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Cognitive-behavioral Therapy for Late-life Anxiety: Similarities and Differences between Veteran and Community Participants

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Abstract

Cognitive-behavioral therapy (CBT) is an evidence-based treatment for anxiety; however, a growing body of research suggests that CBT effect sizes are smaller in Veteran samples. The aim of this study was to perform secondary data analyses of a randomized controlled trial of CBT for late-life generalized anxiety disorder compared with treatment as usual (TAU) in a Veteran ($n = 101$) and community-based ($n = 122$) sample. Veterans had lower income and less education than community participants, greater severity on baseline measures of anxiety and depression, poorer physical health, and higher rates of psychiatric comorbidity. Treatment effects were statistically significant in the community sample (all $ps < .01$), but not in Veterans (all $ps > .05$). Further analyses in Veterans revealed that poorer perceived social support significantly predicted poorer outcomes (all $ps < .05$). Our results underscore the complexity of treating Veterans with anxiety, and suggest that additional work is needed to improve the efficacy of CBT for Veterans, with particular attention to social support.

Keywords

cognitive-behavioral therapy; anxiety; veterans; psychotherapy; randomized controlled trial

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1. Introduction

Generalized anxiety disorder (GAD) is one of the most common anxiety disorders, affecting approximately 6.8 million American adults each year (Kessler, Chiu, Demler, & Walters, 2005). Understudied in Veteran samples, GAD is highly prevalent among VA primary care patients and is associated with substantial impairment in functioning (Milanak, Gros, Magruder, Brawman-Mintzer & Frueh, 2013). Cognitive-behavioral therapy (CBT) is an evidence-based treatment for GAD and has demonstrated efficacy in both younger and older adult civilian populations (Cuijpers et al., 2014). The strong body of evidence supporting the efficacy of CBT for GAD led to endorsement of CBT as a first-line intervention for GAD by the American Psychiatric Association and The United Kingdom's National Institute for Health and Clinical Excellence as a first-line intervention (APA, 2010; NICE, 2009). Despite the high incidence of GAD among Veterans in the Veterans Health Administration (VHA) system (more than 22,000 Veterans were newly diagnosed with GAD in fiscal year 2012; Barrera et al., 2014), the Department of Veterans Affairs has not yet published clinical practice guidelines for the treatment of GAD and only a single randomized controlled trial of CBT for GAD recently published by our group has included a Veteran sample. It is important to examine the effectiveness of CBT for GAD in Veteran populations given the growing body of research suggesting that CBT effect sizes for anxiety and depression are smaller for Veteran seeking care in the Veterans Health Administration (VHA) than for community samples (e.g., Bisson et al., 2007).

Three meta-analyses of CBT for PTSD found smaller treatment effect sizes for Veteran samples than for non-Veteran samples (Barrera, Mott, Hofstein, & Teng, 2013; Bisson et al., 2007; Bradley, Greene, Russ, Dutra, & Westen, 2005), and a randomized controlled trial comparing CBT for depression to treatment as usual in Veterans yielded nonsignificant results (Mohr, Carmody, Erickson, Jin, & Leader, 2011). Similarly, a study of telemedicine-based collaborative care for depression in Veterans (Fortney et al., 2007) found smaller effect sizes for symptom improvement than a similar study of telemedicine-based collaborative care in patients from federally qualified health centers (Fortney et al., 2013). When the samples from these two studies were combined to examine predictors of treatment outcome, Veteran status was a significant moderator (risk factor) for treatment outcome (Grubbs, Fortney, & Pyne, 2014).

Although no CBT outcome studies have included both Veteran and community participants within the same trial, several hypotheses regarding the seemingly differential response to treatment have been proposed. Potential explanations for Veterans' poorer treatment response include greater chronicity and symptom severity among Veterans (Mohr et al., 2011; Selim et al., 2004), higher rates of psychiatric and medical comorbidity (Agha, Lofgren, Van Ruiswyk, & Layde, 2000; Campbell et al., 2007), lack of social support (Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012; Pietrzak & Cook, 2013), and, although controversial, the potential for reinforcement of symptom maintenance through the VHA service-connected disability program (Frueh et al., 2007). Further exploration of these factors is warranted, as no studies have examined differences between Veteran and community participants in a single CBT trial; and few studies report predictors of CBT outcomes among Veterans.

Our group recently published results of a three-arm randomized controlled trial of CBT for late-life generalized anxiety disorder (GAD) in a combined sample of community and Veteran participants, which examined the effectiveness of CBT delivered by expert, PhD-level providers (PLP) and non-expert, bachelor-level providers (BLP) compared with usual care (UC; Stanley et al., 2014). Results demonstrated significant improvements in GAD severity, anxiety, depression, insomnia, and mental health quality of life at posttreatment in both CBT conditions relative to UC, with no differences in outcomes between the PLP and BLP conditions. To our knowledge this trial is the first study of CBT for anxiety to include both community and Veteran participants, allowing a unique opportunity to examine treatment outcomes in these diverse samples. Although subsample (community vs. Veteran participants) was included as a covariate in the primary outcome analyses (Stanley et al., 2014), the original study design was not powered to test treatment condition by subsample interactions, which were very small to small. A secondary examination of only data from the two CBT conditions found that subsample (community vs. Veteran participants) was a predictor of treatment response, such that community participants receiving CBT showed greater improvements in anxiety and worry symptoms than Veteran participants receiving CBT (Hundt et al., 2014). These findings suggest an additional need to conduct a preliminary examination of the effect of CBT relative to UC separately in the Veteran and community samples and to investigate potential unique characteristics of the Veteran sample that may contribute to poorer outcome.

In the current paper we conduct secondary exploratory analyses of the original data to 1) evaluate outcomes for CBT relative to UC separately within the two subsamples and 2) examine predictors of treatment outcomes in the Veteran sample. Due to the lack of difference between the PLP and BLP conditions in the original trial, analyses were conducted with the PLP and BLP conditions collapsed into a single CBT condition. We expected that treatment effects for CBT versus UC would be moderate in the community sample and small in the Veteran sample. Given the relative dearth of CBT studies in Veterans, we made no a priori hypotheses about predictors of outcomes but instead explored potential factors that may impede or enhance the effectiveness of CBT in this population.

2. Method

2.1 Participants

Detailed information about study design and recruitment is reported in Stanley et al. (2014). Patients aged 60 and older were recruited from primary care clinics at two diverse healthcare settings: a large Veterans Administration Medical Center and an academic community medical center. The study protocol was approved by the institutional review boards at both facilities. Potential participants were identified in collaboration with primary care physicians (PCP) through the electronic medical record and by self-referral through educational brochures placed in waiting and examination rooms. Patients with a documented diagnosis of GAD or Anxiety Not Otherwise Specified in the electronic medical records, as well as those for whom anxiety symptoms were noted on the problem list, or for whom anti-anxiety or antidepressant medication had been prescribed, were identified for recruitment. With PCP

approval, identified patients received a letter of invitation from the PCP and the senior author to participate in the study. Interested patients called for an appointment.

After providing informed consent, all participants completed a diagnostic evaluation, including the Mini Mental State Exam (MMSE; Folstein, & McHugh, 1975) and the Structured Clinical Interview for *DSM-IV* Disorders (SCID; First, Spitzer, Miriam & Williams, 1997). All SCID interviews were audio taped so that a random 20% could be rated by a second clinician to assess inter-rater agreement. Kappa coefficients indicated adequate agreement for GAD (.68), depression (major depression or dysthymia; .91), and other anxiety disorders (.75).

Inclusion criteria required that participants meet criteria for principal or co-principal *DSM-IV* diagnosis of GAD of at least moderate severity (4 on 0–8 scale), according to the SCID. All coexistent anxiety, affective, and somatization disorder diagnoses were allowed, as well as all coexistent medical conditions. Participants were allowed to continue psychotropic medications, provided the dosing was stable over the prior month. Participants were required to speak English to enroll in the study, although English did not need to be their first language. Individuals were excluded for conditions that threatened their safety or precluded participation (e.g., active suicidal intent, current psychosis or bipolar disorder, substance abuse within the past month, and cognitive impairment, according to an MMSE score of 23 or lower). A total of 101 Veterans and 122 community participants met the inclusion criteria and were enrolled in the study (see Stanley et al., 2014 for full CONSORT diagram).

2.2 Measures

2.2.1 Sociodemographic characteristics—Sociodemographic variables, including age, gender, race/ethnicity, education, income, marital status, and employment status, were obtained via self-report.

2.2.2 Clinical characteristics—Presence of medical and psychotropic medication use at baseline was obtained via self-report. Psychiatric comorbidity was assessed according to the SCID. The following self-report measures were used to assess comorbid psychiatric symptom severity, physical health status, and level of perceived social support.

Depression severity: Depressive symptoms were assessed with the Patient Health Questionnaire-8 (PHQ-8), an eight-item version of the PHQ-9 (Kroenke, Spitzer, & Williams, 2001) that omits the item assessing suicide. Psychometric properties of the PHQ-9 are strong among older adults, and the two versions of the scale are highly correlated (Razakov, Ziegelstein, Whooley, & Thombs, 2012).

PTSD symptom severity: The Civilian version of the PTSD Checklist (PCL-C) was used to assess PTSD symptom severity (Weathers, Litz, Huska & Keane, 1993). The PCL-C contains 17 items corresponding to the three *DSM-IV* symptom clusters of reexperiencing, avoidance/numbing, and hyperarousal (APA, 2000). The PCL-C has good internal consistency and convergent validity among older adults in primary care (Cook, Elhai & Aréan, 2005).

Physical health status: The Short Form-12 physical component summary scale (SF-12 PCS) was used to assess physical health status (Ware, Kosinski, & Keller, 1996). Adequate reliability and validity of the SF-12 PCS have been demonstrated in older adults (Resnick & Nahm, 2001).

Social support: Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 12-item measure of perceived support from family, friends, and significant others, with good psychometric properties in older adults (Stanley, Beck, & Zebb, 1998).

VA service-connected disability status: The VHA identifies Veterans who are disabled as a result of an injury or illness that occurred during active military service as having a service-connected disability. Veterans with service-connected disability status receive monthly monetary compensation and free healthcare for service-connected disabilities. For this study, Veterans' medical records were reviewed to determine the service-connected disability status for mental health conditions, including PTSD ($n = 20$), major depressive disorder ($n = 8$), and other anxiety disorders ($n = 3$). Veterans were then categorized into dichotomous disability groups [service-connected mental health disability ($n = 31$) vs. no service-connected mental health disability ($n = 70$)].

2.2.3 Health service use—Medical and mental health service use was assessed via participant self-report. At three and six months, participants were asked, "During the past three months, how many outpatient visits did you make to any medical care providers?" and "During the past three months, how many outpatient visits (not counting study visits) did you make to mental healthcare providers?" Frequency of service use was summed from baseline to six months to create a count of medical health service use and mental health service use during the study period.

2.2.4 Primary outcomes—Primary outcomes included self-report and clinician-rated measures of worry and anxiety. Self-report worry severity was rated with the Penn State Worry Questionnaire (PSWQ-A), an eight-item inventory derived from the original 16-item PSWQ (Meyer, Metzger & Borkovec, 1990). The PSWQ-A is useful for identifying GAD in older primary care patients (Webb et al., 2008), is capable of demonstrating change following treatment (Stanley et al., 2009; Shrestha et al., 2012), and is advantageous for older adults because of its brevity and simplicity (Hopko, et al 2003). Clinician-rated GAD severity was rated with the Generalized Anxiety Disorder Severity Scale (GADSS; Shear, Belnap, Mazumdar, Houck, & Rollman, 2006), a six-item measure that assesses *DSM-IV* criteria and has adequate psychometric properties among older adults (Andreescu et al., 2008; Weiss et al., 2009). Self-report anxiety severity was assessed with the Spielberger State-Trait Anxiety Inventory, trait subscale (STAI-T; Spielberger, Gorsuch, & Lushene, 1970). The STAI-T is a 20-item measure of general anxiety, used commonly in studies of older adults (Therrien & Hunsley, 2012). Clinician-rated anxiety severity was rated using the Structured Interview Guide for the Hamilton Anxiety Scale (SIGH-A; Shear, et al., 2001). The SIGH-A is a 14-item measure with demonstrated sensitivity to change in clinical trials (Brenes et al., 2012).

2.3 Procedure

2.3.1 Data collection—Master's-level independent evaluators (IEs) administered baseline and posttreatment measures. All assessments were administered via telephone, and IEs were unaware of treatment assignment and not involved in any other way with the project. The second author held regular calibration meetings with the IEs and rated 10% of each IE's audiotaped interviews to estimate inter-rater agreement. As reported in Stanley et al., (2014), intraclass correlation coefficients indicated excellent agreement for the SIGH-A (.92) and GADSS (.87).

2.3.2 Intervention—Detailed description of the intervention is presented in Stanley et al., (2014). Patients were randomly assigned to treatment condition (CBT delivered by PLP, CBT delivered by BLP, or UC) within each subsample (Veteran vs. community) according to a 1:1:1 ratio within blocks of nine. Each PLP and BLP delivered CBT to both Veteran and community participants. The CBT protocol utilized in this study is based on elements of prior CBT protocols for GAD in younger adults (Borkovec & Costello, 1993; Craske, Barlow, & O'Leary, 1992) and modified to include a flexible delivery format to meet the needs of older adults in primary care medical settings (Stanley, Diefenbach, & Hopko, 2004). This protocol has demonstrated efficacy in prior trials of CBT for late-life GAD in primary care (Calleo et al., 2013; Stanley et al., 2003, 2009). CBT was delivered over six months and included two phases. During the first three months, patients received up to 10 skills-based sessions. Core skills included education, awareness training, motivational interviewing, deep breathing, and coping self-statements. Providers recommended a subset of 2–3 elective skill sessions (behavioral activation, exposure, sleep management, problem solving, progressive muscle relaxation, thought stopping, and cognitive restructuring), that best fit participants' needs based on an algorithm. Certain elective skills such as behavioral activation, exposure, progressive muscle relaxation, and cognitive restructuring were covered in multiple sessions, thus no participant received all skills. Providers conducted check-in calls 2–3 days after each session to review skills and problem-solve any difficulties. Additionally, the first few minutes of each skill session were used to review previously learned skills and practice again if necessary. During the second three months, patients were called weekly for four weeks and then biweekly for eight weeks to review skills and provide support for continued practice and skill use. Patients assigned to UC did not receive any contact from study clinicians during the six-month period.

2.3.3 Data Analytic Strategy—To examine treatment effects separately in the Veteran and community samples, we first collapsed the PLP and BLP conditions into a single CBT condition (based on comparative findings in the primary trial – Stanley et al., 2014) to allow comparison of only two treatment arms: CBT vs. UC. Identical outcome analyses were conducted separately within the Veteran and community samples. Specifically, within each sample, four models were conducted, one for each of the four primary outcomes (i.e., PSWQ-A, GADSS, STAI-T, and SIGH-A). The dependent variable was the six-month score. Treatment group (CBT vs. UC) was the primary predictor, and the baseline equivalent of the outcome variable of interest was a covariate. Initial analyses included all observations and used intent-to-treat (ITT) methods with multiple imputation procedures (Proc MI and Proc MIANALYZE, SAS Version 9.3) to address missing data at six months. Analyses were

then repeated using only data from participants who completed the six-month assessment ($n = 180$). Cohen's d between-groups effect-size estimate was calculated for each treatment effect (CBT relative to UC), along with its 95% confidence interval. For any given measure, confidence intervals that are non-overlapping between the VA and community samples would indicate a potential between-sample difference in treatment effects. We also examined pre-post effect sizes for the CBT and UC arms separately to determine the strength of the effect of each treatment condition in the VA and community samples.

Within the Veteran sample, linear regression was used to assess relationships between each individual potential predictor variable (i.e., baseline sociodemographic characteristics, clinical characteristics, and health service use) and each of the four dependent variables: 1) six-month PSWQ-A scores, 2) six-month STAI scores, 3) six-month GADSS scores, and 4) six-month SIGH-A scores. For each of the four outcomes, independent variables associated with the outcome with a $p \leq 0.25$ were then simultaneously included in multivariable linear-regression models. Using a more conservative p value of < 0.25 to inform which variables should be included in the multivariable predictor models enables variables that could be important collective predictors of an outcome to be simultaneously included in the model even though they are only weakly associated with the outcome in and of themselves (Bendel & Afifi, 1977). Interactions between each predictor and treatment condition were separately examined for each of the four outcomes. All analyses controlled for baseline values of the respective outcome measure, as well as treatment condition. Analyses initially used ITT methods but were then repeated using data from completers only. Though our primary interest is in predictors of outcomes in the Veteran subsample because this was the first study of CBT for GAD conducted with VA patients, we also conducted identical regression analyses to examine predictors of treatment outcome in the community sample to determine whether significant predictors for the Veteran sample are also evidenced in the community participants. All analyses were conducted in SAS[®] version 9.3 (SAS Institute, Cary, NC).

3. Results

3.1 Sample characteristics and study attrition

Table 1 reports the baseline demographic and clinical characteristics and six-month health service use of VA and community participants. The Veteran and community subsamples significantly differed on the majority of demographic and clinical variables, as well as health service use. Of the 223 randomized participants, 21 Veterans (22%) and 14 community participants (17%) did not complete the 6 month assessment and were considered dropouts. This difference was not statistically significant ($\chi^2(1) = 0.74, p = 0.39$). Similarly, no significant differences in dropout rates between the Veteran and community samples were found for the CBT ($\chi^2(1) = 1.31, p = 0.25$) or UC conditions ($\chi^2(1) = 0.09, p = 0.76$).

3.2 Six-month CBT outcomes

Mean observed scores at zero and six months are presented in Table 2, along with the results from ITT analyses. Imputed means were not statistically or substantially different from observed values. ITT analyses revealed significant main effects of treatment for all four measures in the community sample (all $ps < .01$), but not in the Veteran sample (all $ps > .05$;

see Table 2). Completer analyses revealed similar results. Effect-size estimates in the community sample suggested moderate improvements in worry and anxiety, and large improvements in GAD symptom severity for CBT relative to UC. Effect-size estimates in the Veteran sample suggested small improvements in all outcome measures for CBT relative to UC. Although the effect-size estimates are numerically larger in the community sample than in the Veteran sample, the overlapping confidence intervals suggest that the effects are not statistically different between community and Veteran samples. To explore the possibility that the small treatment effects within the Veteran sample could be due to robust usual care within the VA system, we examined pre-post effect sizes for each of the four outcome measures within the CBT and UC arms separately for both the Veteran and community samples (see Table 2). These analyses revealed small to moderate CBT pre-post effect sizes for the Veteran sample (d range = 0.29 – 0.55), and moderate effect sizes for the civilian sample (d range = 0.63 – 0.73). Conversely, UC effects were very small to small in both Veterans (d range = 0.17 – 0.34) and civilians (d range = –0.04 – 0.43), suggesting only minimal improvement in worry and anxiety symptoms for participants in usual care.

3.3 Predictors of outcomes in Veterans

3.3.1 Six-month self-report outcomes—Results of multivariable linear regression analyses for both the PSWQ-A and STAI are presented in Table 3. Multiple-regression results using ITT methods suggest that baseline social support and mental health service use were the only significant and unique predictors of self-report worry and anxiety severity (see Table 3). The direction of these relationships indicate that poorer perceived social support and increased use of mental health services predict poorer outcomes on self-report measures of worry and anxiety. There were no significant interactions between any individual predictor variable and treatment condition (all $ps > .07$, data not reported) for either analysis. Completer analyses revealed similar results.

3.3.2 Six-month clinician-rated outcomes—Results of multivariable linear regression analyses for the GADSS and SIGH-A are presented in Table 4. Multiple-regression results using ITT methods with GADSS as the dependent variable revealed no significant predictors of clinician rated GAD severity at 6 months (see Table 4). ITT multiple regression results with SIGH-A as the dependent variable revealed mental health service use as the only significant predictor, such that increased mental health service use predicted worse clinician-rated anxiety severity. There were no significant interactions between any individual predictor variable and treatment condition (all $ps > .32$, data not reported) for either analysis. Completer analyses revealed similar results.

3.4 Predictors of outcome in community participants

To determine whether perceived social support and mental health service use were unique predictors for the Veteran sample, we replicated the regression analyses in the community sample. Both ITT and completer multiple-regression analyses revealed that increased mental health service predicted worse 6-month STAI, GADSS, and SIGH-A scores, but that social support was not a significant predictor of either self-report or clinician-rated outcomes in the community sample.

4. Discussion

This is the first study to include Veteran and community participants within a single CBT trial, allowing examination of differences in treatment outcome. Examination of six-month outcomes revealed significant CBT treatment effects for community, but not Veteran, participants, relative to UC on measures of anxiety and worry. These data add to the growing evidence that treatment effects for standard CBT packages may be smaller for Veterans in the VA healthcare system than for their civilian counterparts. Though the explanation for this disparity in treatment response remains uncertain, the greater psychiatric symptom severity, poorer physical health status, and higher rates of psychiatric comorbidity among the Veteran sample support previous assertions that Veterans tend to have more chronic and severe presentations than non-Veterans (Goodson et al., 2011; Selim et al., 2004). Complexities in psychiatric presentation and medical comorbidity likely influence Veteran treatment response. Another possibility is that disparities in socioeconomic arenas, such as education, employment status, and income, may contribute to differences in uptake of CBT materials in Veteran and community participants. Finally, cohort effects should not be overlooked. The Veterans included in this study were primarily of the Vietnam era; and, in fact, the majority of CBT studies within Veteran samples have been conducted with Vietnam Veterans. Previous studies examining treatment outcome for PTSD between Veteran cohorts suggest poorer treatment outcome in Vietnam-era Veterans than in returning Veterans from the wars in Iraq and Afghanistan (Chard, Schumm, Owens, & Cottingham, 2010; Eftekhari et al., 2013; but see Yoder et al., 2012). The unique experiences of the Vietnam Veteran cohort may negatively impact response to treatment.

Despite the numerous clinical and demographic differences between the Veteran and community samples, only social support and mental health service use significantly predicted six-month treatment outcome in multivariable models within the Veteran sample. Given that mental health service use also predicted treatment outcome in the community sample, this finding suggests that participants from both subsamples with more complex and possibly treatment-refractory presentations were less likely to respond to the CBT intervention. However, these participants may have fared worse without the additional CBT received through this study. Interestingly, Veteran and community participants did not differ on perceived levels of social support at baseline; yet this finding that social support was the sole unique predictor for the Veteran sample suggests that perceived social support is an important factor in Veterans' recovery, regardless of whether they received CBT or treatment as usual. Social support has been identified as an important predictor in the onset and maintenance of anxiety and PTSD in Vietnam Veterans (Boscarino, 1995; Schnurr, Lunney, & Sengupta, 2004) and may, therefore, be important to address directly in treatment. Other dimensions of social support, such as social connectedness (the quantity and quality of interpersonal relationships) and enacted social support (specific supportive actions), were not assessed. However, these may interact with perceived social support in predicting distress (Wethington & Kessler, 1986). Interventions with a strong social component, such as peer support, have the potential to enhance social connectedness and increase enacted support. Recent data suggest that peer support interventions are valued by Veterans (Jain, McLean, & Rosen, 2012) and have the potential to reduce psychiatric

symptoms (Barber, Rosenheck, Armstrong, & Resnick, 2008; Pfeiffer, Heisler, Piette, Rogers, & Valenstein, 2011). Alternatively, Veterans with complex psychiatric and social service needs (e.g., unemployment, homelessness) may benefit from a combination of CBT and case management, an approach shown to benefit impoverished older adults with depression (Areán et al., 2005; 2010).

Limitations to this work include secondary data analysis of a study that was not originally powered to detect differences in subsamples. While the findings from this study support previous research demonstrating smaller CBT treatment effects for Veterans compared to civilians, the overlap in effect size confidence intervals raises the possibility that these differences may not be clinically meaningful. A lack of statistical power in detecting significant interactions between baseline sample characteristics and treatment allocation in the Veteran sample restricted our ability to determine whether CBT treatment response in Veterans can be predicted by factors such as demographics, symptom severity, psychiatric comorbidity, or physical health status. Future studies with larger samples are needed to identify predictors of CBT treatment response in Veterans. Additional studies may also benefit from more detailed measurement of social support constructs, such as social connectedness and actual or enacted social support, as well as more robust assessments of physical health status and reaction to CBT, including the ability of a focused CBT intervention to impact the unique needs of Veterans (e.g., impact on multiple mental health conditions). Finally, the results from this study may not generalize to other population including Veterans of different eras and those seeking care outside the VHA system, as well as underserved, male, and/or minority individuals in the community.

The results from this study highlight the challenges in successfully treating older Veterans within the VHA healthcare system. This was the first trial of CBT for GAD to include Veterans, and, given our findings suggesting that Veterans may show smaller treatment effects with a standard CBT package than community participants, future work should identify how to better adapt CBT protocols for Veteran populations. Modifying existing CBT interventions to specifically address social support, either through case management or connection to peers, may be particularly beneficial for Veterans. Alternatively, exploration of novel treatment methods for Veterans with anxiety may also be warranted.

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Highlights

Veterans had greater symptom severity than community participants at baseline.

Veterans showed smaller improvements in anxiety and worry symptoms.

Social support predicted treatment outcome in Veterans.

Additional work is needed to improve the efficacy of CBT for Veterans.

Table 1

Baseline Sociodemographic Characteristics, Clinical Characteristics, and Six-month Health Service Use by Clinic Sample

	Clinic Sample			<i>p</i> Value*
	Total N = 223	Community (<i>n</i> = 122)	VA (<i>n</i> = 101)	
Demographics				
Age, mean (<i>SD</i>)	66.92 (6.64)	67.99 (6.70)	65.63 (6.35)	0.008
Education, mean (<i>SD</i>)	15.52 (2.92)	16.02 (2.82)	14.91 (2.94)	0.004
Women, <i>n</i> (%)	119 (53.36)	95 (77.87)	24 (23.76)	<0.001
Race, (%)				0.01
White	176 (78.92)	104 (85.25)	72 (71.29)	
Black	40 (17.94)	14 (11.48)	26 (25.74)	
Asian	3 (1.35)	3 (2.46)	0 (0.00)	
American Indian/Alaskan Native	1 (0.45)	0 (0.00)	1 (0.99)	
Multirace	3 (1.35)	1 (0.82)	2 (1.98)	
Hispanic/Latino, <i>n</i> (%)	24 (10.76)	9 (7.38)	15 (14.85)	0.07
Marital Status, <i>n</i> (%)				0.75
Married or Cohabiting	121 (54.26)	65 (53.28)	56 (55.45)	
Widowed	33 (14.80)	22 (18.03)	11 (10.89)	
Separated/Divorced	60 (26.90)	31 (25.41)	29 (28.71)	
Never Married	9 (4.04)	4 (3.28)	5 (4.95)	
Income, <i>n</i> (%)				<0.001
< 10k	21 (9.72)	9 (7.69)	12 (12.12)	
10k–20k	26 (12.04)	7 (5.98)	19 (19.19)	
20k–30k	32 (14.81)	13 (11.11)	19 (19.19)	
30k–40k	31 (14.35)	16 (13.68)	15 (15.15)	
40k–50k	24 (11.11)	10 (8.55)	14 (14.14)	
50k–60k	24 (11.11)	16 (13.68)	8 (8.08)	
>60k	58 (26.85)	46 (39.32)	12 (12.12)	
Employment Status, <i>n</i> (%)				0.02
Employed Full- or Part-time	79 (35.42)	51 (41.80)	28 (27.72)	
Homemaker	6 (2.69)	4 (3.28)	2 (1.98)	
Retired	116 (52.02)	58 (47.54)	58 (57.43)	
Unemployed	22 (9.87)	9 (7.38)	13 (12.87)	
Clinical Characteristics				
Assessment scores, mean (<i>SD</i>)				
GADSS	11.74 (4.31)	10.75 (3.96)	12.94 (4.44)	0.001
PSWQ-A	24.66 (7.72)	24.36 (7.55)	25.03 (7.94)	0.52
STAI-T	47.10 (9.84)	45.60 (9.62)	48.91 (9.84)	0.01

	Total N = 223	Clinic Sample		<i>p</i> Value*
		Community (<i>n</i> = 122)	VA (<i>n</i> = 101)	
SIGH-A	19.81 (9.45)	16.84 (8.59)	23.39 (9.24)	<0.001
PHQ-8	9.87 (5.50)	8.24 (4.71)	11.83 (5.76)	<0.001
PCL Total	43.71 (12.63)	40.21 (11.04)	48.00 (13.16)	<0.001
MSPSS Total	5.27 (1.27)	5.39 (1.34)	5.11 (1.18)	0.10
SF-12 PCS	42.02 (12.15)	44.45 (12.08)	39.10 (11.63)	0.001
Presence of Coexistent Diagnosis, <i>n</i> (%)				
Any Anxiety, <i>n</i> (%)	80 (35.87)	41 (33.61)	39 (38.61)	0.48
PTSD	21 (9.42)	2 (1.64)	19 (18.81)	<0.001
Any Depression, <i>n</i> (%)	86 (38.57)	38 (31.15)	48 (47.52)	0.01
Medications				
All Medications, <i>M</i> (<i>SD</i>)	6.87 (4.57)	5.65 (3.60)	8.34 (5.17)	<0.0001
Medical Medications, <i>M</i> (<i>SD</i>)	5.91 (4.44)	4.81 (3.46)	7.23 (5.10)	<0.001
Any Psychotropic Medications, <i>n</i> (%)	145 (65.02)	75 (61.48)	70 (69.31)	0.22
Number of Psychotropic Medications, <i>M</i> (<i>SD</i>)	0.92 (0.84)	0.87 (0.83)	0.99 (0.84)	0.28
0–6 Month Health Service Use, <i>n</i> = 195**				
Frequency of Outpatient Visits to Medical Care Providers	7.56 (10.05)	6.82 (10.00)	8.48 (10.08)	.02
Frequency of Outpatient Visits to Mental Health Care Providers	1.86 (5.33)	1.15 (3.41)	2.74 (6.94)	.00

Note: race comparison is white versus not-white; marital status comparison is married/cohabiting versus not married/cohabiting; employment status comparison is employed (FT or PT) versus not employed (six homemakers not included in analysis). GADSS = Generalized Anxiety Disorder Severity Scale; PSWQ-A = Penn State Worry Questionnaire-Abbreviated; STAI-t = Trait subscale of the Spielberger State-Trait Anxiety Inventory; SIGH-A = Structured Interview Guide for the Hamilton Anxiety Scale; PHQ-8 = 8-Item Patient Health Questionnaire; PCL = PTSD Checklist – civilian version; MSPSS = Multidimensional Scale of Perceived Social Support

* Chi-square tests were used to compare frequencies for categorical measures and independent samples t-tests were used to compare means for interval and continuous variables

** N = 195 total (108 for community, 87 for VA) due to missing six-month assessments

Table 2

Six-Month Outcomes; ITT GLM Analyses

	Condition	Observed means by time point				Baseline Covariate				Treatment (CBT VS. UC)						95% CI of <i>d</i>	
		Baseline <i>M</i> (<i>SD</i>)	6 month ^a <i>M</i> (<i>SD</i>)	Cohen's <i>d</i>	<i>b</i>	<i>SE(b)</i>	<i>F^b</i>	<i>p</i>	<i>b</i>	<i>SE(b)</i>	<i>F^b</i>	<i>p</i>	Cohen's <i>d</i>				
Community																	
PSWQ-A	CBT	23.67 (7.79)	18.12 (7.38)	0.73	0.66	0.07	93.32	<.001	-3.23	1.09	8.70	0.004	0.57	0.18	0.96		
	UC	25.82 (6.91)	22.89 (6.75)	0.43													
STAI-T	CBT	45.13 (10.11)	38.00 (10.11)	0.71	0.75	0.08	95.45	<.001	-5.72	1.49	14.67	<.001	0.74	0.35	1.13		
	UC	46.59 (8.52)	44.72 (10.23)	0.20													
GADSS	CBT	10.45 (3.77)	7.75 (3.67)	0.73	0.36	0.10	12.74	0.001	-3.25	0.75	18.58	<.001	0.84	0.44	1.23		
	UC	11.38 (4.31)	11.53 (4.20)	-0.04													
SIGH-A	CBT	16.17 (8.26)	11.18 (7.52)	0.63	0.53	0.09	39.31	<.001	-5.20	1.50	12.04	<.001	0.67	0.28	1.06		
	UC	18.28 (9.21)	17.86 (9.99)	0.04													
VA																	
PSWQ-A	CBT	25.46 (8.09)	23.09 (8.18)	0.29	0.70	0.09	57.91	<.001	-0.73	1.46	0.25	0.620	0.11	-0.31	0.52		
	UC	24.18 (7.70)	22.72 (8.51)	0.18													
STAI-T	CBT	49.06 (9.95)	44.74 (10.37)	0.43	0.76	0.10	52.56	<.001	-2.19	1.93	1.30	0.260	0.24	-0.17	0.65		
	UC	48.62 (9.76)	46.14 (11.61)	0.23													
GADSS	CBT	13.15 (4.48)	10.62 (4.74)	0.55	0.55	0.11	24.90	<.001	-0.86	1.02	0.72	0.401	0.18	-0.23	0.59		
	UC	12.53 (4.40)	10.84 (5.12)	0.34													
SIGH-A	CBT	23.07 (9.15)	20.13 (10.82)	0.29	0.68	0.11	35.88	<.001	-2.61	2.08	1.59	0.214	0.27	-0.15	0.68		
	UC	24.00 (9.52)	22.28 (10.54)	0.17													

^a Observed means for the six-month outcome measures are reported for 101 community completers (65 CBT; 36 UC) and 79 VA completers (47 CBT; 32 UC).^b Error/denominator degrees of freedom are adjusted, based on number of imputations and relative increase in variance due to nonresponse. Complete error degrees of freedom is 121 for the community sample and 100 for the VA sample.

ITT = intention to treat; GLM = ; GADSS = Generalized Anxiety Disorder Severity Scale; PSWQ-A = Penn State Worry Questionnaire-Abbreviated; STAI-t = Trait subscale of the Spielberger State-Trait Anxiety Inventory; SIGH-A = Structured Interview Guide for the Hamilton Anxiety Scale

Simultaneous ITT Multivariate Regression Models Predicting 6 Month Veteran Self-Report Outcomes

Table 3

	Self-Report Outcomes							
	DV: PSWQ-A at 6 months				DV: STAI-T at 6 months			
	b	SE(b)	F ^a	p	b	SE(b)	F	p
Baseline Value	0.58	0.12	24.30	<0.0001	0.57	0.12	21.62	<0.0001
Treatment Group	-0.18	1.43	0.02	0.90	-2.44	1.81	1.80	0.18
Demographics								
Age	---	---	---	---	---	---	---	---
Gender	---	---	---	---	---	---	---	---
Employment	---	---	---	---	0.19	0.45	0.16	0.69
Income	---	---	---	---	1.97	2.12	0.86	0.36
Education	---	---	---	---	---	---	---	---
Race	---	---	---	---	---	---	---	---
Clinical Characteristics								
Baseline PTSD(PCL)	0.03	0.08	0.10	0.76	0.13	0.10	1.72	0.20
Baseline MSPSS total	-1.26	0.59	4.54	0.04	-1.68	0.76	4.84	0.03
Baseline PHQ	0.06	0.20	0.08	0.77	---	---	---	---
Baseline SF-12 PCS	---	---	---	---	0.11	0.08	1.88	0.17
Baseline Any Psych meds	---	---	---	---	---	---	---	---
Number of diagnoses	---	---	---	---	---	---	---	---
MH Service Connection	-0.87	1.62	0.28	0.60	---	---	---	---
Health Service Use								
Frequency of outpatient visits to medical care providers	0.06	0.07	0.52	0.47	---	---	---	---
Frequency of outpatient visits to mental health care providers	0.24	0.12	4.41	0.04	0.27	0.14	3.88	0.05

* For each outcome fifteen separate individual predictor models were initially conducted, with each predictor individually predicting the outcome at 6-months, controlling for the baseline value of the outcome and treatment group. Predictors with p < .25 from individual models were included in the simultaneous predictor model for that outcome (depicted in this table), controlling for baseline value of the outcome and treatment group. Predictors with "--" indicate that the variable did not individually predict the outcome at p < .25 and were therefore not included in the simultaneous model.

* Race is white versus non-white

^aError/denominator degrees of freedom are adjusted based on number of imputations and relative increase in variance due to nonresponse. Complete error degrees of freedom is 100.

Table 4
Simultaneous ITT Multivariate Regression Models Predicting 6 Month Veteran Clinician-Rated Outcomes

	Clinician-Rated Outcomes						
	DV: GADSS at 6 months				DV: SIGH-A at 6 months		
	b	SE(b)	F ^a	p	b	SE(b)	F
Baseline Value	0.33	0.15	4.49	0.04	0.48	0.13	13.25
Treatment Group	-0.82	0.94	0.77	0.38	-2.97	1.89	2.46
Demographics							
Age	--	--	--	--	--	--	--
Gender	--	--	--	--	--	--	--
Employment	--	--	--	--	--	--	--
Income	--	--	--	--	--	--	--
Education	--	--	--	--	--	--	--
Race	--	--	--	--	--	--	--
Clinical Characteristics							
Baseline PTSD(PCL)	0.03	0.06	0.18	0.67	0.15	0.10	2.19
Baseline MSPSS total	--	--	--	--	--	--	--
Baseline PHQ	0.10	0.15	0.49	0.49	--	--	--
Baseline SF-12 PCS	--	--	--	--	--	--	--
Baseline Any Psych meds	1.28	1.11	1.35	0.25	--	--	--
Number of diagnoses	--	--	--	--	--	--	--
MH Service Connection	0.58	1.12	0.27	0.60	1.35	2.16	0.38
Health Service Use							
Frequency of outpatient visits to medical care providers	--	--	--	--	--	--	--
Frequency of outpatient visits to mental health care providers	0.12	0.08	2.46	0.12	0.38	0.14	6.96
							0.01

* For each outcome fifteen separate individual predictor models were initially conducted, with each predictor individually predicting the outcome at 6-months, controlling for the baseline value of the outcome and treatment group. Predictors with p < .25 from individual models were included in the simultaneous predictor model for that outcome (depicted in this table), controlling for baseline value of the outcome and treatment group. Predictors with "--" indicate that the variable did not individually predict the outcome at p < .25 and were therefore not included in the simultaneous model.

* Race is white versus non-white

^aError/denominator degrees of freedom are adjusted based on number of imputations and relative increase in variance due to nonresponse. Complete error degrees of freedom is 100.