

BRIEF REPORT

Validation of the Use of Video Teleconferencing Technology in the Assessment of PTSD

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The Veterans Health Administration (VHA) has promoted the use of telehealth technologies to deliver mental health care to veterans with limited access to services on account of geographic and other barriers. The use of technology to deliver interventions to veterans with posttraumatic stress disorder (PTSD) has been a particular focus within VHA. Much less attention has been paid to the use of telehealth technologies to diagnose veterans with PTSD for both treatment and/or disability compensation purposes, in spite of the need for such services. The literature evaluating the use of video teleconferencing methods in the assessment of PTSD is limited; to our knowledge, only 1 previous study has been published. The current study evaluated the psychometric characteristics of the Clinician Administered PTSD Scale (CAPS) administered by video teleconferencing with a larger and more diverse sample of veterans. The CAPS raters had high interrater reliability and there were strong correlations between face-to-face CAPS assessments and video teleconferencing CAPS assessments for diagnosis and total severity. The results suggest that the CAPS can and should be used via video teleconferencing with veterans who have barriers to face-to-face evaluations.

Keywords: assessment, PTSD, telehealth, veterans

The expansion of telemedicine into mental health care has dramatically increased access to care for many patient groups and evidence supports its use with patients with various psy-

chiatric disorders (see Richardson, Frueh, Grubaugh, Egede, & Elhai, 2009 for review). The U.S. Veterans Health Administration (VHA) has recognized the importance of this technology in health care delivery and uses telehealth methods to provide care to many of the 3.1 million veterans living in remote locations, including 31% of VHA enrolled Operation Enduring Freedom/Operation Iraqi Freedom veterans (Office of Rural Health, U.S. Department of Veteran Affairs, 2013). In addition to improving access to care for those who do not live near a Veterans Affairs (VA) health care facility, telehealth technologies hold the promise of delivering care in a more cost-effective and efficient manner (Sloan, Marx, & Keane, 2011) and may also obviate stigma because privacy is ensured (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009).

VA researchers have determined the efficacy of telehealth treatments for a number of different mental health conditions, including substance misuse (Santa Ana, Stallings, Rounsaville, & Martino, 2013), depression (Aburizik et al., 2013; see Deen, Godleski, & Fortney, 2012 for review) and posttraumatic stress disorder

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(PTSD; Morland et al., 2010; Strachan, Gros, Ruggiero, Lejuez, & Acierno, 2012; Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010). Telehealth treatments for PTSD are particularly important given that approximately one in 10 veterans receiving care through VHA have PTSD (Erbes, Westermeyer, Engdahl, & Johnsen, 2007; Magruder et al., 2005) and the number of veterans seeking treatment continues to rise (approximately 896,000 in 2006 to over 1.2 million in 2010; U.S. Government Accountability Office, 2011). Telehealthcare for PTSD would reduce the burden on the VHA and increase access to services for this growing population.

Although there is empirical support for the delivery of evidence-based therapies for PTSD via video conferencing, it is unclear whether PTSD should or can be evaluated via video teleconferencing-based assessment. Telehealth treatment cannot be administered unless there is first a reliable and valid diagnosis of PTSD and an assessment of overall PTSD symptom burden. The Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995) is considered the “gold standard” for assessing PTSD. However, the standard administration of this interview requires a face-to-face meeting with a trained clinician. Consequently, it is not available to patients who live far from health care centers, individuals with medical problems that make traveling more difficult, as well as patients whose symptoms of avoidance prevent them from presenting for an evaluation. If the CAPS can be reliably and validly delivered via video teleconferencing, it will save time and travel costs for veterans and bring state-of-the-art diagnosis to anyone with a computer and a video set-up. In addition, not all providers are trained in the CAPS; the ability to have competently trained providers delivering the CAPS via telemedicine addresses the issue of limited local providers trained to administer the CAPS.

In contrast to the relative abundance of research on the efficacy of telehealth treatments for PTSD and other mental disorders, only one study to date has examined the validity, reliability, and acceptability of this technology for comprehensive PTSD assessments. In this study, Porcari and colleagues (2009) compared CAPS assessments administered face-to-face with video teleconferencing-based CAPS assessments in a group of 20 male veterans. They found significant correlations between the face-to-face CAPS and video teleconferencing CAPS assessments in terms of total CAPS severity (.74) and subscale scores (.92). The sensitivity of the video teleconferencing method of CAPS assessment, relative to the face-to-face criterion was strong (.94), however the specificity was very low (.33). Moreover, the interrater reliability of the CAPS total score was low ($\kappa = .32$), which the authors attributed to the low base rate of participants who were not diagnosed with PTSD. Although Porcari and colleagues’ study provides an important first step in understanding the potential utility of tele-assessment for PTSD, this study was limited by a small, homogenous sample and lack of evidence for convergent validity.

We examined the reliability, validity, and acceptability of a video teleconferencing CAPS administration (teleCAPS) by administering both a face-to-face CAPS (FTF) and a teleCAPS to a larger, heterogeneous sample of male and female veterans. We expected high rates of interrater reliability at the diagnostic and symptom levels, as well as equally high rates of satisfaction between in-person CAPS assessments and CAPS assessments delivered via video teleconferencing. We also predicted that the

teleCAPS would have a strong association with a self-report measure of PTSD and a self-report measure of depression.

Method

Participants

Forty-two trauma-exposed veterans (9.5% women), ranging in age from 23–75 years ($M = 53.17$, $SD = 11.48$), were recruited from a VHA hospital in New England using either an internal participant recruitment database or recruitment from group psychotherapy sessions held at a local VHA community-based outpatient clinic. Local IRB approval was obtained prior to recruitment. The majority of participants identified as non-Hispanic White (78.6%), 14% identified as non-Hispanic Black, two identified as Asian or Pacific Islander, and one identified as American Indian. Participants varied in their reported index traumas.

We first conducted a pilot feasibility study administering the teleCAPS to 12 participants. Following the initial feasibility study, 30 participants completed both FTF and teleCAPS assessments. One participant was excluded after identifying different index events during the two assessments. All participants were required to speak English as their primary language. Participants provided informed consent prior to the initiation of data collection and they were compensated \$15 per hour for their participation.

Measures and Procedures

Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995). The CAPS is a semistructured clinical interview designed to assess the 17 core symptoms of PTSD, as defined by the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. (*DSM-IV*; American Psychiatric Association, 1994). The CAPS allows the interviewer to rate the frequency and intensity of each symptom along 5-point ordinal scales. A frequency score of 1 and an intensity score of 2 is required for a particular symptom to meet criterion (Blake et al., 1990). PTSD diagnosis was determined according to *DSM-IV* criterion (American Psychiatric Association, 1994), which requires endorsement of at least one re-experiencing symptom, three avoidance symptoms, and two arousal symptoms resulting in demonstrated functional impairment. The total score for the CAPS PTSD ratings (frequency + intensity) ranges from 0 to 136. One-week test-retest reliabilities have been reported between .90 and .98 (Blake et al., 1995). Interrater reliability is excellent, ranging from .92 to .99 (Blake et al., 1990).

PTSD Checklist (PCL; Weathers, Litz, Huska, & Keane, 1994). The PCL is a 17-item self-report measure of PTSD symptomatology. This measure has demonstrated good internal consistency, sensitivity, and specificity (Ruggiero, Del Ben, Scotti, & Rabalais, 2003). Internal consistency in the current sample was strong ($\alpha = .95$).

Beck Depression Inventory-II (BDI-II; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI-II is a 21-item, multiple-choice, self-report measure assessing symptoms of depression as defined by the *DSM-IV* (American Psychiatric Association, 1994). The BDI-II is a widely used measure of depression with strong psy-

chometric properties (Beck, Brown, & Steer, 1996). The internal consistency in the current sample was high ($\alpha = .89$).

Videoconferencing Participant Satisfaction Questionnaire (VPSQ; Wong, 2002). The VPSQ is a seven-item measure assessing satisfaction with a videoconferencing interaction. Participants are asked to use a 5-point Likert scale ranging from 1 (*very unsatisfied*) to 5 (*very satisfied*) to rate their comfort with the videoconferencing experience, lack of in-person contact, and interview material, as well as their concern about confidentiality, willingness to use teleconferencing in the future, preference for in-person versus teleconferencing assessment, and convenience of the assessment.

This study consisted of two phases. During the pilot phase, 12 participants completed the teleCAPS and self-report measures. Following this phase, an additional 30 participants completed both FTF CAPS and teleCAPS assessments. A within-subject crossover design with pseudorandom assignment was used for the second study group. All CAPS assessments were administered by a doctoral-level clinician experienced in CAPS administration and scoring. Different clinicians administered each of the CAPS assessments for those participants in the study group. We used the Polycom VSX 7000 videoconferencing system connected via the Internet through the VA Health Care System's Local Area Network (LAN) at 100Mbps. All images were displayed on a 36-inch Samsung monitor.

After providing informed consent, participants in the pilot phase completed the teleCAPS and participants in the second study phase were randomly assigned to complete either a FTF CAPS or teleCAPS for their first assessment. Participants during this phase returned approximately 2 weeks later ($M = 12.72$ days, $SD = 7.28$ days) to complete their second assessment. Clinicians provided debriefing following all CAPS assessments to monitor and address the psychological needs of participants. After completion of their last CAPS assessment, participants were asked to complete the PCL, BDI-II, and VPSQ.

Results and Discussion

Phase 1 Pilot Feasibility Study

Of the 12 participants in the pilot sample, seven were diagnosed with PTSD. The average total score on the teleCAPS for the pilot sample was 36.59 ($SD = 13.91$). Internal reliability of the teleCAPS for these first 12 participants was high ($\alpha = .84$). Also, teleCAPS total score correlated strongly with the PCL ($r = .81$, $p < .01$) and the BDI-II ($r = .77$, $p < .01$). With regard to acceptability, 58% of the pilot participants reported feeling "very comfortable" or "comfortable" with the lack of in-person contact, 33% of participants reported feeling "neither comfortable or uncomfortable," and one participant reported feeling "uncomfortable" (no participants reported feeling "very uncomfortable"). Similarly, 80% of this sample rated the convenience of the assessment as "very convenient" or "convenient," one participant rated it as "neutral," and one participant rated the assessment as "very inconvenient."

Based on these findings, the teleCAPS appeared to be a valid and well-received method of assessment and we proceeded with administering both the face-to-face CAPS and teleCAPS to a

Table 1
Correlations and Descriptive Statistics for Face-To-Face CAPS and TeleCAPS

	Face-to-face CAPS		TeleCAPS		<i>r</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
CAPS total severity	52.83	27.35	49.97	25.60	.87
CAPS Cluster B severity	13.79	9.10	14.00	8.54	.81
CAPS Cluster C severity	22.55	12.08	20.86	11.39	.78
CAPS Cluster D severity	16.48	9.03	15.10	9.31	.71

Note. CAPS = Clinician Administered PTSD Scale, TeleCAPS = teleconferencing CAPS administration.

larger group of participants in order to directly compare the different methods of assessment.

Phase 2 Study Sample

Thirty participants completed both a FTF CAPS and teleCAPS assessment. Interrater reliability at the diagnostic level between FTF CAPS and teleCAPS administrations was high ($\kappa = .83$). Correlations between the two administration methods for total severity score and subscale severity scores all exceeded .70 (see Table 1). Internal consistency for the teleCAPS administration was good ($\alpha = .86$) and comparable with the internal consistency identified for the standard FTF CAPS ($\alpha = .91$). Using the FTF CAPS as the criterion, teleCAPS administration was found to have strong sensitivity (90.91%), specificity (100%), positive predictive power (100%), negative predictive power (77.78%), and diagnostic efficiency (93.1%).

Endorsement of specific PTSD symptoms is presented in Figure 1. With one exception, paired samples *t* tests revealed no significant differences between CAPS administration method for individual symptoms between veterans diagnosed with PTSD at both assessments ($p \geq .1$) and, in separate analyses, between veterans who were not diagnosed with PTSD ($p \geq .1$). The one exception was for symptom D1 (sleep difficulties); participants diagnosed with PTSD were more likely to endorse this item in the FTF assessment compared with the teleCAPS assessment, $t(19) = -2.85$, $p = .01$.

Both assessment methods were highly correlated with the PCL ($r = .82$ for teleCAPS; $r = .89$ for FTF CAPS). These correlations were not significantly different from one another ($p = .38$). Both assessment methods were also strongly correlated with the BDI-II ($r = .73$ for teleCAPS; $r = .84$ for FTF CAPS). Similarly, these correlations did not differ between assessment method ($p = .29$).

Consistent with participants in the pilot sample, participants in the study sample reported high levels of acceptability for the teleCAPS. Specifically, 56.1% of participants reported feeling "very comfortable" or "comfortable" with the lack of in-person contact, 33.3% of participants reported feeling "neither comfortable or uncomfortable," and 9.5% of participants reported feeling "uncomfortable" (no participants reported feeling "very uncomfortable"). Similarly, 80.5% of participants rated the convenience of the assessment as "very convenient" or "convenient," 14.3% of participants rated it as "neutral," one participant rated the assessment as "inconvenient," and one participant rated the assessment as "very inconvenient."

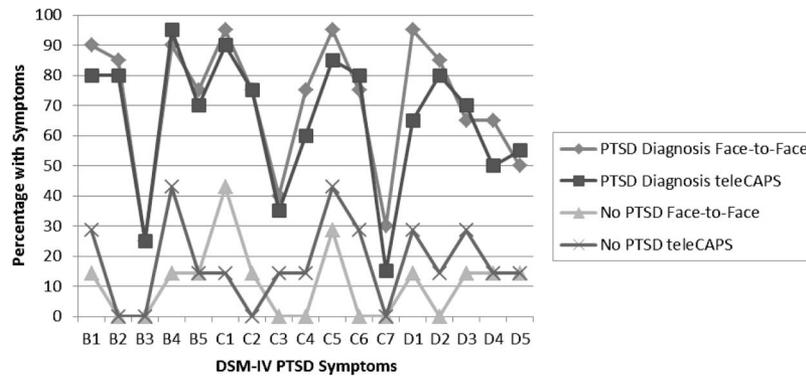


Figure 1. Percentage with PTSD symptoms by diagnostic status and method of administration. PTSD = posttraumatic stress disorder. Twenty veterans met criteria for PTSD, seven veterans did not meet criteria for PTSD. Two participants were not diagnostic matches across FTF and teleCAPS assessments and are not represented in this figure.

Comparing the teleCAPS assessment method with the FTF assessment method, veterans reported equally high levels of satisfaction with both administration methods, including (a) “how comfortable they felt with the clinician,” $t(28) = .95, p = .35$; (b) “how comfortable they felt with the interview material,” $t(28) = .00, p = 1.00$; and (c) “the convenience of the assessment,” $t(28) = -1.31, p = .20$. In addition, veterans reported equally low levels of concern regarding confidentiality and trust, $t(28) = .83, p = .41$, with both administration methods.

Participants were asked to compare the two methods of CAPS administration and to indicate whether they preferred one method of assessment over the other. One participant reported a “strong preference” for the FTF assessment and 12 participants (41.4%) reported a “preference” for the FTF assessment. Twelve participants (41.4%) expressed a lack of preference (41%), and one participant reported a “preference” for the teleCAPS assessment. Three participants did not complete the VPSQ.

Our results demonstrate that video conferencing can be used to assess PTSD among veterans, that clinicians can have confidence in the validity of their assessment results, and that this method of administration is as well received as the face-to-face administration. The pilot study showed that the teleCAPS could be administered reliably and feasibly. The larger study directly comparing the teleCAPS with traditional face-to-face CAPS administration in 30 veteran participants provided further support for the internal reliability, validity, and acceptability of the teleCAPS. The teleCAPS had high sensitivity and specificity relative to the face-to-face CAPS, and the interrater reliability was high between the two methods of administration. In addition, veterans were satisfied with the teleCAPS and willing to use this approach. Across both the pilot and study samples, evidence of strong construct validity was reflected in high associations between both CAPS administration methods and self-report measures of PTSD (i.e., PCL) and depression symptoms (i.e., BDI-II).

Telehealth administration of the CAPS via real-time, two-way, PC-based video (teleCAPS) can reduce time and travel costs and bring high quality PTSD assessment to more veterans. Although the current study provides strong support for the tele-assessment of PTSD among veterans, the generalizability of the results are limited by the relatively small sample size, restricted recruitment from

one VA system, and older age of the sample relative to many of the veterans from the most recent conflicts in Iraq and Afghanistan who may be in need of PTSD assessment. Furthermore, the veterans who participated in this study were aware that they were not being evaluated for treatment or compensation purposes and were recruited during a visit to their local VA health care facility. Individuals who may be most likely to be interested in a teleCAPS assessment for treatment or compensation and pension purposes may have limited access to VA facilities either due to geographic restrictions, physical or mental health considerations, or stigma associated with receiving mental health care services. Although yet to be examined, it is possible that these veterans with limited access to VA facilities may find a teleCAPS assessment acceptable and, in fact, may express a stronger preference for teleCAPS than the samples examined in this study. This may help to explain why, when asked to indicate their preference for face-to-face versus teleCAPS administration, the large majority of participants indicated either a neutral preference or a mild preference for the FTF method of assessment. A preference for FTF assessment over tele-assessment by some participants may reflect their familiarity with the FTF modality, without the same type of consideration for the challenges of accessing in-person care faced by many other veterans. Furthermore, veterans in the current study did not report greater satisfaction with FTF assessment compared with teleCAPS assessment. Future examinations of the teleCAPS with a veteran sample with limited access to in-person assessment and treatment options will be important to evaluate the preference and satisfaction with tele-assessment within the target veteran population.

The number of veterans in need of assessment for PTSD for both treatment and compensation purposes has been growing considerably over the past decade (Frueh, Grubaugh, Elhai, & Buckley, 2007; Rosenheck & Fontana, 2007; U.S. Department of Veterans Affairs Office of Public Affairs, 2013). The VA has extended the use of tele-assessment into formal compensation and pension evaluations, thereby improving the speed and efficiency with which these types of evaluations may be conducted (U.S. Department of Veterans Affairs, 2012). Delivering mental health assessment to veterans with limited access to VA facilities is an ongoing challenge that may be addressed, at least in part, by the use of video conferencing. Tele-mental health presents a more

convenient and economical way to provide evaluations to veterans living remotely or those who are otherwise unable to access services at their local VA. This study provides support for the implementation and use of this technology for PTSD assessment within a veteran population. Future research aimed at examining PTSD assessment via video teleconferencing among a larger, more diverse sample of veterans who have limited access to VA facilities is indicated. In particular, it will be important to evaluate veterans who are seeking PTSD assessment for different reasons (i.e., compensation, treatment), as reliability and tolerability may differ. Ultimately, the use of video teleconferencing for PTSD assessment remains a promising opportunity to further address the mental health needs of veterans who may otherwise be limited in their ability to obtain quality evaluations through the VHA.

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