Trauma Exposure and Posttraumatic Stress Disorder in Primary Care Patients: Cross-Sectional Criterion Standard Study

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Objective: Posttraumatic stress disorder (PTSD) is one of the most common but least recognized anxiety disorders in primary care. This study aimed to describe the association of PTSD and trauma exposure with somatic symptoms, psychiatric comorbidity, functional impairment, and the actual treatment of PTSD in primary care.

Method: This cross-sectional criterion standard study included 965 consecutive primary care patients from 15 civilian primary care clinics in the United States. The Structured Clinical Interview for *DSM-IV* (SCID) was used to establish diagnosis of PTSD and other anxiety disorders. Somatic symptoms, depression, and anxiety were measured with the Patient Health Questionnaire (PHQ), and functional impairment was measured with the Medical Outcomes Study Short-Form General Health Survey (SF-20). The study was conducted from November 2004 to June 2005.

Results: PTSD was diagnosed in 83 patients (8.6%; 95% CI, 7.0%–10.5%), and trauma exposure without fulfilling *DSM-IV* criteria for PTSD was reported by 169 patients (17.5%; 15.2%–20.0%). With odds ratios ranging between 2.1 (95% CI, 1.2–3.6) for headache and 9.7 (3.8–24.8) for chest pain, PTSD patients had markedly elevated somatic symptom rates compared to the reference group of patients with no PTSD or trauma exposure. PTSD was significantly associated with elevated rates of psychiatric comorbidity, pain, and impaired functioning. Patients reporting trauma but no PTSD had rates of somatic symptoms, psychiatric comorbidity, and functional impairment that were intermediate between PTSD and reference group patients. Adjusting for depression substantially attenuated the association of PTSD and trauma with somatic symptoms, suggesting that depression may be an important mediator of the PTSD-somatic symptoms relationship.

Conclusions: The high frequency of PTSD in primary care and its association with psychiatric comorbidity and functional impairment underscore the need to better detect and treat PTSD in primary care. Recognizing the frequent somatic presentation of PTSD and appreciating the salience of comorbid depression may be especially important in optimizing PTSD care.

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Posttraumatic stress disorder (PTSD) is one of the most common anxiety disorders in primary care,[1] but it has received relatively little attention outside veteran populations. Despite the high psychological strain associated with PTSD, the availability of effective treatments,[2–6] and the fact that primary care physicians usually are the first point of contact for patients suffering from PTSD,[7] recent studies indicate that primary care physicians identify only 2%–48% of patients with PTSD.[8–11] Consequently, only a minority of primary care patients with PTSD receives adequate psychotherapeutic or psychopharmacological treatment.[1,10,12] Similar to depressed patients in primary care,[13] PTSD patients may be more likely to report somatic symptoms rather than psychological symptoms or traumatic experiences. To better understand the presentation of PTSD in primary care, the association of individual somatic symptoms with traumatic experiences and PTSD should be clarified. However, this issue has been inadequately studied in civilian primary care patients.

The early stage of PTSD research in primary care is reflected by the relatively wide range of PTSD prevalence rates (8%–23%) reported by recent primary care studies.[8,9,11,12,14] The generalizability of study results among civilian primary care patients and comparability of the different PTSD studies is limited due to small sample sizes,[12,14] low participation rates,[9,12,14,15] use of self-report instruments for PTSD diagnoses,[8,14] and different primary care settings (eg, civilians versus veterans).[11,16,17] Nevertheless, some of these studies suggest that primary care patients with PTSD may have an elevated risk for chronic pain, irritable bowel syndrome, anemia, arthritis, asthma, diabetes, eczema, kidney disease, lung disease, ulcer, psoriasis, and thyroid disease.[9,15,16,18] There is some empirical evidence for the association of PTSD with somatic symptoms and somatization,[17,19,20] and there is strong evidence that PTSD is associated with major depression,[9,11,12,21,22] anxiety disorders,[1,9,11,22–24] substance abuse,[11] and functional impairment.[1,11,12] At the same time, it is less clear if trauma without consecutive PTSD is also associated with somatic symptoms, psychiatric disorders and functional impairment.

The current study attempts to clarify the association of PTSD and trauma exposure with somatic symptoms, psychiatric comorbidity, and functional impairment using a large civilian primary care sample and a criterion standard psychiatric interview. We also aimed to describe the demographic characteristics and treatment rates of primary care patients with PTSD. Our main hypothesis was that primary care patients with either PTSD or trauma exposure would

have higher frequencies of somatic symptoms compared to the reference group with neither PTSD nor trauma exposure. Second, we hypothesized that primary care patient groups with PTSD or trauma exposure would have elevated rates of psychiatric comorbidity, specifically depression, somatization, and anxiety disorders. Finally, we expected higher functional impairment in primary care patients with PTSD or trauma exposure, compared to the reference group.

METHOD

Patient Sample

This study draws on data from the Patient Health Questionnaire (PHQ) Anxiety Study, which was conducted to develop a short self-administered measure for generalized anxiety disorder.[1,25] Patients were enrolled from a research network composed of 15 primary care sites (11 family practice and 4 internal medicine) located in 12 states in the United States and administered centrally by Clinvest, Inc (Springfield, Missouri) from November 2004 to June 2005. All 15 sites were in private practice, with the location being rural for 2 sites, suburban for 8, and urban (not inner city) for 5. Regarding the size of the practice, 7 sites reported being in practice alone, 4 reported 2 physicians in the practice, 1 reported 3, 1 reported 7, 1 reported 8, and 1 reported 52. Enrollment began in November 2004 for 1 site, January 2005 for 8 sites, and March 2005 for 6 sites. This staggered schedule was implemented primarily to enable the interviewers to telephone all selected patients back within the designated time window for the contact. Sites were instructed to either screen consecutive patients or approach every *n*th patient, but once the pattern was determined, it could not vary. Prior study enrolment disqualified a patient from being sampled on a future visit.

To minimize sampling bias, consecutive patients were approached at each site during clinic sessions until the target quota for that week had been achieved. Patients were invited to complete a 4-page questionnaire before seeing their physician. A total of 2,149 patients (participation rate, 92%) completed the questionnaire, and 2,091 (97%) had no or minimal missing data. Of the 2,149 patients, 1,654 agreed to a telephone interview. Of those, 965 were randomly selected by 1 of 2 mental health professionals to undergo this interview within 1 week of their clinical visit. The 965 interviewed patients comprise the study population for this article. Compared to the 1,184 patients who did not undergo the mental health interview, the 965 interviewed patients did not differ in terms of age and education but were more often women (63% vs 69%; $P = .003$), and had slightly higher depression (PHQ-8 score: 5.5 vs 4.8; $P = .001$) and anxiety (GAD-7 score: 5.6 vs 5.1; $P = .009$) scores. The study was approved by the Sterling Institutional Review Board, and all participants provided informed consent.

Measures

Diagnoses of specific anxiety disorders for the 965 patients were made by diagnostic interview. Two mental health professionals (a PhD clinical psychologist and a senior psychiatric social worker), who were blinded to the results of the consultation and the self-report questionnaire, conducted structured psychiatric interviews by telephone to establish independent criteria-based diagnoses for anxiety disorders according to the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (*DSM-IV*).[26] The interview included the social anxiety disorder, generalized anxiety disorder, and posttraumatic stress disorder (PTSD) sections of the Structured Clinical Interview for *DSM-IV* (SCID).[27] Interview by telephone was employed because of its feasibility in our multisite study and its demonstrated comparability with face-to-face research interviews.[28–30] Traumatic events were also documented in accordance with the guidelines of the SCID interview. For generalized anxiety disorder, several additional questions were added to the SCID to assess in greater detail some of the diagnostic criteria of *DSM-IV*.[25] The diagnosis for social anxiety disorder was made when the patient's symptoms met SCID diagnostic criteria and the patient had a score of 8 or greater on the 3-item version of the Social Phobia Inventory (Mini SPIN),[31] thus improving the accuracy of social anxiety diagnoses.[1] For the diagnosis of panic disorder, we used the 5-item PHQ panic module, requiring a response of *yes* to all 5 questions for a positive diagnosis,[32] because it produces realistic estimates of panic disorder prevalence rates[33] and because it is well-validated in patients from primary care and specific medical outpatient settings.[32,34–36]

The self-report questionnaire included questions about age, sex, education, ethnicity, marital status, current treatment, physician visits, and disability days in the last 3 months, and the Medical Outcomes Study Short Form General Health survey (SF-20)[37] which measured functional status in 6 domains. Somatic symptoms were measured using the individual items of the Patient Health Questionnaire Somatic Symptom Severity Scale (PHQ-15).[38] The PHQ-15 inquires about 15 somatic symptoms or symptom clusters that account for more than 90% of the somatic complaints reported in the outpatient setting.[38] Each of these items is given a rating of 0 (*not bothered at all*), 1 (*bothered a little*), or 2 (*bothered a lot*) regarding the last 4 weeks. For this study, a symptom was counted as present if the patient checked that the symptom bothered him a lot in the past 4 weeks.

Depression was assessed with the 8-item depression module of the Patient Health Questionnaire (PHQ-8),[39] which includes all items from the PHQ-9[34,40] except for the item on suicidal ideation. PHQ-8 and PHQ-9 scores are highly correlated and have nearly identical operating characteristics.[39] Superior criterion validity of the PHQ compared to other established self-report questionnaires was confirmed with respect to the diagnoses of major depressive disorder and other depressive disorders diagnosed by a standard interview for assessing psychiatric disorders.[41,42] A recent general population telephone survey, including 198,678 participants, supports the validity of the PHQ-8: Of the 17,040 respondents with a PHQ-8 score ≥ 10, major depressive disorder was present in 49.7%, other depressive disorder in 23.9%,

depressed mood or anhedonia in another 22.8%, and no evidence of depressive disorder or depressive symptoms in only 3.5%.[43] Internal consistency of the PHQ-8 in our study sample was $r(\alpha) = .90$.

Anxiety was assessed with the PHQ Generalized Anxiety Disorder Scale (GAD-7),[1,25] which has good test-retest reliability (intraclass correlation, $r = .83$) as well as convergent, construct, criterion, procedural, and factorial validity for the diagnosis of generalized anxiety disorder.[1,25,44] In a criterion standard study in primary care, the sensitivity of the GAD-7 for a cutoff point of ≥ 10 was 89%, the specificity was 82%, and the positive likelihood ratio was 5.1.[25] The sensitivity and specificity of GAD-7 was also good with regard to the other 3 most frequent anxiety disorders that are present in primary care patients—panic disorder, social anxiety disorder, and posttraumatic stress disorder.[1] Therefore, the GAD-7 is a reasonable overall measure of anxiety. Internal consistency of the GAD-7 in our study was $r(\alpha) = .92$.

Somatization severity was measured using the sum score of the Patient Health Questionnaire somatic symptom severity scale (PHQ-15). As an indicator of construct validity, a strong relationship between increasing PHQ-15 severity score and worsening function has been described.[38] Given that total self-reported PHQ-15 somatic symptom counts are highly correlated with clinician-rated somatoform disorder symptom counts,[45–48] there is evidence that the PHQ-15 not only measures severity of somatic symptoms but is also among the best validated self-report measures for somatization severity.[49] Similar to results from earlier studies,[38,50] internal consistency of the PHQ-15 in our sample was $r(\alpha) = .80$.

We used cutoff scores of ≥ 15 on the PHQ-8 and PHQ-15, because this threshold reflects severe levels of depression and somatization, respectively.[25,38,40,48] In addition to the PHQ scales, we used visual analog scales (range, 0 to 10) to measure global levels of pain, depression, and anxiety.

Based on the SCID interview, we divided the patients of the study population into 3 groups: (1) The *PTSD Group* included patients fulfilling the *DSM-IV* criteria of posttraumatic stress disorder; (2) the *Trauma, No PTSD Group* comprised patients who were exposed to a traumatic event (*DSM-IV*, criteria A) but did not meet the full criteria of PTSD; and (3) the *No Trauma Group* included patients who did not report a history of a traumatic event. The No Trauma Group was regarded as the reference group for group comparisons.

Statistical Analysis

We determined the frequency of PTSD and trauma exposure in our primary care patient population and compared the 3 patient groups in terms of demographic characteristics, treatment rates, depression severity, anxiety severity, and pain severity. For continuous variables, we used an analysis of covariance (ANCOVA) to adjust for demographic variables shown to be associated with the prevalence of mental and physical disorders; ie, age, sex, marital status, educational level, and race.[1,51] Categorical variables were compared using χ^2 tests. To adjust for multiple testing, Bonferroni corrections were performed for pairwise statistical comparisons.

The frequency of somatic symptoms was measured in each patient group, and multiple logistic regression analyses, adjusted for the above-named demographic characteristics, were used to determine the odds for each symptom in the PTSD Group versus the No Trauma Group and for the trauma exposure group (the PTSD Group and the Trauma, No PTSD Group) versus the No Trauma Group. In order to investigate to what extent the level of somatic symptoms in the 3 patient groups was influenced by comorbid depression, the same analyses were repeated with additional adjustment for depression severity (PHQ-8).

To describe the association between PTSD and psychiatric comorbidity, we compared the frequency of severe levels of self-reported depression (PHQ-8 ≥ 15) and somatization (PHQ-15 ≥ 15) in the 3 patient groups. Similarly, the frequency of generalized anxiety disorder, social anxiety disorder (diagnostic interview), and panic disorder (PHQ) were compared across the patient groups. Finally, functional impairment (as measured with the SF-20 scales), self-reported disability days, and physician visits in the 3 patient groups were compared using an ANCOVA, controlling for demographic variables. Similar to the procedure in somatic symptoms, we repeated the same analyses with additional adjustment for depression severity (PHQ-8).

Consistent with previous work, missing values in a scale were replaced with the mean value of the existing items if the number of missing items was below 25%. Otherwise, the sum score was not computed and was counted as missing.[1,25] Depending on the scale, it was possible to compute scale scores for 98.9%–99.6% of patients. The 15 sites did not differ in the volume of missing data. All statistical analyses were performed using SPSS, version 14.0 (SPSS Inc, Chicago, Illinois).

RESULTS

Patient Characteristics

Posttraumatic stress disorder was diagnosed in 83 patients, corresponding to 8.6% (95% CI, 7.0%–10.5%) of patients in our study sample. Trauma exposure without fulfilling the *DSM-IV* criteria for PTSD was reported by 169 patients (17.5%; 95% CI, 15.2%–20.0%). The patient characteristics of the 3 patient groups are summarized in Table 1. The groups did not differ with respect to age, sex, or education; but patients in the PTSD Group were significantly more likely to be women and less likely to be white or married. With regard to current treatment, the proportion of patients receiving psychotropic medications or psychotherapy/counseling was nearly 2 times higher in the PTSD Group compared to the No Trauma Group. However, only 51.2% of patients diagnosed with PTSD reported current psychotropic medication treatment, and only 12.2% were receiving counseling or psychotherapy. Considering the overlap of psychopharmacologic and psychosocial treatments, 46.3% of patients with PTSD were not receiving medication, counseling, or psychotherapy; 41.5% reported receiving psychotropic medication only; 2.4%

Table 1. Demographic and Clinical Characteristics of Primary Care Patients With PTSD; Trauma Exposure, No PTSD; and No Trauma Exposure

Characteristic	PTSD (n = 83)	Trauma, No PTSD (n = 169)	No Trauma (n = 713)	Overall Group Comparison	
				Test Statistic[a]	*P* Value
Age					
Mean (SD), y	44.7 (15.4)	46.2 (13.9)	47.6 (15.4)	1.7	.186
Range, y	18–87	18–83	18–85		
Sex, female, %	81.9	69.8	67.5	7.3	.026
Race, white, %	68.3	84.6	81.2	9.9	.007
Education, some college, %	56.1	67.9	66.0	3.7	.158
Married, %	48.2	68.0	65.9	11.2	.004
Current treatments, patient-reported					
Psychotropic medications, %	51.2	28.0	25.2	24.8	< .001
Counseling or psychotherapy, %	12.2	13.0	6.0	11.7	.003
Scale scores, mean (95% CI)[b,c]					
GAD-7 Anxiety Severity (possible score, 0–21)	11.4 (10.3–12.5)	6.2 (5.5–7.0)	4.8 (4.4–5.2)	65.4	< .001
PHQ-8 Depression Severity (possible score, 0–24)	11.8 (10.7–12.8)	6.8 (6.0–7.5)	4.5 (4.2–4.9)	84.1	< .001
PHQ-15 Somatic Symptom Severity (possible score, 0–30)	12.6 (11.6–13.6)	8.7 (8.0–9.4)	7.2 (6.9–7.6)	52.6	< .001
VAS Global Anxiety Severity (possible score, 0–10)	5.9 (5.3–6.4)	3.5 (3.1–3.9)	2.1 (1.9–2.3)	87.7	< .001
VAS Global Depression Severity (possible score, 0–10)	5.7 (5.2–6.3)	3.3 (2.9–3.7)	2.1 (1.9–2.3)	83.3	< .001
VAS Global Pain Severity (possible score, 0–10)	5.3 (4.8–5.9)	4.6 (4.1–5.0)	3.7 (3.5–3.9)	18.2	< .001

[a] χ^2 test for frequencies, ANOVAs for continuous variables. Test statistics given in the table are χ^2 values and *F* values, respectively.
[b] Means are adjusted for age, sex, race, education, and marital status.
[c] All pairwise statistical comparisons are significant ($P < .005$, Bonferroni adjusted), except for the difference in global pain severity between the PTSD Group and the Trauma, No PTSD Group.
Abbreviations: ANOVAs = analyses of variance, GAD-7 = Generalized Anxiety Disorder Screener, OR=odds ratio, PHQ = Patient Health Questionnaire, PTSD = posttraumatic stress disorder, VAS = visual analogue scale.

reported receiving only counseling; and 9.8% reported receiving both treatments.

Compared to the 2 other patient groups, PTSD patients had significantly higher scores on the self-report measures of depression, anxiety, somatic symptom severity, and pain. With respect to all measures of symptom severity, the patient group with Trauma exposure not meeting *DSM-IV* criteria for PTSD was intermediate between the PTSD Group and the No Trauma Group. All pairwise statistical comparisons were significant, except for the comparison of global pain severity between the PTSD Group and the Trauma, No PTSD Group.

Somatic Symptoms

The frequencies of somatic symptoms in the 3 patient groups are displayed in Table 2. Consistently, for each individual somatic symptom, patients with PTSD had the highest rate. *Loss of energy*, *sleep disturbance*, *musculoskeletal pain* (*back*, *arms*, *legs*, *joints*), *headache*, and *gastrointestinal problems* were the most frequent somatic symptoms, each present in more than one-fourth of PTSD patients. The overall group comparisons indicate significant differences in the frequencies of somatic symptoms in the 3 patient groups for all but 1 somatic symptom (*dizziness*). Compared to the reference group with no trauma exposure, the PTSD Group had significantly elevated rates of all somatic symptoms except *menstrual cramps or other problems with periods*. The adjusted odds ratios (95% CI) ranged between 2.1 (1.2–3.6) for *headache* and 9.7 (3.8–24.8) for *chest pain* (Table 2). Although the odds were lower in individuals in the Trauma, No PTSD Group, these individuals still were more likely than those in the reference group (No Trauma) to report 8 of the 15 somatic symptoms.

After additionally adjusting the same analyses for PHQ-8 depression severity, the odds ratios substantially decreased for all somatic symptoms. While depression severity was a significant covariate in all analyses, only the odds ratios from the group comparison of 2 somatic symptoms remained significant after controlling for depression: *pain in arms, legs or joints,* with an adjusted odds ratio of 1.6 (95% CI, 1.1–2.4) and *sleep disturbance,* with an adjusted odds ratio of 0.5 (95% CI, 0.3–0.9); both were for the comparison of the Trauma, No PTSD Group versus the No Trauma Group.

Psychiatric Comorbidity

The proportions of patients with PTSD who also reported severe levels of depression (PHQ-8 ≥ 15) and somatization (PHQ-15 ≥ 15) are displayed in Figure 1. Severe depression differed significantly between the 3 groups (overall $\chi^2 = 80.1$, $P < .001$), being present in 30.1% (95% CI, 21.3%–40.7%) of PTSD patients, in 12.6% (95% CI, 8.4%–18.5%) of patients in the Trauma, No PTSD Group and in 3.8% (95% CI, 2.6%–5.5%) of patients in the No Trauma Group. Severe somatization differed significantly as well (overall $\chi^2 = 64.5$, $P < .001$), being present in 34.9% (95% CI, 25.6%–45.7%), 12.5% (95% CI, 8.3%–18.4%), and 6.9% (95% CI, 5.2%–9.0%) of the 3 groups, respectively.

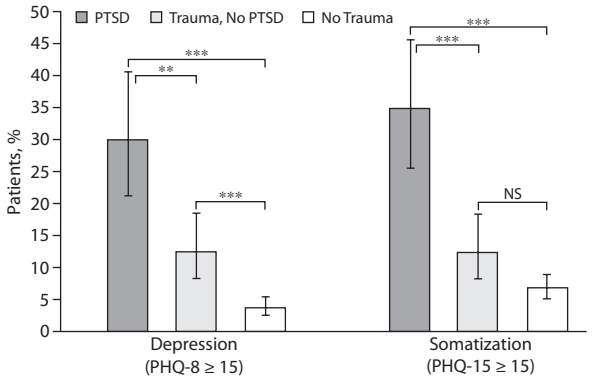
Anxiety disorders were also more prevalent in the PTSD Group compared to the other 2 groups (Figure 2). Panic disorder was diagnosed in 26.5% (95% CI, 18.2%–36.9%) of patients in the PTSD Group, in 9.5% (95% CI, 5.9%–14.8%) of patients in the Trauma, No PTSD Group, and in 3.9% (95% CI, 2.7%–5.6%) of patients in the No Trauma Group. Social anxiety disorder was diagnosed in 24.1% (95% CI, 16.2%–34.3%), 7.7% (95% CI, 4.6%–12.7%), and 3.8% (95% CI, 2.6%–5.5%) of the same patient groups, respectively. Finally, generalized anxiety disorder was diagnosed in 21.7% (95% CI, 14.2%–31.7%), 11.2% (95% CI, 7.3%–16.9%), and 5.0% (95% CI, 3.7%–6.9%) of the same groups, respectively. All overall χ^2 tests revealed significant differences between

Table 2. Somatic Symptoms in Primary Care Patients With PTSD; Trauma Exposure, No PTSD; and No Trauma Exposure

Somatic Symptom	PTSD (n = 83) %	Trauma, No PTSD (n = 169) %	No Trauma (n = 713) %	Overall Group Comparison χ^2	Overall Group Comparison *P* Value	PTSD vs No Trauma OR[a]	PTSD vs No Trauma (95% CI)	Trauma, No PTSD vs No Trauma OR[a]	Trauma, No PTSD vs No Trauma (95% CI)
Loss of energy	63.4	33.9	25.4	52.0	<.001	4.8	(2.9–7.8)	1.5	(1.1–2.2)
Sleep disturbance	57.8	26.9	21.4	51.9	<.001	4.4	(2.7–7.2)	1.4	(0.9–2.0)
Pain in arms, legs, or joints	41.0	34.3	21.0	25.2	<.001	2.6	(1.6–4.4)	2.0	(1.4–3.0)
Back pain	41.0	23.1	20.5	17.7	<.001	2.6	(1.6–4.3)	1.2	(0.8–1.7)
Nausea, gas, or indigestion	28.9	14.8	8.8	31.2	<.001	3.8	(2.2–6.7)	1.9	(1.1–3.1)
Constipation, loose bowels, or diarrhea	27.7	10.7	10.7	20.6	<.001	3.0	(1.7–5.2)	1.0	(0.6–1.7)
Headache	27.7	24.3	15.3	13.3	.001	2.1	(1.2–3.6)	1.7	(1.1–2.6)
Shortness of breath	18.1	7.7	4.1	27.2	<.001	5.2	(2.5–10.7)	2.1	(1.1–4.2)
Stomach pain	18.1	7.8	6.4	14.5	.001	2.9	(1.5–5.5)	1.2	(0.6–2.4)
Feeling heart pound or race	15.7	4.1	3.4	25.9	<.001	4.3	(2.0–9.1)	1.3	(1.1–4.2)
Menstrual cramps or other problems with periods	15.4	13.7	6.9	8.9	.012	2.0	(0.9–4.4)	1.9	(1.0–3.8)
Chest pain	13.3	1.2	1.3	49.0	<.001	9.7	(3.8–24.8)	1.0	(0.2–4.6)
Dizziness	8.4	4.1	3.2	5.5	.064	2.8	(1.1–7.0)	1.3	(0.6–3.2)
Pain or problems during sexual intercourse	3.8	4.2	1.3	7.2	.028	3.8	(1.0–15.0)	3.3	(1.2–9.0)
Fainting spells	3.6	0.6	0.1	…	…	…	…	…	…

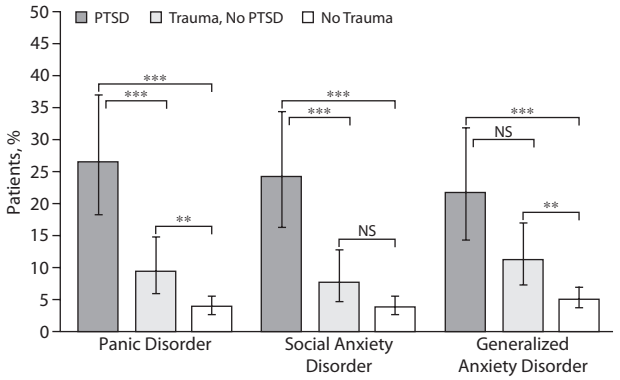
[a]Multiple logistic regression analyses, adjusted for age, sex, race, education, and marital status.
Symbol: … = Not reported due to small number of patients with that symptom.
Abbreviation: PTSD = posttraumatic stress disorder.

Figure 1. Depression and Somatization in Primary Care Patients With PTSD; Trauma Exposure, No PTSD; and No Trauma Exposure[a,b]



[a]The values displayed are the percentages of patients with severe levels of depression (PHQ-8 ≥ 15) and severe levels of somatization (PHQ-15 ≥ 15).
[b]Error bars indicate the 95% confidence interval.
**P < .01.
***P < .001.
Abbreviation: NS = not significant.

Figure 2. Anxiety Disorders in Primary Care Patients With PTSD; Trauma Exposure, No PTSD; and No Trauma Exposure[a,b]



[a]The values displayed are the percentages of patients with diagnoses of anxiety disorders.
[b]Error bars indicate the 95% confidence interval.
**P < .01.
***P < .001.
Abbreviation: NS = not significant.

the 3 patient groups with respect to the frequencies of comorbid anxiety disorders ($\chi^2 = 61.7$, $P < .001$; $\chi^2 = 53.6$, $P < .001$; and $\chi^2 = 33.4$, $P < .001$, respectively).

Functional Impairment

Analyses of covariance comparing the 3 patient groups with regard to health-related functional impairment revealed significant differences in all 6 SF-20 domains (Table 3). All SF-20 scores appear in the expected order, with the highest functional values in the No Trauma Group, intermediate values in the Trauma, No PTSD Group, and the lowest scores in the PTSD Group. In post hoc, pairwise statistical comparisons, the PTSD Group had significantly lower scores on the SF-20 scales than the Trauma, No PTSD Group, except on the SF-20 pain dimension. Also, the Trauma, No PTSD Group had significantly lower scores on all SF-20 domains compared to the No Trauma Group. Finally, patients in the PTSD Group had the highest number of self-reported disability days and medical visits in the past 3 months. In pairwise statistical comparisons, both the PTSD and Trauma, No PTSD groups had significantly more disability days and medical visits than the reference group (No Trauma).

These group differences decreased for all variables after controlling for depression severity. However, the group differences remained significant for 4 of the 8 variables; ie, for SF-20 physical functioning ($F = 6.0$, $P = .003$), SF-20 role functioning ($F = 3.4$, $P = .04$), disability days ($F = 3.6$, $P = .03$), and medical visits ($F = 5.1$, $P = .006$).

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Table 3. Functional Impairment in Primary Care Patients With PTSD; Trauma Exposure, No PTSD; and No Trauma Exposure[a]

Measure of Impairment	PTSD (n = 83)	Trauma, No PTSD (n = 169)	No Trauma (n = 713)	Overall Group Comparison[b]	
				F	*P*
SF-20 Dimension					
Physical functioning	57.0 (51.8–62.2)	70.0 (66.5–73.6)	79.5 (77.7–81.2)	38.6	< .001
Social functioning	58.7 (53.0–64.4)	74.8 (70.9–78.7)	84.5 (82.6–86.4)	39.8	< .001
Role functioning	43.8 (34.8–52.8)	61.3 (55.2–67.5)	75.9 (72.9–78.9)	27.3	< .001
Pain	49.0 (43.5–54.6)	55.7 (52.0–59.5)	63.0 (61.3–65.0)	15.3	< .001
Mental health	49.9 (45.7–54.1)	67.8 (64.9–70.6)	73.5 (72.1–74.9)	57.3	< .001
General health	38.0 (32.4–43.6)	53.1 (49.3–57.0)	61.5 (59.6–63.4)	34.2	< .001
Disability days[c]	13.2 (9.7–16.6)	11.7 (9.3–14.1)	6.0 (4.9–7.2)	14.2	< .001
Medical visits	2.7 (2.1–3.3)	2.4 (2.0–2.8)	1.5 (1.3–1.7)	12.6	.001

[a]Data are reported as mean (95% CI) except where noted otherwise. Means are adjusted for age, sex, race, education, and marital status.
[b]All pairwise statistical comparisons are significant ($P < .005$, Bonferroni adjusted), except for the differences in SF-20 pain, disability days, and medical visits between the PTSD Group and the Trauma, No PTSD Group.
[c]Self-reported for the past 3 months.
Abbreviations: PTSD = posttraumatic stress disorder, SF-20 = Medical Outcomes Study Short-Form General Health Survey.

DISCUSSION

This large primary care study adds several new findings to the growing body of knowledge on PTSD in primary care. First, primary care patients with PTSD suffer from markedly elevated rates of somatic symptoms compared to other primary care patients. This finding was true for all individual somatic symptoms except menstrual complaints, and particularly prevalent were loss of energy, sleep disturbances, musculoskeletal pain, headache, and gastrointestinal symptoms. With respect to the frequency of somatic symptoms, the Trauma, No PTSD Group was intermediate between the PTSD Group and the reference group (No Trauma). Second, our frequency of 8.6% for full-blown PTSD and 17.5% for the Trauma, No PTSD Group indicate the relevance of PTSD and trauma in primary care. Third, psychiatric comorbidity in PTSD patients and patients with trauma history is elevated, with approximately one-third of PTSD patients suffering from severe levels of depression or somatization and approximately one-quarter of patients having diagnoses of comorbid panic disorder, generalized anxiety disorder, or social anxiety disorder. Fourth, PTSD patients and patients with trauma history report substantially more functional impairment and disability days than do other primary care patients, and this effect was only partially explained by comorbid anxiety and depression. Finally, almost half of PTSD patients in primary care remain untreated.

An earlier study conducted in a health maintenance organization found higher levels of somatic symptoms and somatization in PTSD patients compared to patients with other mental disorders.[19] Several factors have been postulated as potential links in the association between PTSD and elevated somatic symptom rates. Exposure to severe trauma may be related to alterations in neuroendocrine and immunologic functions.[16] For example, decreased cortisol levels were observed in individuals who have developed PTSD after exposure to trauma, concurrent with higher levels of catecholamines and increased leukocyte counts.[16,52] These alterations in neuroendocrine and immune function might explain preliminary results showing associations between PTSD and autoimmune-related disorders, such as rheumatoid arthritis and psoriasis.[15,16,53,54] An earlier meta-analysis supported a positive association between PTSD and basal cardiovascular activity,[55] and a recent retrospective cohort survey, the Adverse Childhood Experiences study, found a dose-response relationship between the number of adverse childhood experiences and ischemic heart disease.[56] However, thus far, it remains unclear whether these results can be explained by a neurobiological link between trauma and atherosclerosis or if PTSD and ischemic heart disease are both results of disordered social environments as a common risk factor. Similarly, another study provided evidence of increased levels of multiple types of childhood trauma in a population-based sample of clinically confirmed chronic fatigue symptom cases compared with nonfatigued controls.[57]

Notably, adjusting for depression substantially attenuated the association of PTSD and trauma with somatic symptoms in our study. The fact that most of the elevated odds ratios were reduced and no longer significant suggests that comorbid depression may be an important mediator of the PTSD-somatic symptom relationship. As evidenced by our study and earlier research, PTSD is frequently comorbid with depression,[21,22,52,58] and in most cases, PTSD is the primary diagnosis and increases the risk for first-onset major depression.[59,60] However, other cross-sectional and prospective studies reported an independent association between trauma, PTSD, and somatic symptoms that was not explained by depression[15,61] Future research is warranted to disentangle the differential associations between trauma, PTSD, depression, and somatic symptoms. Depression also partially attenuated the association of PTSD and trauma with functional impairment, though to a lesser degree. The strong effects of depression on somatic symptom-reporting and functional impairment are supported by a considerable amount of previous research.[62–64] Given these findings, it is possible that the neuroendocrine, cardiologic, and long-term results mentioned above are at least partially attributable to comorbid depression rather than PTSD alone. In any case, the study results highlight the need to control for depression severity in future studies investigating the effects of PTSD or trauma.

Our study aimed to overcome methodological limitations of prior studies of PTSD in primary care that have been subject to small samples, low participation rates, veteran settings, or use of self-report diagnostic instruments.[8,9,11,12,14–16] Compared to those studies, our PTSD frequency of 8.6% was at the lower end of the reported range.[8,9,11,12,14] On the one hand, we believe that the multisite design, the large sample size, the

use of a standard diagnostic interview, and the demographic comparability of our study sample to patients seen in US primary care[65] support the generalizability of our frequency rate. Conversely, waiting room samples are not equivalent to random samples of community or practice populations in which the frequency of disorders reflects true prevalence rates with greater precision. The fact that patients with chronic illnesses—including depression, somatization, and PTSD—visit primary care physicians at markedly elevated rates[66] may inflate frequency rates in waiting room samples. At the same time, effective treatment may decrease the severity of symptoms and, consequently, may affect the frequency of symptoms among patients presenting in primary care practices. Other factors, such as the socioeconomic settings of the practices and the time of year, might also affect the composition of a waiting room sample and the representativeness of the study sample.

The treatment rate of 54% in our study is in line with reports from earlier studies.[10,12] However, while some patients may wait for spontaneous remission or may be reluctant to seek care from a mental health professional, increasing this treatment rate is desirable given the availability of effective PTSD treatments.[2–4] In our study, 51% of PTSD patients received psychotropic medication, while only 12% received psychotherapy or counseling. The low proportion of patients treated with psychotherapy or counseling does not reflect the important role of psychological therapies in the treatment of PTSD.[2,3,5,52,67,68] In fact, for the treatment of PTSD, psychological interventions are more effective than pharmacologic interventions, although both are better than placebo.[2,69] Our findings with respect to elevated rates of depression, pain, and anxiety disorders are consistent with previous primary care research in patients with PTSD.[8,9,12,14,15]

The strengths of our study include its large sample size, patient recruitment in diverse clinical settings, a high participation rate, the use of a criterion standard psychiatric interview, statistical adjustment for the most important demographic characteristics, and recruitment from civilian primary care settings, where the majority of patients with PTSD are treated. However, several limitations need to be mentioned: First, the frequency of PTSD and psychiatric comorbidity may have been overestimated, because frequent clinic attendees could be overrepresented and because the 965 analyzed patients had slightly higher anxiety and depression scores compared to the patients not undergoing a diagnostic interview. However, our patients are demographically similar to those seen in US primary care practices nationwide,[65] and our frequency was not higher than previously reported.[8,9,11,12,14] Second, we relied on self-report measures for somatic symptoms, treatment rates, functional impairment, depression, pain, and somatization. However, compared to interviewer-based diagnostic interviews, self-report measures have the advantage of not being prone to bias introduced by different interviewers, and prior research has established the reasonable reliability of self-report for these outcomes.[17,25,34,37–39,41] Third, an elevated rate was found in PTSD patients for 14 of the 15 most prevalent somatic symptoms in primary care. Nonetheless, it is possible that there are other symptoms we did not inquire about that are not elevated in PTSD. Fourth, we did not assess for physical injury caused by the trauma, which could potentially explain some somatic differences between the PTSD Group, the Trauma, No PTSD Group," and the No Trauma Group. Finally, our cross-sectional design does not permit conclusions about cause-effect relationships regarding PTSD, somatic symptoms, and all other variables.

Given the elevated frequency of somatic symptoms in PTSD patients, we expect that PTSD patients frequently present in primary care with somatic symptoms rather than psychological problems, contributing to underdetection of PTSD. However, this possibility was not examined explicitly in our study, and future research should investigate which problems PTSD patients actually present with at their primary care visits. In any case, several short and well-validated screening questionnaires[70–73] are available that can assist physicians in detecting PTSD symptomatology. Comorbid depression and/or anxiety, which are also detectable with a brief 4-item screening questionnaire,[74] may also be indicators of PTSD in primary care. Given our study results, it appears reasonable to equip not only physicians who provide care for veterans but also physicians in civilian primary care settings with basic PTSD knowledge. Certainly, the provision of optimal care for patients with PTSD will frequently require collaboration with or referral to a mental health professional. However, as with other mental disorders, the role of the primary care physician is pivotal; with some basic knowledge, he or she can significantly help traumatized patients with the provision of education, support, and a sense of safety.[52] The elevated rates of somatic symptoms in PTSD patients might actually prompt more of them to seek primary care and, if recognized as potential indicators of PTSD, might facilitate diagnosis and treatment. Indeed, the assurance that the PTSD symptoms are not signs of a disturbed personality but instead a normal psychobiological reaction to a traumatic event can provide emotional relief for the patient and open the door for appropriate treatments and sustainable symptom improvement.

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