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Empirical Research

A trauma-focused intensive outpatient program integrating elements of exposure therapy with acceptance and commitment therapy: Program development and initial outcomes[☆]

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ABSTRACT

A Performance Improvement project conducted within Army Behavioral Health identified significant challenges associated with treating service members diagnosed with posttraumatic stress disorder (PTSD) including unavailability of frequent and consistent therapy, a low completion rate of evidence-based treatment, and a high non-response rate. In response to these findings, clinical staff at Brooke Army Medical Center developed an intensive outpatient program for the treatment of PTSD and combined Acceptance and Commitment Therapy with Prolonged Exposure therapy to create an integrative and uniquely tailored intervention. This project included 311 active duty service members who had not made significant progress in individual outpatient therapy for PTSD. Each participant completed pre- and post-treatment measures of symptoms, functioning, and processes related to psychological flexibility. Program evaluation also included participant interviews, survey responses, and clinician reports. Overall, the program was tolerable and reviewed favorably by participants. Preliminary pre-post treatment analyses revealed, on average, large reductions in PTSD symptoms as well as significant changes in the target direction on nine of ten outcome measures. These findings encourage further investigation of process-outcome relationships and future, rigorous implementation studies of ACT and exposure integration and culturally and contextually sensitive treatments for military-related PTSD.

From 2015 to 2019, a performance improvement (PI) project was conducted at the Brooke Army Medical Center Trauma-Focused Intensive Outpatient Program. The initial phase, which focused on identifying areas of deficit and defining a need within the system, revealed many posttraumatic stress disorder (PTSD) treatment-seeking service members were unable to acquire access to sufficiently frequent and consistent therapy appointments. Appointment availability was often sporadic and unpredictable. The initial phase also revealed many service members who engaged in individual PTSD therapy dropped out of treatment prior to completion. Based on feedback systematically collected from providers and patients, we ascertained problematic experiential avoidance

and an unwillingness to tolerate exposure therapy contributed to a significant number of these treatment dropouts.

Orsillo and Batten (2005) noted that addressing these inflexibility processes through acceptance and commitment therapy (ACT) may be useful for patients who refuse or do not respond to exposure therapy. Drawing on these considerations, the growing evidence for the effectiveness of ACT for PTSD (e.g., Batten & Hayes, 2005; Meyer et al., 2018) and other discourse around broader approaches to change via exposure (e.g., Craske et al., 2008; Morris, 2017), we hypothesized integrating elements of exposure therapy (specifically Prolonged Exposure for PTSD; Foa, Hembree, & Rothbaum, 2007) with ACT (Hayes, Strosahl, &

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Wilson, 2012) would be an effective, evidence-based approach to treating service members experiencing PTSD.

In addition to delivering the intervention in an intensive outpatient format, which has been shown to drastically reduce dropout rates relative to traditional outpatient structures (e.g., Rauch et al., 2020), we hypothesized the addition of ACT would increase psychological and behavioral flexibility (Batten & Hayes, 2005; Burrows, 2013; Codd, Twohig, Crosby, & Enno, 2011; Orsillo & Batten, 2005; Thompson, Luoma, & LeJeune, 2013) and would also support reduced attrition. Finally, despite the relative lack of methodologically rigorous studies on group therapy for PTSD (Sloan & Beck, 2016), we hypothesized a PTSD treatment program offering both group and individual psychotherapy would decrease dropout while increasing treatment buy-in and effectiveness. We determined group therapy was essential to our program given the military cultural value of cohesion and due to the association between group cohesion and patient improvement (Burlingame, McClendon, & Alonso, 2011).

Related specifically to treatment outcomes, the initial phase of the PI project revealed the majority of service members who did complete an evidence-based PTSD treatment protocol did not experience a significant decrease (i.e., per reliable changes indices on validated measures) in PTSD symptoms. Though the project did not identify specific contributors to non-improvement, the research shows those who are more emotionally avoidant are less likely to benefit from exposure therapy alone (Orsillo & Batten, 2005). Based on research by Clark, Kingston, James, Bolderston, and Remington (2014), we hypothesized the inclusion of ACT would enhance treatment acceptability and effectiveness for those service members who had not benefitted from previous interventions. Again drawing on the burgeoning evidence supporting ACT for PTSD (Batten & Hayes, 2005; Meyer et al., 2018), we hypothesized that an emphasis on new learning supporting psychological flexibility (rather than simply habituation or cognitive restructuring) would bring meaningful and clinically significant change to patients' lives and functioning by focusing on improving overall wellbeing and quality of life as opposed to symptom reduction.

In summary, we concluded from a synthesis of the abovementioned literature and the results of the first phase of this PI project that an augmentation to standard exposure protocols is warranted to improve engagement, acceptability, retention, and effectiveness of treatment for service members with PTSD. The PI project revealed access and dropout represented significant barriers to effective treatment completion in this military population. Additionally, a growing body of literature points to the potential impact of psychological inflexibility including emotional avoidance on the uptake and impact of PTSD treatment. Thus, we concluded that an accessible, cohesive program integrating psychological flexibility practices by augmenting and/or reframing exposure interventions with ACT processes represented a potentially meaningful next step in treatment enhancement for service members with PTSD. Positive outcomes with this population may, too, guide program development and enhancement to improve engagement, acceptability, retention, and effectiveness of treatment for other populations.

1. Program overview

The PTSD IOP developed and evaluated in response to the problems identified in this PI project is a closed, cohort-style group program in which each cohort consists of 8–11 active duty service members. The program has a six-week duration over which time each service member receives 12 h of group therapy and two, 60- to 90-min individual therapy sessions per week. Table 1 depicts the schedule and general content of the six-week program.

Group therapy sessions include delivery of exposure therapy rationales, in vivo exposure selection and review, processing experiences of and responses to exposure exercises, introduction to each of the psychological flexibility processes, and in-session learning through ACT experiential exercises and metaphors. Throughout group sessions,

Table 1
Example program schedule.

	Monday*	Tuesday ⁺	Wednesday*	Thursday ⁺
Week 1	Program Introduction/ Assessments	PTSD psychoeducation/ Present Moment Awareness	Present Moment Awareness/ Creative Hopelessness	Present Moment Awareness/ In Vivo Exposure Rationale
Week 2	Present Moment Awareness/ Imaginal Exposure Rationale/In Vivo Exposure Processing	Present Moment Awareness/In Vivo Exposure Processing	Present Moment Awareness/In Vivo Exposure Processing	Present Moment Awareness/ In Vivo Exposure Processing
Week 3	Present Moment Awareness/ Willingness	Present Moment Awareness/ Willingness	Present Moment Awareness/ Willingness	Present Moment Awareness/ Willingness
Week 4	Present Moment Awareness/ Defusion	Present Moment Awareness/ Defusion	Present Moment Awareness/ Defusion	Present Moment Awareness/ Defusion
Week 5	Present Moment Awareness/ Defusion	Present Moment Awareness/Self as Context	Present Moment Awareness/ Values and Goals	Present Moment Awareness/ Valued Living
Week 6	ACT Matrix Exercise	Committed Action	Committed Action	Graduation

*/+ Each service member completed two 60- to 90-min individual therapy sessions weekly on non-consecutive days.

Note: Group sessions conducted 4x weekly and lasted ~3 h; Group schedule changed slightly from cohort to cohort but content and general sequence remained consistent.

clinicians focus their efforts on creating a constructive and supportive group setting conducive to group cohesion (Harpine, 2011). Individual therapy sessions focus on imaginal exposure and processing and generally follow Prolonged Exposure imaginal exposure session procedures (Foa et al., 2007). Participants also engage in homework exercises (i.e., in vivo exposure and listening to imaginal exposure recording) on their own outside of group and individual sessions.

All service members were expected to participate in every group and individual therapy session and to complete daily homework assignments. Reflecting a meaningful and highly effective integration of ACT and PE, each member engaged in committed action by selecting in vivo exposure exercises in line with their personally identified values in order to expand their behavioral repertoire, increase contact with positive reinforcement (Thompson et al., 2013), and increase the richness of the overall in vivo exposure experience. The goal of imaginal exposure in this program is emotional processing (Rauch & Foa, 2006) but includes an explicit focus on enhancing willingness to non-defensively contact trauma-related memories and associated emotions (Thompson et al., 2013). Following IOP completion, each participant completed a program evaluation survey. Program clinicians included Licensed Clinical Social Workers and Clinical Psychologists.

1.1. Exposure components

Early in the program, the overall rationale for exposure was delivered in the group setting. This rationale was primarily drawn from the PE for PTSD manual (Foa et al., 2007). However, the rationale was adapted to describe the target of exposure as emotional processing specifically in the service of engagement in life according to personally chosen values rather than focusing on habituation (Morris, 2017). The delivery of the overall rationale was followed by group discussion including questions and clarification to ensure understanding and

buy-in by participants. This discussion also allowed service members to address their concerns and apprehensions, which contributing positively to early group cohesion (Burlingame et al., 2011). Subsequently, participants were helped to identify the unworkable and costly control strategies they were using to cope with (or avoid) the distress associated with their traumatic event. This process incorporated “Creative Hopelessness,” an ACT intervention that allowed service members to increase their awareness of avoidance strategies in a non-judgmental way while growing their willingness to be open to their emotional experiences. This augmentation to the exposure preparation potentially enabled participants to experientially contact the cost of their control agendas and supported buy-in to and awareness of the need for an alternative way of responding to unwanted thoughts and feelings.

The more specific in vivo exposure rationale was also delivered in the group setting and was augmented to highlight the function of the procedure as enhancing emotional, cognitive, and behavioral flexibility (Harris, 2015) rather than exclusively focusing on habituation and a decrease in distress (Morris, 2017). In this rationale, service members were oriented to the notion that inflexible control strategies including experiential avoidance, suppression of thought, and distraction are, in fact, part of the problem and often exacerbate PTSD symptoms (Steil & Ehlers, 2000). Each day, following processing of the in vivo exposure activities, service members were asked to select another in vivo exposure to engage in prior to returning to the next group. The next day, each service member shared what they noticed their mind telling them as they engaged in these actions and described how they chose to respond. Program clinicians regularly incorporated this type of ACT language during in vivo review, enabling this procedure (which traditionally has a narrow behavioral change target) to facilitate engagement of multiple psychological flexibility processes. Importantly, participants assist each other with the selection of in vivo exposures and gently held accountable any member who is not engaging in this portion of the program.

Finally, the imaginal exposure rationale was also delivered in the group setting, included standard PE discussion of emotional processing of an index trauma, and also highlighted the broader function of this type of exposure to increase willingness to come in contact with painful internal phenomena. ACT metaphors, such as “Person in the Hole” (Hayes et al., 1999), were interwoven and utilized throughout the rationale discussion to increase service members’ awareness of the utility of willingness to experience difficult thoughts, emotions, sensations, and memories. Following the delivery of this rationale, service members engaged in imaginal exposure during each individual session for the remainder of the program. Individual sessions were included in the program specifically for this purpose to minimize the risk of vicarious traumatization (Sloan & Beck, 2016). In group sessions, service members were asked to process their experience of engaging in imaginal exposure with each other. This activity targeted enhancement of both group cohesion and empathic responding (Nietlisbach, Maercker, Rössler, & Haker, 2010).

1.2. Acceptance and commitment therapy

As mentioned in the previous section as it related to the exposure rationale, “Creative Hopelessness” was the first ACT intervention introduced in group psychotherapy sessions. Several metaphors drawn from ACT manuals or designed by program clinicians were utilized experientially in the group setting in order to help service members contact a sense of hope for renewed vitality in their lives while noticing hopelessness for an experiential control/avoidance agenda (Wilson, Follette, Hayes, & Batten, 1996). Introducing this component in group at the outset was intended to enhance willingness for each individual as well as for the group collectively.

Throughout the IOP, clinicians place great emphasis on Present Moment Awareness. This component was introduced early on and was linked to each part of the program. Service members engaged in formal and informal Present Moment Awareness exercises during each group

therapy session. These exercises began with short and simple directions (e.g., focusing on the breath) and increased in length and complexity each day. Present Moment Awareness was often focal in individual sessions, as service members were guided to stay with difficult emotions and thoughts while engaging in imaginal exposure. Service members were also asked to consistently engage in Present Moment Awareness on their own outside of therapy sessions. Service members were guided on how to stay with difficult, previously avoided thoughts and feelings while engaging in in vivo exposure and listening to imaginal exposure recordings.

Willingness and Defusion were introduced early in the program, with these components becoming the focus of the program after each service member began regular engagement with in vivo and imaginal exposure. Beginning midway through the program, each group psychotherapy session involved experiential exercises targeting Willingness and Defusion. The majority of these exercises were developed by our clinicians and were intentionally designed to be relevant to military service members and based on the needs of each cohort. Prioritizing Willingness and Defusion after initiating imaginal and in vivo exposure is intended to enhance participants’ willingness to engage in increasingly aversive exposure exercises while increasing their ability to disentangle themselves from the ongoing control oriented content of their minds.

Following the introduction and continued discussion of Willingness and Cognitive Defusion, service members are presented with Self-as-Context. The transitory internal phenomena each participant experiences and (over)identifies readily with is compared/contrasted in the group setting. Several metaphors and exercises, including the chess board exercise (Zettle, 2007) and cargo space exercise (Walser & Westrup, 2007), are used to help participants engage experientially with this process. Group members volunteered to partake in these exercises in the group setting with other members offering insight, observations, and recommendations. At this point in the program, service members are increasingly enabled to separate themselves from their traumatic experiences as well as to recognize and show pride in their resiliency via connection with their unbroken Self-as-Context.

During the last two weeks of the program, the focus shifts from participants’ trauma histories to the futures they each desire by deepening their awareness of a connection to personal values. Group sessions focus on helping participants come to the realization that an inflexible commitment to avoiding traumatic memories and trauma reminders is frequently at the expense of engaging in the parts of life that are the most important and meaningful (Wilson & Murrell, 2004). Group facilitators focus on helping members learn how to pursue values-based living regardless of anxiety, fear, or urges (Morris, 2017). At this point, group cohesion is well-established, which allows group members to help each other with the values clarification process based on what they have learned about each other throughout the program.

As the program nears the end, each member completes the ACT Matrix (Polk, Schoendorff, Webster, & Olaz, 2016) in the group setting. Members complete their personal matrix with group facilitators asking for feedback from other service members following the completion of each quadrant. Service members are also invited to provide feedback and observations to each other throughout. This exercise provides a visual demonstration showing that discriminating one’s actions, in relation to toward and away moves, can reduce experiential avoidance and increase values-based living (Polk & Schoendorff, 2014).

2. Method

2.1. Participants

A total of 311 participants were included in this PI project. This sample size represents the number enrolled in the IOP over the pre-determined data collection period of four years. In order to describe the limits of external validity of the sample, demographic information was collected including age, gender, race, ethnicity, marital status,

education level, rank, service branch, number of deployments, and total deployment length (Table 2). Participants did not participate in other behavioral health therapy while engaged in the IOP. As medication is often a frontline Behavioral Health intervention, the majority of service members in this sample did concurrently participate in medication management with their assigned psychiatrist.

Due to this program being implemented on a joint base, active duty service members of all branches of service were accepted into the program. Most service members were referred by their assigned outpatient provider due to a lack of progress in individual outpatient PTSD therapy. Upon referral, each service member participated in an assessment session. If the service member met criteria for a PTSD diagnosis according to the PTSD Symptom Scale Interview for DSM-5 (PSSI-5; Foa, McLean, Zang, Zhong, Rauch, et al., 2016) and was willing to participate in exposure therapy, they were admitted to the program. The traumas experienced by the service members who participated in this program included combat exposure; sexual assault and military sexual trauma; childhood physical, emotional, and sexual abuse; motor vehicle accidents; and random acts of violence. Ninety seven percent of the service members who participated experienced more than one traumatic event. Of the 311 participants, 29 (9.3%) did not complete the program. Of these, 17 (5.5%) were unable to complete the program due to physical injuries requiring medical attention or determination by the treatment team that their behavioral health needs were better met at a different level of care (i.e., inpatient psychiatric treatment). Twelve service members (3.9%) elected to drop out of treatment.

2.2. Measures

PTSD diagnosis. The PSSI-5 (Foa, McLean, Zang, Zhong, Rauch, et al., 2016) was utilized during the assessment phase of the IOP to

confirm a diagnosis of PTSD and screen participants into the program. The PSSI-5 is a flexible, semi-structured interview that allows clinicians to make a diagnosis of PTSD and gather an estimate of the severity of PTSD symptoms. According to the measure's authors, the PSSI-5 demonstrates good internal consistency ($\alpha = 0.89$), good test-retest reliability ($r = 0.87$), excellent interrater reliability for the total severity score (intraclass correlation = 0.98), and interrater reliability for agreement for PTSD diagnosis ($k = 0.84$; Foa, McLean, Zang, Zhong, Rauch, et al., 2016).

The following measures were administered during the first week of the IOP and once weekly thereafter for the duration of the program.

PTSD symptoms. The Posttraumatic Diagnostic Scale for DSM5 (PDS-5; Foa, McLean, Zang, Zhong, Powers, et al., 2016) is a self-report measure of PTSD symptoms based on the diagnostic criteria of the DSM5 (APA, 2013). The PDS-5 has demonstrated excellent internal consistency ($\alpha = 0.95$) and test-retest reliability ($r = 0.90$). In addition, the PDS-5 has demonstrated good convergent validity with the PSSI-5 ($r = 0.85$).

The PTSD Checklist for DSM5 (PCL-5; Weathers et al., 2013) is a widely used self-report measure of PTSD symptoms. The PCL-5 demonstrated good internal consistency ($\alpha = 0.96$), test-retest reliability ($r = 0.84$), and convergent and discriminant validity among a sample of veterans receiving care at a Veterans Affairs Medical Center (Bovin et al., 2016).

Depression symptoms. The Patient Health Questionnaire 9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a widely used self-report screening measure of depression symptoms. According to Kroenke et al. (2001), the PHQ-9 demonstrates excellent internal reliability ($\alpha = 0.89$); excellent test-retest reliability; and strong criterion, construct, and external validity.

Anxiety symptoms. The Generalized Anxiety Disorder – 7 (GAD; Spitzer, Kroenke, Williams, & Löwe, 2006) is a self-report measure of anxiety symptoms. A criterion-standard study performed in 15 primary care clinics showed good reliability as well as criterion, construct, factorial, and procedural validity. The GAD-7 also demonstrates excellent internal consistency ($\alpha = 0.92$), good test-retest reliability (intraclass correlation = 0.83), and good procedural validity (Spitzer et al., 2006).

Insomnia. The Insomnia Severity Index (ISI; Bastien, Vallières, & Morin, 2001) is a 7-item, self-report questionnaire assessing the nature, severity, and impact of insomnia. On a 5-point scale, respondents rate a range of sleep difficulties including onset, maintenance, awakening problems, dissatisfaction, interference with daytime functioning, noticeability by others, and distress caused by sleep difficulties). Validation studies demonstrate adequate psychometric properties (e.g., Morin, Belleville, Bélanger, & Ivers, 2011).

Functioning. The Behavior and Symptom Identification Scale (BASIS-24; Eisen, Norman, Belanger, Shapiro, & Esch, 2004) is a self-report measure of psychopathology and functioning with six domains including functioning, interpersonal relationships, psychotic symptoms, alcohol/drug use, emotional lability, and self-harm. In a sample of over 1200 adults in the United Kingdom, the BASIS-24 demonstrated adequate reliability, validity and responsiveness to change in a diverse clinical sample and can be considered robust (Cameron et al., 2007).

Psychological flexibility. The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011) is a measure of acceptance, experiential avoidance, and psychological flexibility. Results from six samples comprised of 2816 participants indicate the satisfactory structure, reliability, and validity of this measure in addition to appropriate discriminant validity (Bond et al., 2011). The mean alpha coefficient is 0.84 with a 3- and 12-month test-retest reliability of 0.81 and 0.79, respectively (Bond et al., 2011). Another study demonstrated an internal consistency of 0.81 (Chang, Chi, Lin, & Ye, 2017).

Cognitive fusion. The Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014) is a self-report measure of cognitive fusion. A series of studies comprised of 1800 participants showed good preliminary

Table 2
Participant Demographics.

Number of participants	311
Age (SD)	37.6 (8.06)
Gender	
Male	212 (68.2%)
Female	99 (31.8%)
Race & Ethnicity	
White	135 (43.4%)
Black	80 (25.7%)
Asian/Pacific Islander	15 (4.8%)
Hispanic/Latino	63 (20.3%)
American Indian/Alaskan Native	5 (1.6%)
Other	13 (4.2%)
Marital Status	
Married	215 (69.1%)
Single	95 (30.5%)
Missing	1 (0.3%)
Education Level	
High School Diploma or Equivalent	114 (36.7%)
Associate's Degree	77 (24.8%)
Bachelor's Degree	70 (22.5%)
Graduate Degree	50 (16.0%)
Rank	
Junior Enlisted	37 (11.9%)
Non-commissioned Officer	207 (66.6%)
Warrant Officer	8 (2.6%)
Commissioned Officer	59 (19.0%)
Service Branch	
Army	251 (80.7%)
Air Force	34 (10.9%)
Navy	16 (5.1%)
Marines	8 (2.6%)
Coast Guard	2 (0.6%)
Years in Service (SD)	15.0 (7.87)
Deployment Experience	
Yes	268 (86.2%)
No	43 (13.8%)
Total Months Deployed (SD)	21.9 (17.65)

evidence of the CFQ's factor structure, reliability, temporal stability, validity, discriminant validity, and sensitivity to treatment effects. The CFQ also demonstrated excellent internal consistency and good test-retest reliability (Gillanders et al., 2014).

Valued Action. The Valued Living Questionnaire (VLQ; Wilson, Sandoz, Kitchens, & Roberts, 2010) is a self-report assessment of personally chosen values and how much respondents have been living in accordance with them across 10 domains including family, marriage/couples/intimate relations, parenting, friendship, work, education, recreation, spirituality, citizenship, and physical self-care, respondents first indicate, on a scale of 1–10, the importance of each of these ten domains. Then respondents rate (1–10) how consistently they have lived in accord with their values over the past week.

2.3. Procedure

The participants were 311 PTSD treatment-seeking, active duty service members. Participants were referred to the IOP by their outpatient provider due to lack of progress in individual outpatient PTSD treatment. All service members who were referred to the IOP participated in an assessment session. Service members who voiced a willingness to participate in all aspects of the program and who met criteria for PTSD, according to the PTSD Symptom Scale Interview for DSM-5, were admitted to the program and enrolled in the next available slot. All participants were discharged upon completion of the 6-week program with the exception of those who unable or unwilling to complete the program in its entirety. Data was collected weekly with a final data collection occurring on the last day of the program. Patients' total scores for each outcome measure were entered into a de-identified Statistical Package for the Social Sciences (SPSS) data set by mental health technicians for future analysis. Participants were then referred back to their outpatient provider.

2.4. Data analytic approach

Before executing the planned statistical analyses, tests of statistical assumptions were conducted. This included assessment of the normality of the distribution for skew and kurtosis, as well as linearity and homogeneity of variance. All variables were found to be normally distributed except Deployment Number and Deployment Length. Age was significantly and positively correlated with both Time in Service ($r = 0.79, p < 0.001$) and Deployment Length ($r = 0.34, p < 0.001$). Missing data were also assessed to determine if patterns of missing data related to any demographic variables. No such relationships were found. Missing data were imputed using five imputed datasets from the multiple imputation procedures in the SPSS. Statistical transformations were not needed to address outliers, as an analysis of the variable distributions and Mahalanobis distances indicated no outliers. All analyses were conducted using SPSS.

A power analysis was conducted to determine the sample size necessary to detect a significant effect. This statistical analysis explores the relationship between four variables: statistical power, sample size, significance criterion, and effect size (Cohen, 1992). For this study, the specification for power was set at 0.80. Cohen's criteria operationally defined effect sizes, with $d = 0.2$ as small, $d = 0.5$ as medium, and $d = 0.8$ as large. Given that we were measuring for clinically significant change, we wanted to be able to detect medium to large effect sizes. Given a medium effect size, an alpha set at 0.05, a power of .80, and the use of a Student's t -test, Cohen (1992) suggests a minimum sample size of 64 participants. Therefore, in order to provide a rigorous test of the study hypothesis, initial analyses were not conducted until this benchmark was exceeded.

3. Results

These initial outcomes include comparison of pre- to post-treatment

measurement. Process-level analyses are forthcoming. Among the most salient and striking results was the notably low dropout rate. In this sample, 29 service members (9.3%) did not complete the six-week program. Of those, 17 (5.5%) discontinued due to competing medical care needs or due to treatment team decisions to remove participants from the IOP to a higher level of behavioral health care. As a result, only 12 (3.9%) non-completers voluntarily dropped out of the program.

A series of two-tailed, repeated-measures, Student's t -tests were used to ascertain changes in symptoms, processes, and functioning from pre-treatment to post-treatment. These are delineated in Table 3. Treatment non-completers are included in all analyses in an intent-to-treat model, using their most current weekly self-report measures as their post-treatment scores. Bonferroni corrections were used to counter the increased risk of type I error associated with multiple analyses. A total of 10 tests were attempted, requiring that probability values of 0.005 be achieved to reach statistical significance ($0.05 \div 10 = 0.005$).

All 10 tests revealed statistically significant change in the target direction at $p < 0.005$. Cohen's d was used to measure effect sizes ($d = (M_2 - M_1) / (\sqrt{((SD_1^2 + SD_2^2) / 2)})$). Large effect sizes ($d > 0.8$) were found for the PDS-5, PCL-5, AAQ-II, and CFQ. Medium effect sizes ($0.5 > d > 0.2$) were found for the BASIS-24 and GAD-7. Small effect sizes ($0.5 > d > 0.2$) were found for the PHQ-9, VLQ-Do, and VLQ-Imp. The effect size found for the ISI was not clinically significant.

At pre-treatment, 309 patients scored above the clinical cutoff (28) for a probable PTSD diagnosis PDS-5. Similarly, 302 patients scored above the cutoff of 31 on the PCL-5. With regard to depressive symptoms, 278 scored above the cutoff of 12 on the PHQ-9 and, with regard to anxiety symptoms, 197 scored above the cutoff of 15 on the GAD-7. At post-treatment, 75 (24.1%) participants who scored above the clinical cutoff at pre-treatment no longer screened positive for PTSD on the PDS-5, 79 (25.4%) no longer screened positive on the PCL-5, 88 (28.3%) were below the cutoff on the PHQ-9, and 174 (56.0%) were below the cutoff on the GAD-7.

4. Discussion

This IOP for PTSD among military service members integrates two powerful and effective treatments and addresses a number of challenges to PTSD treatment within Army Behavioral Health. Barriers to treatment delivery and completion at this installation identified during the initial system evaluation of this Performance Improvement project included a lack of frequent access to evidence-based care for PTSD, a low completion rate among those who receive care for PTSD, and a low response rate to trauma-focused treatments. The design of this program supported a significant increase in access to care among PTSD treatment-seeking service members relative to the infrequent and difficult to engage treatments available elsewhere on this military installation. In this IOP, each participant received a minimum of 14 h of evidence-based PTSD treatment per week. In addition, in crisis situations or as otherwise required, service members were provided with additional treatment on a consistent and predictable basis.

The program had a completion rate of over 90% and, on average, yielded large decreases in PTSD symptoms and facilitated loss of PTSD diagnosis in a quarter of participants over the course of the six-week program. This is significant given a recent meta-analysis, which revealed that even in randomized controlled trials of PTSD treatment, the average dropout rate is 16% and the average dropout rate in Prolonged Exposure is 22% (Lewis, Roberts, Gibson, & Bisson, 2020). These rates are higher still in clinical samples studied in the DoD (Hoge et al., 2014) and in the VA (Mott et al., 2014). Participants also reported an increase in psychological flexibility and functioning across domains as well as a decrease in cognitive fusion. Analysis of the relatedness of psychological flexibility processes of changes in symptoms and functioning is forthcoming.

Responding to system level evaluation as well as to some of the broader critiques of psychotherapy for military-related PTSD (e.g.,

Table 3

T-test results.

	Pre-treatment Mean (SD)	Post-treatment Mean (SD)	Mean Score Change (SD)	df	t	Cohen's d (95% CI)	p
PDS-5	60.59 (11.62)	40.11 (18.41)	-20.47 (16.13)	281	21.32	1.33 (1.17–1.50)	<0.00001
PCL-5	59.66 (11.75)	41.54 (17.97)	-18.12 (15.49)	281	19.65	1.19 (1.03–1.36)	<0.00001
BASIS-24	2.24 (0.57)	1.91 (0.72)	-0.33 (0.59)	281	9.48	0.51 (0.35–0.68)	<0.00001
PHQ-9	18.00 (4.79)	15.36 (6.07)	-2.64 (5.03)	281	8.82	0.48 (0.32–0.65)	<0.00001
GAD-7	15.57 (4.75)	12.90 (5.81)	-2.67 (5.10)	281	8.78	0.50 (0.34–0.67)	<0.00001
ISI	19.81 (6.35)	18.96 (7.09)	-0.86 (4.79)	281	3.01	0.13 (0.04–0.29)	0.00289
AAQ-II	39.83 (6.65)	32.97 (8.79)	-6.86 (9.30)	281	12.38	0.88 (0.71–1.05)	<0.00001
CFQ	40.64 (5.7)	33.93 (8.86)	-6.71 (9.02)	281	12.49	0.90 (0.74–1.07)	<0.00001
VLQ-imp	68.10 (15.45)	72.41 (12.48)	4.32 (14.58)	281	-4.97	-0.31 (-0.47–0.14)	<0.00001
VLQ-Do	43.00 (16.19)	50.86 (17.85)	7.87 (16.77)	281	-7.88	-0.51 (-0.67–0.34)	<0.00001

Steenkamp, Litz, Hoge, & Marmar, 2015), this project entailed development and evaluation of a novel evidence-based, trauma-focused treatment integrating exposure therapy (i.e., PE for PTSD) and ACT in an IOP format. The addition of and emphasis on psychological flexibility processes may be a contributory factor in increasing acceptance of distressing emotions and cognitions that flow from traumatic events. Though process-level measurement as well as longitudinal analysis (i.e., hierarchical linear modeling of weekly assessment scores) are necessary to ascertain the relations among variables/processes of interest, preliminary program evaluation data offer early indications of the positive and robust impact of situating exposure exercises in a psychological flexibility frame and integrating ACT and exposure interventions in a process-oriented program of care.

4.1. Preliminary program evaluation

Program evaluation, including clinician observations, interviews with participants, and program evaluation surveys revealed the success of the program was related to a number of factors. The first factor identified was substantial group cohesion. Participants often reported they returned to group each day in order to support each other. As common challenges and resistance related to PTSD treatment emerged, group members supported each other and encouraged continued effort. The second factor identified was a decrease over the course of the program in experiential avoidance. This decrease was evidenced by quantitative data as well as participant feedback. Though further study is needed to ascertain the relative added value of integrating ACT and PE (compared to ACT alone or PE alone), this change was directly related by the participants to the inclusion of ACT processes in trauma-focused groups and individual exposure sessions.

Among the specific elements highlighted by participants, the early engagement of “Creative Hopelessness” was reported to be a main source of motivation for staying committed to the program later in treatment when exposure exercises became increasingly difficult. Additionally, service members consistently reported experiencing increased self-confidence related to a growing ability to stay non-defensively present with difficult thoughts and feelings. Many members also noted they had never taken the time to identify their values, much less ensure their actions were in line with them, and emphasized the helpfulness of values clarification and committed action work. This was also reflected in program evaluation surveys, which revealed the values identification process often led to the conclusion that willingly experiencing difficult thoughts, feelings, and memories was “worth it” in the service of directing energy into the most personally important and vitalizing parts of life. Finally, many of the service members reported that the ACT Matrix exercise solidified their understanding of the entire program and established a desire/motivation to let go of rigid and inflexible behaviors for the first time since their trauma/s occurred.

Clinicians involved in this project credit participants' decrease in distress and dysfunction to participants' increased ability to come in contact with difficult trauma reminders and commit to valued living. This ability to mindfully observe difficult thoughts, feelings, and

sensations observably decreased participants' tendency to avoid internal and external trauma reminders during in vivo and imaginal exposure exercises. In addition, program evaluation surveys revealed a majority of participants noticed a significant improvement in their functioning and credited this improvement to the thorough processing of their index trauma and their newfound ability to experience difficult feelings in service of valued living.

4.2. Limitations and future directions

A few limitations must be considered when interpreting the results of this study overall as well as these preliminary pre-post data. Within the scope of this PI project and in this clinical setting, the inclusion of a control group was not feasible. Certain findings (e.g., low dropout rate) may be compared to studies of treatment as usual and, indeed, the program was developed out of an identified problem with dropout in treatment as usual within Army BehavioralHealth. However, conclusions about the effectiveness of this IOP relative to comparable IOPs, ACT- and exposure-based outpatient treatment, etc. cannot be concluded. Future studies should include control group(s) that would allow for such determinations.

In regards to generalizability of findings, this sample is reasonably representative of a range of military-specific factors (e.g., branch, rank) and is demographically diverse on several counts suggesting this intervention may be effective for many within the military. Caution may still be warranted, however, when generalizing to the broader population of military personnel including younger and junior ranking service members. Replication at other military installations and with larger and even more diverse samples is necessary to ensure generalizability and to enable sufficiently powered analyses with subgroups. Furthermore, though ACT and exposure have been widely studied outside the U.S., the utility and effectiveness of this program with military forces in countries other than the U.S. cannot be concluded from this study.

In the future, it will be necessary to develop more robust outcome evaluations for this type of program. Such evaluations may wish to engage more structured qualitative interviews than were included in this study. Interviews or surveys that ascertain to perceived relative contribution of each intervention component would be most valuable. Additionally, future evaluations may add to the current study by comparing frequency and duration of programming to determine the most effective program design. In addition, dismantling studies may help determine which program factors are most important for successful clinical outcome. Perhaps most important to the issue of ACT integration, more substantial investigation of the relationship of psychological flexibility to outcomes (i.e., symptoms, functioning) is essential. Within the capacity of this clinical program, more rigorous and elucidative analyses are forthcoming.

While this program was conducted by seasoned clinicians with extensive experience in both exposure therapy and ACT, treatment fidelity was not formally assessed. Future research of similar programs should include measures to better ensure true fidelity to the therapeutic modalities. Finally, the administration of 12-month follow-up

assessment would have enabled clinicians to ascertain whether post-treatment gains seen in the six-week program would endure over time.

5. Conclusion

Several barriers exist to the effective treatment of military-related PTSD (Steenkamp et al., 2015). This performance improvement project conducted at Brooke Army Medical Center provides preliminary evidence for the effectiveness of an IOP integrating ACT and exposure therapy to address poor access to care, high dropout, and treatment non-response. The preliminary findings described herein encourage future research into this model of care. The level of reported participant satisfaction suggests tolerability of the treatment model and participant responses provide initial insight into the processes and procedures experienced by the service members as most impactful in their recovery and wellbeing. Looking ahead, it is hoped these initial efforts will provide meaningful information to the leaders, researchers, and clinicians serving military service members and will guide future enhancement of approaches to treatment in Army Behavioral Health and to stakeholders globally in military resilience and health.

Declarations of competing interest

The authors declare that there are no conflicts of interest.

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