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Telemedicine and PTSD Assessment of Veterans: A Study of Equivalence Between Videoconferencing (VTC) and Face-to-Face (FTF) Methods

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Telemedicine and PTSD Assessment of Veterans: A Study of Equivalence Between
Videoconferencing (VTC) and Face-to-Face (FTF) Methods

by

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Thesis

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in

Clinical Psychology

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ABSTRACT

Telemedicine systems use telecommunications technology to provide health care services to clients with distance barriers to providers. This is relevant for America's veterans who require services for posttraumatic stress disorder (PTSD) but find that these specialty services are not always available locally. This study compared a face-to-face (FTF) Clinician-Administered PTSD Scale (CAPS) interview and a videoconferencing (VTC) administration of the CAPS. Participants were 20 male veterans referred to a veteran's affairs center for a PTSD assessment. Correlations between assessments ranged from .74 - .92, and statistical equivalence was demonstrated at 90% confidence intervals. Sensitivity of the VTC interview was found to be 94%, and specificity was found to be 33% as compared with the FTF criterion. Additional analyses indicated that a working alliance was established with VTC, and the majority of veterans reported satisfaction with the VTC method and would utilize this technology for service barriers.

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Telemedicine and PTSD Assessment of Veterans: A Study of Equivalence between Videoconferencing (VTC) and Face-to-face Methods

Introduction

The primary focus of this study was to evaluate and compare a face-to-face Clinician-Administered PTSD Scale (CAPS) interview and a videoconferencing (VTC) administration of the CAPS. Client satisfaction and telepresence were assessed for VTC, and working alliance was assessed for each method.

Problem Statement

Posttraumatic Stress Disorder (PTSD) is a significant problem within the veteran population. The Department of Veterans Affairs (2002) estimates more than 150,000 veterans were newly service-connected¹ for PTSD in 2001 alone. The National Vietnam Veterans Readjustment Survey ([NVVRS], Kulka et al., 1990) reported that lifetime prevalence of PTSD among American Vietnam theater veterans is estimated at 30.9% for men and 26.9% for women. In addition, the NVVRS reported that 22.5% of men and 21.2% of women have had partial PTSD at some point in their lives. This suggests that more than half of all male Vietnam veterans and almost half of female Vietnam veterans have experienced “clinically serious stress reaction symptoms” (Kulka, 1990).

PTSD is an anxiety disorder resulting from exposure to a traumatic event involving a perceived direct or indirect threat of death or serious injury. Symptoms resulting from the exposure include persistent reexperiencing of the event, persistent avoidance of stimuli associated with the event, numbing, and increased arousal (APA, 2000). The effects of PTSD can be debilitating. Individuals may experience painful feelings of survivor guilt,

¹ Veterans are considered service-connected when their condition is attributable to their active military service and the degree of the service-connected disability (SCD) determines the veteran’s eligibility for additional benefits.

problems with interpersonal relationships, self-destructive behavior, hopelessness, hostility, social withdrawal, feeling threatened, and somatic problems. PTSD is highly comorbid with Major Depressive Disorder, Substance-Related Disorders, and the range of Anxiety Disorders (APA, 1994).

In remote areas, travel distances represent a significant barrier for veterans to access timely and expert care (VHA Notice 99-04, 1999). In a report by the Department of Veterans Affairs (National Survey of Veterans [NSV], 2001), veterans who did not use VA health care in the past year were asked to give their reasons why they did not use it. Although the majority of veterans (around 40%) indicated they had other sources for health care, 18.2% of veterans perceived VA health care as inconvenient, and 17% stated they were not aware of VA health care benefits. In addition to distance barriers for veterans seeking health care, there may exist barriers to health care for veterans who are incarcerated. According to the NVVRS report, almost half of all male veterans currently suffering from PTSD had been arrested or incarcerated at least once, and 11.5% had been convicted of a felony (Kulka, 1990).

The Veterans Health Administration (VHA) has been a leader in the use of information technology to improve health care for veterans. This is evidenced by the number of successful projects initiated by the VHA in the areas of teleradiology, telepathology, telephone liaison care, telenuclear medicine, and cardiac pacemaker monitoring programs (VHA notice 99-04, 1999). The VA currently has more than 20 sites across the U.S. that offer a variety of telemedicine services to veterans. However, few clinical studies in telemedicine have demonstrated the efficacy, safety, reliability, and outcomes of clinical telemedicine (VHA Notice 99-04), and to date there are no studies that compare VTC and

face-to-face assessments for PTSD. It is imperative to research and examine this process, given that veterans are already receiving some services via these methods.

This telemedicine study evaluated VTC and face-to-face CAPS assessments for veterans seeking a mental health evaluation for PTSD. Working alliance was assessed after completion of both assessments, and VTC satisfaction and telepresence was assessed after the VTC interview. The study utilized statistical methods based on descriptive statistics, equivalence testing, and signal detection for a comprehensive data analysis.

Literature Review

The Institute of Medicine (IOM) defines telemedicine as “the use of electronic information and communications technologies to provide and support health care when distance separates the participants” (IOM, 1996). According to the IOM, most of the telemedicine projects from the 1960s through the early 1980s failed. Telecommunications costs were high, and the technologies were awkward to use. Recently, with dropping costs for communications technologies along with improved quality and ease of use, there has been increased interest in telemedicine projects.

There are two viable options to configuring a VTC system: connection via one or more ISDN (integrated services digital network) phone lines or via the Internet through a facility’s local area network (LAN). An ISDN phone line is a dedicated digital phone line, typically offering a bandwidth of 128 kbps (kilobits per second). Video and audio quality is the main issue when constructing a VTC system, and quality translates to the bandwidth of a system. With greater bandwidth, the video and audio quality are increased and the video and audio latency is reduced. The Internet can offer much greater bandwidths than ISDN at

reduced costs as long as the facility's local network is able to accommodate the bandwidth required for VTC.

In a study by Ball and Puffett (1998), assessment of cognitive functioning was completed on eight elderly residents by VTC and also face-to-face. Reassessments were carried out within one week of the initial assessment. Each participant was administered a subtest of the Cambridge Examination for Mental Disorders of the Elderly (CAMDEX, Roth, Huppert, Tym, & Mountjoy, 1988) called the CAMCOG test. The CAMDEX is a structured interview designed to identify early cognitive impairment. A subsection of the CAMDEX is the CAMCOG test, which investigates the participant's cognitive functioning in the areas of memory, praxis, perception, abstract thought, calculation, orientation, language, and concentration. Due to practical considerations, the authors indicated there was no random assignment, and it is not clear from the study if assessment order was counterbalanced. Correlations between scores from face-to-face and VTC were performed and were found to be reasonable. Correlation coefficients ranged from a low of 0.1 for calculation to a high of 0.84 for memory. The majority of coefficients were 0.62 or above. The authors stated that there were technical problems during the study. A camera had been stolen just before the study began, and the authors were able to find only an incompatible camera that provided a poor picture. The equipment used in this study was PC-based² connected through an ISDN connection at 128 kbps.

Kirkwood, Peck, and Bennie (2000) compared neuropsychological assessments performed via telecommunication and face-to-face. VTC equipment consisted of two

² Clarification of PC-based systems - The latest technology provides integrated cameras that incorporate the personal computing functions of older systems. Therefore, the necessity for a personal computer is dependent on the type of video conferencing system that is used.

desktop VTC units connected by ISDN at 128 kbps. One VTC system was located in the clinical psychology department at the university in Inverness, Ireland, and a second unit was located in a building 10 km away, approximately 15 minutes by car. Twenty-seven participants with a mean age of 46 were recruited through various rehabilitation centers and mental health centers. All participants were receiving support services for alcohol problems.

The assessments used were well known standardized assessments covering the main areas of functioning commonly used in clinical practice in the United Kingdom. The tests assessed pre-morbid and current intellectual functioning, verbal memory, visual memory, attention, and concentration. These tests also have parallel forms (identical format but different item content.) The researchers suggest that the use of parallel forms reduces the risk of high levels of agreement due to practice effects if the same test is presented as with Ball and Puffett (1996).

Some participants were administered the tests via VTC first, and others were administered the tests face-to-face first in order to minimize order effects. During the second administration whether VTC or face-to-face, the order the tests were given were reversed as well. Participants were also asked to complete a satisfaction questionnaire regarding their VTC experience. They rated sound quality, picture quality, ability to communicate, and overall satisfaction on a 10-point Likert scale. Limits of agreement analyses were performed on each test and results indicated that for most of the measures, cognitive assessment via VTC produced similar results to face-to-face assessments. However, there were wide limits of agreement intervals for several of the tests, suggesting some inconsistencies between the two methods. The authors suggest that audio and video quality may explain some of these

differences. These factors may also help to explain why VTC assessments were almost 25% longer than the face-to-face assessments.

In another study, researchers in Newfoundland report shortages of mental health professionals, especially child psychiatrists (Elford et al., 2000). As of 1996, there were only five child psychiatrists in this very large province, and that shortage was compounded by the fact that all five were located in the city of St. John's. Elford et al. conducted a study using VTC to conduct child psychiatric assessments. Twenty-two children with a mean age of nine were randomly divided into two groups. Participants in the first group were initially assessed via VTC and then by a different child psychiatrist face to face. For participants in the second group, the order was reversed and assessments were conducted on the following day. All five of the child psychiatrists in the area participated and were randomly assigned to each assessment. Both the VTC and face-to-face assessments were conducted at the hospital in St. John's.

The VTC equipment was PC-based connected via three ISDN lines for a total bandwidth of 384 kbps. Elford et al. (2000) reported that the quality of the equipment was good; however, they encountered problems with this particular population due to many of the children moving around the room, not speaking into the microphone, and playing with the equipment. Elford et al. (2000) administered multiple questionnaires to assess client, parent, and provider satisfaction. The researchers stated they were unable to find suitable questionnaires and thus designed their own for the purposes of this study. The questionnaires were not validated. Overall, the results from the questionnaires indicated the client, parents, and psychiatrists were satisfied with VTC, although the psychiatrists and the parents indicated a preference for face-to-face assessment. The children were very positive about the

VTC system; 16 out of 17 “liked” using the system and five liked it better than the face-to-face assessment. An independent child psychiatrist blind to how diagnoses were obtained concluded that 96% of the time, the diagnosis and treatment recommendations made using VTC were clinically the same as those made face to face.

As in Newfoundland, researchers in Australia (Guilfoyle et al., 2003) state that distribution of doctors, nurses, and other health care providers is geographically unequal. As a result, less qualified health-care workers find themselves having to perform tasks beyond their training. This study compared assessments via VTC and face-to-face in a rural residential facility for highly dependent elderly people. The VTC unit was a Sony 1500, connected via ISDN at 384 kbps set up at the residential facility and at a larger city approximately 225 km apart. The 12 participants were high-dependent residents considered suitable for the study. There were five health care providers, each assessing their own specialty in dietetics, occupational therapy, physiotherapy, podiatry, and speech pathology. The same health provider administered both face-to-face and VTC assessments. Six of the participants received a face-to-face assessment first and the other six received a VTC assessment first. The two assessments were carried out within one week of each other. Health care providers rated three outcome variables assessing efficiency, suitability, and adequacy of the VTC assessment. Also, two independent raters blind to the assessment format compared the health care plans developed for each resident. Results indicated that the mean ratings for all three outcome variables were significantly lower for VTC than for face-to-face, and only the dietician’s assessments did not differ significantly between the two methods.

Baer et al. (1995) assessed the interrater reliability of various rating scales administered face to face and over a videoconferencing system for persons diagnosed with obsessive-compulsive disorder. The authors developed a method termed the “simultaneous video reliability interview,” which was based on the simultaneous live reliability interview. In the simultaneous live reliability interview, both raters sat together with the participant and scored the participant’s responses (N=16). In the video reliability interview, the interviewer (rater 1) sat at the local site using VTC and a second rater sat together with the participant at the remote site (N=10). Both raters then scored the participant’s responses to the various rating scales.

Two PictureTel 4000 model 400 units were connected via ISDN lines using a narrower bandwidth of 128 kbps. The researchers chose to operate at this lower bandwidth with the hope of demonstrating reliability between methods at a lower cost. The VTC units were located at hospitals approximately 20 miles apart. The rating scales used in the study were the Yale-Brown Obsessive Compulsive Scale, the Hamilton Depression rating scale, and the Hamilton Anxiety rating scale.

Results demonstrated excellent reliability (.97 and higher) on all rating scales for both interview methods, and there were no significant differences found on severity of obsessive-compulsive disorder between participants in the live interview group and participants in the VTC group. In addition, participants in the VTC group were asked to rate their comfort level during the interview, their ability to express themselves, the quality of the interpersonal relationship, and the helpfulness of the interview. The response choices were “much below average,” “below average,” “average,” “better than average,” and “much better than average”

as compared to other interviews. Results indicated that mean scores for all the questions fell between the “average” and “better than average” ranges.

Kobak (2004) compared face-to-face and videoconference administration of the Hamilton Depression Rating Scale (HAMD) for persons diagnosed with an affective disorder. The participants consisted of two groups of 21. In the first group, two independent interviewers administered the HAMD twice on the same day, face to face, in order to establish interrater reliability between the raters. The second group of 21 was also administered the HAMD twice on the same day, once via VTC and once face to face, by two independent interviewers. Order of administration was balanced between interviewers. For both groups, a distracting task was conducted between interviews. The equipment consisted of iPower Standard and Polycom units on different floors of the same building connected via Ethernet at 384 kbps.

Results indicated that the VTC method was not significantly different from the face-to-face method on interrater reliability, internal consistency of the scale, correlation between scores, and total mean scores. Participants who received a VTC interview were asked to evaluate their experience. Of the 21 participants, 14 reported feeling fairly or very comfortable with the method, 15 liked the experience ‘a little or a lot’ and 19 thought this was a useful method if face-to-face evaluation was limited or unavailable. Seven participants reported that the method interfered with their ability to communicate with the interviewer. Sixteen stated they would be willing to be interviewed via VTC to avoid travel time, and 15 stated they would like to be interviewed via VTC again.

In addition to research on assessments via VTC, there have been studies providing treatment services that compare VTC and face-to-face methods. A study by Deitsch, Frueh,

and Santos (2000) delivered group therapy services via VTC for veterans with PTSD. Sessions were conducted between the Dorn VAMC (Veteran's Affairs medical center) in Columbia, SC, and the Ralph Johnson VAMC in Charleston, SC, approximately 200 km away. A PC-based VTC system was used, connected via three ISDN lines at 384 kbps. The group therapy sessions involved four male combat veterans with PTSD. This group had been meeting together for about seven years at the Charleston VAMC and looked to one another for support in dealing with many PTSD-related issues. Attendance was variable over the years for a variety of reasons, but lack of transportation was the most frequent reason cited.

For the VTC session, the veterans and two of three group leaders met at their usual site at the Charleston VAMC. The third group leader traveled to the Dorn VAMC. Initially, there was some experimentation of equipment and questions regarding confidentiality, but then the remaining portion of the session (45 minutes) proceeded as usual. At the end of the session, the four members were asked to complete a questionnaire about the process and provide verbal feedback. Satisfaction with VTC was rated as good or very good in all cases. The members reported that they felt comfortable using the equipment and that they would use the system if it would save them a two-hour drive.

Another study by Bouchard et al. (2004) delivered cognitive-behavior therapy for clients with panic disorder. Participants were 21 adults referred by mental health professionals in Ottawa, Canada. Ten participants were to receive psychotherapy services face to face at the local site in Gatineau, Ottawa, and 11 participants were to receive services via VTC at the remote site in Maniwaki, Ottawa. The treatment protocol was based on a 12-week cognitive-behavioral treatment model for panic disorder. Both groups were instructed to self-monitor their panic four weeks prior to treatment. The treatment consisted of a brief

case conceptualization, presentation of the cognitive-behavioral model for panic, application of cognitive-restructuring strategies in interpreting physiological arousal, interoceptive exposure, exposure to agoraphobic situations, and relapse prevention. Therapeutic alliance was measured after the first, third, and final sessions using the Working Alliance Inventory (WAI) only for the telepsychotherapy group. The face-to-face group had begun treatment prior to the WAI being added to the assessment protocol.

The equipment consisted of a Tandberg 2500 videoconferencing system connected via six ISDN lines providing a bandwidth of 384 kbps. The researchers reported excellent image quality and no significant delays. The therapists were encouraged to use the picture-in-picture function for visual feedback of their presentation. At posttreatment, 90% of the face-to-face participants and 81% of the VTC participants were panic-free. At 6-months follow-up, 100% of the face-to-face and 91% of the VTC participants were panic-free. The WAI scores were high for the VTC participants indicating a strong therapeutic bond, agreement on in-session tasks, and agreement on treatment goals. The authors also reported on anecdotal evidence of “presence” in this study. Presence in a telepsychotherapy context refers to the impression and feeling of really being with the client rather than being at a remote location. In the current study, participants made comments such as “I’m glad you are here, it helps me so much,” and they often reported forgetting that they were in a different location than the therapist.

Morland, Pierce, and Wong (2004) compared face-to-face and VTC treatment of a coping skills group for veterans diagnosed with PTSD. Twenty participants were randomly assigned to the face-to-face group or VTC group. The two groups were conducted on different days of the same week for eight weeks. A clinician traveled by air to the Kona

Veteran's Center to provide the face-to-face group sessions, and then the same clinician conducted the VTC group the following day at the VA hospital on Oahu. Two videoconferencing units were connected by a bandwidth of 512 kbps. The remote site had a backup clinician in case of a clinical emergency, and a VA technician was available to address technical difficulties. The treatment protocol was based on four coping skills modules: general education regarding PTSD, communication, anger management, and relapse prevention, which included a workbook and weekly homework assignments. Attrition, compliance, patient satisfaction, clinician satisfaction, and patient's retention of information between methods were assessed.

The authors reported that substantial attrition occurred in the face-to-face group. At the end of the study, 89% of the participants remained in the VTC group and only 50% of the participants remained in the face-to-face group, although there were no significant differences found between groups in the average number of sessions attended. There were no significant differences in total mean scores for patient satisfaction at week four or week eight. However, patient satisfaction did increase for both groups at week eight. The clinician's mean rating on satisfaction was slightly higher for the face-to-face but the difference was not significant. Finally, with regard to information retention, mean scores indicated that the face-to-face group had retained more information; however, the difference was not significant. The authors suggest that the findings demonstrate the feasibility of using VTC to provide psycho-educational group services to veterans in remote locations.

The previous studies described provided an overview of past research in using VTC as an alternate form of assessment and treatment. The extant literature, however, suggested problems with methodology and limited data analysis. Although some studies have assessed

cognitive functioning and other psychopathology, there were no studies that existed in using telemedicine technology and assessment of PTSD using the CAPS.

The Present Study

The purpose of this study was to evaluate and compare CAPS assessments via VTC with CAPS assessments in a face-to-face format. Correlational relationships, Kappa, and percent agreement between assessments via each method are reported at the subscale and total severity score level. Signal detection analysis was conducted for calculation of the sensitivity, specificity, and other diagnostic efficiency measures for the VTC method as compared to the face-to-face criterion. For purposes of demonstrating functional equivalence between VTC and face-to-face methods, a statistical equivalence procedure was conducted. In addition, client satisfaction and telepresence were assessed for VTC, and working alliance was assessed and compared for each method.

Method

Participants

Twenty male veterans who were referred to the Ann Arbor VA Health Care System for PTSD evaluations were either contacted by phone in advance or approached after their full psychiatric evaluation and asked to participate in the proposed study. Referrals to the Ann Arbor VA typically come from multiple sources: self-referrals, physicians, and clinicians within the VA system, and other VA's and Vet centers. A summary of the demographic characteristics for the participants is shown in Appendix A.

Ethical Treatment of Participants

The researchers on the proposed study were committed to ensure the ethical treatment of participants. Informed consent (see Appendix B) was obtained from each participant prior to the assessment process. The purpose of the proposed study was explained verbally and in writing on the consent form. It was highlighted to the participant that a mental health evaluation was not contingent upon participation in the study. All participants were given both written and oral assurance that their participation was voluntary and that they could withdraw from the study at any point. There was no penalty for withdrawal or refusal to participate at any time during the study.

All participants received oral and written assurance of confidentiality. Participant data were coded with a participant number, and participants were instructed to return any assessment instruments to the clinician at the site. During both VTC and face-to-face interviews, there was a written indicator on the room door that an interview was in process so as to reduce the possibility of being disturbed. Participants were advised of risks orally and in writing. In the event of an equipment malfunction during VTC, the participant had the

option to withdraw or reschedule the interview. There was no equipment malfunction during the study.

Regardless of interview method, it was explained to participants that the evaluation process for PTSD involved discussion of past events that could cause distress and discomfort. If a participant became distressed, he or she could choose to end the interview at any time. In the case of VTC, the participant had the option of speaking with the clinician face to face. Finally, participants were warned that they could experience an increase in symptoms over the next few days following the evaluation. Participants were reassured that this was normal and could be due to the fact that they had not discussed these events for some time. Participants were given emergency phone numbers during the day and after hours if any problems arose in connection with the study. In the current study, no interviews were terminated prematurely and no emergencies arose.

Measures

Clinician Administered PTSD Scale (CAPS) – The CAPS is a structured clinical interview designed to assess adults for the 17 symptoms of PTSD as specified by the Diagnostic and Statistical Manual of Mental Disorders (APA, 2000) as well as five associated features (guilt, dissociation, derealization, depersonalization, and reduction in awareness of surroundings). Since its initial development by the National Center for PTSD (Blake et al., 1990b), it has been used in more than 200 studies (Weathers, Keane, & Davidson, 2001). The CAPS consists of standardized prompt questions, supplementary follow-up questions, and behaviorally anchored 5-point rating scales corresponding to the frequency and intensity of each symptom. The CAPS yields a global severity score, ranging from 0 to 136, which is accumulated based on frequency (0 to 4) and intensity ratings (0 to 4)

across all 17 symptoms. A cutoff score of 65 was found to accurately diagnose PTSD (Weathers and Litz, 1994). The CAPS was found to have excellent psychometric properties as compared to the PTSD module of the Structured Clinical Interview for DSM-IV (SCID). Keane, Newman, and Orsillo (1997) reported an alpha coefficient of 0.93, sensitivity of 0.84, specificity of 0.95, and a kappa coefficient of 0.78. It takes approximately 40 to 60 minutes to administer the CAPS.

In the present study, scoring of the CAPS follows the protocol consistent with scoring at the Ann Arbor VA Health Care System, although there are nine scoring rules for converting CAPS frequency and intensity scores into a PTSD diagnosis (Weather, Ruscio, & Keane, 1999). This involves first dichotomizing the individual CAPS items using the item severity 4 rule (ISEV4; Weathers, Ruscio, & Keane). Using the ISEV4 rule, a PTSD symptom is considered to be present if the severity of the item (frequency + intensity) is four or higher. In addition, following the criteria based on the DSM-IV, one intrusive, three avoidance, and two hyperarousal symptoms are required for a diagnosis of PTSD. In one sample of 60, the Kappa Coefficient for ISEV4 rule was 0.8 and in a second sample of 24, the Kappa Coefficient was found to be 0.88 (Weathers, Ruscio, & Keane).

VTC Participant Satisfaction Questionnaire - Client satisfaction with the VTC assessment was measured using the VTC Participant Satisfaction Questionnaire utilized in a study by Wong (2003) but is not yet validated. However, it was selected because it was developed specifically for PTSD telehealth assessment of veterans and is therefore relevant for this study. The questionnaire consists of seven items rated on a 5-point Likert-type scale (with 5 indicating satisfaction with VTC) that assess the following domains: comfort with VTC method, comfort with lack of face-to-face contact, comfort with the interview material,

concern about confidentiality and trust, the willingness to use VTC in the future, preference for face-to-face interview versus the VTC interview, and overall convenience. An eighth item is an open-ended prompt for the participant to provide any additional comments.

The first seven items were added to yield a total score, ranging from 7 to 35. A lower score suggests low overall satisfaction with the VTC assessment, and conversely, a higher score suggests high overall satisfaction. A moderate score (e.g. 21) would indicate neutrality of the method; however, it should be noted that no cutoff criterion are given for this instrument. In this study, a score of 22 or higher (any score above neutral) was used to indicate some satisfaction with VTC.

Working Alliance Inventory (WAI) - The WAI is a self-report measure developed by Horvath and Greenberg (1989) designed to assess the working alliance relationship between the client and therapist. It is based on the construct proposed by Bordin (1979), who theorized the working alliance concept based on client-therapist agreement of therapy goals, agreement on therapy tasks, and development of a strong relational bond. The WAI is composed of 36 items rated on 7-point Likert-type scales (1 = *strongly agree*, 7 = *strongly disagree*) with 12 items in each of three subscales: Goal Agreement, Task Agreement, and Bond Development. Goals refer to mutual agreement between the client and therapist on desired therapeutic outcomes. Tasks refer to behavioral and cognitive processes that occur during counseling sessions. Bond refers to the positive attachment between client and therapist. The Ann Arbor VA Health Care System uses a modified version of the WAI that specifically addresses the evaluation process. The 12 items related to task agreement have been removed and wording of several items has been changed to reflect evaluation sessions with the PTSD Clinical Team (PCT) clinicians as opposed to therapy sessions. Of the 24

items within the Goal and Bond subscales, 15 items are positively worded and 9 are negatively worded; therefore, reverse scoring is implemented. Although there is no set cutoff point that determines working alliance, a higher score is considered to indicate the presence of a working alliance. A response of four on the Likert-type scale indicates neutrality.

Telepresence in Videoconferencing Scale - Bouchard et al., 2004, and Bouchard et al., 2000, used this self-report measure to assess “telepresence,” the sense of another person being present at a remote site. This questionnaire is not yet validated. However, it was selected because it was developed specifically for use after a videoconferencing session and is therefore relevant for this study. The questionnaire consists of ten items where participants rate their level of agreement on a percentage scale of 0-100%. The scale was designed to assess the following domains: physical presence, social interaction, and absorption.

Items 2, 3, 4, and 8 make up the physical presence domain; items 1, 5, 6, and 7 make up the social interaction domain; and items 9 and 10 make up the absorption domain. A total score is calculated by taking the mean of all ten items. Means for each of the three domains are calculated as well. Each of the mean scores represents levels of agreement. The higher the percentage, the greater the sense of telepresence.

Equipment

VTC - The VTC system was connected via the Internet through the Ann Arbor VA Medical Center’s Local Area Network (LAN) at a bandwidth of 512 kbps. Equipment consisted of a 27” monitor connected to the Tandberg 500 videoconferencing system that included a wireless remote control, microphone, and camera.

Procedure

Those consenting to participate were evaluated for PTSD via VTC and face-to-face assessments. Both assessments were administered at the Ann Arbor Health Care System PTSD Clinic. The VTC assessment consisted of administration of the CAPS interview and three self-report measures filled out after the interview. The self-report measures for the VTC assessment included the WAI, the VTC Satisfaction Questionnaire, and the Telepresence in Videoconferencing Scale. The face-to-face assessment was a full psychiatric evaluation of the participant that included self-report measures filled out by the participant, their military history, the CAPS interview, evaluation of comorbid conditions, psychosocial history, medical history, and an interview by a PTSD clinical team (PCT) psychiatrist or nurse practitioner. The self-report measures for the full psychiatric assessment included the Combat Scale, Impact of Events Scale - Revised (IES-R), Quality of Life Inventory (QOLI), Toronto Alexithymia Scale (TAS), the Dissociative Experiences Scale (DES), Beck Depression Inventory - II (BDI-II), Trait Anger Scale (TA), University of Rhode Island Change Assessment (URICA) scale, State-Trait Anxiety Inventory (STAI), and the modified version of the WAI. These self-report measures were part of the full psychiatric evaluation process at the Ann Arbor VA PTSD clinic and were included here for purposes of describing the sample.

Twenty participants received both the full psychiatric evaluation face to face and a CAPS-only evaluation via VTC. Participants were randomly assigned to first receive either the full psychiatric evaluation face to face or the CAPS-only evaluation in a crossover design. Therefore, ten participants first received a full psychiatric evaluation face to face and then received the CAPS-only evaluation via VTC within approximately one week. The other

ten participants received the CAPS-only evaluation via VTC and then received the full psychiatric evaluation face to face within approximately one week (for study design, see Appendix C). A one-week reassessment was chosen to reduce recency and practice effects and to reduce the likelihood of clinical changes. Since the proposed study involved two different assessment methods, this crossover design controlled for order effects. To encourage participants to undergo a second assessment, an incentive of \$50 was offered to each participant.

Clinicians were three members from the Ann Arbor VA PTSD Clinic trained in administration of the CAPS interview and evaluation of PTSD. Clinicians consisted of a social worker, post-doctoral fellow, and a doctoral student, all of whom had been administering the CAPS for PTSD assessments for at least one year. Interrater reliability was found to be 80% and involved calculating the percent agreement between each clinician's ratings of a patient interview on each item of the CAPS. For each participant, one clinician administered the face-to-face interview and a different clinician administered the interview via VTC. Having a different clinician administer the CAPS for each method controlled for relationship history effects. Therefore, the assumption was that the participant's relationship to the clinician during the first interview did not affect the subsequent interview.

Participants completed the WAI after each interview, once as part of the full psychiatric evaluation and again after the CAPS-only interview. Ten participants did not complete the working alliance inventory after their full psychiatric interview. All participants completed the working alliance inventory after the VTC interview. After completion of the VTC assessment, participants completed the VTC Participant Satisfaction Questionnaire and the Telepresence in Videoconferencing Scale.

All participants in the study completed the VTC Satisfaction Questionnaire, but at different times. Due to a procedural error at the beginning of the study, the VTC Satisfaction Questionnaire was not included in the packet given to the participants. Once this error was recognized, the questionnaire was included in the packet. Nine participants completed the questionnaire immediately following the VTC interview, and 11 participants completed the questionnaire approximately 5-6 months after the VTC interview. All twenty participants completed the Telepresence in Videoconferencing Scale immediately following the VTC interview.

Results

Twenty individuals who agreed to participate in the study completed both interviews. Two individuals dropped out after receiving their full psychiatric evaluation administered face to face. Both of these individuals reported increased symptomology after the first interview and did not want to undergo an additional interview. Due to a scheduling error, one participant completed both interviews with the same clinician and therefore was not included in the study.

Correlational Results

Pearson product-moment bivariate correlations were computed to address questions regarding correlations of total and subscale scores between methods, CAPS administered via VTC, and CAPS administered face-to-face. Table 1 shows the means, standard deviations, and correlation coefficients for the total and subscale scores.

Results indicated significant correlations on all three subscales as well as significance on the total severity score at the $p < .01$ level. Subscale B, a subscale that assesses an individual's intrusive symptoms related to the traumatic event, yielded the highest correlation coefficient of $r(19) = 0.924, p < .01$. The total severity score, which includes all items within each subscale, yielded the next highest correlation coefficient at $r(19) = 0.828, p < .01$. The subscale that assesses for hyperarousal symptoms, subscale D, yielded a significant correlation coefficient of $r(19) = 0.769, p < .01$ as did subscale C, a subscale that assess an individual's avoidance symptoms related to the trauma with $r(19) = 0.744, p < .01$. Overall, the results of this analysis indicate high correlations between administration of the CAPS via FTF methods and administration of the CAPS via VTC.

Percent agreement and Kappa were computed to evaluate the reliability of the VTC method as compared with the standard face-to-face method. Results are presented in Table 2 and indicate high levels of agreement between methods on all subscales as well as total severity score. Percent agreement for all subscales was calculated to be 100% and percent agreement for determining a PTSD diagnosis was found to be 85%. Kappa was found to be excellent on all subscales; however, the Kappa computed for total severity score was much lower at 0.32.

Table 1

Means, Standard Deviations, and Pearson Product-Moment Correlations for the Total Severity and Subscale Scores

| Scale | CAPS Face to Face | | CAPS Videoconferencing | | r_{xy} |
|-------------|-------------------|-----------|------------------------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | |
| Subscale B | 23.35 | 7.57 | 24.95 | 7.24 | 0.92** |
| Subscale C | 35.50 | 11.85 | 36.00 | 9.39 | 0.74** |
| Subscale D | 27.95 | 5.58 | 28.45 | 6.40 | 0.77** |
| Total Score | 86.80 | 21.40 | 89.40 | 20.17 | 0.83** |

Note. ** = $p < .01$

Table 2

Percent Agreement and Kappa for the Total Severity and Subscale Scores between VTC and Face-to-face Methods

| Scale | Percent Agreement | Kappa (<i>k</i>) |
|----------------------|-------------------|--------------------|
| Subscale B | 100% | 1.0 |
| Subscale C | 100% | 1.0 |
| Subscale D | 100% | 1.0 |
| Total Severity Score | 85% | 0.32 |

Statistical Equivalence

Equivalence testing is a statistical procedure that is used to determine if two methods are functionally the same (Stegner, Bostrom, & Greenfield, 1996). If a researcher is able to demonstrate statistical equivalence, then it is possible for service providers to make assessment and treatment decisions based on alternative considerations such as convenience, cost-effectiveness, and access to experts rather than effectiveness.

The aim in this study was not to establish superiority of one method versus the other, but rather to determine if the two methods were equivalent. This is in contrast to traditional hypothesis testing where the purpose is to determine whether a difference exists between two groups. However, failure to reject the null hypothesis is not the same as demonstrating that the null hypothesis is true. Equivalence testing is appropriate for situations in which the goal is to demonstrate that two (or more) conditions are functionally the same (Stegner, Bostrom, & Greenfield, 1996).

Mean total and subscale scores were calculated for the CAPS administration via face-to-face methods (μ_R , the reference group) and the CAPS administration via VTC (μ_T , the test group). The equivalence procedure involved calculating a confidence interval for a test group (VTC interview) and evaluating that interval against the equivalence region. The equivalence region is the range of scores for the reference group (face-to-face interview) that are considered acceptable. Stated another way, the equivalence region contains a range of scores in which differences are considered inconsequential. The equivalence region for this study was a range within 20% of the sample group mean for the reference group (face-to-face group). The criterion of 20% was derived from medical research in the field of drug testing. Since no criterion standards yet exist for psychosocial research, we adopted the 20% criterion. Next, a 90% confidence interval for the test group was constructed (Tryon, 2001; Rogers, Howard, & Vessey, 1993). Statistical equivalence is considered established if the entire 90% confidence interval of the test group is contained within the equivalence region of the reference group.

The confidence interval analysis statistics for the study are summarized in Table 3 and are shown in graphical form in Figure 1. On all total and subscale scores, results indicate statistical equivalence between administrations of the CAPS FTF and administrations of the CAPS via VTC.

Table 3

Confidence Interval Analysis Statistics

| | Subscales | | | |
|------------------------------------|----------------------------|----------------|----------------|----------------|
| | Total Severity Score | Criterion B | Criterion C | Criterion D |
| <i>CAPS Face-to-Face</i> | | | | |
| CAPS Mean | 86.8 | 23.35 | 35.5 | 27.95 |
| ± 20% Value | 17.36 | 4.67 | 7.1 | 5.59 |
| Equivalence Region | 69.44-104.16 | 18.68-28.02 | 28.4-42.6 | 22.36-33.54 |
| <i>CAPS- Videoconferencing</i> | | | | |
| CAPS Mean | 89.4 | 24.95 | 36.0 | 28.45 |
| 90% CI | 81.98-96.82 | 22.29-27.61 | 32.55-39.45 | 26.09-30.81 |
| Upper 90% CI as % of CAPS Mean | 11.5% | 18.3% | 9.6% | 8.3% |
| Lower 90% CI as % of CAPS Mean | -5.6% | -4.5% | -9.6% | -8.3% |

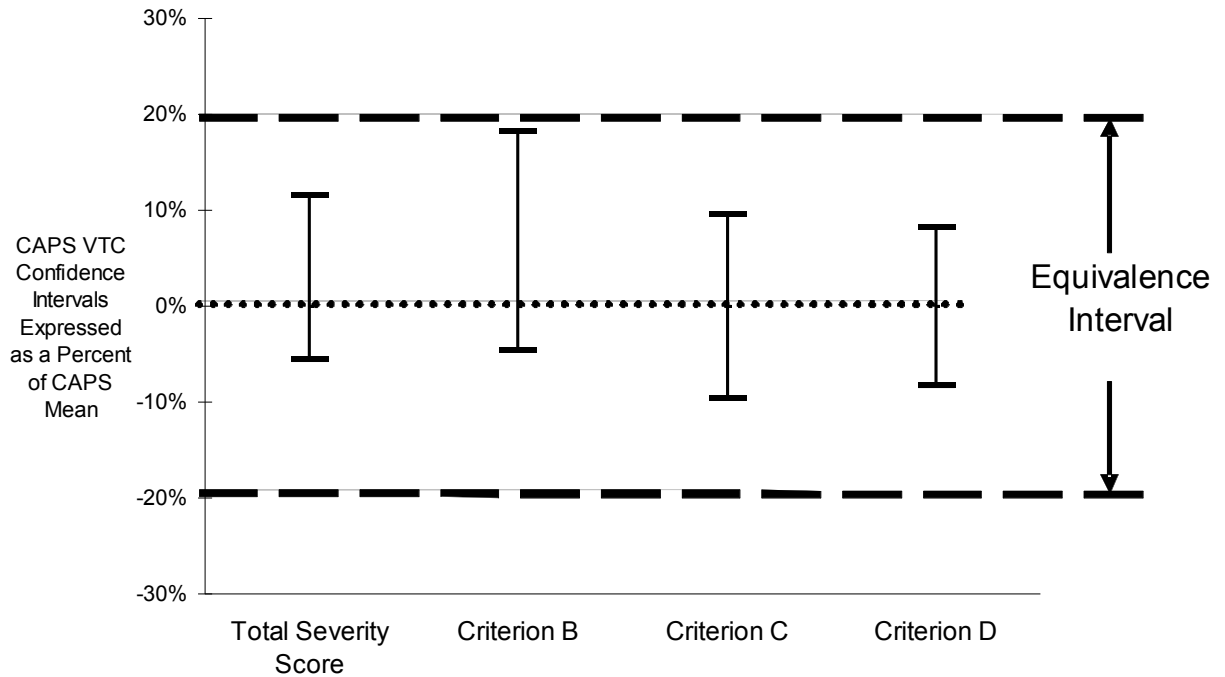


Figure 1. Confidence and Equivalence Intervals.

As can be seen graphically in Figure 1, all the confidence intervals calculated for the total severity score and subscales B, C, and D are contained within the equivalence region, indicating statistical equivalence between FTF and VTC methods.

Signal Detection Analysis

Additionally, this study utilized signal detection analysis, an analysis that involves two independent processes: discrimination and decision (Green & Swets, 1989). A decision process involves detection of a stimulus that is either present or absent. The discrimination process involves the comparison of a test signal against a criterion. For this study, signal detection analysis was used as a decision process to detect the presence or absence of PTSD via VTC with FTF interview reflecting the criterion.

In addition, we were interested in knowing how well an assessment via VTC could “pick up” or accurately diagnose PTSD. Signal detection analysis involved comparing scores from the CAPS via VTC against scores from the CAPS in the face-to-face assessment³. Through these comparisons, the number of “hits” (correctly diagnosing PTSD), the number of “misses” (missing the presence of PTSD), the number of “false alarms” (incorrectly diagnosing PTSD), and the number of “true negatives” (correctly diagnosing no PTSD) were calculated. These results are used to calculate diagnostic efficiency and are summarized in Table 4.

Table 4

Two-by-two Contingency Table for Diagnostic Efficiency

| | | CAPS FTF (Cutoff = 65) | |
|-------------------------------|--------------|-----------------------------------|----------------------------|
| | | PTSD Present | PTSD Absent |
| CAPS VTC (Dx = 65) | PTSD Present | 16 TP (Hit) | 2 FP (False Alarm) |
| | PTSD Absent | 1 FN (Miss) | 1 TN (True Negative) |

From these basic comparisons, diagnostic efficiency measures such as sensitivity, specificity, positive predictive power, negative predictive power, and diagnostic utility were computed. Table 5 summarizes the results of these calculations. The results from the

³ A face-to-face CAPS assessment is considered the criterion or “gold standard” in diagnosing PTSD.

diagnostic efficiency measures indicate high sensitivity but low specificity. This result suggests that for this sample, the likelihood of detecting the presence of PTSD was much greater than the likelihood of detecting the absence of PTSD. This is supported by the result of positive predictive power at 0.89 versus negative predictive power at 0.5. However, the analysis yields an overall diagnostic utility of 85% that suggests VTC as a viable method for diagnosing PTSD (Siegel, Vukicevic, & Spitzer, 1990).

Table 5

Diagnostic Efficiency Measures

| Measure | Results |
|---------------------------|---------|
| Sensitivity | 0.94 |
| Specificity | 0.33 |
| Positive Predictive Power | 0.89 |
| Negative Predictive Power | 0.5 |
| Diagnostic Utility | 0.85 |

VTC Satisfaction

The analyses conducted thus far have dealt with the accuracy of VTC as a means of diagnosing PTSD using the CAPS. The following analyses show the results of whether veterans were satisfied with the VTC method, whether a therapeutic alliance was established, and the level of telepresence during the interview. The first of these questions addressed the issue of patient satisfaction. Frequency data on the total satisfaction score as well as on questions 1-7 from all participants are summarized in Appendix C. Question 8 was an open-ended prompt for any additional comments.

The most significant result regarding the questionnaire is that of overall satisfaction with the VTC method, with 90% of participants indicating satisfaction. On the issue of comfort with the VTC method, 80% of participants indicated neutrality or higher with comfort level during the interview. Results from Question 7 showed that 100% of participants were neutral or higher in their rating of convenience with the method. Only 15% of participants reported an issue with confidentiality and trust. Frequency data from question 6 indicated that 60% of participants preferred a face-to-face interview, 35% indicating neutrality of preference, and 5% strongly preferred VTC. This result is consistent with the majority of comments made to question 8, the open-ended question, where most veterans indicated that they would prefer seeing a clinician face to face but would utilize VTC if there were distance barriers to services.

An independent samples t-test was computed to assess for group differences on VTC Satisfaction for those who rated their satisfaction immediately following the interview to those who rated their satisfaction 5-6 months after the interview. Results indicated no significant differences in satisfaction of the VTC method between immediate and retrospective ratings.

Working Alliance

Working alliance was assessed after both FTF and VTC interviews. Descriptive data from the WAI are shown in Table 6.

Table 6

Working Alliance Inventory Item Means and Standard Deviations for FTF and VTC

| | FTF (n=10) | VTC (n=20) |
|----------------------------|---------------|---------------|
| Working Alliance Inventory | M (SD) | M (SD) |
| Total | 4.71 (0.97) | 4.95 (0.94) |
| Bonds | 4.98 (0.94) | 5.18 (1.04) |
| Goals | 4.43 (1.03) | 4.73 (0.92) |

Overall, total and subscale scores suggest the presence of a moderate working alliance with both methods (Multon, Kivlighan, & Gold, 1996). Total and subscale item averages ranged from a low of 4.43 for the FTF Goal subscale to a high of 5.18 for the VTC Bond subscale. Although moderate, the results indicate some alliance present after each interview. However, it should be noted that no cutoff exists for this measure. Prado and Meyer (2003) considered the range 5.16 – 6 as “medium” values of a working alliance for patients who completed their course of therapy. Paired sample t-tests were computed on the total and subscale scores to assess for differences between methods. Results indicated no significant differences between the working alliance after a FTF interview and the working alliance after a VTC interview. As can be seen in Table 6, however, the means for the VTC interviews are slightly higher than with the FTF interview on both total and subscale scores.

Telepresence

Telepresence was assessed after completion of the VTC interview. All of the participants completed the questionnaire that assessed physical presence, social interaction, and absorption. The results are summarized in Table 7.

Table 7

Means and Standard Deviations for Telepresence in Videoconferencing Scale

| Telepresence | VTC M (SD) |
|--------------------------------------|----------------|
| Total Score (average % on all items) | 62.18% (39.08) |
| Physical Presence Subscale | 55.69% (38.83) |
| Social Interaction Subscale | 77.63% (29.95) |
| Absorption Subscale | 44.25% (44.89) |

The mean total score for telepresence during the VTC interview suggests that most participants had some sense of telepresence. The social interaction subscale indicated the highest level of presence at close to 80% and included items such as, “Our conversation seemed natural,” and “I had the feeling I was actively participating to the conversation.”

Results for the physical presence subscale showed just slightly above average and the absorption subscale indicated below average presence. The absorption subscale includes the two items, “I lost track of time,” and “I felt like I was coming back from the real world.”

Additional Analysis

A paired sample t-test was computed to determine any differences between CAPS scores on the first interview compared with CAPS scores on the second interview. Results indicated no significant differences between groups, suggesting that the first interview had little effect on the second interview regardless of method.

Discussion

The primary purpose of this study was to evaluate and compare a face-to-face Clinician-Administered PTSD Scale (CAPS) interview and a videoteleconferencing (VTC) administration of the CAPS. Utilizing telemedicine technology is particularly relevant for the soldiers and veterans of the United States who may need specialized services that are not readily available in their geographic regions. In addition to analysis of the CAPS between each administration, factors such as client satisfaction and telepresence were assessed for VTC as well as working alliance. Results of the study are discussed in the following section as well as limitations to the study and directions for future research. Last, the impact on the way our veterans and others receive health care services will be addressed.

Overall, the results of the present study support the use of videoconferencing technology in the assessment of PTSD. The total and subscale scores of the CAPS administered via VTC and the CAPS administered face to face were highly correlated ($r(19) = .828, p < .01$ for the total severity score). The lowest correlation coefficient was found on subscale C ($r(19) = .744, p < .01$) and is statistically significant. The slightly lower correlation is not surprising given that subscale C is assessing avoidance symptoms by asking questions such as “How often do you stay away from activities or situations that remind you of the event.” It is generally more difficult to quantify negative symptoms such as avoidance as opposed to positive symptoms such as nightmares.

Percent agreement between methods was found to be very high, with perfect agreement on each of the subscales and 85% agreement on overall PTSD diagnosis. Kappa was excellent on all subscales indicating perfect reliability; however, the Kappa coefficient for PTSD diagnosis was 0.32, much lower than would be expected given the other Kappa

calculations and percent agreement on PTSD diagnosis. This lower coefficient may be explained by the low base rates of individuals in the current sample who were not diagnosed with PTSD.

Results based on the statistical equivalence analysis also yielded results suggesting VTC as a viable method in the assessment of PTSD. Total and subscales scores were contained within the equivalence region, suggesting that administration of the CAPS via VTC and administration of the CAPS FTF are functionally the same. However, as stated previously, as no criterion standards yet exist for psychosocial research, the 20% criterion used in the medical field may or may not be an appropriate criterion.

This study also utilized signal detection methods to help determine the likelihood of a PTSD diagnosis via VTC administration. Results from the signal detection analysis showed high sensitivity but low specificity of the VTC method relative to the criterion. The fact that specificity is not high limits the diagnostic efficiency of the VTC method. The diagnostic utility of the VTC method was found to be 85%. However, this is not particularly helpful given the small sample size. Of the criterion sample, only 15% did not meet criteria for PTSD. One of the advantages to using signal detection analysis is that it takes into account the prevalence of a diagnosis. In the current sample, there are an insufficient number of “true negatives” (Kraemer & Thieman, 1987; Kraemer, 1985). This is to be expected given that the sample consisted of veterans specifically referred to the PTSD clinic for assessment; however, it is a limitation of the study.

Results of responses from the VTC Satisfaction Questionnaire were promising, with 90% of participants indicating some level of satisfaction with the VTC method. In addition, no significant differences were found between veterans who completed their satisfaction

questionnaire immediately after the VTC interview and those who completed their questionnaire retrospectively. Most veterans, although indicating satisfaction with the VTC method, indicated that they would prefer seeing a clinician face to face. It should be stated again that the VTC Satisfaction Questionnaire has not been validated. In addition, Question 7, which asked veterans to rate the “convenience” of VTC, is not relevant for the design of this study, given that both interviews were conducted at the Ann Arbor VA. Therefore, there were no differences in the amount of distance or travel time between FTF and VTC methods. Veterans indicated a preference for VTC if it avoided excessive travel time to a specialty clinic.

In response to Question 8, the open-ended question regarding VTC satisfaction, comments were varied but generally positive. One veteran wrote, “It was better than I thought it would be.” Several veterans commented that the method seemed a little awkward at first but that things improved as time went on. One veteran stated, “It seemed a bit more detached or mechanical at the onset, but as time progressed, it became more natural and real.” Another vet commented that after he got into the interview, he forgot the person was in the other room.

Results of the analyses of the working alliance inventory indicated that some level of working alliance was established during the VTC interview. Interestingly, no significant differences in working alliance were found between each method. It is also interesting to note that although there were no significant differences between group means based on interview method, group means for the VTC group on both the subscale and total scores indicated a slightly higher level of alliance. However, it should be noted that sample sizes for each method were significantly different. In the FTF group, where participants are going

through a full psychiatric evaluation, 50% of the participants did not complete the WAI.

This is a typical occurrence during the full psychiatric evaluation at the clinic, where veterans often forget to complete this scale following their interview.

One issue was found in the study relating to the working alliance analysis. Often, the clinician who was conducting the interview via VTC would be the one to escort the veteran to the appropriate office. It was typical that this clinician obtained informed consent and the VTC process was explained to the veteran in person. The reason for this was simply limited personnel available to assist the veteran at the time of the interview. Unfortunately, this process acted as a confound to the results of the WAI for the VTC method in that there was face-to-face contact with the clinician prior to the interview.

Finally, results indicated that veterans reported some level of telepresence. The total telepresence score ($M = 62.18\%$, $SD = 39.08$) indicates a moderate level of telepresence. It should be reiterated, however, that this questionnaire has not been validated and no cutoff criterion has been established that determines telepresence. This raises questions about the direction of future research.

One major limitation to the present study was the small sample size, and some of the positive statistical results need to be considered in light of this fact. The small sample size certainly raises concerns about the generalizability of the findings. The current sample, though, does seem consistent with other study samples involving veterans and PTSD on such factors as gender, race, and theater; namely, that the majority of veterans who participated were white, male, Vietnam veterans (Blake, 1994; Weathers & Litz, 1994). The CAPS total severity scores ($M = 86.8$, $SD = 21.40$) for the FTF method and the CAPS total severity

scores ($M = 89.4$, $SD = 20.17$) for the VTC method are both higher but similar to scores ($M = 74.60$, $SD = 16.40$) in another study utilizing VTC technology (Wong, 2003).

Although there are a number of studies involving the assessment of telemedicine and physical health, there are very few studies involving telemedicine and mental health. A need for future studies would be to have validated scales in which to consistently measure variables relative to VTC technology. In addition, researchers interested in working with this population should be attentive to the fact that veterans were required to complete two CAPS assessments, approximately one week apart, in order to compare the two methods.

Discussing past traumatic events for many of the veterans was very difficult. Two veterans dropped out after initially agreeing to participate due to a significant exacerbation of PTSD symptoms. They indicated that it would be too distressing to be interviewed a second time.

Many other veterans continued in the study, however, and they also reported an increase in symptoms. On two separate occasions, the participants became very distressed after the VTC interview and the VTC clinician needed to provide additional therapeutic support face to face. This was not a significant issue for the current study given that the interview was not conducted at a remote site. However, it would be imperative that psychiatric support be available at the remote site to ensure the safety and well-being of the participants. Having raised concerns regarding the process of administering two assessments, for the most part this population was very willing to participate in the study, with most veterans stating that they would participate in “anything that would help other vets.”

Suggestions for future telemedicine studies in the assessment of PTSD would be a larger sample and a more evenly distributed sample regarding PTSD pathology. The current

sample was limited in size as well as the distribution of PTSD versus non-PTSD participants. To build on the current study, assessments should be conducted at remote sites to better evaluate process variables as well as quality and accuracy of the interview. To this end, validated measures are needed to consistently and accurately assess variables associated with a VTC assessment.

It is certainly the hope that this current study, although limited in external validity, will contribute to the literature and that ultimately telemedicine technology can be used to provide the necessary services to the people who need them.

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Appendix A

Demographic Characteristics of Participants

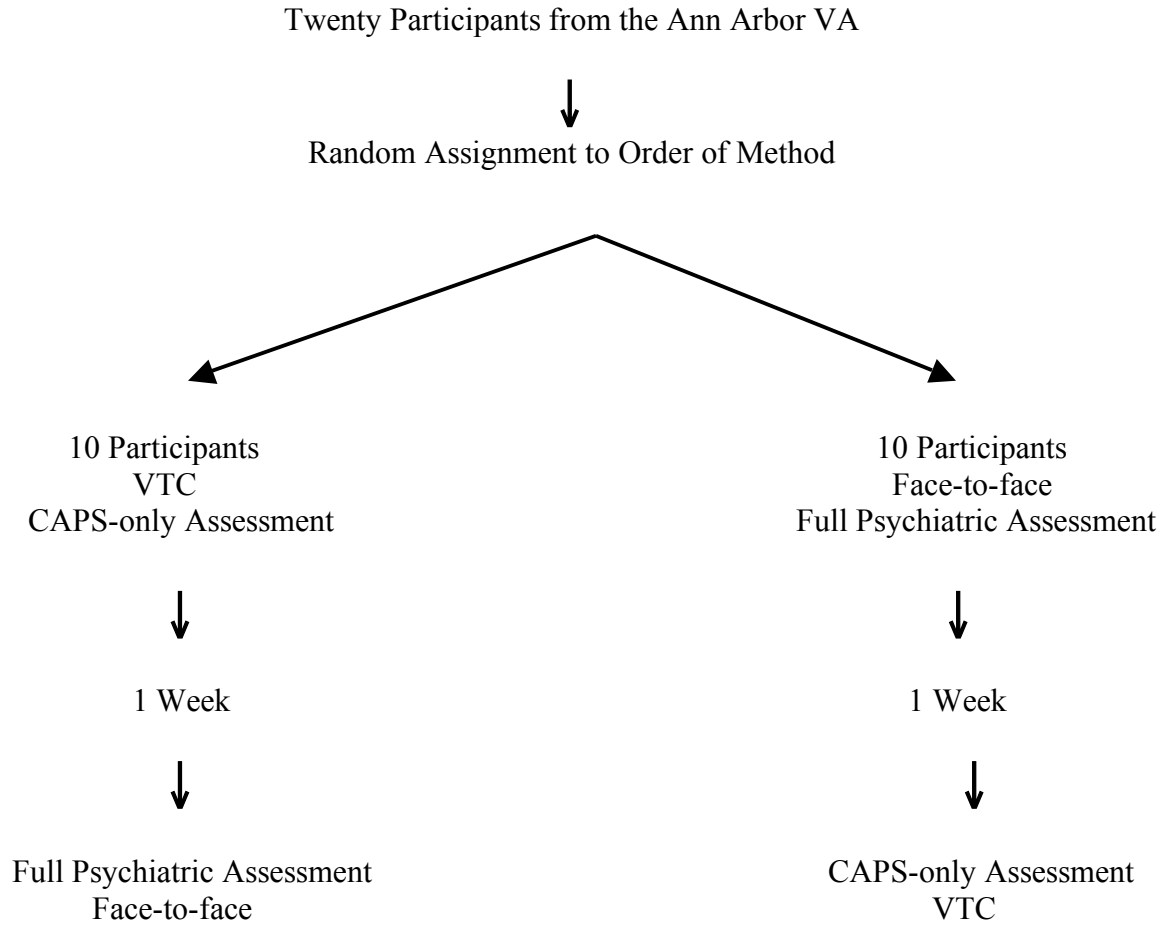
| Characteristics | n | % |
|------------------------|----|------|
| Age | | |
| 20-29 | 2 | 10% |
| 30-39 | 2 | 10% |
| 40-49 | 2 | 10% |
| 50-59 | 13 | 65% |
| 60-69 | 1 | 5% |
| Age | | |
| Male | 20 | 100% |
| Female | 0 | 0% |
| Race | | |
| Caucasian | 18 | 90% |
| African American | 2 | 10% |
| Theater | | |
| Vietnam | 14 | 70% |
| Post-Vietnam | 1 | 5% |
| Persian Gulf | 2 | 10% |
| OEF/OIF | 3 | 15% |
| Marital Status | | |
| Married | 12 | 60% |
| Divorced | 6 | 30% |
| Single/Never married | 2 | 10% |
| Type of Trauma | | |
| Combat | 16 | 80% |
| Motor Vehicle Accident | 1 | 5% |
| Sexual Assault | 1 | 5% |
| Other | 2 | 10% |
| Branch of Service | | |
| Army | 13 | 65% |
| Navy | 3 | 15% |
| Air Force | 1 | 5% |
| Marines | 3 | 15% |

Appendix B

VA Research Consent Form

Appendix C

Diagram of Study Design



Appendix D

Frequency and Percentage of VTC Satisfaction Questionnaire

| | VTC Satisfaction N (%) |
|--------------------------------|---------------------------|
| Total VTC Satisfaction | |
| Satisfied (score > 21) | 18 (90%) |
| Unsatisfied (score < 21) | 1 (5%) |
| Neutral (score = 21) | 1 (5%) |
| Q1 – Comfort with method | |
| Very Comfortable | 4 (20%) |
| Comfortable | 9 (45%) |
| Neutral | 5 (25%) |
| Uncomfortable | 1 (5%) |
| Very Uncomfortable | 1 (5%) |
| Q2 – Lack of FTF contact | |
| Very Comfortable | 2 (10%) |
| Comfortable | 9 (45%) |
| Neutral | 5 (25%) |
| Uncomfortable | 3 (15%) |
| Very Uncomfortable | 1 (5%) |
| Q3 – Interview material | |
| Very Comfortable | 4 (20%) |
| Comfortable | 7 (35%) |
| Neutral | 2 (10%) |
| Uncomfortable | 5 (25%) |
| Very Uncomfortable | 2 (10%) |
| Q4 – Confidentiality and trust | |
| Low | 12 (60%) |
| Mild | 2 (10%) |
| Moderate | 3 (15%) |
| Severe | 1 (5%) |
| Extreme | 2 (10%) |
| Q5 – Willingness to use VTC | |
| Strong | 9 (45%) |
| Moderate | 6 (30%) |
| Neutral | 3 (15%) |
| Weak | 1 (5%) |
| Very Weak | 1 (5%) |
| Q6 – Preference | |

| | VTC Satisfaction N (%) |
|---------------------|---------------------------|
| Strongly prefer FTF | 4 (20%) |
| Prefer FTF | 8 (40%) |
| Neutral | 7 (35%) |
| Prefer VTC | 0 (0%) |
| Strongly prefer VTC | 1 (5%) |
| Q7 – Convenience | |
| Very Convenient | 5 (25%) |
| Convenient | 11 (55%) |
| Neutral | 4 (20%) |
| Inconvenient | 0 (0%) |
| Very Inconvenient | 0 (0%) |

