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## Social anxiety disorder in veterans affairs primary care clinics

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### Abstract

To examine the prevalence and correlates of social anxiety disorder (SAD) in veterans, 733 veterans from four VA primary care clinics were evaluated using self-report questionnaires, telephone interviews, and a 12-month retrospective review of primary care charts. We also tested the concordance between primary care providers' detection of anxiety problems and diagnoses of SAD from psychiatric interviews. For the multi-site sample, 3.6% met criteria for SAD. A greater rate of SAD was found in veterans with than without post-traumatic stress disorder (PTSD) (22.0% vs. 1.1%), and primary care providers detected anxiety problems in only 58% of veterans with SAD. The elevated rate of comorbid psychiatric diagnoses and suicidal risk associated with SAD was not attributable to PTSD symptom severity. Moreover, even after controlling for the presence of major depressive disorder, SAD retained unique, adverse effects on PTSD diagnoses and severity, the presence of other psychiatric conditions, and suicidal risk. These results attest to strong relations between SAD and PTSD, the inadequate recognition of SAD in primary care settings, and the significant distress and impairment associated with SAD in veterans.

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*Keywords:* Social anxiety disorder; Post-traumatic stress disorder; Veterans; Comorbidity; Suicidality; Specificity

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## Introduction

Social anxiety disorder (SAD) is the third most prevalent psychiatric condition in the United States with epidemiological studies estimating a lifetime prevalence rate of 13.3%, and a 1-year prevalence rate of 7.9% in community samples (Kessler et al., 1994). Rates apparently have increased over the past few generations (Heimberg, Stein, Hiripi, & Kessler, 2000). Left untreated, SAD is a persistent and disabling condition that involves the often paralyzing fear of interacting or doing things in front of other people because of social evaluative concerns. Individuals with SAD experience high levels of functional impairment at work and school (Schneier et al., 1994; Wittchen, Fuetsch, Sonntag, Mueller, & Liebowitz, 2000). As for interpersonal functioning, SAD is associated with smaller social networks, less social support and acceptance, a high probability of being single or divorced, a low probability of being in a romantic relationship, and less sexual satisfaction (Davidson, Hughes, George, & Blazer, 1994; Schneier et al., 1994; Wittchen et al., 2000). Over 70% of individuals with SAD meet criteria for comorbid anxiety, mood, and alcohol abuse disorders (e.g., Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992), and these individuals are at high risk for suicidality (Schneier et al., 1992). The present study was interested in expanding the study of SAD to trauma-exposed veterans with and without post-traumatic stress disorder (PTSD).

Several studies have shown that PTSD is associated with significant social functioning difficulties and impaired social relations (e.g., Frueh, Turner, Beidel, & Cahill, 2001; Jordan et al., 1992; Riggs, Byrne, Weathers, & Litz, 1998). In particular, the presence of PTSD is associated with social skills problems, less satisfaction in intimate relationships (e.g., romantic, parent–child), and social interactions and relationships that tend to be characterized by more conflict and hostility, poorer communication, and less emotional expressiveness, intimacy, and positive sharing. Despite increased attention to SAD and its role in psychological functioning, the study of SAD in trauma-exposed veterans (or any trauma survivors) is in its infancy. For the few published examinations of SAD in veterans, samples have ranged from 41–47 veterans (Crowson, Frueh, Beidel, & Turner, 1998; Hofmann, Litz, & Weathers, 2003; Orsillo, Heimberg, Juster, & Garrett, 1996); the exception ( $n = 304$ ) narrowly focused on rates of SAD in veterans with and without PTSD (Orsillo, Weathers, Litz, Steinberg, Huska, & Keane, 1996). For those studies using diagnostic interviews, 15% (Hofmann et al., 2003; Orsillo et al., 1996) and 72% (Orsillo et al., 1996) of veterans with PTSD met criteria for a diagnosis of SAD compared to 5% (Hofmann et al., 2003), 7% (Orsillo et al., 1996), and 22% (Orsillo et al., 1996) of veterans without PTSD. Although Orsillo et al. (1996) reported very high rates of SAD in veterans, only 41 veterans were examined and interviewers were not blind to hypotheses. Overall, existing data support a significant, albeit neglected, relation between these psychiatric conditions.

Only one published study has examined the correlates of SAD in veterans (Orsillo et al., 1996), finding post-war social anxiety to be positively associated with war-related shame and adverse homecoming experiences. Although Orsillo's seminal work on SAD and PTSD was published almost a decade ago, only three additional studies have been conducted on the topic with each narrowly focusing on relations among PTSD, SAD and depressive symptoms. Moreover, the sample sizes of these studies were small and the recruitment process tended to lack generalizability, relying on advertisements (Hofmann et al., 2003) and outpatients from mental health specialty clinics (Crowson et al., 1998; Orsillo et al., 1996).

There are reasons to expect the presence of SAD to amplify the difficulties of veterans with and without PTSD. Individuals who are especially concerned about being rejected and embarrassed are more sensitive to social threat cues, and tend to interpret neutral and ambiguous social situations as threatening (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). These information-processing biases lead to intense negative emotions, and negative emotions tend to be misinterpreted as evidence of social failure, further intensifying initial fears and social cognitive biases. Depending on the severity and intensity of this cyclical process, ultimately, individuals engage in some level of experiential avoidance as a means of coping. One of the by-products of experiential avoidance is that the prerequisites to positive social interactions, such as the ability to properly display and read social cues, as well as emotional self-disclosure, expressiveness, responsiveness are disrupted. Thereby, social fears can lead to less positive social activity and relationships, and greater social impairment.

The manifest behaviors of PTSD and SAD, such as distress in social interactions, behavioral inhibition, social avoidance patterns, and impaired social relationships may be similar. However, the etiological and maintaining factors can be expected to diverge across these conditions. With SAD, these behaviors derive from core fears of being negatively evaluated and rejected, whereas with PTSD, these behaviors could derive from symptoms such as feeling detached from others, experiencing a restricted range of positive and negative emotions, and avoidance of social stimuli associated with trauma experiences. Thus, whether SAD develops before, after, or concomitantly with PTSD, there is reason to believe that SAD will have an incremental adverse association with indices of distress, impairment, and well-being in veterans. Overall, there is a general absence of empirical data on the complex relation between SAD and PTSD, and outcomes related to the presence of SAD in veterans.

The examination of SAD in veterans is of clinical importance because: (a) positive social activity is arguably the largest contributor to well-being and quality-of-life (Baumeister & Leary, 1995; Ryff & Singer, 2000), (b) high levels of social support offer resilience for post-trauma recovery (King, King, Fairbank, Keane, & Adams, 1998; Solomon, Mikulincer, & Avitzur, 1988), (c) social difficulties tend to be a primary complaint of clients treated for PTSD (Herman, 1992), and (d) facilitating social and emotional skills has been evaluated as a useful target of PTSD intervention (Frueh, Turner, Beidel, Mirabella, & Jones, 1996). Factors that impede social functioning, such as the social fear and avoidance, and functional impairment associated with SAD, represent a critical area to examine in individuals who have experienced trauma or are at risk for adverse stress-related outcomes.

Primary care providers tend to be the initial, and sometimes only, professionals to recognize, diagnose, and manage anxiety disorders in the large majority of medical patients (Fifer, Mathias, Patrick, Mazaonson, Lubeck, & Buesching, 1994; Kirmayer, Robbins, Dworkind, & Yaffe, 1993; Ormel, Koeter, van den Brink, & van de Willige, 1991). Benefits of examining SAD in veterans recruited from Veterans Affairs (VA) primary care clinics are that findings can be generalized to those veterans who use the VA for their healthcare (as opposed to samples recruited from mental health or specialty clinics), and primary care providers are at the frontline of psychiatric evaluations and treatments. Thus, using a primary care veteran sample with assessment information from primary care providers allows for an examination of prototypical psychiatric assessment and treatment. To our knowledge, there are no published data on the prevalence and nature of SAD using primary care veteran samples.

The present study was designed to extend the small body of work on SAD in veterans in several ways. First, we used a large-scale multi-site sample of veterans from four VA primary care clinics. To maximize generalizability, we began with an initial sample of every veteran with at least one primary care appointment in the year under study (as opposed to randomly selecting patient arrivals, which oversamples for heavy health service users). Second, we were interested in correlates of SAD in veterans. We examined a broad range of socio-demographic and clinical characteristics including comorbidity, suicidal risk, and dimensions of psychological and physical quality-of-life. For all variables related to the presence/absence of SAD, we examined the specificity of SAD effects by controlling for (1) PTSD severity and (2) the presence of depression. Third, because primary care providers tend to be the first, and sometimes only, professionals that evaluate psychological distress in veteran and non-veteran populations, we examined whether or not primary care physicians detected the presence of SAD in their patients. We compared the recognition rate of anxiety problems in veterans (a liberal test) compared to the presence of SAD diagnoses as assessed by validated, semi-structured psychiatric interviews.

We hypothesized a strong relationship between SAD and PTSD in veterans. Upon examining SAD as the index disorder, SAD was expected to increase the risk for other psychiatric conditions, greater suicidal risk, and lower quality-of-life. Due to an absence of research on the topic, relations between SAD and socio-demographic and clinical characteristics were exploratory. Additionally, we expected that primary care providers would fail to detect anxiety problems in a large percentage of their patients diagnosed with SAD by structured psychiatric interviews.

## **Method**

### *Study design*

We examined veterans at four VA Medical Centers (Charleston and Columbia, SC; Tuscaloosa and Birmingham, AL) (Magruder et al., 2004). Study participants were randomly selected from a master list of all patients during the fiscal year 1999 at each site. Consenting participants were provided with a semi-structured clinic assessment and within 2 months, were administered a structured telephone interview. Study measures were read aloud to all participants because many veterans had vision problems or insufficient literacy skills. Additionally, using available medical charts, we conducted a 12-month retrospective review of each participant's primary care treatment. Exclusionary criteria included dementia-related symptoms and being age 80 or older.

### *Participants*

A total of 1198 randomly identified veterans (known to be alive) were approached for participation, and 885 veterans provided informed consent (74%). Overall, 746 veterans completed the telephone interview. For those veterans with missing telephone interviews, reasons were given for 107: 59% were not contactable (incorrect phone 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. Because of missing follow-up data on primary instruments, our final sample was 733 veterans. 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,  $p = .02$ ), indicating that those who did *not* complete the telephone PTSD diagnostic study materials had somewhat higher levels of PTSD symptomatology.

### *Clinic interview measures*

*Demographic information:* Participants were asked about socio-demographic information, disability status, and combat exposure.

*PTSD checklist military version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993):* The 17-item PCL-M is a self-report measure of PTSD symptoms during the past month (e.g., Blanchard, Jones, Buckley, & Forneris, 1996). Items correspond to Diagnostic and Statistical Manual of Mental Disorders—4th Edition (DSM-IV; American Psychiatric Association, 1994) criteria for PTSD.

*The short-form health survey (SF-36; Ware & Sherbourne, 1992):* The 36-item SF-36 is a self-report measure of several health domains including: physical functioning; social functioning; daily role limitations because of physical health problems (role-physical); daily role limitations because of emotional problems (role-emotional); vitality; psychological distress and well-being (mental health); and general health perceptions (general health). For all subscales, higher scores reflect greater health. The SF-36 has been shown to be a valid and reliable instrument for use with veteran populations (e.g., Richardson, Engel, Hunt, McKnight, & McFall, 2002). The SF-36 raw scores for physical functioning, vitality, mental health, and general health were transformed to a 0–100 scale (according to scoring and formulas in the SF-36 Health Survey Manual; Ware, Kosinski, & Keller, 1997). Due to very non-normal distributions, 3 subscales were transformed into categorical variables based on response distributions (i.e., role-physical on a 0–4 scale; social functioning and role-emotional on 0–3 scales).

### *Telephone interview*

Records of patients who completed clinic interviews were sent to the Charleston VA Medical Center, where master's level clinicians administered structured interviews via telephone. Interviewers were all master's level clinicians (psychologists and psychiatric nurse practitioners), with prior clinical activities with trauma populations and/or involved in prior research projects using identical measures to those included in this study. Interviewers underwent one training session in the administration of clinical interviews from one of the authors (BCF). They also received ongoing supervision. Inter-rater reliability analysis (kappa) was conducted for a random sample of interviews (approximately 8%). Raters were 100% concordant for PTSD and SAD diagnoses.

*The trauma assessment for adults-interview version (TAA; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993)* assessed lifetime prevalence of trauma and has been widely used to screen community and medical populations (Kilpatrick, Acierno, Saunders, Resnick, Best, & Schnurr, 2000; Resnick et al., 1993). This interview provided data to categorize patients as to whether they met PTSD criterion A1.

*The clinician-administered PTSD scale (CAPS; Blake et al., 1990)* was administered to veterans scoring positively on the TAA. The CAPS is a structured clinical interview that measures the



intensity and frequency of DSM-IV PTSD symptoms (APA, 1994). The CAPS is considered the “gold standard” for assessing PTSD (Weathers, Keane, & Davidson, 2001).

The *mini international neuropsychiatric interview* (MINI; Sheehan et al., 1997) is a brief structured interview that assesses the criteria for DSM-IV diagnoses and suicidality risk (Lecrubier et al., 1997; Sheehan et al., 1997). The MINI exhibits similar sensitivity and specificity to more time-intensive structured psychiatric interviews (e.g., Structured Clinical Interview for DSM-IV, Composite International Diagnostic Interview) (Lecrubier et al., 1997; Sheehan et al., 1997). We examined SAD and other anxiety, mood, and alcohol-related disorders.

Suicide risk was assessed with six differentially weighted MINI items. Participants were asked if they engaged in any of the following in the past month (item weightings in parentheses): think they would be better off dead or wish they were dead (1), want to harm themselves (2), think about suicide (6), have a suicide plan (10), or attempt suicide (10). They were also asked about any lifetime suicide attempts (4). Based on item weightings, suicidal risk was defined as low for scores between 1 and 5, moderate for scores between 6 and 9, and high for scores  $\geq 10$ .

#### *Chart review*

Electronic medical records for the 12 months preceding study participation were reviewed for each consenting patient. The information recorded included medical and psychological diagnoses and conditions. In the present study, we examined primary care providers' recognition/documentation of anxiety problems that require clinical attention as compared to the presence/absence of SAD diagnoses based on MINI interviews. Anxiety problems were coded as “present” if any primary or specialty care progress notes indicated anxiety, synonyms of anxiety (e.g., nervous, jittery, stressed), or any DSM-IV anxiety disorder as a problem to be addressed. This strategy represented a liberal effort to determine whether providers recognized, not only specific anxiety disorders, but also any general concern about anxiety symptoms in these patients.

#### *Assignment of PTSD diagnostic category (positive or negative)*

PTSD diagnoses were based on results of structured phone interviews. Participants who scored negative on either the TAA (failing to meet PTSD criterion A1) or the CAPS comprised the PTSD (–) group. Corresponding with DSM-IV criteria, participants were designated as PTSD (+) if they met criterion A1 on the TAA, criteria B, C, and D on the CAPS, and the duration of CAPS symptoms was greater than 1 month (Blake et al., 1990).

#### *Overview of analytic strategies*

All tests were two-tailed. The primary data strategy involved examining relationships between study variables and the presence/absence of SAD. We examined the prevalence rate of SAD in the full sample and then conducted a chi-square analysis to examine the comorbidity of SAD and PTSD. To examine correlates of SAD, *t*-tests were used for continuous outcomes (e.g., severity of PTSD symptom clusters) and chi-square analyses for categorical outcomes (e.g., presence of comorbid psychiatric conditions). To examine the unique effects of SAD on study outcomes, we conducted linear and logistic regression models with SAD and PTSD severity (i.e., PCL-M total

score) entered simultaneously. To examine whether SAD effects were a function of shared variance with depression, we conducted secondary analyses statistically controlling for depression (with a series of linear and logistic regression models).

Our final analyses focused on primary care providers' recognition of anxiety problems. Using chi-square analyses, we tested the agreement between SAD diagnoses and primary care providers' recognition of (a) anxiety problems other than PTSD and (b) any anxiety problems (including PTSD).

## Results

### *Preliminary analyses*

Comparisons were made between the final sample ( $n = 733$ ) and excluded participants ( $n = 152$ ) on PTSD symptoms and clinical and socio-demographic variables. The only significant difference was a higher rate of living with someone in the final sample (70.5–57.2%),  $\chi^2(1, 883) = 57.38, p < .001$ .

To examine the inter-rater reliability of PTSD and SAD diagnoses, interviews were conducted by speakerphone for a random 8% ( $n = 61$ ) of the sample. Raters were 100% concordant on PTSD and SAD diagnoses.

### *Sample characteristics*

The average age of the final sample was 61.2 ( $\pm 11.9$ ), with nearly 43% age 65 years or older (ranging from 25.5 to 81.1 years); 93.3% was male; 62.7% was Caucasian; 22.1% had less than a high school education; 48.5% reported serving in a war zone; and 32.9% were employed.

### *Prevalence of SAD and relations with PTSD*

For the entire sample, 3.6% of veterans met criteria for SAD diagnoses. We found a strong relationship between the likelihood of meeting criteria for PTSD and SAD diagnoses;  $\chi^2(1, 733) = 98.13, p < .001$ . Specifically, 73.1% of veterans with SAD had comorbid PTSD whereas 26.9% of veterans without SAD met criteria for PTSD. Alternatively, 22.1% of veterans with PTSD had comorbid SAD whereas 1.1% of veterans without PTSD met criteria for SAD.

Relationships between the presence of SAD and PTSD severity are shown in [Table 1](#). Using interviews (i.e., CAPS) and self-reports (i.e., PCL-M), veterans with SAD exhibited higher scores for each PTSD symptom cluster and total symptom severity (all  $p$ -values  $< .001$ ).

### *Relation between SAD and demographic and clinical characteristics*

We examined clinical characteristics associated with SAD. There were no significant differences between veterans with and without SAD in gender, ethnicity, marital status, education, or current disability status. Veterans with SAD were significantly younger ( $X = 55.4, SD = 10.5$ ) than patients without SAD [SAD (+),  $X = 55.4, SD = 10.5$ ; SAD (–),  $X = 61.4, SD = 11.9$ ];

Table 1  
Presence of social anxiety disorder and PTSD symptom severity

PTSD symptom severity	Group		<i>t</i> (728)
	SAD (+) (mean ± <i>SD</i> )	SAD (–) (mean ± <i>SD</i> )	
CAPS cluster B	19.00 ± 10.48	8.19 ± 9.33	5.58***
CAPS cluster C—avoidance	16.78 ± 6.60	5.43 ± 6.82	8.34***
CAPS cluster C—numbing	13.73 ± 6.84	4.56 ± 6.28	7.29***
CAPS cluster D	24.19 ± 6.68	9.39 ± 10.45	7.16***
CAPS total	75.88 ± 27.31	25.85 ± 31.79	7.92***
PCL cluster B	11.85 ± 6.44	6.98 ± 4.14	5.75***
PCL cluster C—avoidance	10.46 ± 4.52	5.92 ± 3.35	6.69***
PCL cluster C—numbing	7.50 ± 3.48	4.63 ± 2.81	5.07***
PCL cluster D	14.46 ± 5.81	8.57 ± 4.71	6.21***
PCL cluster total	44.27 ± 17.99	25.78 ± 13.35	6.84***

Notes: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . To assess PTSD severity on the CAPS, intensity and frequency symptom scores were aggregated.

$t$  (726) = 2.55,  $p = .01$ . A greater percentage of SAD (+) patients were unemployed (84.6%) compared to SAD (–) patients (61.5%);  $\chi^2$  (1, 730) = 5.70,  $p = .01$ . The majority of SAD (+) patients were unemployed due to disability (81.8%) whereas the majority of SAD (–) patients were unemployed due to retirement (62.6%). Compared to SAD (–) patients, SAD (+) patients were significantly more likely to have had combat experience (80.8% to 49.4%, respectively;  $\chi^2$  (1, 724) = 9.85,  $p = .002$ ) and witnessed someone seriously injured or violently killed (61.5% to 35.8%, respectively;  $\chi^2$  (1, 722) = 7.16,  $p = .01$ ). Moreover, SAD (+) patients were significantly more likely to pursue disability compensation compared to SAD (–) patients (57.7% to 24.3%, respectively;  $\chi^2$  (1, 730) = 14.81,  $p = .001$ ).

#### *Relation between SAD and psychological and physical health*

*Comorbid psychiatric conditions and suicidality risk:* We examined the risk of psychiatric disorder and suicidal risk associated with the presence of SAD. As shown in Table 2, SAD was highly comorbid with other mental disorders. On average, SAD (+) patients had 4.04 ( $SD = 1.78$ ) comorbid mental disorders compared to .52 ( $SD = 1.08$ ) for SAD (–) patients;  $t$  (728) = 15.89,  $p < .001$ . As can be seen in Table 2, the three most common psychiatric conditions found in SAD (+) patients were Major Depressive Disorder (MDD), Dysthymic Disorder, and Generalized Anxiety Disorder (rates ranging from 50% to 69.2%); all  $p$ -values  $< .001$ . Additionally, 53.8% of SAD (+) patients were at moderate to high suicidal risk;  $p < .001$ . Compared to SAD (–) patients, SAD (+) patients were at greater risk for all psychiatric conditions (OR's ranged from 2.31 to 74.01; all  $p$ -values  $< .01$ ) (the exception being alcohol abuse).

*Relation between SAD and health-related quality of life:* We examined differences between SAD (+) and SAD (–) groups on quality-of-life dimensions (SF-36 subscales). Table 3 shows that the



Table 2  
Psychiatric comorbidity and suicidal risk associated with social anxiety disorder

Psychiatric condition <sup>a</sup>	Diagnosis from MINI		$\chi^2$ (1, 730)	OR (95% CI) <sup>b</sup>
	SAD (+) <i>n</i> = 26	SAD (–) <i>n</i> = 707		
Anxiety disorders				
Panic disorder	9 (34.6%)	44 (6.3%)	29.96***	7.94 (3.35, 18.84)
Agoraphobia	9 (34.6%)	38 (5.4%)	35.53***	9.28 (3.88, 22.18)
OCD	9 (34.6%)	5 (.7%)	153.24***	74.01 (22.42, 244.35)
GAD	13 (50.0%)	75 (10.7%)	36.62***	8.39 (3.75, 18.76)
Major depressive disorder	18 (69.2%)	103 (14.6%)	54.06***	13.13 (5.56, 30.98)
Dysthymic disorder	16 (61.5%)	80 (11.4%)	55.27***	12.48 (5.48, 28.44)
Alcohol abuse	1 (3.8%)	12 (1.7%)	.66	2.31 (.29, 18.44)
Alcohol dependence	4 (15.4%)	12 (1.7%)	17.38**	8.35 (2.56, 27.22)
Suicidal risk	14 (53.8%)	57 (8.1%)	59.77***	13.24 (5.85, 29.98)

Notes: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

<sup>a</sup>Presence of psychiatric conditions is reported in descriptive statistics.

<sup>b</sup>Odds of having given co-morbid condition for SAD (+) group compared to SAD (–) group.

presence of SAD was associated with poor scores on all dimensions of psychological health; all  $p$ -values  $< .01$ . In contrast, no significant relations were found with physical health indices.

### Specificity of SAD effects

*Statistically controlling for PTSD severity:* Focusing on study outcomes with significant relations to SAD, we examined the unique variance attributable to SAD after statistically controlling for PTSD severity. PTSD severity was a significant predictor in all logistic regression models; all  $p$ -values  $< .01$ . After statistically controlling for PTSD severity, veterans with SAD were still at significantly higher risk for comorbidity and higher suicidal risk compared to veterans without SAD (ORs ranged from 2.92 for panic disorder to 34.58 for obsessive–compulsive disorder; all  $p$ -values  $< .05$ ). As for clinical characteristics, veterans with SAD retained a greater likelihood of combat experience (OR = 2.75, 95% CI = .99–7.63,  $p < .05$ ). No other clinical characteristics or quality-of-life dimensions retained significant relations with SAD.

*Statistically controlling for depression:* Focusing on study outcomes with significant relations to SAD, we examined the unique variance attributable to SAD after statistically controlling for the presence of MDD. Using linear and logistic regression models, the presence/absence of SAD and the presence/absence of MDD were entered simultaneously as predictors. Except for alcohol abuse and dependence, MDD was a significant predictor in all linear and logistic regression models; all  $p$ -values  $< .01$ . After statistically controlling for the presence of MDD, veterans with SAD still exhibited significantly higher rates of PTSD (OR = 12.75, 95% CI = 4.26–38.15,  $p < .001$ ) and greater PTSD severity (i.e., each symptom cluster and total severity) compared to veterans without SAD; all  $p$ -values  $< .01$  (the only exception was emotional numbing on the PCL-M). After statistically controlling for the presence of MDD, veterans with SAD were still at

Table 3  
Relations between social anxiety disorder and quality-of-life dimensions

SF-36 subscales	SAD (+) <i>n</i> = 24	SAD (–) <i>n</i> = 670	Test of group differences
<i>Role-physical</i> <sup>a</sup>			<i>p</i> = .15
0	13 (54.2%)	219 (32.7%)	
1	3 (12.5%)	88 (13.1%)	
2	3 (12.5%)	62 (9.3%)	
3	2 (8.3%)	74 (11.0%)	
4	3 (12.5%)	227 (33.9%)	
<i>Role-emotional</i> <sup>a</sup>			$\chi^2$ (3, 694) = 30.29, <i>p</i> < .001
0	12 (50.0%)	105 (15.6%)	
1	4 (16.7%)	57 (8.5%)	
2	4 (16.7%)	47 (7.0%)	
3	4 (16.7%)	461 (68.8%)	
<i>Social functioning</i> <sup>a</sup>			$\chi^2$ (3, 694) = 15.85, <i>p</i> = .001
0	8 (33.3%)	72 (10.8%)	
1	7 (29.2%)	122 (18.2%)	
2	3 (12.5%)	104 (15.5%)	
3	6 (25.0%)	372 (55.5%)	
Mental health <sup>b</sup>	54.33 (21.2)	76.70 (20.8)	<i>t</i> (692) = 5.18, <i>p</i> < .001
Vitality <sup>b</sup>	36.25 (24.6)	49.94 (25.0)	<i>t</i> (692) = 2.64, <i>p</i> = .008
General health <sup>b</sup>	59.63 (12.2)	58.84 (10.9)	<i>p</i> = .73
Physical functioning <sup>b</sup>	52.50 (29.4)	60.75 (29.2)	<i>p</i> = .18

Notes: Due to missing data on the SF-36, the sample size for all analyses was 694. For all subscales, higher scores reflect greater health and functioning.

<sup>a</sup>Role-physical (assessing role limitations due to physical health) was on a 0–4 scale, role-emotional (assessing role limitations due to emotional problems) and social functioning were on 0–3 scales, and the raw count and percentage of veterans reporting each score are shown.

<sup>b</sup>Continuous raw scores were transformed to a 0–100 scale and means and standard deviations are shown.

significantly higher risk for comorbidity and higher suicidal risk compared to veterans without SAD (ORs ranged from 2.27 for panic disorder to 22.25 for obsessive–compulsive disorder; all *p*-values < .05). As for clinical characteristics and quality-of-life dimensions, none retained significant relationships with SAD after controlling for MDD. Evidence suggests that the effects of SAD on psychiatric comorbidity and suicidal risk were not attributable to the presence of MDD.

#### Concordance between SAD diagnoses and assessments by primary care providers

We examined primary care providers' recognition of anxiety difficulties in SAD (+) and SAD (–) patients. As shown in Table 4, for SAD (+) patients, 42.3% (11/26) were recognized as having anxiety problems above and beyond PTSD, and 57.7% (15/26) were recognized as having any type of anxiety difficulty (including PTSD); *p*-values < .001. Thus, primary care providers exhibited less than adequate recognition of anxiety problems.

Table 4

Concordance between social anxiety disorder diagnoses and anxiety problems assessed by primary care providers

Based on primary care clinical charts	Social anxiety disorder diagnosis from MINI		Test of group differences
	SAD (+) ( <i>n</i> = 26)	SAD (–) ( <i>n</i> = 704)	
<i>Diagnosis of Anxiety</i> <sup>a</sup>			
Yes	11 (42.3%)	67 (9.5%)	$\chi^2$ (1, 730) = 28.25, <i>p</i> < .001
No	15 (57.7%)	637 (90.5%)	
<i>Diagnosis of Anxiety or PTSD</i>			
Yes	15 (57.7%)	94 (13.4%)	$\chi^2$ (1, 730) = 38.81, <i>p</i> < .0001
No	11 (42.3%)	610 (86.6%)	

Notes: <sup>a</sup>Primary care physician ratings of clinically significant anxiety refers to concerns over and above PTSD-related problems.

## Discussion

Prior studies of SAD in veterans have relied on small samples and examined a limited number of variables. Using a large multi-site sample of veterans in primary care clinics, 3.6% of the veterans met criteria for SAD and veterans with PTSD had a greater rate of SAD compared to veterans without PTSD (22.0% vs. 1.1%). These prevalence rates are comparable to those reported in other studies (Hofmann et al., 2003; Orsillo et al., 1996). The presence of SAD also was associated with greater PTSD severity for each of the DSM-IV symptom clusters. Evidence suggested that the adverse effects of SAD on psychiatric comorbidity and suicidal risk were not attributable to PTSD severity or the presence of MDD. In other findings, primary care providers exhibited a poor rate of detecting anxiety problems in veterans diagnosed with SAD.

The elevated psychiatric comorbidity and suicidal risk associated with SAD were not attributable to PTSD severity. Consistent with prior work (e.g., Brown, Chorpita, & Barlow, 1998; Kessler et al., 1994), we found MDD to be the most highly comorbid psychiatric condition associated with SAD in veterans. Also similar to non-veteran samples (Magee et al., 1996; Schneier et al., 1992), SAD was associated with alcohol dependence, but not alcohol abuse. One interpretation is that veterans with SAD fall at two extremes, frequently consuming large quantities of alcohol that inevitably lead to dependence, or altogether avoiding excessive alcohol use. The temporal sequence among SAD, avoidance behaviors, and substance abuse requires further investigation in veterans.

Both SAD and MDD share core features such as high negative affectivity and low positive affectivity (Brown et al., 1998; Kashdan, 2002, 2004) and interpersonal sensitivity is a primary symptom of atypical depression (APA, 1994). These data suggest the need for specificity tests in examinations of either condition. After controlling for the presence of MDD, SAD was uniquely associated with an elevated rate of PTSD diagnoses and other psychiatric conditions, greater PTSD severity, and elevated suicidal risk. Recent data suggest that after controlling for depressive symptoms, differences in social anxiety among veterans with and without PTSD, and healthy controls disappears (Hofmann et al., 2003). Using a larger sample than Hofmann et al., and diagnoses as opposed to dimensional ratings, we found evidence for unique SAD effects. Over

two-thirds of veterans in our sample with SAD also met criteria for MDD. Thus, our specificity tests should be considered conservative.

In an examination of over 1000 adult outpatients, the majority of clients with a current principal diagnosis of SAD had an additional Axis I diagnosis (72%) (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). In our study, 73.1% of veterans with SAD met criteria for an additional Axis I diagnosis. Thus, our data fit with prior work suggesting that only a small percentage of adults meet criteria for SAD without the presence of other psychiatric conditions. Other data suggest that SAD has an earlier average age of onset than PTSD (15.7 vs. 21.5) and there is a greater frequency of cases with SAD preceding the onset of comorbid anxiety and mood disorders (68% and 85%, respectively) (Brown et al., 2001). More research is needed on the temporal sequence of these psychiatric conditions and whether the presence of SAD, MDD, and PTSD in veterans reflects multiple conditions or manifestations of a single condition. Taxometric analyses support the dimensional nature of social anxiety and depression (e.g., Ruscio & Ruscio, 2002). The use of dimensional measures may be a more accurate reflection of reality than the potentially artificial, diagnostic boundaries inherent in categorical diagnoses.

We found an alarmingly low rate of anxiety problem detection by primary care physicians. Primary care provider ratings were liberal as anxiety problems were not specific to SAD and could have reflected difficulties stemming from any anxiety disorder or anxiety-related condition. Although physicians' tended not to diagnose SAD given the absence of SAD (i.e., good specificity), there is reason to believe that physicians missed other anxiety disorders in this sample. Prior data find that approximately 46% of veterans with PTSD and 27% of veterans without PTSD meet criteria for at least one current anxiety disorder (Orsillo et al., 1996). In our study, for those veterans without SAD, physicians diagnosed anxiety problems in only 9.5% of the sample. Overall, primary care providers appear to be underidentifying and thus, undertreating anxiety disorders in veterans.

All of the limitations associated with cross-sectional examinations are relevant to the present study (e.g., retrospective reporting biases, inability to address temporality and causality). Our multi-site, large-scale sampling precluded the ability to conduct the extensive anxiety disorder assessments used in specialty clinics. As the next step, there is great merit in conducting multi-method assessments of social anxiety before and after military deployment to gauge the causal impact of social anxiety on psychological functioning. In generalizing from the present data, the average age of our sample (> 55 years old) and the use of patients who utilize the VA health care system should be taken into consideration. Nonetheless, the majority of our results fit with prior work on SAD and PTSD using other veteran, community, and college student samples.

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