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Pilot Study of a Telehealth-Delivered Medication-Augmented Exposure Therapy Protocol for PTSD

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Abstract

PTSD is a serious condition, with certain occupations at increased risk due to greater trauma exposure. These same individuals face multiple barriers to care. This study aimed to investigate the feasibility of conducting a research trial with exposure therapy delivered via videoconferencing. Eleven adults working in occupations at risk with PTSD enrolled and 7 completed 12–15 sessions. Individuals were randomized to receive the cognitive enhancer D-cycloserine or placebo, and participants provided saliva samples for genetic analysis. Treatment completers demonstrated decreases in PTSD and depressive symptomatology (measured by CAPS

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($p < .001$, $d = 2.79$) and BDI-II ($p = .004$, $d = 0.92$). Participants reported high therapeutic alliance, treatment satisfaction, and telehealth satisfaction. There were no significant technical, medication, or safety issues, and no clinical emergencies. The results suggest that it may be feasible to conduct clinical research using telehealth for PTSD and to use telehealth to increase access to care.

Keywords

Telehealth; Telemedicine; PTSD; Posttraumatic Stress Disorder; Exposure Therapy

INTRODUCTION

Posttraumatic Stress Disorder (PTSD) causes significant distress and impairment, including relationship dysfunction (Kehle et al., 2011; Monson, Taft, & Fredman, 2009), increased health care utilization (Hidalgo & Davidson, 2000; Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000; Walker et al., 2003), health problems (Andersen, Wade, Possemato, & Ouimette, 2010; Trief, Ouimette, Wade, Shanahan, & Weinstock, 2006), and increased risk of suicide (Gradus et al., 2010). Individuals in certain occupations, termed “occupations at risk,” such as firefighters, law enforcement, emergency workers, and military personnel, are at greater risk of developing PTSD due to their increased frequency of trauma exposure. For example, studies of disaster workers have found rates of PTSD ranging from 9% to 35% (Harvey-Lintz & Tidwell, 1997; Marmar et al., 1999; North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002; North, Tivis, McMillen, Pfefferbaum, Spitznagel, et al., 2002; Rosenczweig, Kravitz, & Devlin, 2002); emergency medical workers have estimated PTSD rates of 21% (Bennett et al., 2005; Clohessy & Ehlers, 1999; Jonsson, Segesten, & Mattsson, 2003); and Iraq and Afghanistan (OIF/OEF/OND) combat veterans have an estimated PTSD prevalence rate of 25% (Gentes et al., 2014; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Ramchand et al., 2010; U.S. Department of Defense, U.S. Department of Veterans Affairs, U.S. Department of Health and Human Services, & U.S. Department of Education, August 2013).

Exposure therapy is considered the first-line treatment with the greatest evidence for effectiveness in treating PTSD across populations (Institute of Medicine, 2008). In an effort to improve outcomes, translational investigations are underway to identify genetic predictors of treatment response (Nugent, Amstadter, & Koenen, 2008) and psychopharmacological agents that might augment exposure therapy for PTSD, among them the cognitive enhancer D-cycloserine (de Kleine, Hendriks, Kusters, Broekman, & van Minnen, 2012; Difede et al., 2014; Litz et al., 2012; Rothbaum et al., 2014).

However, despite effective treatments and promising new avenues of inquiry, many individuals in occupations at risk face multiple psychological and physical barriers to mental health treatment including reluctance to seek care, stigma (Langston, Gould, & Greenberg, 2007), fears of negative occupational consequences to seeking care (Burnam, Meredith, Tanielian, & Jaycox, 2009), geographic barriers to in-person care (Druss & Rosenheck, 1997), and PTSD-related avoidance itself (Bomyea & Lang, 2012).

Telehealth-delivered exposure therapy offers great promise to improve access to PTSD treatment in populations in need of services, with increasing evidence that these interventions are feasible and acceptable (Germain, Marchand, Bouchard, Drouin, & Guay, 2009; Strachan, Gros, Ruggiero, Lejuez, & Acierno, 2012; Yuen et al., 2015; Ziemba et al., 2014). These studies are highly encouraging but have typically included an initial in-person visit, limiting the real-world applicability of the studies. In addition, no prior studies have attempted to administer medication or collect genetic material. This pilot study aimed to provide a medication-augmented exposure therapy protocol, including collection of a genetic sample and use of the novel pharmacotherapy agent DCS, to treat individuals in occupations at risk with PTSD. The study goals were to: 1) provide remote PTSD exposure therapy using videoconference technology, 2) determine whether it was feasible to conduct a medication-augmented psychotherapy trial entirely remotely, and 3) determine whether a telehealth-delivered trial could include the successful collection of a genetic sample.

METHOD

Participants were recruited for this study (See Figure 1) through online, print, and in-person efforts to publicize the study in medical centers and the general community in the Northeast. Inclusion criteria were: English-speaking adults age 18–70 years who were survivors of trauma resulting from working in an occupation at risk for PTSD (e.g. disaster workers, firefighters, police officers, military service workers, reservists, and veterans) with PTSD, and in good health. Exclusion criteria were: substance dependence, history of psychosis, active suicidal or homicidal ideation; use of pacemaker; significant health impairment including renal disease; taking the oral anticoagulant medications ethionamide or isoniazid; hypersensitivity to cycloserine; history of seizures; pregnant, currently trying to conceive, or breastfeeding. Participants taking psychotropic medications had to be on a stable dose of their medications for at least two months before enrollment and maintain their medication regimen throughout the study. Because this study was conducted entirely via videoconferencing, participants either presented to the University of Vermont Medical Center for videoconference or accessed a DSL- or cable-speed Internet connection through a computer at home; once a modality was chosen, it did not change during the study. This study was approved by the Weill Cornell Medical College and the University of Vermont Institutional Review Boards. Subjects provided written informed consent that was signed during the video assessment and then physically mailed back to Weill Cornell Medical College.

Measures

Given the goal to examine the feasibility of this intervention, several measures were administered weekly to assess treatment satisfaction and therapeutic alliance. Therapeutic alliance was measured with the Working Alliance Inventory-Short Form (WAI) (Hatcher & Gillaspay, 2006). Overall patient satisfaction was assessed with the Client Satisfaction Questionnaire (CSQ; Larsen et al., 1979) and telehealth-specific satisfaction was measured with the Telemedicine Satisfaction and Acceptance Scale (TSAS) (Frueh, Henderson, & Myrick, 2005). The participant's expectancy of their treatment outcome was assessed with a four-item "Expectancy of Therapeutic Outcome" Likert-scale measure (ETO) used in prior

PTSD treatment outcome studies (J. Difede et al., 2007). Clinical outcome measures included the Clinician Administered PTSD Scale (CAPS) (Blake et al., 1995) and Beck Depression Inventory-second edition (BDI-II) (Beck, Steer, & Brown, 1996). Additional clinical self-report measures included the PTSD Checklist (PCL) (Weathers, Litz, Herman, Huska, & Keane, 1993) and State-Trait Anger Expression Inventory-2 (STAXI-2) (Spielberger, 1999).

Telehealth Technology

All assessment and treatment appointments were conducted using either matched Polycom videoconference apparatuses (www.polycom.com) for participants who came to the University of Vermont Medical Center (UVMMC), or via Internet-based videoconferencing for individuals receiving home-based treatment. Polycom transmission was via three Basic Rate Interface (BRI) Integrated Services Digital Network (ISDN) lines transmitting at a minimum bandwidth of 384 kbps. Individuals who used home-based videoconferencing required a minimum DSL or cable Internet connection on the participant's end, and a high speed connection on the therapist's end.

Psychotherapy Intervention

Psychotherapy consisted of a 12–15 session exposure therapy protocol that has been successfully used in several of our studies (Difede et al., 2007a; See Table 1 for treatment session outline). The treatment was conducted weekly in 1.5 hour sessions and included (a) psychoeducation and treatment rationale; (b) relaxation training; (c) imaginal exposure; (d) gradual in vivo exposure; (e) cognitive reprocessing; (f) relapse prevention; and (g) homework (audio recorded imaginal exposure from treatment sessions, graduated in vivo exposure). Participants digitally recorded exposure components of sessions and listened to them in between sessions.

Medication and Genetics Collection

DCS is an FDA-approved antibiotic that has been used in clinical trials as a cognitive enhancer. Participants were randomized to take either 100 mg of DCS or placebo, prepared in a double-blind fashion by the New York Presbyterian research pharmacy, 90 minutes before their weekly exposure session (session 3 through to the penultimate session), with compliance assessed by verbal inquiry at the beginning of the session. A medication side-effect questionnaire was read to participants prior to each exposure session (see Difede et al., 2014 for medication dosing and timing rationale). Saliva samples were collected during the initial assessment visit to determine the feasibility of gathering genetics data during a telehealth-based trial. Oragene system kits (DNA Genotek) were mailed to participants and utilized during the initial baseline interview. Participants returned these samples in a self-addressed stamped envelope with their signed consents. Due to the small sample size, it was not possible to examine differences in treatment outcome between the placebo and DCS group or draw conclusions from the genetics data.

Assessment Procedures

Before the initial videoconferencing appointment, potential participants were mailed informed consent documents and a saliva collection container. Initial consenting and assessment was conducted via videoconference by an independent psychologist who consented the patient, conducted a clinical interview assessing PTSD, depression, and other DSM-IV disorders, and instructed the participant on providing the genetics sample. A separate videoconferencing appointment was conducted with a physician to review each individual's medical history to ensure there were no contraindications to DCS treatment. Assessments were additionally conducted following therapy sessions 3, 6, 10, and immediately post-treatment. Participants also completed self-report questionnaires at baseline and prior to each weekly treatment session using REDCap, a Web-based database system that allows real-time data entry and secure HIPAA-compliant data storage. The study was registered with ClinicalTrials.gov (NCT00875342).

Safety Considerations

Several steps were taken to ensure that adequate safety protections were in place for this telehealth-delivered therapy. A safety plan was in place to alert on-site personnel at UVMHC for participants using Polycom, or for investigators to alert 911/EMS personnel for individuals participating from home. Patient self-report measures were reviewed during each session. In the case of a clinical emergency outside of a regular session, the therapist would direct the patient to the nearest ER, as is standard protocol for patients seen in person. Telehealth patients were also asked to provide contact information for their local health care provider in the rare case of a medication side effect that could not be managed remotely.

Data Analysis

Sample baseline clinical and demographic characteristics, as well as treatment retention, therapeutic alliance and satisfaction with treatment and the telehealth modality were reported using means and standard deviation for continuous variables and frequencies and percentages for categorical variables. Mixed models for repeated measures were utilized to explore the effect of treatment on primary and secondary clinical outcomes at post-treatment. Effect sizes (Cohen's *d*) were determined. The analyses were exploratory and not adjusted for multiple hypotheses testing. All analyses adhered to the intent-to-treat principle.

RESULTS

Participant flow and retention

Of 51 individuals who inquired about the study, 17 appeared potentially eligible and were mailed study materials, with 14 individuals undergoing initial assessment (the remaining three were unable to be reached), and 11 deemed eligible and enrolled in the study. Seven participants completed the study intervention (Figure 1). There were no apparent differences in the distribution of sociodemographic factors between treatment completers ($n = 7$; 63.6%) and study dropouts ($n = 4$; 36.4%), and no substantial differences in therapeutic alliance, treatment outcome expectancy, general treatment satisfaction, or telehealth satisfaction between treatment completers and study dropouts (Table 2).

Sample Demographic and Clinical Characteristics

Study participants were mostly male ($n = 9$; 81.8%) and Caucasian ($n = 7$; 63.3%). The majority of participants were married or living with a significant other ($n = 7$; 63.3%) with at least some college or training ($n = 7$; 63.6%), and about half the sample was employed ($n = 6$; 54.5%). Two individuals used the Polycom equipment available at UVMCC ($n = 2$; 18.1%) and the remainder ($n = 9$; 81.8%) chose to use a home-based telehealth Internet connection due to their distance from the Burlington, VT area. Participants had worked in a variety of at-risk occupations. Additional characteristics of the sample are included in Table 2.

Overall at baseline, participants had a mean CAPS score of 87.45 ($SD = 18.92$), and 63.6% of participants ($n = 7$) met criteria for major depressive disorder. Individuals who dropped out had lower CAPS scores than completers ($M = 81.73$, $SD = 10.21$ versus $M = 90.71$, $SD = 22.60$) but were more likely to meet criteria for depression (75%, 3/4 versus 57%, 4/7).

The study demonstrated feasibility of collecting genetic information and randomized medication administration. All 11 participants were willing to provide a saliva sample, and 100% successfully returned samples via mail to our offices that yielded DNA of ample quantity and quality for genetic analyses. Participants were randomized to take DCS ($n = 5$; 50.0%) or placebo ($n = 5$; 50.0%), and reported taking the study medication as prescribed with respect to dosage and timing. One study participant was excluded from taking study medication due to pre-existing health problems.

Therapeutic Alliance and Expectancy of Treatment Outcome

Participants reported high levels of therapeutic alliance with their therapist throughout the treatment (WAI $M = 74.44$, $SD = 9.00$ at session 1, $M = 83.25$, $SD = 1.50$ at session 12, maximum possible score is 84) (Table 3). Alliance scores for each subscale (goal, task and bond) were also high (data not shown).

Participants also endorsed high expectations that the intervention would be helpful throughout the course of treatment (ETO $M = 24.50$, $SD = 4.74$ at session 1, $M = 29.00$, $SD = 3.32$ at session 12, maximum possible score is 32) and in the four areas assessed in the scale including that the treatment: 1) is logical, 2) is likely to be successful for symptoms, 3) is likely to be successful for other problems, and 4) that they would recommend the treatment to a friend (data not shown).

Treatment Satisfaction and Satisfaction with Telehealth Modality

Participants reported high satisfaction with treatment received (CSQ $M = 27.67$, $SD = 1.79$ at session 1 – $M = 31.25$, $SD = 31.25$ at session 12, maximum possible score is 32; Table 3), and high satisfaction with the telehealth mode of treatment delivery, which was rated as high and increased as treatment progressed. The satisfaction with clinical interaction was rated as Excellent or Very Good in 94% (126/134) of sessions and assessments. Likewise, participants rated the quality of communication as Excellent or Very Good for 90.0% (120/134) of sessions. Similar ratings were reported regarding understanding the therapist accurately and confidence that the therapist understood participants accurately (98.5%,

131/134 and 95.5%, 128/134, respectively). The majority of participants rated the quality of audio and video transmissions as Excellent or Very Good (85.8%, 115/134 and 79.4%, 105/134 respectively). Lastly, throughout the duration of treatment, the majority of participants reported that they would be willing to use telehealth delivered treatment again (likelihood rated as Excellent or Good: 92.5%, 124/134).

Preliminary Clinical Outcomes

At post-treatment all study completers demonstrated statistically and clinically significant reductions across clinical measures. Total CAPS scores dropped by more than half from $M = 87.45$, $SD = 18.93$ to $M = 34.57$, $SD = 17.71$ ($p < .001$, $d = 2.79$), with cluster D symptoms (hyperarousal) showing the most significant decline in symptoms ($p < .001$, $d = 2.70$), followed by cluster B (re-experiencing) symptoms ($p < .001$, $d = 2.58$) and cluster C (avoidance/numbing) symptoms ($p < .001$, $d = 2.21$). The pattern of results for PCL scores was similar to that observed for the CAPS scores, with large effect sizes across all three symptom clusters. Complete PTSD remission rate (defined as not meeting PTSD criteria at the post-treatment assessment) was 42.8% (3/7) based on CAPS and 85.7% (6/7) based on the PCL. Improvements in depressive symptomatology were also evident at the post-treatment assessment, with significant reductions in the overall BDI score, as well as the Cognitive and Somatic subscales ($p = .004$, $d = 0.92$; $p = .003$, $d = 0.96$; and $p = .050$, $d = 0.72$, respectively). None of the study completers met criteria for major depression at the post-treatment assessment (100% remission rate, 4/4). Lastly, participants reported improvements in the STAXI-2 Anger Expression Index, with a medium effect size at the post-treatment assessment ($p = 0.048$, $d = 0.71$) (Table 4).

Technical and Safety Issues

There were few technical issues with the videoconferencing equipment, whether Polycom-based or via Internet. Connectivity problems were rare and occurred only twice during the study. During one Polycom session, the connection was dropped mid-session. In this instance, the therapist called the patient on one phone and contacted the onsite technical expert on a separate line; the connection was quickly restored and the session continued with little negative impact. In the second instance, one Internet-based participant had a poor wireless connection that was made significantly worse when a hurricane in the area downed trees and power lines; on that occasion after attempts to improve the Internet connectivity mid-session failed, the session was completed via telephone to minimize the clinical disruption.

No safety issues arose during any of the assessments or treatment sessions. There were no instances of participants prematurely terminating the session or walking away from the video camera. Emotional distress arising from revisiting traumatic memories was handled verbally by the therapist in the same manner that it would have been handled in face-to-face exposure therapy. No safety issues arose from remote dispensing and intake of medication. No side effects were reported during the course of the study.

DISCUSSION

This study is the first to our knowledge to conduct a telehealth-delivered medication-augmented exposure therapy protocol for PTSD. Several aspects of this telehealth trial are novel: it examined the feasibility of telehealth-delivered exposure therapy for occupations at risk for PTSD, it is the first to include a randomized drug component or collection of a genetics sample; and this trial was conducted entirely remotely, with no initial in-person assessment or clinic appointment as is common for telehealth investigations. This final aspect is significant in that if an exposure-based intervention can be conducted without a single in-person visit, then the potential to expand access to care is significantly increased. Results from this pilot study found that individuals in occupations at risk with PTSD in this telehealth therapy trial endorsed high levels of therapeutic alliance and treatment satisfaction, as well as satisfaction with the use of videoconferencing to conduct the therapy. Participants also reported extremely high satisfaction with the clinical interaction (>90%), which is notable given the remote nature of assessments and therapy sessions. No clinical emergencies or safety issues arose during the course of the study and there were few technical problems.

The medication component and genetic collection in this study also demonstrated feasibility, with all participants able to take the medication on time and as prescribed, with no medication-related side effects, and with all individuals agreeing to genetic sampling and successfully returning their saliva collection kits to the study team by mail. In light of the field's growing interest in including research domain criteria and genetics investigations in trials, it is important to learn that these modes of inquiry can be successfully included in telehealth investigations. Finally, the telehealth-delivered exposure therapy led to substantial reductions in PTSD, with CAPS scores dropping by more than half, and to a complete remission of depression for study completers, as well significant reductions in anger symptoms.

The dropout rate of 36% is similar to other studies of prolonged exposure in occupations at risk (JoAnn Difede et al., 2007), and dropout rates for prolonged exposure therapy for PTSD range from 20% to 41% (Hembree et al., 2003; A. McDonagh et al., 2005) across trauma types. Telehealth-delivered exposure therapy trials across populations have reported dropout rates of approximately 25% (Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010). In the present study, subjects who dropped out had slightly lower scores on the CAPS ($M = 81.73$ versus $M = 90.71$) than those who finished treatment (scores for both groups were in the severe range) but a slightly higher rate of MDD (75% versus 57%), which is consistent with other studies reporting that individuals with higher rates of depression are more likely to drop out of exposure treatment (Markowitz et al., 2015). The four participants who did not complete treatment had extenuating circumstances and multiple competing life commitments that likely affected their ability to complete treatment. The authors hypothesize that same the challenges that made face-to-face treatment logistically impossible for these individuals also likely contributed to their inability to complete the intervention. In addition, two of the four dropouts were survivors of military sexual trauma. Several studies have identified higher treatment dropout rates for sexual trauma survivors, with rates ranging as high as 32% to

50% in some studies (Foa & Rauch, 2004; Ironson, Freund, Strauss, & Williams, 2002; A. McDonagh et al., 2005; Nishith, Resick, & Griffin, 2002).

Limitations of the study should be acknowledged. The sample size of this study was small, limiting conclusions that can be drawn. However, the strong satisfaction and therapeutic alliance scores, as well as the positive clinical outcomes, suggest that delivering PTSD care using videoconference technology is not only feasible and acceptable; it is also likely to be effective. Because this study was a small pilot investigation, we were unable to draw any inferences from the genetic or medication data collected beyond noting that there was no difficulty collecting or transporting the saliva samples or in medically clearing subjects for DCS using a telehealth approach, and no DCS-related side-effects.

CONCLUSIONS

The results of this study suggest that it can be feasible to conduct a medication-augmented psychotherapy trial and collect genetic data solely relying on distance technologies to conduct the research and therapy. Despite the small size of this pilot study, participants who completed treatment showed clinical improvement and high treatment satisfaction. This pilot trial demonstrates the promise of telehealth-delivered clinical research. Future studies are needed with larger sample sizes to confirm these findings. In addition, further investigation is needed to determine whether telehealth delivered exposure interventions are noninferior to those conducted in-person.

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Figure 1.
Consort Diagram

Table 1

Outline of Treatment Sessions

Session	Components of Treatment
1	<p><u>Psycho-education</u>: Participant learns about common reactions to trauma.</p> <p><u>Review treatment plan</u>: introduce and provide the rationale for all interventions</p> <p><u>Anxiety Management Techniques</u>: controlled-breathing, guided-imagery relaxation, exercise, and engaging in pleasurable events</p>
2	<p><u>Psycho-education for loved one</u>: subject brings family member to session and person learns about common reactions to trauma and PTSD.</p> <p><u>Anxiety Management Techniques</u>: review between session work</p>
3	<p><u>Imaginal Exposure</u>: target 45 minutes</p> <p><u>Introduction to Cognitive Therapy Techniques</u>: adaptive self talk</p> <p><u>Anxiety Management Techniques</u>: review between session work</p>
4	<p><u>Imaginal Exposure</u>: target 45 minutes</p> <p><u>Reinforce Adaptive self-talk</u></p> <p><u>Introduction to In Vivo Exposure</u>: creation of in vivo hierarchy</p> <p><u>Anxiety Management Techniques</u>: review between session work</p>
5	<p><u>Imaginal Exposure</u>: target 45 minutes</p> <p><u>In Vivo Exposure</u>: Participant reviews assignment and plans next assignment</p> <p><u>Cognitive Therapy</u>: Teach restructuring, types of maladaptive thoughts, thought monitor</p> <p><u>Anxiety Management Techniques</u>: review between session work</p>
6–11	<p><u>Imaginal Exposure</u>: target 45 minutes</p> <p><u>In Vivo Exposure</u>: Participant reviews assignment and plans next assignment</p> <p><u>Cognitive Therapy</u>: Reinforce restructuring, review thought monitor</p>
12	<p><u>Wrap up</u>: Review of skills learned and progress in treatment. Note: if clinically indicated, treatment can be extended to include up to 3 additional exposure therapy sessions, for a total of 15 sessions.</p>

Table 2

Baseline Demographics, Clinical Characteristics, and Acceptability Measures

Characteristic	All (n=11)	Completers (n=7)	Dropouts (n=4)
Age <i>M(SD)</i>	42.82 (13.53)	48.43 (10.39)	33 (13.88)
Gender <i>n(%)</i>			
Male	9 (81.8%)	7 (100%)	2 (50.0%)
Female	2 (18.2%)	0 (0%)	2 (50.0%)
Relationship status <i>n(%)</i>			
Married/Cohabiting	7 (63.7%)	5 (71.4%)	2 (50.0%)
Separated/divorced	1 (9.1%)	1 (14.3%)	0 (0%)
Single	3 (27.3%)	1 (14.3%)	2 (50.0%)
Ethnicity <i>n(%)</i>			
White	7 (63.6%)	4 (57.1%)	3 (75.0%)
Black	1 (9.1%)	0 (0%)	1 (25.0%)
Hispanic	2 (18.2%)	2 (28.6%)	0 (0%)
Other	1 (9.1%)	1 (14.3%)	0 (0%)
Occupational Status <i>n(%)</i>			
Unemployed	3 (27.3%)	1 (14.3%)	2 (50.0%)
Retired/Disabled	2 (18.2%)	2 (28.6%)	0 (0%)
Employed full-time	5 (45.5%)	3 (42.8%)	2 (50.0%)
Employed part-time	1 (9.1%)	0 (0%)	0 (0%)
Trauma Type <i>n(%)</i>			
9/11 Exposure	6 (54.5%)	4 (36.4%)	2 (50.0%)
War	2 (18.2%)	2 (28.6%)	0 (0%)
MST	2 (18.2%)	0 (0%)	2 (50.0%)
Disaster response to plane crash	1 (9.1%)	1 (14.3%)	0 (0%)
Occupation <i>n(%)</i>			
Navy	1 (9.1%)	1 (14.3%)	0 (0%)
Army Reserves	1 (9.1%)	0 (0%)	1 (25.0%)
Coast Guard	1 (9.1%)	0 (0%)	1 (25.0%)
Army	1 (9.1%)	1 (14.3%)	0 (0%)
Firefighter	1 (9.1%)	1 (14.3%)	0 (0%)
National Guard	2 (18.2%)	2 (28.6%)	0 (0%)
Law Enforcement	3 (27.3%)	1 (14.3%)	2 (50.0%)
Salvation Army worker	1 (9.1%)	1 (14.3%)	0 (9.1%)
Baseline CAPS severity score <i>M(SD)</i>	87.45 (18.93)	90.71 (22.60)	81.73 (10.21)
Baseline MDD diagnosis <i>n(%)</i>	7 (63.6%)	4 (57.0%)	3 (75.0%)
WAI, session 1	72.90 (9.79)	74.83 (11.18)	70.00 (7.79)
ETO, session 1	24.50 (4.74)	25.83 (5.71)	22.50 (2.08)
CTQ, session 1	27.67 (3.24)	27.50 (3.21)	28.00 (4.00)
TSAS, session 1	49.44 (4.67)	50.33 (4.80)	47.67 (4.73)

Note. MST: Military Sexual Trauma; CAPS: the Clinician Administered PTSD Scale, total score range 0–136; MDD: Major Depressive Disorder. WAI- Working Alliance Inventory-short form, total score range 12–84; ETO- Expectancy of Therapeutic Outcome, total score range 0–32; CSQ- Client Satisfaction Questionnaire, total score range 8–32; TSAS Telemedicine Satisfaction and Acceptance Scale, total score range 0–55.

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Table 3
Therapeutic Alliance, Expectancy of the Therapeutic Outcome and Client Satisfaction.

Session number	N	WAI		ETO		CSQ	
		Mean	SD	Mean	SD	Mean	SD
1	9	74.44	9.00	24.50	4.74	27.67	3.24
2	9	71.20	8.85	25.70	5.52	28.89	2.37
3	9	69.88	6.56	24.90	5.11	28.11	3.10
Assessment after session 3	8	69.88	14.23	--	--	28.50	3.07
4	5	72.57	7.66	24.00	7.16	28.80	2.49
5	8	74.14	8.49	25.75	5.42	29.38	2.39
6	7	70.71	6.52	26.75	4.80	29.14	2.19
Assessment after session 6	7	77.00	8.92	--	--	29.43	2.94
7	7	75.43	9.62	27.33	5.32	29.57	2.64
8	7	75.33	10.17	27.29	5.12	29.29	2.43
9	7	76.14	8.95	28.00	5.06	30.14	2.48
10	6	75.80	8.50	27.57	4.89	29.83	2.32
Assessment after session 10	7	78.43	8.40	--	--	30.00	2.08
11	7	76.17	8.91	28.00	4.00	29.86	1.77
12	4	83.25	1.50	29.00	3.32	31.25	0.96
Assessment Post-treatment	6	80.50	8.09	--	--	31.33	1.21

Note. WAI- Working Alliance Inventory-short form, total score range 12–84; ETO- Expectancy of Therapeutic Outcome, total score range 0–32; CSQ-Client Satisfaction Questionnaire, total score range 8–32.

Table 4

Changes in clinical outcomes

Measure	Baseline		Post-Treatment		Analysis (Pre to Post)		Effect Size *
	Mean	SD	Mean	SD	F	Df	p
CAPS Severity	87.45	18.92	34.57	17.71	36.61	1, 9.0	<.001
Cluster B	25.18	7.05	7.00	4.69	46.17	1, 9.50	<.001
Cluster C	34.45	9.70	13.00	10.46	19.71	1, 16.0	<.001
Cluster D	27.81	4.91	14.57	5.44	28.64	1, 16.0	<.001
PCL Severity	58.36	12.00	31.29	11.56	30.88	1, 6.80	.001
Cluster B	17.00	3.58	8.86	3.24	24.92	1, 13.9	<.001
Cluster C	22.45	7.01	12.43	5.26	19.43	1, 6.70	.003
Cluster D	18.91	2.88	12.16	5.04	35.38	1, 14.5	<.001
BDI-II Severity	26.09	13.11	14.00	14.69	10.98	1, 16.0	.004
Cognitive	16.81	9.21	8.00	9.45	12.70	1, 15.9	.003
Somatic	9.30	4.57	6.00	5.26	4.57	1, 14.8	.050
STAXI-2 Anger Expression Index	41.44	13.73	31.71	12.83	4.73	1, 13.4	.048

Note: CAPS-the Clinician Administered PTSD Scale; PCL- the PTSD Checklist; Cluster B-re-experiencing symptoms, Cluster C-avoidance/numbing symptoms, Cluster D-hyperarousal symptoms; BDI-II-Beck Depression Inventory, second edition; STAXI-2 Anger Expression Index- State-Trait Anger Expression Inventory-2.

* Cohen's $d = (M_{pre} - M_{post})/s$; cutoff's scores are: 0.2—small, 0.5—medium, and 0.8—large