 November 2004

Abstract

Although posttraumatic stress disorder (PTSD) is relatively common in community epidemiologic surveys (5–6% for men, 10–12% for women), and psychiatric patients with PTSD are known to have poor functioning and high levels of psychiatric comorbidity, there are no studies that address PTSD prevalence, functioning, and burden in primary care settings. This article reports on (1) the prevalence of PTSD using Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition diagnostic criteria in Veterans Affairs (VA) primary care settings, (2) associated sociodemographic characteristics and comorbidities, (3) functional status related to PTSD, (4) the extent to which PTSD was recognized by providers and (5) health services use patterns (including specialty mental health) of PTSD patients. Patients were randomly selected from those who had an outpatient visit in FY 1999 at one of four VA hospitals; 888 patients consented (74.1% of 1198 contacted); 746 patients (84.0% of consenting patients; 62.3% of contacted patients) were reached for telephone diagnostic interviews. Diagnostic interviews with the Clinician Administered PTSD Scale yielded estimates of current PTSD prevalence of 11.5%. At statistically significant levels, PTSD was positively associated with a variety of comorbid psychiatric disorders, war zone service, age <65 years, not working, less formal education and decreased functioning. Of patients diagnosed with PTSD by study procedures, 12-month medical record review indicated that providers identified only 46.5% and only 47.7% had used mental health specialty services. PTSD-positive [PTSD(+)] patients who used mental health care in the past 12 months were more apt to be identified as having PTSD than nonmental health service users (78.0% vs. 17.8%). Although PTSD(+) patients had more medical record diagnoses than PTSD-negative [PTSD(-)] patients (6.28 vs. 4.95), their use of primary care, urgent care and inpatient care was not different from PTSD(-) patients.

© 2005 Elsevier Inc. All rights reserved.

Keywords: Posttraumatic stress disorder; Prevalence; VA primary care clinics; DSM-IV; CAPS

1. Introduction

Effective treatment of mental health problems in primary care patients has been plagued for decades by underdiagnosis and undertreatment of mental and substance-related disorders. Although there have been marked gains in the identification and treatment of some mental disorders (e.g., major depression [1–4], attention-deficit disorder

[5–7]) in many primary care settings, progress has been slower for the anxiety disorders, particularly posttraumatic stress disorder (PTSD).

Community epidemiologic studies estimate lifetime prevalence of PTSD between 5.0% and 6.0% for men [8,9] and between 10.4% and 12.3% for women [8–10]. Estimates are higher for veterans with war zone exposure [11,12], with the National Vietnam Veterans Readjustment Study reporting current and lifetime PTSD prevalence of 15% and 31%, respectively, for Vietnam theater veterans [12]. More recent studies of U.S. and U.K. Gulf War veterans estimate current PTSD prevalence between 5.4–12.1% [13–15] and 4.2% for non-Gulf War veterans [15].

* Corresponding author. Mental Health Service (116), Ralph H. Johnson Veterans Affairs Medical Center, 109 Bee Street, Charleston, SC 29401-5799, USA. Tel.: +1 843 789 7280; fax: +1 843 805 5782.

E-mail address: magrudkm@musc.edu (K.M. Magruder).

Studies of PTSD in primary care have estimated prevalence of 6–36% [16–20]. Two were conducted with Veterans Affairs patients. One estimated 20% prevalence, but relied on a screening tool rather than a diagnostic instrument [17]. The other (of only women) found 36% prevalence [19]. In Taubman-Ben-Ari et al.'s study [20], of those who met criteria for a diagnosis of PTSD, only 2% were so diagnosed by their primary care physician, although considerably more were recognized as being “distressed.” These low recognition rates are surprising, given that the study was conducted in Israel where traumatic events are not uncommon.

The syndrome of PTSD exacts a heavy toll, if untreated or inadequately treated, on individuals and society. Consequences of undertreatment include high rates of subsequent major depressive disorder, increased rates of other comorbid psychiatric illnesses including substance use disorders, severe social and occupational disability, poor quality of life and comorbid medical illnesses [21–24]. Schnurr and Green [25] have recently compiled an excellent volume that sets forth a model with data supporting a causal relationship among trauma, PTSD and physical health.

In the general population, persons diagnosed with PTSD use health services at rates exceeding that of almost all psychiatric diagnostic groups, making PTSD one of the most costly psychiatric conditions in the U.S. health care delivery system in general [26–28]. In studies within the Veterans Affairs (VA) system, PTSD has been associated with greater medical impairment and use of medical services [29–31]. Although persons with PTSD may be higher users of medical care services, they often are reluctant to use mental health services [27,28] and often receive inadequate mental health services [32]. Thus, the burden on the VA is significant.

The overall purpose of this article is to evaluate the burden and health services use patterns of PTSD in primary care. Specifically, we will (1) estimate the prevalence of PTSD (using Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition [DSM-IV] diagnostic criteria) in VA primary care settings, (2) describe sociodemographic characteristics and comorbidities associated with PTSD, (3) describe functional status related to PTSD, (4) examine the extent to which PTSD was recognized by providers and (5) describe health services use patterns (including specialty mental health) of PTSD patients.

2. Methods

2.1. Overview

We conducted a cross-sectional survey of veterans attending primary care clinics at four Veterans Affairs Medical Centers (Charleston and Columbia, SC; Tuscaloosa and Birmingham, AL) followed by a diagnostic telephone interview and 12-month retrospective chart review. These medical centers are part of a Veterans Integrated Service Network (VISN7), which covers all of South Carolina, Georgia and parts of Alabama. All procedures were

reviewed and approved by the following institutional review boards: Medical University of South Carolina, University of South Carolina, Birmingham VA and Tuscaloosa VA.

2.2. Study population

Eligible patients were those who had been primary care attenders at any of the four target hospitals in fiscal year 1999. Stratifying on hospital, each patient was assigned a random number and the patient list ordered. According to this ordered list, blocks of 200 patients were sent to each hospital (new blocks were sent when these lists were exhausted). Appointment lists were checked by a research assistant, so that when one of the randomly selected patients was scheduled for a primary care visit, a letter of invitation was mailed in advance explaining the study. At the time of the clinic visit, further explanations were given and written informed consent was obtained before study participation. Patients with known dementia, octogenarians and non-agenarians were excluded due to concern over ability to recall information critical to the study.

2.3. Clinic interview

Patients who agreed to the study and signed informed consent documents were interviewed by a research assistant who obtained sociodemographic information and administered the PTSD Checklist-Military (PCL-M) and 36-item Short-Form Health Survey (SF-36). Patients were also told that they would be contacted by telephone for additional information. The PCL-M is a 17-item questionnaire adapted from the DSM-IV PTSD Criteria B–D [33] that takes about 5 min to complete and has good psychometric properties [34]. The SF-36 [35] is a self-report, generic measure of functional health status that assesses two factor analytically derived dimensions (physical health and mental health) with multiple subscales: Physical Functioning, Role Functioning Limited by Health, Energy and Fatigue, Pain, General Health, Role Functioning Limited by Emotional Problems, Emotional Well-Being and Social Functioning. The SF-36 discriminates severity of functional impairments across a variety of disease states such as hypertension, arthritis, gastrointestinal disorders and myocardial infarction [35,36].

2.4. Telephone interview

Records of patients who completed the clinic interview were sent to Charleston where clinicians (master's level and above) contacted them via telephone for a longer interview. At this telephone interview, patients were administered (1) the Trauma Assessment for Adults Questionnaire [37], (2) (for those positive on the Trauma Assessment Questionnaire) the Clinician Administered PTSD Scale (CAPS) [38] diagnostic version as the “gold standard” for PTSD diagnosis and (3) the Mini International Neuropsychiatric Interview (MINI) [39–41] (to assess for co-occurring mental and substance abuse disorders). Interviewers underwent a training session with one of the investigators

(B.C.F.). Additionally, a random sample of interviews (approximately 8%) was conducted by speakerphone for interrater reliability analysis. Raters were 100% concordant for PTSD diagnosis on the CAPS.

The Trauma Assessment for Adults was developed for identification of lifetime incidence of trauma (both military and nonmilitary) and has been used widely for screening community and medical populations for trauma history [23,37,42]. It was used in this interview to rule out patients who could not possibly meet DSM-IV PTSD criterion A.

The CAPS is a well validated structured clinical interview that measures the intensity and frequency of the 17 DSM-IV PTSD symptoms and 8 associated symptoms [43–46]. The result is a dichotomous assessment of PTSD by DSM-IV criteria (rather than a score). There is a current and lifetime diagnostic version.

The MINI (version 5.0.0) is comprised of closed questions (yes/no format) and measures DSM-IV (and ICD-10) mental diagnoses and conditions common in primary care, including major depressive episode, dysthymia, suicidality, hypomanic and manic episode, panic disorder, agoraphobia, social phobia, obsessive–compulsive disorder, alcohol abuse and dependence, drug abuse and dependence and generalized anxiety disorder. In tests of early versions, there were good psychometric properties for most disorders relative to the WHO Composite International Diagnostic Interview and the SCID-P [39–41]. We used version 5.0.0, which has been upgraded to improve upon the earlier psychometric properties.

The algorithm for assigning PTSD caseness among patients with a telephone interview was as follows. Those patients who were negative on the trauma assessment were assigned as PTSD(–) (because they could not possibly meet criterion A). Those who were positive on the trauma assessment were administered the CAPS. CAPS(+) patients were assigned as PTSD(+), and CAPS(–) patients as PTSD(–). Thus, the trauma(–) and CAPS(–) patients comprised the PTSD(–) group.

2.5. Chart review

Electronic medical records were reviewed by trained research assistants (blind to PTSD caseness status) for each patient who completed the clinic interview for the 12 months preceding this interview. Recorded medical and mental diagnoses and conditions were collected as was use of primary care and mental health specialty services. Mental health specialty services included: mental health clinics, substance abuse clinics and PTSD specialty clinics. A closed format checklist instrument was developed to collect this information for each visit or hospitalization.

2.6. Statistical analysis

2.6.1. Population and sample description

Non-patient-linked information for the basic set of demographics (age, race and gender) and number of

outpatient visits were obtained from the VISN7 clinical database for (1) all VA patients seen in primary care during FY1999 at the Charleston and Columbia (SC) and Birmingham and Tuscaloosa (AL) VA Medical Centers and (2) all subjects approached for participation in the study (participants and nonparticipants). For the latter, subject identification numbers for the random sample of selected patients were sent to the VISN7 Data Manager who then supplied nonlinked summary information to the study investigators. Univariate descriptive statistics (mean±S.D. and median) and frequency distributions were also obtained for the full set of demographic variables for the overall participating sample and within each study clinical site and for the PTSD(+) and PTSD(–) subgroups.

2.6.2. Prevalence

Prevalence was determined as percent of patients meeting diagnostic criteria for PTSD as determined by the Trauma Assessment and CAPS administered during the telephone interview.

2.6.3. Correlates of PTSD

The set of putative correlate variables were age (treated as both categorical and continuous), gender, race (white/nonwhite), VA site, education (<high school, high school diploma, some college, college degree or higher), living arrangements (living alone, not living alone), work status (working, not working/disabled, not working/retired), war zone experience (served, did not serve in war zone) and prisoner of war status (POW, not POW). A series of univariate logistic regression analyses with PTSD(+/-) as the dependent variable were carried out to determine the unadjusted odds ratio (OR) for each of the putative correlate variables. In further analyses, adjusted ORs for the correlate variables were obtained using multivariable logistic regression analyses with age, race, VA site, education, war zone, living arrangements and employment status as control (adjustment) variables. In a final set of exploratory analyses, a stepwise logistic regression was used to identify the set of correlate variables that constitute the best “predictor set” for presence of PTSD among patients in VA primary care and PTSD recognition by providers.

2.6.4. Comorbidity, SF-36 subscales, PTSD Recognition and Mental Health Specialty Care

To evaluate the relationship between comorbidity and PTSD, we estimated the prevalence of each individual condition for the total sample and within the PTSD(+) and PTSD(–) groups. Chi-square tests were used to compare proportions for dichotomous outcomes (e.g., presence/absence of a disorder) and either the independent sample *t* test or its nonparametric analog (Wilcoxon rank sum test) was used to compare continuous outcomes (e.g., average number of comorbid conditions) for the PTSD(+) and PTSD(–) groups. For the SF-36 analyses, subscales General Health, Mental Health, Vitality and Physical

Functioning were evaluated using simple and multiple linear regression modeling; however, because scores for social functioning, role-physical and role-emotional grouped in a few distinct categories, these variables were treated as categorical (ordinal). The two items comprising the Bodily Pain subscale were not analyzed because they were assessed using an incorrect response range. Logistic regression for multicategory ordinal responses was used to evaluate the simple relationship (unadjusted association) between PTSD and the Social Functioning, Role-Physical and Role-Emotional subscales. The multivariable relationship between PTSD and these subscales (adjusted association) was evaluated using multivariable logistic regression with subscale as the ordinal dependent variable and age, race, sex, education, comorbid disorders (identified on the MINI) and site as covariables. To determine if demographic characteristics age or race modified the relationship between CAPS diagnosis and functional status dimensions (SF-36 subscales), interaction effects were examined for the simple linear and logistic models. For PTSD recognition and mental health specialty clinic use, chi-square tests were also used.

3. Results

A total of 229,780 veterans had at least one primary care outpatient visit during FY 1999 at one of the four study hospitals. From this larger population, 1198 patients (all known to be alive) were randomly selected and invited to participate in the study at the time of their primary care appointment. Relative to the larger population, the randomly selected patients had fewer females (6.2% vs. 10.9%), were slightly older (average age of 60 vs. 59) and had more outpatient visits during FY 1999 (20 visits for the randomly selected patients vs. 14 for the overall group). (We were unable to assess representativeness of our sample with regard to race as the large VISN7 clinical database had “unknown” race coded for 49% of all patients.)

Of the 1198 patients invited to participate, 888 (74.1%) signed informed consent. Consenters and nonconsenters were similar with regard to gender (6.8% female for consenters vs. 4.2% female for nonconsenters); consenters were slightly younger (59 years vs. 64 years); the average number of outpatient visits during FY 1999 was the same (20).

Table 1
Baseline and demographic information for total sample^a and VA site

	Overall (<i>n</i> =885)	Birmingham, AL (<i>n</i> =141)	Tuscaloosa, AL (<i>n</i> =206)	Charleston, SC (<i>n</i> =255)	Columbia, SC (<i>n</i> =283)
Site					
Birmingham, AL	141 (15.9)				
Charleston, SC	255 (28.8)				
Columbia, SC	283 (32.0)				
Tuscaloosa, AL	206 (23.3)				
Gender ^b					
Male	822 (92.9)	128 (90.8)	197 (95.6)	237 (92.9)	260 (91.9)
Age (years) ^b	60.9±12.1	58.0±12.0	63.9±11.2	59.5±12.0	61.2±12.2
18–44	89 (10.1)	19 (13.5)	9 (4.4)	33 (12.9)	28 (9.9)
45–54	217 (24.5)	42 (29.8)	42 (20.4)	63 (24.7)	70 (24.7)
55–64	206 (23.3)	32 (22.7)	41 (19.9)	65 (25.5)	68 (24.0)
65–74	241 (27.2)	31 (22.0)	76 (36.9)	63 (24.7)	71 (25.1)
75–79	129 (14.6)	14 (9.9)	38 (18.5)	31 (12.2)	46 (16.3)
Race ^b					
White	546 (61.7)	60 (42.6)	159 (77.2)	155 (60.8)	172 (60.8)
Education					
<High school	198 (22.4)	29 (20.6)	38 (18.5)	71 (27.8)	60 (21.2)
High school diploma	264 (29.8)	56 (39.7)	65 (31.6)	69 (27.1)	74 (26.2)
Some college or technical course	288 (32.5)	39 (27.7)	75 (36.4)	78 (30.6)	96 (33.9)
4-Year degree or higher	135 (15.3)	17 (12.1)	28 (13.6)	37 (14.5)	53 (18.7)
War zone					
Served in a war zone	420 (47.5)	56 (39.7)	93 (45.2)	100 (39.2)	171 (60.4)
POW status ^b					
POW	10 (1.1)	2 (1.4)	2 (1.0)	3 (1.2)	3 (1.1)
Living arrangements					
Living with someone	601 (67.9)	91 (64.5)	149 (72.3)	168 (65.9)	193 (68.2)
Work status					
Not working/disabled/other	271 (30.6)	84 (45.4)	71 (34.5)	65 (25.5)	71 (25.1)
Not working/retired	324 (36.6)	40 (28.4)	83 (40.3)	94 (36.9)	107 (37.8)
Working	290 (32.8)	37 (26.4)	52 (25.4)	96 (37.7)	105 (37.1)

Data are given as *n* (%) or mean±S.D.

^a Three of 888 subjects consented but had no demographics form on file.

^b Variables with missing values, *n* (% missing): gender 1 (0.1), age 3 (0.3), race 17 (1.9), POW status 15 (1.7), living arrangements 4 (0.5).

Of the 888 consenting patients, 860 (96.8%) completed the PCL at the clinic interview. In this subset, 728 had a telephone interview (18 patients consented and did not complete the PCL, but did complete the telephone interview, thus yielding 746 patients with telephone interviews and CAPS data and providing the basis for Table 2). For the 132 patients with missing telephone interview, reasons were given for 107: 59% cannot be contacted (incorrect telephone number, number disconnected, no answer after multiple attempts), 23% were contacted but declined further interviews, 4% were known to have died and 14% listed “other” reasons. In comparing those with and without a telephone interview, the average PCL score was lower for those with a telephone interview than for those without (26.4 vs. 29.4, $P=.0243$), indicating that those who did not complete the

telephone PTSD diagnostic study materials had somewhat higher levels of PTSD symptomatology.

Table 1 shows the various sociodemographic characteristics by site. The Columbia site contributed the most patients (32.0%), with Birmingham (which was the last site to begin enrollment and therefore had the fewest months of enrollment) contributing the least (15.9%). Overall, the study participants were representative of the typical veteran population in the Southeast. The average age was 60.9 ± 12.1 years; 92.9% were male; the majority of participants (61.7%) were White (although only 42.6% were White for Birmingham) (note there are very few minorities other than African American among veterans in VISN7); most (52.2%) had a high school diploma or less (although this was 47.4% for Columbia); 47.5% reported serving in a

Table 2
Comparison of demographic and baseline characteristics by PTSD diagnosis groups

	Diagnosis from trauma/CAPS procedure ^a ($n=746$)		OR (95% confidence interval)	
	PTSD(+)	PTSD(-)	Unadjusted ^b	Adjusted ^c
Overall prevalence	86 (11.5)	660 (88.5)		
Site				
Tuscaloosa, AL ^d	16 (9.0)	161 (91.0)	1.0	1.0
Birmingham, AL	11 (9.9)	100 (90.1)	1.11 [0.49, 2.48]	0.64 [0.26, 1.59]
Charleston, SC	21 (9.6)	198 (90.4)	1.07 [0.54, 2.11]	0.78 [0.37, 1.66]
Columbia, SC	38 (15.9)	201 (84.1)	1.90 [1.02, 3.54]	1.36 [0.69, 2.68]
Gender				
Female ^d	2 (4.0)	48 (96.0)		
Male	84 (12.1)	611 (87.9)		
Age				
18–44 ^d	8 (11.6)	61 (88.4)	1.0	1.0
45–54	37 (20.8)	141 (79.2)	2.00 [0.88, 4.55]	0.82 [0.32, 2.10]
55–64	23 (12.9)	155 (87.1)	1.13 [0.48, 2.67]	0.37 [0.13, 1.02]
65–74	7 (3.3)	203 (96.7)	0.26 [0.09, 0.75]	0.07 [0.02, 0.24]
75–79	11 (10.1)	98 (89.9)	0.86 [0.33, 2.25]	0.13 [0.04, 0.50]
Race				
Non-White ^d	36 (12.9)	243 (87.1)	1.0	1.0
White	50 (10.7)	417 (89.3)	0.81 [0.51, 1.28]	1.26 [0.73, 2.17]
Education				
<High school	17 (10.5)	145 (89.5)	2.67 [0.96, 7.46]	3.90 [1.30, 11.68]
High school diploma	24 (11.2)	190 (88.8)	2.88 [1.07, 7.76]	2.99 [1.06, 8.48]
Some college or technical course	40 (15.9)	211 (84.1)	4.32 [1.66, 11.26]	3.85 [1.41, 10.49]
4-Year degree or higher ^d	5 (4.2)	114 (95.8)	1.0	1.0
War zone				
Did not serve in a war zone ^d	17 (4.4)	366 (95.6)	1.0	1.0
Served in war zone	69 (19.0)	294 (81.0)	5.05 [2.91, 8.78]	9.08 [4.77, 17.28]
POW status				
Not POW ^d	83 (11.4)	643 (88.6)		
POW	2 (22.2)	7 (77.8)		
Living arrangement				
Living alone ^d	25 (11.4)	194 (88.6)	1.0	1.0
Living with someone	61 (11.6)	465 (88.4)	1.02 [0.62, 1.67]	1.03 [0.58, 1.81]
Employment status				
Not working/disabled/other	42 (19.3)	175 (80.7)	2.71 [1.54, 4.79]	4.64 [2.40, 8.96]
Not working/retired	24 (8.5)	259 (91.5)	1.05 [0.56, 1.95]	2.35 [1.06, 5.17]
Working ^d	20 (8.1)	226 (91.9)	1.0	1.0

Data are given as n (%).

^a Includes only those who consented, had demographics form, had a CAPS, or had a trauma but no CAPS (assuming no trauma indicated on trauma form).

^b From univariate logistic regression model with PTSD(+/-) as dependent variable.

^c From the multivariable logistic regression model with CAPS(+/-) as dependent variable and adjusted for age, site, race, education, war zone, living arrangement, and employment status.

^d Denotes reference group.

Table 3
Frequency of occurrence of comorbidity as diagnosed from the MINI among PTSD(+) and PTSD(–) patients

Comorbidity ^a	Diagnosis from CAPS		χ^2 (<i>P</i> value)	Prevalence of comorbidity
	PTSD(+) (<i>n</i> =86)	PTSD(–) (<i>n</i> =658)		
Major depression	59 (68.6)	62 (9.4)	195.6165 (<.0001)	121 (16.3)
Anxiety disorders	63 (73.3)	70 (10.6)	203.1403 (<.0001)	133 (17.9)
Substance abuse	9 (10.5)	17 (2.6)	14.0094 (0.0002)	26 (3.5)
Any comorbid disorder	75 (87.2)	139 (21.1)	162.1098 (<.0001)	214 (28.8)

Data are given as *n* (%).

^a Percent of subjects with given comorbidity among PTSD(+) and PTSD(–) participants.

war zone (although this was 60.4% for Columbia); 1.1% reported POW status; 67.9% reported living with someone (whether or not married); and 32.8% were working.

Table 2 shows the prevalence of PTSD (as determined by the CAPS and trauma index) by the various sociodemographic characteristics. We also include raw and adjusted (for age, site, race, education, war zone service, living arrangement and employment status) ORs and 95% confidence intervals. The overall prevalence of PTSD in this sample of patients was 11.5%. This varied by site, with a high of 15.9% for Columbia and a low of 9.0% for Tuscaloosa. The unadjusted OR for Columbia (with Tuscaloosa as the referent group) was marginally significant (1.9), but was not so after adjustment.

There was higher prevalence of PTSD among males than females (12.1% vs. 4.0%). No tests of significance are included for gender because there were only two females with PTSD. PTSD peaked in the 45- to 54-year-old age group (20.8%), was lowest in the 65- to 74-year-old age group (3.3%) and then tailed upward to 10.1% for those ≥ 75 . The 65- to 74-year-old age group was significantly less likely to have PTSD than the youngest age group (in both univariate and multivariable models), as was the oldest age group (≥ 75) in the adjusted model only. Although the prevalence in non-White patients (12.9%) was slightly higher than White patients (10.7%), it was not significant in either model.

PTSD prevalence was highest among those with some college or technical school (15.9%) and lowest among those with a 4-year degree or higher (4.2%). In the adjusted model, all educational groups were significantly more likely to have PTSD than those with a 4-year degree or higher. Among those who reported serving in a war zone, PTSD

prevalence was 19.0% compared with 4.4% for those not serving in a war zone (ORs significant in both models). Similarly, 22.2% of those who were prisoners of war (POW) were positive for PTSD compared with 11.4% of those who were not POWs (we did not run tests of significance as there were only two patients with PTSD who were POWs). Living arrangements were not related to PTSD. Those not working (either disabled/other or retired) were significantly more likely to have PTSD in the adjusted models.

PTSD was highly comorbid with other mental disorders as measured by the MINI. On average, PTSD(+) patients had 2.95 ± 1.81 comorbid mental disorders compared with 0.33 ± 0.79 for PTSD(–) patients. Furthermore, the modal number of disorders for PTSD(+) patients was 3–4, compared with none for PTSD(–) patients. As can be seen in Table 3, 87.2% of PTSD(+) patients had a comorbid mental disorder compared with 21.1% of PTSD(–) patients [$\chi^2(1)=162.1098$, $P<.0001$].

Table 3 displays PTSD comorbidity for particular classes of disorders assessed. For all of the disorders measured, PTSD(+) patients were significantly more likely to have a comorbidity (all comparisons statistically significant). Major depression was the single most common comorbid mental disorder (68.6% of all PTSD(+) patients had major depression, compared with 9.4% of PTSD(–) patients [$\chi^2(1)=195.6165$, $P<.0001$]. In general, 73.3% of PTSD(+) patients had another anxiety disorder compared with 10.6% of PTSD(–) patients [$\chi^2(1)=195.6165$, $P<.0001$]. Only 10.5% of PTSD(+) patients had a substance abuse disorder compared with 2.6% of PTSD(–) patients [$\chi^2(1)=14.0094$, $P=.0002$]. Additionally, 51.2% of PTSD(+) patients were positive for suicidality compared with 4.1% of PTSD(–) patients [$\chi^2(1)=195.1271$, $P<.0001$].

Table 4
Relationship between PTSD diagnosis from CAPS and SF-36 subscales

SF-36 subscale	μ	Unadjusted β	<i>P</i> value	<i>R</i> ²	Adjusted ^c β	<i>P</i> value	<i>R</i> ²
General Health ^a	58.89	–4.77	.0002	.02	–4.39	.0024	.04
Mental Health ^a	76.05	–31.54	<.0001	.23	–15.48	<.0001	.43
Vitality ^a	49.67	–21.69	<.0001	.08	–9.53	.0020	.17
Physical Functioning ^a	60.81	–20.08	<.0001	.05	–10.77	.0035	.13
Social Functioning ^b	76.37	–2.00	<.0001		–1.18	<.0001	
Role-Physical ^b	49.54	–1.44	<.0001		–0.94	.0004	
Role-Emotional ^b	74.98	–2.41	<.0001		–1.36	<.0001	

^a From univariate and multivariate general linear models using subscale as continuous dependent variable.

^b From univariate and multivariate logistic regression models using subscale as ordinal dependent variable.

^c Adjusted for age, race, sex, education and comorbid disorders identified on the MINI and site.

SF-36 General Health Scores as a Function of Age and PTSD Status in Veterans

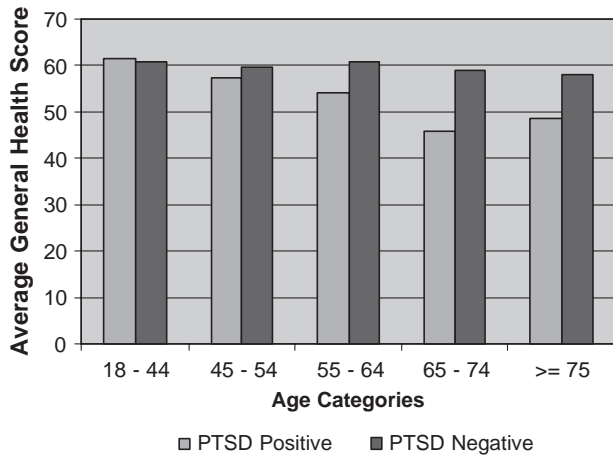


Fig. 1. SF-36 general health scores as a function of age and PTSD status in veterans. (The reader is referred to the web version of this article for the colored figure.)

After major depression, generalized anxiety disorder (GAD) was the next most common mental disorder [44.2% PTSD(+) vs. 7.6% PTSD(-)] [$\chi^2(1)=97.6271, P<.0001$], followed by panic disorder [40.7% PTSD(+) versus 2.7% PTSD(-)] [$\chi^2(1)=165.6701, P<.0001$] and agoraphobia [34.9% PTSD(+) vs. 2.6% PTSD(-)] [$\chi^2(1)=134.0835, P<.0001$].

We examined presence or absence of PTSD relative to the SF-36 subscales (see Table 4). For every subscale, in both unadjusted and adjusted (for age, race, site, education and comorbid mental disorders as identified on the MINI) models, patients with PTSD had significantly lower scores (worse functioning) than those without PTSD. The R^2 was highest for the Mental Health subscale in both unadjusted and adjusted models (.23 and .43, respectively). For the General Health subscale, there was a significant interaction of PTSD with age ($F=8.84, P=.0030$). This was of magnitude, not direction, meaning that for the three oldest age groups (55–64, 65–74 and >75 years) PTSD was associated with much worse functioning (see Fig. 1).

Another area of concern is the extent to which providers recognized and diagnosed PTSD in their patients. Using the data from the 12-month retrospective chart review, any notation of PTSD during that period was flagged as that patient being “recognized” as having PTSD by his/her clinician. Of those who had a positive PTSD research

Table 5
Average number of primary care visits by PTSD status and mental health clinic use status

	Mental health clinic use		All
	No	Yes	
PTSD(-)	3.35	4.28	3.44
PTSD(+)	3.31	4.05	3.66
All	3.34	4.19	

Table 6
Average number of medical record diagnoses by PTSD status and mental health clinic use status

	Mental health clinic use		All
	No	Yes	
PTSD(-)	4.77	6.55	4.95
PTSD(+)	5.04	7.63	6.28
All	4.79	6.95	

diagnosis, 46.5% were considered recognized by that criterion; 3.4% of those with a negative PTSD research diagnosis were considered recognized as having PTSD [$\chi^2(1)=186.15, P<.0001$]. These findings are equivalent to a sensitivity of 46.5% and specificity of 96.6% for provider detection of PTSD. Regarding use of mental health specialty care (in addition to primary care) in the previous 12 months, 47.7% of PTSD(+) patients used such care one or more times compared with 10.4% of PTSD(-) patients [$\chi^2(1)=83.8458, P<.0001$]. Use of mental health specialty care in the past 12 months influenced provider detection of PTSD, with detection much more accurate for patients who had been seen in mental health (78.0%) than for those seen exclusively in primary care (17.8%) [$\chi^2(1)=31.3252, P<.0001$]. Logistic regression analysis showed that the following variables (with ORs) were significantly associated with provider recognition: war zone exposure (4.170), CAPS PTSD diagnosis (4.567), other medical record diagnoses (1.262), mental health specialty visit (12.309) and SF-36 role emotional score (0.601).

We also examined use of urgent care and inpatient services. During the 12 months prior to screening interview, 21.3% of all patients had used urgent care (27.9% for PTSD(+) patients, 20.4% for PTSD(-) patients). This was not a statistically significant difference [$\chi^2(1)=2.5197, P=.1124$]. Similarly, 6.7% of the sample had been admitted as inpatients in the previous year (5.8% for PTSD(+) patients; 6.8% for PTSD(-) patients). This was not statistically significant [$\chi^2(1)=0.1227, P=.7261$].

The average number of primary care visits in the prior year was not significantly different by PTSD status (3.66 for PTSD(+), 3.44 for PTSD(-) ($t=-0.98, P=.3277$)) (see Table 5). However, those who used mental health services had significantly higher 12-month primary care visitation rates than those who did not (3.34 vs. 4.19; $t=-3.65, P=.0004$), and this held regardless of PTSD status.

In terms of major diagnostic groupings in the medical record, PTSD(+) patients had significantly more listed than did PTSD(-) patients: 4.95 vs. 6.28 ($t=-4.34, P<.0001$). Mental health clinic users also had significantly more diagnoses: 6.95 vs. 4.79 ($t=-8.97, P<.0001$). As seen in Table 6, there is an interaction effect between PTSD status and mental health clinic use status, such that each contributes independently to the number of diagnoses. Examining individual conditions, PTSD(+) patients were more likely to have the following problems in their records: depression, panic, anxiety, bipolar/mania, psychosis, dysthymia, alcohol,

drugs and musculoskeletal (all $P < .05$). (The following conditions were not significant: hypertension, cardiac conditions, diabetes, cancers, chronic obstructive pulmonary disease, arthritic conditions, gastrointestinal conditions, genitourinary conditions, liver conditions, HIV/AIDS and other conditions.) When we stratified on mental health clinic use status, the relationship still held between PTSD status and depression (for mental health users and nonusers), anxiety (for nonmental health users) and alcohol (for nonmental health users) (all $P < .05$).

4. Discussion

Our prevalence estimate, representing a general cross-section of VA primary care patients, was lower than the 20% found in the one study of VA outpatients; however, as noted before, that study used a screening rather than a diagnostic instrument [17]. Other studies estimating veteran population prevalence, but within specific war-era and combat exposure groups, found higher prevalence among Vietnam theater veterans [12] and those with Gulf War experience [15], but lower or comparable estimates to the general population of nonwar veterans. Only one study (with a small sample size of 256) [14] found relatively low prevalence (5.4–7.2%) for Persian Gulf-deployed veterans; their comparison group of non-Gulf War (nonexposed) veterans had no persons positive for PTSD. Our own findings that PTSD prevalence was highest among the 45- to 54-year-old age group (the age of most Vietnam-era veterans), those with war zone service and those who were POWs is an indication that our primary care findings are a reflection of the veteran community population findings.

Of note is the 10.1% prevalence of PTSD for our oldest group of patients (those >75 years old). With 109 patients in this age group, it is not likely that this finding is an anomaly. While it is possible that the psychometric properties of our instruments may not be as robust in these older age groups, more likely is that these World War II veterans are still symptomatic from traumas of more than 50 years ago. In fact, a number of researchers have documented the chronicity of PTSD [47–49], some even before PTSD was an official diagnosis [50,51]. It is also possible that new traumas or experiences — or even the aging process itself — may have rekindled previously suppressed symptoms.

Statistical adjustments actually reduced the odds of PTSD for the two oldest age groups relative to the 18- to 44-year-old group. The forces of selective mortality may be evident; however, others have observed that the prevalence of PTSD symptoms and their severity are in fact lower (although not insignificant) in World War II and Korean War veterans than among Vietnam veterans [52, 53]. It may be difficult to tease out definitively age and cohort effects without extensive longitudinal studies of veterans of both eras.

It is also notable that our prevalence for females (4.0%) was drastically lower than the 36.0% of Dobie et al. [19]. The fact that we had few females (only 50) and a different

recruitment strategy may have contributed to these discrepant findings.

In looking at our PTSD clinical diagnostic information, we were surprised to find that 3.4% of those who were PTSD(–) by CAPS and Trauma Index had a PTSD diagnosis in the medical record. Our instrumentation may not be perfect; thus, these patients may be bona fide false-negatives. Another possibility is that these patients may have successfully recovered from PTSD but still carry the historical diagnosis in the medical record. To check this, we examined lifetime PTSD diagnosis by the CAPS, finding that only three additional patients were considered correctly recognized using current or lifetime PTSD as the criterion. Under this scenario, recognition dropped from 46.5% to 34.4% (because the denominator increases by three patients but the numerator is the same).

Our finding that only 10.5% of our PTSD(+) patients had a comorbid substance use disorder is unusual. Even the underlying prevalence of 3.5% for substance use disorders seems low for this population. A recent review article cited estimates of 21.6–43.0% for the prevalence of comorbid lifetime substance use disorders among persons with PTSD [54]. One explanation for part of the discrepancy is that we report current substance use disorders, and given the average age of our sample, it is likely that many of our patients have either recovered (and have past substance use disorders, which would not be reported here) or have died (related to their substance use). In addition, the drug dependence module on the MINI had weaker psychometric properties than the other modules; thus, we may have missed some drug-abusing patients due to instrumentation.

We used the telephone interview for the PTSD diagnostic assessment. This is a possible source of variation from results that would have been obtained had the more conventional face-to-face method been used. Hearing impairments as well as willingness to disclose very personal information could have influenced the telephone interviews. Others have used this methodology to study PTSD [55]; however, few have compared methods. In one published report comparing telephone and face-to-face psychiatric interviews, the prevalence of anxiety disorders was identical, with a kappa of 0.84 [56]. There was a slight (but insignificant) tendency to report more anxiety or depression symptoms in the telephone interview (the reverse was true for substance use disorders). It is doubtful that the telephone methodology made a significant difference in our PTSD prevalence estimates.

Not surprisingly, the functional status of our PTSD(+) patients was uniformly worse than our PTSD(–) patients — even after adjustments. Relative to U.S. population norms [57], our entire sample was worse functioning in every category with the exception of mental health, which was approximately the same (average = 76.05 current study; 74.74 U.S. population). These identical relationships held even when looking at national norms for the 55- to 64-year-old age group (which incorporates the average age of our sample,

60.9 years). Relative to the Dobie et al. [19] sample of female veteran patients, our patients had generally better functioning, with the exception of role-physical (worse) and physical functioning (the same).

What was surprising is that the poorer functional status of PTSD(+) patients did not translate into more nonpsychiatric conditions (with the exception of musculoskeletal problems) and increased primary care services utilization. It may be that PTSD severity is a factor (not captured in our diagnostic assessment) that would alert primary care providers to make a diagnosis, send patients to mental health specialty care, and at the same time contribute to poor health status — but only for the subset of the most symptomatic patients.

There are a number of strengths in the current study. First, we have a large sample from four different hospitals in two southern states. While this sample may not be generalizable to all regions of the country, it fairly represents the deep South with excellent minority representation. Second, it is the first study to use a well-accepted DSM-IV equivalent diagnostic tool (CAPS) to estimate prevalence in VA primary care. Furthermore, because all aspects of the VA medical record (including mental health and substance abuse treatment) were in electronic form for all the hospitals in our sample, we were able to get accurate data on PTSD recognition and specialty mental health treatment. As such, the results provide an excellent indication of unmet need for the 52.3% of VA primary care attenders who meet criteria for PTSD and are not using mental health services. In this regard, our findings that 47.7% of PTSD(+) patients had used mental health services in the past year correspond with nearly identical findings in civilian primary care (52%) [58]. We will explore in more detail health and mental health service-use patterns, as well as medication profiles (including psychotropic drugs) and fill patterns, in future papers.

A word is in order concerning our sampling methodology. We attempted to avoid some of the problems that result from sampling patients based on their use patterns (e.g., every tenth patient appearing in the clinic). Our worry about sampling based on use was that if PTSD was related to over (or under)-use of services, then we would over (or under) estimate the prevalence. Given that VA patients are encouraged to have at least one appointment annually, we anticipated that we would be able to interview the majority of patients randomly preselected during our enrollment period, which would extend more than 12 months. In reality (as is clear from the data comparing patients we approached versus all eligible patients from the four hospitals in our sampling frame), the patients in our study were higher users of service. Since PTSD was not related to increased primary care service use, this should not affect our prevalence estimates.

Limitations include our reliance on follow-up telephone interviews for the CAPS data. Although interrater reliability was excellent, we missed these interviews with 18.8% of our consenting patients, some of whom may have had hearing problems, been without telephone or not

participated in this phase for other unknown reasons. We do note that these patients tended to have higher PCL scores that may have led to a slight underestimate of PTSD prevalence.

Last, it is clear that our data only reflect patients who use the VA health care system. Many veterans do not use VA health services at all, and we have no way of estimating PTSD prevalence in this group. Because we found employment status to be related to PTSD, and employed veterans are more likely to have health care coverage through their employers, we might extrapolate that the prevalence among veteran nonusers of VA health services would be lower than among veteran users.

5. Summary

In this article, we document that PTSD (by DSM IV criteria) is not an uncommon mental disorder among VA primary care patients. Only major depression and generalized anxiety disorder are more prevalent. PTSD is highly comorbid with major depression, other anxiety disorders and substance use disorders. After controlling for relevant sociodemographic factors, we found those in the older age groups (65–74 and >75 years) to be less apt to have PTSD, while those with education less than a college degree, war zone service and unemployment had significantly increased odds of having PTSD. Patients who were positive for PTSD had lower levels of functioning on every dimension measured — even after control for potential confounds. Furthermore, over half (53.5%) of these patients had not been recognized as having PTSD nor had they received specialty mental health care in the previous 12 months. The odds of being recognized as having PTSD were 12.3 for those in mental health specialty care versus those who are not. PTSD(+) patients with no mental health specialty care appear to be at increased risk for not having their needs met. These results argue for new strategies to improve recognition and treatment of PTSD in primary care.

Acknowledgments

This work was partially supported by grant VCR-99-010-2 from the Veterans Affairs Health Services Research and Development program to Dr. Magruder. This work was also supported by the Office of Research and Development, Medical Research Service, Department of Veterans Affairs.

References

- [1] Dobscha SK, Gerrity MS, Ward MF. Effectiveness of an intervention to improve primary care provider recognition of depression. *Eff Clin Pract* 2001;4(4):163–71.
- [2] Harman JS, Mulsant BH, Kelleher KJ, Schulberg HC, Kupfer DJ, Reynolds III CF. Narrowing the gap in treatment of depression. *Int J Psychiatry Med* 2001;31(3):239–53.

- [3] Middleton N, Gunnell D, Whitley E, Dorling D, Frank S. Secular trends in antidepressant prescribing in the UK, 1975–1998. *J Public Health Med* 2001;23(4):262–7.
- [4] Wittchen HU, Pittrow D. Prevalence, recognition and management of depression in primary care in Germany: the Depression 2000 Study. *Hum Psychopharmacol* 2002;17(Suppl 1):s1-11.
- [5] Schirm E, Tobi H, Zito JM, de Jong-van den Berg LT. Psychotropic medication in children: a study from the Netherlands. *Pediatrics* 2001;108(2):E25.
- [6] Zito JM, Safer DJ, dosReis S, Gardner JF, Boles M, Lynch F. Trends in the prescribing of psychotropic medications to preschoolers. *JAMA* 2000;283(8):1025–30.
- [7] Zito JM, Safer DJ, dosReis S, Gardner JF, Magder L, Soeken K, et al. Psychotropic practice patterns for youth: a 10-year perspective. *Arch Pediatr Adolesc Med* 2003;157(1):17–25.
- [8] Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry* 1995;52(12):1048–60.
- [9] Breslau N, Davis GC, Andreski P, Peterson E. Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Arch Gen Psychiatry* 1991;48(3):216–22.
- [10] Resnick HS, Kilpatrick DG, Dansky BS, Saunders BE, Best CL. Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *J Consult Clin Psychol* 1993;61(6):984–91.
- [11] Center for Disease Control. Health status of Vietnam veterans. *JAMA* 1988;259:2701–24.
- [12] Kulka RA, Schlenger WE, Fairbank JA, Hough RL, Jordan BK, Marmar CR, et al. Trauma and the Vietnam War generation: report of findings from the National Vietnam Veterans Readjustment Study. New York: Brunner/Mazel; 1990.
- [13] Lee HA, Gabriel R, Bolton JPG, Bale AJ, Jackson M. Health status and clinical diagnoses of 3000 UK Gulf War veterans. *J R Soc Med* 2002;95:491–7.
- [14] Wolfe J, Proctor SP, Erickson DJ, Heeren T, Friedman MJ, Huang MT, et al. Relationship of psychiatric status to Gulf War veterans' health problems. *Psychosom Med* 1999;61:532–40.
- [15] Kang HK, Natelson BH, Mahan CM, Lee KY, Murphy FM. Post-traumatic stress disorder and chronic fatigue syndrome-like illness among Gulf War veterans: a population-based survey of 30,000 veterans. *Am J Epidemiol* 2003;157:141–8.
- [16] Davidson JR, Weisler RH, Malik ML, Connor KM. Treatment of posttraumatic stress disorder with nefazodone. *Int Clin Psychopharmacol* 1998;13(3):111–3.
- [17] Hankin CS, Spiro III A, Miller DR, Kazis L. Mental disorders and mental health treatment among U.S. Department of Veterans Affairs outpatients: the Veterans Health Study. *Am J Psychiatry* 1999;156(12):1924–30.
- [18] Stein MB, McQuaid JR, Pedrelli P, Lenox R, McCahill ME. Posttraumatic stress disorder in the primary care medical setting. *Gen Hosp Psychiatry* 2000;22(4):261–9.
- [19] Dobie DJ, Kivlahan DR, Maynard C, Bush KR, McFall M, Epler AJ, et al. Screening for post-traumatic stress disorder in female Veteran's Affairs patients: validation of the PTSD checklist. *Gen Hosp Psychiatry* 2002;24:367–74.
- [20] Taubman-Ben-Ari O, Rabinowitz J, Feldman D, Vaturi R. Post-traumatic stress disorder in primary-care settings: prevalence and physicians' detection. *Psychol Med* 2001;31(3):555–60.
- [21] Jacobsen LK, Southwick SM, Kosten TR. Substance use disorders in patients with posttraumatic stress disorder: a review of the literature. *Am J Psychiatry* 2001;158(8):1184–90.
- [22] Keane TM, Wolfe J. Comorbidity in post-traumatic stress disorder: an analysis of community and clinical studies. *J Appl Soc Psychol* 1990;20:1776–88.
- [23] Kilpatrick DG, Acierno R, Saunders B, Resnick HS, Best CL, Schnurr PP. Risk factors for adolescent substance abuse and dependence: data from a national sample. *J Consult Clin Psychol* 2000;68(1):19–30.
- [24] Schnurr PP, Spiro III A, Paris AH. Physician-diagnosed medical disorders in relation to PTSD symptoms in older male military veterans. *Health Psychol* 2000;19(1):91–7.
- [25] Schnurr PP, Green BL, editors. Trauma and health: physical health consequences of exposure to extreme stress. Washington (DC): American Psychological Association; 2004.
- [26] Greenberg PE, Sisitsky T, Kessler RC, Finkelstein SN, Berndt ER, Davidson JR, et al. The economic burden of anxiety disorders in the 1990s. *J Clin Psychiatry* 1999;60(7):427–35.
- [27] Kessler RC. Posttraumatic stress disorder: the burden to the individual and to society. *J Clin Psychiatry* 2000;61(Suppl 5):4–12.
- [28] Solomon SD, Davidson JR. Trauma: prevalence, impairment, service use, and cost. *J Clin Psychiatry* 1997;58(Suppl 9):5–11.
- [29] Beckham JC, Moore SD, Feldman ME, Hertzberg MA, Kirby AC, Fairbank JA. Health status, somatization, and severity of posttraumatic stress disorder in Vietnam combat veterans with posttraumatic stress disorder. *Am J Psychiatry* 1998;155(11):1565–9.
- [30] Calhoun PS, Bosworth HB, Grambow SC, Dudley TK, Beckham JC. Medical service utilization by veterans seeking help for posttraumatic stress disorder. *Am J Psychiatry* 2002;159(12):2081–6.
- [31] Ford JD. Disorders of extreme stress following war-zone military trauma: associated features of posttraumatic stress disorder or comorbid but distinct syndromes? *J Consult Clin Psychol* 1999;67(1):3–12.
- [32] Amaya-Jackson L, Davidson JR, Hughes DC, Swartz M, Reynolds V, George LK, et al. Functional impairment and utilization of services associated with posttraumatic stress in the community. *J Trauma Stress* 1999;12(4):709–24.
- [33] Weathers FW, Litz BT, Herman JA, Huska JA, Keane TM. The PTSD Checklist (PCL): reliability, validity and diagnostic utility. Paper presented at the 9th Annual Conference of the ISTSS, San Antonio, TX; 1993.
- [34] Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA. Psychometric properties of the PTSD Checklist (PCL). *Behav Res Ther* 1996;34(8):669–73.
- [35] Ware Jr JE, Sherbourne CD. The MOS 36-item Short-Form Health Survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30(6):473–83.
- [36] Stewart AL, Hays RD, Ware Jr JE. The MOS short-form general health survey. Reliability and validity in a patient population. *Med Care* 1988;26(7):724–35.
- [37] Resnick HS, Best CL, Kilpatrick DG, Freedy JR, Falsetti SA. Trauma Assessment for Adults — Interview Version [unpublished scale]. Crime Victims Research and Treatment Center, Medical University of South Carolina, Charleston (SC); 1993.
- [38] Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, et al. The development of a Clinician-Administered PTSD Scale. *J Trauma Stress* 1995;8(1):75–90.
- [39] Sheehan D, Lecrubier Y, Sheehan KH, Janavas J, Weiller E, Keskiner A, et al. The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *Eur Psychiatry* 1997;12:232–41.
- [40] Lecrubier Y, Sheehan DV, Weiller E, Amorim P, Bonora I, Sheehan KH, et al. The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. *Eur Psychiatry* 1997;12:224–31.
- [41] Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavas J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998;59(Suppl 20):22–33.
- [42] Dansky BS, Saladin ME, Brady KT, Kilpatrick DG, Resnick HS. Prevalence of victimization and posttraumatic stress disorder among women with substance use disorders: comparison of telephone and in-person assessment samples. *Int J Addict* 1995;30(9):1079–99.

- [43] Keane TM, Caddell JM, Taylor KL. Mississippi scale for combat-related posttraumatic stress disorder: three studies in reliability and validity. *J Consult Clin Psychol* 1988;56(1):85–90.
- [44] Keane TM, Malloy PF, Fairbank JA. Empirical development of an MMPI subscale for the assessment of combat-related posttraumatic stress disorder. *J Consult Clin Psychol* 1984;52(5):888–91.
- [45] Weathers FW, Litz B. Psychometric properties of the Clinician-Administered PTSD Scale, CAPS-1. *PTSD Res Q* 1994;5:2–6.
- [46] Weathers FW, Ruscio AM, Keane TM. Psychometric properties of nine scoring rules for the Clinician Administered Posttraumatic Stress Disorder Scale. *Psychol Assess* 1999;11:124–33.
- [47] Spiro III A, Schnurr PP, Aldwin CM. Combat-related posttraumatic stress disorder symptoms in older men. *Psychol Aging* 1994;9(1):17–26.
- [48] Schnurr PP, Lunney CA, Sengupta A, Waelde LC. A descriptive analysis of PTSD chronicity in Vietnam veterans. *J Trauma Stress* 2003;16(6):545–53.
- [49] Zlotnick C, Rodrigues BF, Weisberg RB, Bruce SE, Spencer MA, Culpepper L, et al. Chronicity in posttraumatic stress disorder and predictors of the course of posttraumatic stress disorder among primary care patients. *J Nerv Ment Disord* 2004;192(2):153–9.
- [50] Brill NQ, Beebe GW. A follow-up study of war neuroses. Washington (DC): Veterans Administration; 1955.
- [51] Archibald HC, Tuddenham RD. Persistent stress reaction after combat: a 20-year follow-up. *Arch Gen Psychiatry* 1965;12:475–81.
- [52] Blum MD, Kelly EM, Meyer M, Carlson CR, Hodson WL. An assessment of the treatment needs of Vietnam-era veterans. *Hosp Community Psychiatry* 1984;35:691–6.
- [53] Davidson JRT, Kudler HS, Saunders WB, Smith RD. Symptom and comorbidity patterns in World War II and Vietnam veterans with posttraumatic stress disorder. *Compr Psychiatry* 1990;31:162–70.
- [54] Jacobsen LK, Southwick SM, Kosten TR. Substance use disorders in patients with posttraumatic stress disorder: a review of the literature. *Am J Psychiatry* 2001;158:1184–90.
- [55] Vaiva G, Brunet A, Lebigot F, Boss V, Ducrocq F, Devos P, et al. Fright (effroi) and other peritraumatic responses after a serious motor vehicle accident: prospective influence on acute PTSD development. *Can J Psychiatry* 2003;48(6):395–401.
- [56] Rohde P, Lewinson PM, Seeley JR. Comparability of telephone and face-to-face interviews in assessing Axis I and II disorders. *Am J Psychiatry* 1997;154:1593–8.
- [57] Ware JE, Kosinski M, Gandek B. SF-36 Health Survey: manual and interpretation guide. Lincoln (RI): QualityMetric Incorporated; 2003.
- [58] Rodriguez BF, Weisberg RB, Pagano ME, Machan JT, Culpepper L, Keller MB. Mental health treatment received by primary care patients with posttraumatic stress disorder. *J Clin Psychiatry* 2003;64(10):1230–6.