EFFECTIVENESS OF RELATIONAL EQUINE-PARTNERED COUNSELING (REPC) ON REDUCTION OF SYMPTOMS OF PTSD IN MILITARY VETERANS: A SINGLE CASE DESIGN

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There is currently a crisis in military veteran mental health care. At 5-30% of veterans receive a PTSD diagnosis. Veterans face a large gap that exists in accessing and receiving high quality care. One intervention that is becoming more popular is equine assisted counseling (EAC). The purpose of the present study was to examine the effectiveness of Relational Equine-Partnered Counseling (REPC) in reducing symptoms of PTSD in military veterans. I also examined specific PTSD symptom clusters including intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. The present study utilized a single-case design consisting of a baseline phase, intervention phase, and post-intervention phase. Participants included four military veterans presenting for war zone-related PTSD: four males and one female, aged 32-67 years, two White/European non-Hispanic, one African American non-Hispanic, and one mixed ethnicity. Symptoms were assessed weekly using the Clinician-Administered PTSD Scale and the PTSD Checklist (PCL-5). The data were analyzed by visual analysis and statistical effect size. The results were mixed across the participants. All participants experienced decreased means between the baseline and intervention phases. However, interpretation of the results indicated that the intervention was effective in some areas for some of the participants. All participants reported that the intervention was beneficial in targeting specific symptoms. Overall, the results indicated that REPC may have some benefit in reducing distress related to PTSD. More research is needed to further explore the effectiveness of REPC on the reduction of PTSD-related distress.
ACKNOWLEDGMENTS

Winston Churchill has been quoted as saying that “there is something about the outside of a horse that is good for the inside of a man”. This quote is especially true in describing both my life journey to the doctoral program and my journey through it. Horses have been an important part of my life for as long as I can remember. As a young child, I felt comforted and understood by these magnificent animals – now I can help others to experience the same. I dedicate this to all those both two-legged and four-legged who have supported me in my journey.

To Dr. Chandler for your encouragement, guidance, and never-ending faith in me to have the confidence to push forward in this new and evolving field. To Dr. Bratton for always believing in me and in my abilities as a counselor. To Dr. Schulz for being a listening ear and supportive of all of my endeavors. To Dr. Kern for your enthusiasm and excitement – you will forever be remembered. To Julie Rivard, Hannah Yterdal, and the staff of Wings of Hope for supporting me and giving me a place to explore the power of healing through horses. To Brooke Knox for believing in me and being my mentor and my friend. To the veterans for their sacrifices in protecting our country and in allowing me to be a part of their healing journeys.

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# TABLE OF CONTENTS

**ACKNOWLEDGMENTS**........................................................................................................... ii

**CHAPTER ONE: INTRODUCTION**............................................................................................. 1

  - Relational Equine-Partnered Counseling........................................................................... 4
  - Statement of the Problem....................................................................................................... 5
  - Significance............................................................................................................................. 6
  - Purpose of the Study and Research Question........................................................................ 6
  - Methodology............................................................................................................................ 7
  - Results.................................................................................................................................... 15
  - Discussion............................................................................................................................... 34
  - Conclusion............................................................................................................................... 46
  - References.............................................................................................................................. 47

**CHAPTER TWO: EXTENDED LITERATURE REVIEW**............................................................... 55

  - Posttraumatic Stress Disorder (PTSD)................................................................................... 56
  - Relational Equine-Partnered Counseling............................................................................ 77

**CHAPTER THREE: EXTENDED METHODOLOGY**................................................................. 94

  - Research Question................................................................................................................ 95
  - Definition of Terms............................................................................................................... 96
  - Participant Selection.............................................................................................................. 96
  - Instruments............................................................................................................................. 97
  - Description of Treatment...................................................................................................... 103
  - Ethical and Legal Considerations......................................................................................... 106
  - Multicultural Considerations............................................................................................... 108
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>108</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>112</td>
</tr>
<tr>
<td>Individual Participant Treatment</td>
<td>114</td>
</tr>
<tr>
<td>CHAPTER FOUR: UNABRIDGED RESULTS</td>
<td>118</td>
</tr>
<tr>
<td>Participant 1: Sam</td>
<td>119</td>
</tr>
<tr>
<td>Participant 2: David</td>
<td>169</td>
</tr>
<tr>
<td>Participant 3: Matt</td>
<td>217</td>
</tr>
<tr>
<td>Participant 4: Abigail</td>
<td>266</td>
</tr>
<tr>
<td>Summary of Results</td>
<td>310</td>
</tr>
<tr>
<td>CHAPTER FIVE: EXTENDED DISCUSSION</td>
<td>337</td>
</tr>
<tr>
<td>REPC and Individual PTSD Symptom Clusters</td>
<td>338</td>
</tr>
<tr>
<td>Clinical Implications</td>
<td>358</td>
</tr>
<tr>
<td>Limitations of the Design</td>
<td>360</td>
</tr>
<tr>
<td>Implications for Future Research</td>
<td>363</td>
</tr>
<tr>
<td>Conclusion</td>
<td>365</td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td>A. RELATIONAL EQUINE-PARTNERED COUNSELING: A MODEL FOR PRACTICE</td>
<td>366</td>
</tr>
<tr>
<td>B. INFORMED CONSENT</td>
<td>383</td>
</tr>
<tr>
<td>COMPREHENSIVE REFERENCE LIST</td>
<td>386</td>
</tr>
</tbody>
</table>
CHAPTER ONE:

INTRODUCTION
INTRODUCTION

Since the beginning of the wars in Iraq and Afghanistan in October 2001, more than 2.6 million troops have been deployed in support of the Global War on Terror (Institute of Medicine, 2012). Although the overall casualty rate has decreased in comparison to past wars, the rate of “invisible wounds” has skyrocketed in military veterans (Tanelian, Jaycox, Adamson, & Metscher, 2008, p. 3). Approximately one third of veterans previously deployed are suffering from posttraumatic stress disorder (PTSD), major depression, or probable traumatic brain injury (Ramchand, Karney, Osilla, Burns, & Caldarone, 2008). As many as 5-30% of Iraq and Afghanistan veterans have or will develop PTSD (Hoge & Warner, 2014). Vietnam veterans continue to experience distress related to PTSD with the rate of veterans seeking treatment continuing to rise (Hermes, Fontana, & Rosenheck, 2015). Without treatment, veterans are at higher risk for additional psychiatric diagnoses, substance abuse, and increased risk of suicide (Ramchand et al., 2008). Furthermore, the effects of PTSD can put veterans at risk for other concerns such as unemployment, homelessness, inability to attain educational goals, divorce, and partner and child abuse (Ramchand et al., 2008).

Schell and Marshall (2008) documented a gap in the need for mental health services and the availability of adequate care systems to meet the mental health needs of this population. When PTSD in veterans goes untreated, many will continue to have symptoms years after their service has ended (Hoge et al., 2004). For those veterans who do receive care, many receive less therapy than they require (Hoge et al., 2014a; Sareen et al., 2007). Another barrier to care is the potential for veterans to drop out of treatment (Hoge et al., 2014a).

Mental health clinicians have used a wide variety of interventions to treat PTSD in military veterans including psychopharmacology, psychoeducation, and mental health
interventions (Burnam et al., 2008). Evidence-based treatments include exposure therapies, cognitive therapies, and eye movement desensitization and reprocessing (Institute of Medicine, 2012). However, some researchers have expressed concerns about the use of evidence-based practice (EBP) in treating veterans as these approaches may not work better than other approaches and do not allow the flexibility necessary to provide a patient-centered approach (Hoge, 2011; Holt & Beutler, 2014; Steenkamp & Lit, 2014).

Due to growing concerns by the Veterans Administration (VA) and the Department of Defense (DoD) regarding the prevalence of PTSD in returning troops, they have allocated funding in order to research, develop, and initiate services specifically targeting PTSD in military veterans such as complementary and alternative medicine (Institute of Medicine, 2012). One such alternative intervention showing promise is equine assisted counseling (Abrams, 2013; Buckley & Raulerson, 2013; Canter, 2013; Duncan, Critchley, & Marland, 2014; Lancia, 2008; MacLean, 2011; Sheade, Box, & Knox, 2012). Practitioners utilizing equine assisted counseling (EAC) with military veterans have reported the intervention to be effective in helping veterans learn to self-regulate, connect with others, readjust to post-war life, and reduce distress related to PTSD (Abrams, 2013; Lancia, 2008; MacLean, 2011; Sheade et al., 2012).

Throughout history, many ancient and spiritual cultures have viewed horses as having spiritual and healing powers (Hallberg, 2008). A variety of organizations and individuals have sought to provide healing through horses for individuals with physical and psychological challenges (Chandler, 2012). Equine assisted counseling (EAC) is one form of equine assisted therapy that enables people to meet specific mental health goals through interaction with horses. Individuals who interact with animals are likely to experience many physiological and psychological benefits during the counseling process. Physiological benefits may include
decreased cortisol, increased oxytocin, decreased state anxiety, lowered heart rate, and improved mood (Allen, 1996; Hama, Yogo, & Matsuyama, 1996; Kaminski, Pellino, and Wish, 2002; Odendaal, 2000; Shiloh, Sorek, & Terkel, 2003). The presence of the animal in the counseling session may also result in other benefits such as increased motivation to attend sessions, facilitation of trust by the client towards the counselor, and the experience of a safe, trusting relationship with the horse (Carlsson, Ranta, Traeen, 2014; Chandler, 2012; Lefkowitz, Prout, Bleiberg, Paharia, & Debiak, 2005).

**Relational Equine-Partnered Counseling**

Relational equine-partnered counseling (REPC) is an integrative, trans-theoretical approach, incorporating aspects of humanistic counseling with a focus on working within the relationship between participant and horse(s). The approach is developmental as the activities for each session are informed by progress made in the previous session and guided by the nature of the client’s relationship with the horse(s) over time. REPC is a counseling approach facilitated by a counselor with the addition of horse(s) and an equine specialist. This approach has four domains: (a) experiential, (b) relational, (c) physiological, and (d) spiritual.

Within this model, the counselor believes in the client’s tendency to seek to build positive and nurturing relationships, which facilitate movement towards growth and healing from trauma (Sheade, 2013). Through the relationship with the horse, the client is afforded the opportunity to create a new pattern for relationships and experience the security necessary to process and heal from trauma. The client proceeds through this growth first by the formation of a safe relationship with the treatment team, followed by activities designed to facilitate increased understanding and awareness of one’s own internal state and the development of empathy towards others. REPC can be applied in specifically targeting trauma in accordance with Van der Kolk’s (2014) six
identified areas for treatment: (a) management of hyperarousal, (b) mindfulness, (c) relationships with others, (d) rhythms and synchrony, (e) touch, and (f) taking action.

**Statement of the Problem**

Military veterans are currently experiencing a crisis in mental health care (Tanelian & Jaycox, 2008). A high number of veterans returning from deployment are suffering from PTSD and other co-morbid disorders. In seeking mental health care services, veterans often face great difficulties in accessing services and in receiving high quality care. Furthermore, many veterans avoid seeking care through the Military Health System due to concerns about confidentiality and stigmas about mental health care. Without treatment, veterans suffering from PTSD are at an elevated risk for other psychiatric disorders, suicide, and substance abuse (Ramchand et al., 2008). These veterans struggle in adjusting to their postwar lives and experience great impairments in their ability to work, attain educational goals, sustain intimate relationships, maintain physical health, and provide for their own basic needs.

One group of treatments mental health clinicians have found to be beneficial are equine assisted mental health interventions (Abrams, 2013; Carlsson et al., 2014; Kendall et al., 2015). Practitioners have lauded the interventions as effective in assisting veterans suffering from PTSD to learn to self-regulate, develop stronger connections with others, and decrease anxiety (Abrams, 2013; Canter, 2013; Lancia, 2008; MacLean, 2011; Sheade et al., 2012). Although there are many anecdotal accounts of the effectiveness of these interventions, there is no research demonstrating the effectiveness of EAC in treating PTSD. Without evidence supporting EAC’s effectiveness, acceptance of and accessibility to this intervention is limited in both veteran and civilian populations.
Significance

The results of this research have multiple implications for further research, teaching, practice, and society. Regarding research, there is currently a demand for alternative treatment options for military veteran mental health. It is my goal that this study will contribute to the EAC research base and assist EAC in becoming an evidence-based practice. Regarding teaching, the limited EAC research base offers few resources for clinicians seeking to practice EAC. Many existing models for practice of EAC are limited in scope and applicability for the counseling field. Therefore, a second goal is increasing access to and awareness of the Relational Equine-Partnered Counseling (REPC) model to promote ethical and effective practice of EAC for counseling professionals. Regarding practice, the results of this study may increase awareness of EAC as a treatment, thus increasing accessibility for veterans seeking alternative mental health interventions and mental health professionals seeking resources. Therefore, a third goal is to increase access and acceptability of EAC within the military mental health and counseling fields. Regarding society, the effects of PTSD are felt not only by veterans but also veterans’ friends, families, and society at large (Tanelian & Jaycox, 2008). Through the reduction of PTSD symptoms through participation in EAC, many financial and psychological burdens may be eased. The impact of this research can also contribute to furthering awareness of the therapeutic nature of animals and to promoting the field of animal assisted therapy as a whole.

Purpose of the Study and Research Question

The purpose of the present study is to examine the effectiveness of the Relational Equine-Partnered Counseling (REPC) model on the reduction of war zone-related PTSD symptoms in military veterans. More specifically, does the REPC model of EAC reduce war zone-related
PTSD severity and symptoms of intrusion, avoidance, negative alterations in cognitions and
mood, and alterations in arousal and reactivity?

Methodology

Participants

For this study, two of the participants completed the entire 25 weeks of the study, one
participant completed 17 weeks, and one participant dropped out. Participants met the following
criteria: (a) identity as military veteran as defined by an individual who has actively served in the
United States military; (b) experienced war zone-related trauma; and (c) met the criteria for a
diagnosis of PTSD based on initial screening scores according to the PTSD Checklist (PCL-5)
and the Clinician-Administered PTSD Scale (CAPS). The researcher gained university approval
in order to conduct research with human subjects prior to meeting with the participants. Each
participant’s actual name was replaced with a pseudonym and military rank was omitted to help
maintain confidentiality.

Participant 1. Sam was a Caucasian retired high-ranking Special Forces Marine who
served in both Operation Desert Storm and on multiple deployments in the Global War on
Terrorism. Sam resides with his wife and child and works in the human resources field. At the
start of the study, Sam was receiving concurrent individual talk therapy with another mental
health professional. Sam identified symptoms related to physiological reactions, detachment,
difficulty concentrating, and sleep problems to be his primary concerns. Sam completed all
phases of the duration of the study.

Participant 2. David was a Black former Army Combat Engineer who served in the
Vietnam War. David had retired from work in law enforcement and was active in his faith
community. He was divorced and lived alone. David identified symptoms related to nightmares
and negative alterations in cognitions and mood including loss of interest, detachment, and inability to experience positive emotions to be his primary concerns. David reported receiving individual and group therapy for the past several years but had not experienced much relief from his symptoms. David completed all phases of the duration of the study.

**Participant 3.** Matt was a former Army Petroleum Supply Specialist of mixed ethnicity who served in Operation Iraqi Freedom. He does not work and lives with his significant other. Matt identified symptoms related to anger and irritability, detachment, loss of interest, intrusive memories, and sleep problems to be his primary concerns. At the start of the study, Matt was receiving concurrent individual talk therapy. During the course of the study, Matt learned that he had been accepted into a residential PTSD program and would need to terminate his participation in the study early. At this time, Matt experienced a worsening of his symptoms that he attributed to feeling anxious and uneasy about going into this treatment. Matt participated in the entire baseline phase, but only 10 weeks of EAC during the intervention phase followed by the post-intervention phase.

**Participant 4.** Abigail was a Caucasian former Army medic who served in Operation Enduring Freedom. Abigail works during the day and lives with her children. She identified her faith to be a strong support in her life. During the study, Abigail received concurrent individual talk therapy. She identified symptoms related to anger and irritability, sleep problems, avoidance, and difficulty with concentration to be her primary concerns. Abigail had a gap of several weeks between her third and fourth sessions of REPC during the intervention phase. Abigail completed the entire baseline phase and six weeks of EAC during the intervention phase before dropping out of the study. Abigail’s treatment differed slightly from the other participants due to her work
schedule and the need for her appointment to be in the evening. Due to this factor, all of her sessions were held in the arena with a pre-selected herd of horses due to the lack of daylight.

**Instrumentation**

**PTSD Checklist (PCL-5).** The PCL-5 is the most extensively used screening instrument for PTSD (Hoge et al., 2014b). This instrument is a self-report assessment based on the DSM-5 symptoms of PTSD and consists of 20 items to measure symptoms in response to stressful experiences (Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2013b). Clinicians may use the PCL-5 to screen individuals for PTSD, make a provisional diagnosis of PTSD, and monitor symptoms both during and after treatment (Weathers et al., 2013b). Researchers are still in the process of determining change scores for PCL-5 but expect change scores to be in a similar range to the PCL for *DSM-IV*. Weathers et al. (2013b) recommended a five-point change to be indicative of an individual’s response to treatment.

Although researchers have not yet completed psychometric studies on the PCL-5, Hoge et al.’s (2014b) comparison of the PTSD Checklist-Specific (PCL-S) for *DSM-IV-TR* and the PCL-5 for *DSM-5* yields some preliminary information on the utility of the PCL-5. Hoge et al. (2014b) completed a head-to-head comparison of the two versions in a sample of 1,822 United States infantry soldiers. Of the 1,822 soldiers, 946 had previously deployed to Iraq or Afghanistan. The researchers found that the PCL-5 and PCL-S showed identical reliabilities with a Cronbach’s reliability score of 0.67. In addition, the researchers found substantial agreement between the two versions (κ = 0.67). However, the researchers also found that 45% of the soldiers, who met the criteria according to one version, did not meet the criteria according to the other version when controlling for order effects.
Keen, Kutter, Niles, and Krinsley (2008) conducted psychometrics on the PCL in accordance with *DMS-IV*. Regarding internal consistency, the alpha coefficient was found to be .94 for B symptoms, .91 for C symptoms, .92 for D symptoms, and .96 for the total severity score. More recently, Cohen et al. (2014) reported on preliminary psychometrics for each of the four symptom clusters for PCL-5. Regarding Cluster B, Cohen et al. (2014) found that a single factor accounted for 71% of the variance with a Cronbach’s reliability of .89. Regarding Cluster C, a single factor accounted for 91% of the variance with a Cronbach’s reliability of .91. For Cluster D symptoms, a single factor accounted for 65% of the variance with a Cronbach’s reliability of .91. Finally, for Cluster E, a single factor accounted for 60% of the variance with a Cronbach’s reliability of .87.

**Clinician-Administered PTSD Scale**

The Clinician-Administered PTSD Scale (CAPS) is a structured interview to diagnose and measure the severity of PTSD (Weathers, Blacke, Schnurr, Marx, & Keane, 2013a). This instrument is regarded as the “gold standard” as it allows for consistent administration and scoring, enables the collection of valid information regarding PTSD symptomatology, and provides flexible administration and scoring options (Weathers et al., 2013a). The CAPS Interview Booklet consists of 30 items designed to measure the intensity and frequency of four PTSD symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Administrators can focus on different time frames such as the past month, past week, or worst month (Weathers et al., 2013a). The CAPS may be given repeatedly and used for the purposes of diagnostic screening and monitoring of weekly assessment (Weathers et al., 2013a). As recommended by Weathers et al. (2013a), the Life Events Checklist was given to establish that Criterion A (presence of a traumatic event) was
satisfied. In conducting the assessment, the administrator is advised to use clinical judgment in determining the appropriate ratings based on the participant’s responses. The CAPS booklet includes space for the clinician to take notes on responses and ask clarifying questions if necessary (Blake et al., 2000). In my notes, I documented all of the participants’ responses that pertained to a given question. I also noted participants’ responses to questions in which they mentioned their time with me, their time with the horse, or outside events that they believed influenced their answers. Therefore, I was able to utilize these responses not only in making a CAPS score determination, but also in helping to explain the effect.

As psychometrics on the CAPS for DSM-5 were not available, psychometrics based on DSM-IV are delineated below. According to Western Psychological Services (2004), the CAPS has high internal consistency, test-retest reliability, and inter-rater reliability. Researchers have reported internal consistency coefficient alphas ranging from .79 to .95 for the total symptom severity score. Interclass correlations between clinicians were found to range from .92 to .95 (as cited in Western Psychological Services, 2004). Other estimates of inter-rater reliability have ranged from .92 to .98 for the total severity score (Western Psychological Services, 2004).

Western Psychological Services (2004) reported that the CAPS has high content validity and high construct validity. The CAPS has also been found to have high correlation with other measures of trauma and PTSD. Regarding criterion validity, diagnoses made using the CAPS correspond well with independently made diagnoses of PTSD using the DSM-IV criteria and correspondence with other assessments offering diagnostic criteria for PTSD (Western Psychological Services, 2004).
Procedures

In the present study, I utilized a single-case quasi-experimental design, an approach that is becoming increasingly utilized in counseling research to develop evidence-based practice (Ray, Barrio Minton, Schottelkorb, & Brown, 2010). I obtained approval to conduct research with human subjects from the University of North Texas’ Institutional Review Board (IRB) and the facility where the study was conducted. I utilized a convenience sample of participants, recruiting military veterans from referrals from other mental health professionals and through word-of-mouth. I obtained written permission by informed consent from the participating clients to take part in the study. During the first meeting with each of the participants, I discussed the nature of the study, reviewed the informed consent and financial incentives, and screened the participants using the CAPS and PCL-5 to ensure that they met the criteria for an initial diagnosis of PTSD.

The study contained three phases: (a) baseline, (b) intervention, and (c) post-intervention as recommended by Kennedy (2005). Throughout all three phases, the participants’ symptoms of PTSD were assessed with the PCL-5 and CAPS each week. In addition, the participants were asked to report on any changes in medication, other PTSD therapies, other forms of counseling for non-PTSD concerns, or any other events that the participant believed may have influenced his or her PTSD symptoms each week in order to help explain the effect and control for threats to internal validity.

The baseline phase lasted five weeks with no intervention in order to try to attain a stable baseline as recommended by Kennedy (2005). During this phase, I administered the PCL-5 and the CAPS. None of the four participants attained a stable baseline and all showed improvement during the baseline period. I decided that it would be best to move forward without a stable
baseline so as not to jeopardize my participants’ continued involvement in the study (Ray, in press). During the intervention phase, the REPC intervention was administered and lasted up to 18 weeks. The intervention was weekly 50-minute REPC sessions according the manualized REPC approach with weekly administration of PCL-5 and CAPS prior to the beginning of each REPC session. The post-intervention phase began one week after the intervention ended in order to determine the stability of the effect on symptoms of PTSD after termination of REPC.

All of the participants in this study received individual equine assisted counseling in accordance with the Relational Equine-Partnered Counseling (REPC) model (Sheade, 2013). In addition to serving as the primary researcher, I also co-facilitated the intervention with a PATH International certified equine specialist. I am Licensed Professional Counselor (LPC) and doctoral candidate and have also developed the REPC model. I am also a PATH certified equine specialist. I have received two years of training in working with PTSD in the military veteran population and four years of training in equine assisted counseling. All equine specialists also received prior training in administering the REPC model. The horses included in the study spanned a range of age, sex, size, breed, and personality characteristics. All horses belong to the therapy center where the research was conducted. Some were used only in counseling, whereas others were used in therapeutic riding lessons and counseling. Sessions were conducted in the pasture, arena, or round pen depending on the client’s needs, weather conditions, and session activity.

Within this model, the counselor believes in the client’s tendency to seek to build positive and nurturing relationships, which facilitate movement towards growth and healing from trauma (Sheade, 2013). Through the relationship with the horse, the client is afforded the opportunity to create a new pattern for relationships and experience the security necessary to process and heal
from trauma. Through this model, the counselor views each client as a unique individual and focuses not only on deployment-related trauma, but also on the client’s entire life history. This broad focus enables the counselor to address historical psychological trauma that may be influencing the manifestation of PTSD (Dursa et al., 2014). The client proceeds through this growth first by the formation of a safe relationship with the treatment team and the horse, followed by activities designed to facilitate increased understanding and awareness of one’s own internal state and development of empathy towards others’ experiences. Activities may be used to target specific goals during the counseling session such as (a) relationship-building, (b) nurturing, (c) mastery and challenge, (d) self-regulation, stress inoculation, and mindfulness, and (e) creativity and free expression. These activities may include choosing a horse, haltering the horse, leading the horse, grooming the horse, being with the horse, moving the horse, bathing the horse, and stress inoculation or relaxation activities.

Data Analysis

The primary method for data analysis in single case design is the use of visual analysis (Morgan & Morgan, 2003). In order to conduct visual analysis, I began by examining the patterns in the data and, more specifically, focused on investigating within-phase patterns including level, trend, variability, and between-phase patterns including overlap, immediacy of effect, and the magnitude of change (Kratochwill et al., 2010). To examine the level, I calculated the mean score of the data in each phase. Regarding trend, I examined the slope and direction of the data to determine the presence of systematic increases or decreases in scores over time. Based on criteria delineated by Cohen (1988), I identified an r value of .10 as indicative of small effect, an r value of .30 as indicative of a medium effect, and an r value of .50 as indicative of a large effect. I examined variability of data within phases by visual inspection and standard
deviation scores. Regarding between-phase patterns, I examined overlap or how many data points in one phase overlap with the data points from the previous phase. In examining the immediacy of the effect, I analyzed the difference in level between the last three points of the previous phase and the first three points of the next phase. I also used anecdotal data including demographic information, historical information, and brief post-intervention discussions to help explain the effect of treatment; the use of this procedure is supported by research (Ray & Schottelkorb, 2010).

Following the completion of the study, I examined the effect size (or the effect of the intervention) using the Percentage of Data Exceeding the Median Trend (PEM-T). After using visual analysis, I determined there to be the presence of a baseline trend and chose to use PEM-T to help account for this trend and detect changes in trends across phases as recommended by Rakap (2015). The PEM-T method has the lowest error percentage in comparison to other overlap methods (Wolery, Busick, Reichow, & Barton, 2010). To calculate the effect size, I followed the steps outlined by Wolery et al. (2010). I used criteria recommended by Rakap (2015) as benchmarks: 90% or higher as indicative of high effectiveness, 70-90% as indicative of moderate effectiveness, 50-70% as indicative of questionable effectiveness, and 50% or lower as indicative of ineffectiveness.

**Results**

I assessed each participant’s PTSD symptoms every week using the CAPS and PCL-5. I evaluated severity and number of symptoms across the total score and across each of the symptom clusters. These symptom clusters included intrusion (Cluster B), avoidance (Cluster C), negative alterations in cognitions and mood (Cluster D), and alterations in arousal and reactivity (Cluster E). I evaluated each construct on the basis of level, variability, trend, immediacy of the
effect, and overlapping data. Due to the large amount of data analyzed, I only included results for substantial findings in this section.

**Participant 1: Sam**

**CAPS.** Sam’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the CAPS can be found in Table 1 and Table 2, respectively. For the severity of four of the constructs, Total, Cluster C, Cluster D, and Cluster E, the means decreased across all phases of the study. For the severity of Cluster B, the means decreased from baseline to intervention but increased during the post-intervention phase. Sam experienced a greater rate of improvement in severity during the intervention phase than during the baseline phase for Cluster C, Cluster D, and Cluster E. PEM-T effect sizes indicated that the intervention was highly effective in reducing Cluster D severity. Regarding the number of symptoms, the means decreased across all phases of all constructs with the exception of Cluster B. For Cluster B, the means decreased from the baseline phase to the intervention phase and increased slightly across the post-intervention phase. Sam experienced a greater rate of improvement in the number of symptoms during the intervention phase than during the baseline phase for Total, Cluster C, Cluster D, and Cluster E. PEM-T effect sizes indicated that the intervention was highly effective in reducing the number of symptoms for Total, Cluster D, and Cluster E. The intervention was moderately effective in reducing Cluster C symptoms. Figures 1-5 are graphical representations of the areas in which Sam experienced the greatest improvement based on both greater rate of improvement ($R^2$) during the intervention phase and PEM-T values indicating intervention effectiveness.
Table 1

*Sam’s CAPS Severity Scores Across Phases*

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<td>$R^2$</td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43.00</td>
<td>3.08</td>
<td>.95</td>
<td>22.47</td>
<td>10.37</td>
<td>.85</td>
<td>15.00</td>
<td>3.00</td>
<td>.25</td>
<td>47%</td>
</tr>
<tr>
<td>B</td>
<td>11.40</td>
<td>1.95</td>
<td>.53</td>
<td>6.59</td>
<td>2.83</td>
<td>.50</td>
<td>6.67</td>
<td>1.53</td>
<td>.43</td>
<td>12%</td>
</tr>
<tr>
<td>C</td>
<td>5.60</td>
<td>0.89</td>
<td>.50</td>
<td>2.59</td>
<td>1.94</td>
<td>.79</td>
<td>0.00</td>
<td>0.00</td>
<td>.00</td>
<td>12%</td>
</tr>
<tr>
<td>D</td>
<td>14.60</td>
<td>0.55</td>
<td>.08</td>
<td>6.47</td>
<td>4.17</td>
<td>.85</td>
<td>3.67</td>
<td>2.31</td>
<td>.75</td>
<td>100%</td>
</tr>
<tr>
<td>E</td>
<td>11.40</td>
<td>1.52</td>
<td>.27</td>
<td>6.82</td>
<td>2.16</td>
<td>.85</td>
<td>4.67</td>
<td>0.58</td>
<td>.75</td>
<td>12%</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

Table 2

*Sam’s CAPS Number of Symptoms Scores Across Phases*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15.60</td>
<td>0.55</td>
<td>.75</td>
<td>7.29</td>
<td>4.82</td>
<td>.79</td>
<td>5.33</td>
<td>1.53</td>
<td>.11</td>
<td>94%</td>
</tr>
<tr>
<td>B</td>
<td>3.80</td>
<td>0.84</td>
<td>.57</td>
<td>2.24</td>
<td>1.30</td>
<td>.48</td>
<td>2.67</td>
<td>0.43</td>
<td>.43</td>
<td>0%</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>0.00</td>
<td>.00</td>
<td>0.76</td>
<td>0.75</td>
<td>.55</td>
<td>0.00</td>
<td>0.00</td>
<td>.00</td>
<td>82%</td>
</tr>
<tr>
<td>D</td>
<td>6.00</td>
<td>0.00</td>
<td>.00</td>
<td>2.06</td>
<td>2.28</td>
<td>.79</td>
<td>1.00</td>
<td>1.00</td>
<td>.25</td>
<td>94%</td>
</tr>
<tr>
<td>E</td>
<td>3.80</td>
<td>0.45</td>
<td>.13</td>
<td>2.24</td>
<td>1.09</td>
<td>.56</td>
<td>1.67</td>
<td>0.58</td>
<td>.75</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.
Figure 1. Sam’s CAPS Total Symptoms Scores. (Decreased scores indicate improvement.)

Figure 2. Sam’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement.)
Figure 3. Sam’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement.)

Figure 4. Sam’s CAPS Cluster D Symptoms Scores. (Decreased scores indicate improvement.)
Figure 5. Sam’s CAPS Cluster E Symptoms Scores. (Decreased scores indicate improvement.)

PCL-5. Sam’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the PCL-5 can be found in Table 3 and Table 4, respectively. Regarding severity, the means decreased across all phases for all constructs. PEM-T effect sizes indicated that the intervention was ineffective across all severity constructs. Regarding the number of symptoms, the means decreased across all phases across all constructs. PEM-T effect sizes indicated that the intervention was ineffective in reducing the number of symptoms for all constructs.
Table 3

*Sam’s PCL Severity Scores Across Phases*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>R²</td>
<td>M</td>
</tr>
<tr>
<td>Total</td>
<td>35.80</td>
<td>14.17</td>
<td>.94</td>
<td>21.76</td>
</tr>
<tr>
<td>B</td>
<td>10.20</td>
<td>4.44</td>
<td>.86</td>
<td>7.18</td>
</tr>
<tr>
<td>C</td>
<td>3.40</td>
<td>1.67</td>
<td>.72</td>
<td>1.94</td>
</tr>
<tr>
<td>D</td>
<td>12.20</td>
<td>5.26</td>
<td>.98</td>
<td>5.18</td>
</tr>
<tr>
<td>E</td>
<td>10.00</td>
<td>3.16</td>
<td>.90</td>
<td>7.47</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = $ Trend.

Table 4

*Sam’s PCL Number of Symptoms Scores Across Phases*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>R²</td>
<td>M</td>
</tr>
<tr>
<td>Total</td>
<td>11.80</td>
<td>4.76</td>
<td>.94</td>
<td>6.06</td>
</tr>
<tr>
<td>B</td>
<td>3.20</td>
<td>1.48</td>
<td>.56</td>
<td>2.47</td>
</tr>
<tr>
<td>C</td>
<td>1.00</td>
<td>1.00</td>
<td>.63</td>
<td>0.53</td>
</tr>
<tr>
<td>D</td>
<td>4.00</td>
<td>2.00</td>
<td>.90</td>
<td>1.59</td>
</tr>
<tr>
<td>E</td>
<td>3.60</td>
<td>0.89</td>
<td>.78</td>
<td>2.29</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = $ Trend.

**Participant 2: David**

**CAPS.** David’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the CAPS can be found in Table 5.
and Table 6, respectively. For the severity of three of the constructs, Total, Cluster C, and Cluster D, the means decreased across all phases of the study. For the severity of Cluster B and Cluster E, the means decreased from baseline to intervention but increased during the post-intervention phase. David experienced a slightly greater rate of improvement in severity during the intervention phase than during the baseline phase for Cluster C. PEM-T effect sizes indicated that the intervention was highly effective in reducing Cluster C severity. Regarding the number of symptoms, the means decreased across all phases for Total, Cluster C, and Cluster D. For Cluster B and Cluster E, means decreased from the baseline phase to the intervention phase and increased slightly across the post-intervention phase. PEM-T effect sizes indicated that the intervention was highly effective in reducing the number of symptoms for Cluster C. Figures 6-7 are graphical representations of the areas in which David experienced the greatest improvement based on both greater rate of improvement ($R^2$) during the intervention phase and PEM-T values indicating intervention effectiveness.

Table 5

David’s CAPS Severity Scores Across Phases

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>$R^2$</td>
<td>M</td>
</tr>
<tr>
<td>Total</td>
<td>34.60</td>
<td>4.39</td>
<td>.22</td>
<td>29.71</td>
</tr>
<tr>
<td>B</td>
<td>7.80</td>
<td>2.95</td>
<td>.05</td>
<td>5.18</td>
</tr>
<tr>
<td>C</td>
<td>4.40</td>
<td>2.51</td>
<td>.10</td>
<td>3.76</td>
</tr>
<tr>
<td>D</td>
<td>15.20</td>
<td>1.31</td>
<td>.72</td>
<td>14.41</td>
</tr>
<tr>
<td>E</td>
<td>7.20</td>
<td>1.64</td>
<td>.45</td>
<td>6.35</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.
Table 6

*David’s CAPS Number of Symptoms Scores Across Phases*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12.20</td>
<td>1.64</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.06</td>
<td>3.03</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.00</td>
<td>1.73</td>
<td>.00</td>
<td>41%</td>
</tr>
<tr>
<td>B</td>
<td>3.20</td>
<td>0.84</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.94</td>
<td>1.20</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>0.00</td>
<td>.00</td>
<td>59%</td>
</tr>
<tr>
<td>C</td>
<td>1.60</td>
<td>0.89</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.24</td>
<td>0.90</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.33</td>
<td>0.58</td>
<td>.75</td>
<td>100%</td>
</tr>
<tr>
<td>D</td>
<td>4.80</td>
<td>0.44</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.65</td>
<td>0.71</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>1.00</td>
<td>.25</td>
<td>5.9%</td>
</tr>
<tr>
<td>E</td>
<td>2.60</td>
<td>0.55</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.24</td>
<td>1.20</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.67</td>
<td>0.58</td>
<td>.00</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

*Figure 6.* David’s CAPS Cluster C Severity Scores. (Decreased scores indicate improvement.)
Figure 7. David’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement.)

**PCL-5.** David’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the PCL-5 can be found in Table 7 and Table 8, respectively. Regarding severity, the means decreased across all phases for Total, Cluster B, and Cluster D. The means decreased from the baseline phase to the intervention phase and slightly increased during the post-intervention phase for Cluster C and Cluster E severity. PEM-T effect sizes indicated that the intervention was ineffective across all severity constructs. Regarding the number of symptoms, the means decreased across all phases across all constructs. PEM-T effect sizes indicated that the intervention was ineffective in reducing the number of symptoms for all constructs.
Table 7

David’s PCL Severity Scores Across Phases

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>29.40</td>
<td>15.66</td>
<td>.86</td>
<td>14.24</td>
</tr>
<tr>
<td>B</td>
<td>6.00</td>
<td>3.94</td>
<td>.71</td>
<td>1.71</td>
</tr>
<tr>
<td>C</td>
<td>4.00</td>
<td>2.35</td>
<td>.89</td>
<td>1.82</td>
</tr>
<tr>
<td>D</td>
<td>10.60</td>
<td>4.62</td>
<td>.86</td>
<td>6.76</td>
</tr>
<tr>
<td>E</td>
<td>9.20</td>
<td>5.36</td>
<td>.78</td>
<td>3.94</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

Table 8

David’s PCL Number of Symptoms Scores Across Phases

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>8.00</td>
<td>7.11</td>
<td>.87</td>
<td>0.94</td>
</tr>
<tr>
<td>B</td>
<td>1.80</td>
<td>1.64</td>
<td>.75</td>
<td>0.06</td>
</tr>
<tr>
<td>C</td>
<td>1.20</td>
<td>1.10</td>
<td>.75</td>
<td>0.00</td>
</tr>
<tr>
<td>D</td>
<td>2.80</td>
<td>2.28</td>
<td>.94</td>
<td>0.59</td>
</tr>
<tr>
<td>E</td>
<td>2.20</td>
<td>2.28</td>
<td>.81</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

Participant 3: Matt

CAPS. Matt’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the CAPS can be found in Table 9 and
Table 10, respectively. For the severity of Cluster E, the means decreased across all phases of the study. For the severity of Cluster C and Cluster D, the means decreased from baseline to intervention but increased during the post-intervention phase. For the severity of Cluster B, the means increased from baseline to intervention and then decreased from intervention to post-intervention. The severity of the Total means increased across all phases. Regarding the number of symptoms, the means increased from baseline to intervention and decreased from intervention to post-intervention for Total and Cluster B. For Cluster E, means decreased across all phases. For Cluster C and Cluster D, the means decreased from baseline to intervention and then increased from intervention to post-intervention. PEM-T effect sizes indicated that the intervention had questionable effectiveness in reducing the number of symptoms for Cluster D.

Table 9

*Matt’s CAPS Severity Scores Across Phases*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>43.40</td>
<td>9.37</td>
<td>.55</td>
<td>43.63</td>
</tr>
<tr>
<td>B</td>
<td>5.80</td>
<td>4.09</td>
<td>.54</td>
<td>8.75</td>
</tr>
<tr>
<td>C</td>
<td>6.0</td>
<td>2.35</td>
<td>.16</td>
<td>5.13</td>
</tr>
<tr>
<td>D</td>
<td>17.00</td>
<td>2.74</td>
<td>.40</td>
<td>16.38</td>
</tr>
<tr>
<td>E</td>
<td>14.60</td>
<td>1.95</td>
<td>.42</td>
<td>13.38</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.
Table 10

Matt’s CAPS Number of Symptoms Scores Across Phases

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th></th>
<th></th>
<th>Intervention</th>
<th></th>
<th></th>
<th></th>
<th>Post-Intervention</th>
<th></th>
<th></th>
<th></th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>R²</td>
<td>M</td>
<td>SD</td>
<td>R²</td>
<td>M</td>
<td>SD</td>
<td>R²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14.40</td>
<td>2.51</td>
<td>.32</td>
<td>14.50</td>
<td>2.51</td>
<td>.14</td>
<td>13.67</td>
<td>2.08</td>
<td>.52</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1.80</td>
<td>1.31</td>
<td>.24</td>
<td>3.13</td>
<td>0.83</td>
<td>.00</td>
<td>3.00</td>
<td>2.00</td>
<td>.25</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.60</td>
<td>0.55</td>
<td>.08</td>
<td>1.50</td>
<td>0.53</td>
<td>.05</td>
<td>1.67</td>
<td>0.58</td>
<td>.75</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>5.60</td>
<td>0.55</td>
<td>.08</td>
<td>5.00</td>
<td>0.76</td>
<td>.01</td>
<td>5.33</td>
<td>0.58</td>
<td>.00</td>
<td>55%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>5.40</td>
<td>0.55</td>
<td>.75</td>
<td>4.88</td>
<td>1.36</td>
<td>.29</td>
<td>3.67</td>
<td>1.15</td>
<td>.75</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

**PCL-5.** Matt’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the PCL-5 can be found in Table 11 and Table 12, respectively. Regarding severity, the means decreased from the baseline to the intervention phase and increased during the post-intervention phase for Cluster D. The means increased from the baseline phase to the intervention phase and decreased during the post-intervention phase for all other severity constructs. Matt’s rate of improvement increased during the intervention phase for Cluster C and Cluster E. Regarding the number of symptoms, the means decreased from baseline to intervention and remained stable from intervention to post-intervention for Cluster D. The number of symptoms increased from the baseline to the intervention phase and then decreased during the post-intervention phase for Total, Cluster B, and Cluster C. For Cluster E, the means decreased across all phases. Matt’s rate of improvement increased during the intervention phase for Cluster E symptoms. Figures 8-9 are graphical representations of the areas in which Matt experienced the greatest improvement based only on
greater rate of improvement ($R^2$) during the intervention phase. All of Matt’s PEM-T values for both assessments and across all constructs indicated that the intervention was ineffective.

Table 11

**Matt’s PCL Severity Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>48.60</td>
<td>9.24</td>
<td>.65</td>
<td>49.25</td>
</tr>
<tr>
<td>B</td>
<td>7.80</td>
<td>4.87</td>
<td>.77</td>
<td>9.88</td>
</tr>
<tr>
<td>C</td>
<td>4.20</td>
<td>2.77</td>
<td>.16</td>
<td>5.13</td>
</tr>
<tr>
<td>D</td>
<td>20.80</td>
<td>2.77</td>
<td>.32</td>
<td>18.38</td>
</tr>
<tr>
<td>E</td>
<td>15.80</td>
<td>2.17</td>
<td>.05</td>
<td>15.88</td>
</tr>
</tbody>
</table>

*Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = Trend$.  

Table 12

**Matt’s PCL Number of Symptoms Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>15.60</td>
<td>2.71</td>
<td>.58</td>
<td>15.88</td>
</tr>
<tr>
<td>B</td>
<td>2.60</td>
<td>1.52</td>
<td>.70</td>
<td>3.50</td>
</tr>
<tr>
<td>C</td>
<td>1.20</td>
<td>1.10</td>
<td>.08</td>
<td>1.75</td>
</tr>
<tr>
<td>D</td>
<td>6.40</td>
<td>0.89</td>
<td>.03</td>
<td>6.00</td>
</tr>
<tr>
<td>E</td>
<td>5.20</td>
<td>0.84</td>
<td>.32</td>
<td>4.88</td>
</tr>
</tbody>
</table>

*Note: Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = Trend$.  

28
Figure 8. Matt’s PCL-5 Cluster C Severity Scores. (Decreased scores indicate improvement.)

Figure 9. Matt’s PCL-5 Cluster E Severity Scores. (Decreased scores indicate improvement.)
**Participant 4: Abigail**

**CAPS.** Abigail’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the CAPS can be found in Table 13 and Table 14, respectively. Regarding severity, the means for Total, Cluster B, Cluster C, and Cluster D decreased across both phases. For the severity of Cluster E, the means slightly increased from baseline to intervention. Abigail experienced a greater rate of improvement during the intervention phase for Cluster D. PEM-T effect sizes indicated that the intervention was highly effective in reducing the severity of Cluster B and moderately effective in reducing the severity of Cluster D. Regarding the number of symptoms, the means decreased from baseline to intervention across Total, Cluster B, and Cluster D. For Cluster E, means slightly increased from baseline to intervention. Means remained stable during baseline and intervention for Cluster C. Abigail experienced a greater rate of improvement during the intervention phase for Total, Cluster B, and Cluster D. PEM-T effect sizes indicated that the intervention was highly effective in reducing the number of symptoms for Cluster B. Figures 10-11 are graphical representations of the areas in which Abigail experienced the greatest improvement based on both greater rate of improvement ($R^2$) during the intervention phase and PEM-T values indicating intervention effectiveness. Figure 12 is a graphical representation of Abigail’s improvement based on a PEM-T value indicating intervention effectiveness.
### Table 13

**Abigail’s CAPS Severity Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>Total</td>
<td>44.60</td>
<td>2.07</td>
<td>.71</td>
</tr>
<tr>
<td>B</td>
<td>10.40</td>
<td>0.55</td>
<td>.08</td>
</tr>
<tr>
<td>C</td>
<td>6.00</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>D</td>
<td>15.40</td>
<td>1.14</td>
<td>.02</td>
</tr>
<tr>
<td>E</td>
<td>12.80</td>
<td>1.48</td>
<td>.92</td>
</tr>
</tbody>
</table>

**Note:** Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = $ Trend.

### Table 14

**Abigail’s CAPS Number of Symptoms Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>Total</td>
<td>15.80</td>
<td>1.30</td>
<td>.37</td>
</tr>
<tr>
<td>B</td>
<td>4.40</td>
<td>0.55</td>
<td>.08</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>D</td>
<td>5.00</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>E</td>
<td>4.40</td>
<td>1.14</td>
<td>.69</td>
</tr>
</tbody>
</table>

**Note:** Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2 = $ Trend.
Figure 10. Abigail’s CAPS Cluster B Symptoms Scores. (Decreased scores indicate improvement.)

Figure 11. Abigail’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement.)
Figure 12. Abigail’s CAPS Cluster B Severity Scores. (Decreased scores indicate improvement.)

PCL-5. Abigail’s results, including the means, standard deviations, trend, and PEM-T effect size for severity and number of symptoms according to the PCL-5 can be found in Table 15 and Table 16, respectively. Regarding severity, the means decreased from the baseline to the intervention phase across all constructs. Regarding the number of symptoms, the means decreased from baseline to intervention across all constructs. Abigail experienced a greater rate of improvement across the intervention phase with regards to Cluster B symptoms. However, Abigail experienced worsening of symptoms during the intervention phase for Cluster C and Cluster D.
Table 15

**Abigail’s PCL Severity Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>Total</td>
<td>40.00</td>
<td>14.78</td>
<td>.83</td>
</tr>
<tr>
<td>B</td>
<td>6.80</td>
<td>4.09</td>
<td>.54</td>
</tr>
<tr>
<td>C</td>
<td>6.00</td>
<td>1.00</td>
<td>.62</td>
</tr>
<tr>
<td>D</td>
<td>14.00</td>
<td>5.60</td>
<td>.81</td>
</tr>
<tr>
<td>E</td>
<td>12.80</td>
<td>5.17</td>
<td>.90</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

Table 16

**Abigail’s PCL Number of Symptoms Scores Across Phases**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>PEM-T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>Total</td>
<td>12.00</td>
<td>3.50</td>
<td>.72</td>
</tr>
<tr>
<td>B</td>
<td>1.80</td>
<td>1.79</td>
<td>.50</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>0.00</td>
<td>.00</td>
</tr>
<tr>
<td>D</td>
<td>4.60</td>
<td>1.14</td>
<td>.69</td>
</tr>
<tr>
<td>E</td>
<td>3.80</td>
<td>1.30</td>
<td>.72</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement. PEM-T = Percentage of Data Exceeding the Median Trend. $R^2$ = Trend.

**Discussion**

The purpose of this study was to examine the effectiveness of Relational Equine-Partnered Counseling (REPC) on the reduction of posttraumatic stress disorder (PTSD) severity.
and symptoms. The results indicated that participation in the study (including assessments and REPC) was beneficial for all participants as all experienced mean improvements in each area. However, regarding the benefits of REPC specifically, the results across participants were mixed. For Sam, the results indicated that the addition of REPC yielded greater benefits than continued assessments alone in multiple areas. The other participants responded to REPC with mixed results.

**REPC and Intrusion (Cluster B)**

In REPC, veterans can target intrusion symptoms through interaction with the horse. As horses are able to perceive human internal experiences, they may respond differently to clients experiencing different emotional states (Chamove, Crawley-Hartrick, & Stafford, 2002; Hama et al., 1996). This feedback can help the veteran gain awareness into his or her own emotional and physiological responses to the reminders of traumatic events. By engaging in stress inoculation activities with the horse such as intentional stroking, muscle relaxation, horse-human matched breathing, veterans can experience improvements in intrusion symptoms.

In this study, REPC may have been beneficial in reducing distress related to intrusion symptoms as Sam, David, and Abigail all experienced decreased means during the intervention phase. However, the results regarding effectiveness across participants were mixed. The PEM-T effect size indicated that REPC was ineffective in reducing Cluster B distress for Sam and Matt across severity and symptoms according to both assessments. For David, the PEM-T effect size indicated that REPC was questionably effective in reducing Cluster B symptoms according to the CAPS. Results indicated that REPC was ineffective in reducing Cluster B severity according to the CAPS and PCL-5 and was ineffective in reducing Cluster B symptoms according to the PCL-5. For Abigail, results indicated that REPC was highly effective in reducing Cluster B severity.
and symptoms according to the CAPS but was ineffective in reducing severity and symptoms according to the PCL-5. The weakness of the effect sizes for the other participants was likely due to baseline trends that may have made it difficult to determine the effectiveness of REPC as separate from the benefits of participating in continued weekly assessments. Abigail experienced greater rates of improvement regarding Cluster B symptoms according to the CAPS across the intervention phase than across the baseline phase. Sam and David both experienced increased Cluster B distress as evidenced by higher means during the post-intervention phase. Matt experienced increased Cluster B distress as evidenced by an upward trend across Cluster B severity and symptoms post-intervention phases. Matt’s scores reflected worsening of intrusion symptoms after termination of REPC. However, it is difficult to separate impact of termination of REPC from Matt’s reported increase in overall stress regarding entry into a residential PTSD program on the worsening of intrusion symptoms.

Participants reported the most improvements in symptoms related to unwanted memories, nightmares, emotional distress, and physiological reactions based on their responses to CAPS interview questions. Some of the participants reported the strongest improvements in physiological reactions. Sam’s reported improvements in physiological reactions were especially pronounced once beginning REPC, which he attributed to being with the horse, based on his CAPS interview responses.

REPC and Avoidance (Cluster C)

In the present study, the participants addressed avoidance symptoms through participation in the study. Due to the nature of the CAPS as a structured interview, the participants answered questions regarding the severity and frequency of each of his or her PTSD symptoms. Therefore, the participants engaged in activity that elicited specific thoughts and
feelings about traumatic events while completing the interview. As REPC does not require clients to disclose or retell traumatic experiences during the session, not all of the participants chose to discuss traumatic events while with the horse during every session. However, when certain participants did chose to talk about traumatic events during the REPC session, the presence of the horse may have produced a calming effect enabling the participant to feel safer when processing such events.

In this study, REPC may have been beneficial in reducing distress related to avoidance severity and symptoms as all four of the participants experienced decreased means during the intervention phase. All participants experienced greater rates of improvement in some areas of Cluster C once REPC was added based on their responses during CAPS interviews. Regarding PEM-T effect sizes, the results were mixed across participants. For Sam, results indicated that REPC was moderately effective in reducing Cluster C symptoms according to the CAPS. However, the intervention was ineffective in reducing Cluster C severity according to both assessments and Cluster C symptoms according to the PCL-5. For David, the results indicated that REPC was highly effective in reducing Cluster C severity and symptoms according to the CAPS and ineffective in reducing Cluster C severity and symptoms according to the PCL-5. For Matt, results indicated that REPC was ineffective in reducing Cluster C across both constructs according to both assessments. Finally, Abigail’s results indicated that REPC was ineffective to questionably effective in reducing Cluster C severity according to the CAPS. Results indicated that REPC was ineffective in reducing Cluster C symptoms according to both assessments and Cluster C severity according to the PCL-5. Sam, David, and Matt all experienced greater rates of improvement during the intervention than during the baseline phase regarding Cluster C severity. Sam and David also experienced greater rates of improvement regarding Cluster C symptoms.
during the intervention phase. Matt and David experienced worsening of Cluster C severity once REPC was terminated as evidenced by higher post-intervention means and a positive trend across the post-intervention phase. David experienced a positive trend regarding Cluster C symptoms across the post-intervention phase and Matt experienced higher Cluster C symptom means during the post-intervention phase. Therefore, it is possible that the removal of the horse or termination of time spent in the pasture had a negative impact on distress related to avoidance.

Regarding avoidance of thoughts and feelings, only David and Matt chose to address specific traumatic events during sessions. During the week 12 CAPS interview, David reported that spending time with the horse helped him to not “suppress” his feelings as much. Matt processed trauma related to distrust of other military personnel by observing how the horses in the herd interacted with each other during the REPC session of week 8. Sam, David, and Matt also reported improvements in avoidance of external reminders during CAPS interviews.

**REPC and Negative Alterations in Cognitions and Mood (Cluster D)**

Through interaction with horses, veterans can target negative alterations in cognitions and mood. As many people feel more comfortable trusting an animal than trusting another person, the participants had the opportunity to engage in relationships that may have felt safer to them than human relationships (Chandler, 2012). Through interaction with the horses, such as stroking the horse and finding humor in the horses’ behaviors and interactions with each other, veterans can experience positive feelings and physiological benefits (Chandler, 2012; Odendaal, 2000).

In this study, REPC may have been beneficial in reducing distress related to negative alterations in cognitions and mood as all four of the participants experienced decreased means for both severity and symptoms during the intervention phase. Results regarding effectiveness using the PEM-T effect size were mixed across participants. For Sam, results according to the
CAPS indicated that REPC was highly effective and moderately effective in reducing Cluster D severity and symptoms, respectively. However, results according to the PCL-5 indicated that REPC was ineffective in reducing Cluster D severity and symptoms. For David, results indicated that REPC was ineffective in reducing Cluster D severity and symptoms according to both assessments. For Matt, results indicated that REPC was questionably effective in reducing Cluster D symptoms according to the CAPS and ineffective in reducing Cluster D symptoms according to the PCL-5. Matt’s results indicated that REPC was ineffective in reducing Cluster D severity according to both assessments. Abigail’s results indicated that REPC was moderately effective in reducing Cluster D severity according to the CAPS and ineffective in reducing Cluster D severity according to the PCL-5. Results indicated that REPC was ineffective in reducing Cluster D symptoms according to both assessments. Sam and Abigail both experienced greater rates of improvement for Cluster D severity during the intervention phase. Sam also experienced a greater rate of improvement during the intervention phase for Cluster D symptoms. Matt experienced a worsening Cluster D severity and symptoms during the post-intervention phase as evidenced by increased means. Sam experienced worsening of Cluster D distress during the post-intervention phase as evidenced by an upward trend for both severity and symptoms. Anecdotally, David reported the greatest improvement in Cluster D distress, as he believed that REPC had made a difference in reducing his depression and he felt better than he had felt in years.

REPC appeared to be most beneficial in reducing distress due to strong negative feelings, detachment, disinterest, and difficulty experiencing positive feelings. David reported during his final REPC session that he believed REPC to be extremely beneficial in reducing his “depression”. The benefits associated with detachment were the strongest as all participants
reported a common of feeling trust towards and from their chosen horse during the CAPS interviews and REPC sessions. The participants also all reported feeling understood and accepted by the horse during the REPC sessions.

**REPC and Alterations in Arousal and Reactivity (Cluster E)**

By engaging in REPC, veterans can target alterations in arousal and reactivity. As horses are prey animals, they are highly attuned to their environment, enabling them to perceive different levels of arousal in the humans in their environment (Chamove et al., 2002; Irwin, 2005). For this reason, horses are likely to respond to humans who are experiencing increased arousal or reactivity. The immediate feedback provided by the horse provides the veteran with an opportunity to recognize and process one’s current state and level of arousal.

In this study, REPC may have been beneficial in reducing distress related to alterations in arousal and reactivity as all four of the participants experienced decreased means for both severity and symptoms during the intervention phase. For Sam, results indicated that REPC was highly effective in reducing Cluster E symptoms according to the CAPS but ineffective in reducing Cluster E symptoms according to the PCL-5. Results indicated that REPC was ineffective in reducing Cluster E severity according to both assessments. For David, Matt, and Abigail, results indicated that REPC was ineffective in reducing distress related to Cluster E severity and symptoms according to both assessments. For Sam, the benefits were especially pronounced as he experienced greater rates of improvement during the intervention than during the baseline phase for both severity and symptoms. Furthermore, Sam experienced worsening of both severity and symptoms once REPC was terminated as evidenced by a positive trend across the post-intervention phases. Matt experienced an increased rate of improvement across the intervention phase for Cluster E severity but not symptoms. David experienced a worsening of
distress related to Cluster E as evidenced by increased means in the post-intervention phase as compared to the intervention phase.

The benefits from REPC were most pronounced for symptoms related to irritable and aggressive behavior, hypervigilance, and sleep problems. During the REPC session of week 8, David reported experiencing benefits with regards to hypervigilance as the experience of being with the horse enabled him to feel safe and less guarded. Matt reported that his observation of how the horses interacted in the environment enabled him to integrate these observations into his own experiences and feel less guarded during his week 8 REPC session.

**Clinical Implications**

In the present study, one clinical implication is that the participants perceived interaction with the horses to be beneficial to them based on statements made during the CAPS interview and during REPC sessions. Some participants reported specific symptom benefits due to this interaction during the CAPS interview or during REPC sessions. For example, Sam reported that he perceived a close, trusting relationship with the horse during his second REPC session. David reported that the horse was “softening” him and increasing his interest in interacting with people during his week 12 REPC session. Matt reported that he believed that the horse trusted him during his week 7 REPC session. Abigail reported feeling safe with the horse during her week 6 REPC session.

A second implication is that REPC may be beneficial in reducing severity and symptoms following a triggering event. During the course of the study, a number of the participants experienced events that triggered an increase in severity and symptoms. However, the severity and symptoms decreased fairly rapidly with continued REPC. For example, Sam experienced increased scores during weeks 11-12 and weeks 18-19 based on CAPS and PCL-5 scores across
both Total and several of the clusters. Based on notes taken during Sam’s CAPS interview, these increases may have been influenced by outside events. During weeks 18 and 19, Sam frequently reported on stress related to having to deliver layoff news to other employees and fear of workplace violence as retaliation. David experienced increased symptoms during week 13 and weeks 19-20. During David’s week 13 CAPS interview, he reported on attending a funeral that had influenced him “feeling down.” Sam and David’s recoveries from these incidents may be indicative of REPC’s effectiveness in helping to bring scores back down after a triggering event.

In addition, statements made by the participants during the CAPS interviews and REPC sessions may be indicative of high motivation to attend REPC sessions. In the first CAPS interview, Sam reported disinterest in most activities but an interest in attending equine assisted counseling. David reported that the “brightest day of the week is coming here” during his week 20 CAPS interview.

A final clinical implication pertains to the participants’ regression following termination of REPC. Most participants experienced some regression following termination. For example, Sam experienced regression as evidenced by increasing scores on the CAPS and PCL-5 during the post-intervention period. Sam also reported worsening of symptoms during his CAPS interviews during the post-intervention phase. Abigail’s scores increased following her three-week break from REPC as evidenced by scores on the CAPS interviews. Matt’s and David’s scores increased in some areas on the assessments during the post-intervention phase.

**Limitations of the Design**

The limitations of the study included limitations regarding threats to both internal and external validity of the design. Regarding internal validity, one of the largest limitations of the study was the presence of the baseline phase trend towards the therapeutic side prior to
beginning the intervention. Another potential explanation for the participants’ improvement was the effect of outside concurrent therapies. At the start of the study, all of the participants were currently engaged in concurrent psychotherapy based on their reports during screening. Although Sam, David, and Matt all reported dropping out of other concurrent therapies during the study, it is difficult to discern the impact that these therapies may have had on the results of the study. In addition, all participants reported taking medication at the start of and throughout the duration of the study.

My subjective observer bias may have influenced the accuracy of the data interpretation during the visual analysis process in single case design. This bias was also present in determining the accuracy of the data collection as the scoring of the CAPS ratings was based on my clinical judgment and my role as researcher and counselor may have interfered with data collection. However, it should be noted that this bias may have been somewhat mitigated by the fact that my rating based on the CAPS typically indicated higher severity and higher number of symptoms than the participants’ own ratings of themselves according to the PCL-5.

Furthermore, there are other threats to internal validity associated with the accuracy of the participants’ PTSD scores. Due to the repeated assessment, participants may have experienced testing bias. As I administered both the assessments and the intervention, the participants’ therapeutic relationship with me may have influenced them responding more favorably during the assessments. In addition, some of the participants may have intentionally minimized their symptoms based on internalized stigmas about PTSD.

For some participants, the scores reflected on the CAPS and PCL-5 often did not match. As the PCL-5 is a self-report measure that explores how “bothered” an individual is by his or her PTSD symptoms, the participant’s perception of symptoms may have been very different than
my evaluation of their symptoms during the CAPS based on clinical judgment in examining overall severity. As both assessments were designed to meet new DSM-5 criteria, researchers have not yet published psychometrics on the reliability or validity of either assessment.

Regarding the effect size, the current lack of researcher agreement concerning acceptable effect size calculations presented a limitation in determining the true effect of the intervention. Furthermore, the PEM-T effect size method has several limitations associated with its use (Wolery et al., 2010). First, researchers have found that the PEM-T does not always discriminate well between charts with and without changes in data patterns (Wolery et al., 2010). Potential extreme outliers in the baseline phase likely influenced the split middle line and may steepen the trend in the therapeutic direction (Rakap, 2015). In addition, the number of data points in the intervention phase may have influenced the percent of overlap. Finally, the method may have been more representative of the change in magnitude between the baseline and intervention phases rather than the change in magnitude of the effect specifically.

Regarding external validity, the limited sample size decreased the ability to generalize the results of this study to veterans of other war eras and other civilian populations. In addition, the current sample was a convenience sample and therefore participants who chose to engage in the study may possess inherent biases that differentiate them from other veterans with PTSD. Attrition through the dropout of the one female participant further decreases the ability to generalize the results. Finally, the use of a new, previously untested model, REPC, limits the generalizability of these results to other forms of equine assisted counseling and other forms of equine assisted therapies and activities.
Implications for Future Research

The current study is only one of a few studies that have examined the relationship between equine assisted therapies and activities and military veterans. As there are no other published studies examining the effectiveness of any type of equine assisted therapy in treating military veterans, this study can serve as a foundation for other studies in this area. Future researchers can use the results of this study as a jumping off point in further exploring the relationship between equine assisted therapies and improvement in military veteran health concerns. Regarding equine assisted counseling and PTSD specifically, there are several recommendations for future research in light of the results of this study.

First, researchers should design a study that can isolate the effect of equine assisted counseling from the effect of the assessments. The most powerful method to accomplish this goal would be the use of a randomized clinical trial that would not require ongoing assessment during the baseline or intervention phases in order to minimize benefits attained through assessment or meeting with a mental health professional prior to the start of the intervention. Using a large sample size, the researcher could compare the participants receiving equine assisted counseling to a wait-list control group or to a group receiving an established treatment for PTSD such as prolonged exposure, cognitive processing therapy, or EMDR. To make the study stronger, only participants who are not receiving any concurrent therapies for PTSD would be included.

A second direction for future research is to examine the mechanism through which the relationship with the horse enables participants to experience increased motivation and improvements in the PTSD symptoms. As the mechanisms for how interaction with animals can promote healing from trauma is still largely theoretical, studies focusing on participants’
perceptions of the benefits could shed some light on better understanding the value of the interaction with the horse. Researchers may explore participants’ experiences of motivation and improvement through a constructive, qualitative study.

Some participants experienced regression or worsening of symptoms in certain areas following termination of REPC. A future research could examine this regression in comparison to regression in other trauma-focused therapies.

**Conclusion**

The purpose of this study was to examine the effectiveness of REPC in reducing PTSD severity and symptoms in military veterans. I examined this effectiveness across total PTSD distress and individual PTSD cluster distress. Although the results showed some small measure of effectiveness for some of the participants, as a general matter, this study did not prove the effectiveness of REPC. However, a great deal was learned in this study. I learned that most participants perceived themselves to be improving at a greater rate than I perceived them to be improving based on differences in PTSD scores between my assessment of them according to the CAPS and their assessment of themselves according to the PCL-5. I also learned that the participants perceived their relationship with the horse to be an important contributor to their improvement as evidenced by the participants’ statements made during the CAPS interviews and REPC sessions. Furthermore, there is some evidence from statements made by participants that would indicate higher motivation to attend REPC sessions. Most importantly, I identified future directions for continued research to further attempt to establish the effectiveness of REPC.
References


Sheade, H., Box, L., & Knox, B. (2012). *The power of equine assisted psychotherapy in working with military veterans.* Presentation presented at the annual meeting of the Texas Counseling Association, Galveston, TX.


CHAPTER TWO:

EXTENDED LITERATURE REVIEW
EXTENDED LITERATURE REVIEW

In this section, I will discuss in greater detail the nature of PTSD, the prevalence of PTSD in the military veteran population, comorbidities and dual diagnoses, co-occurring medical conditions, effects of PTSD, treatments for PTSD, and barriers to treatment. Following this review, I will discuss equine assisted counseling (EAC) including an overview of human-animal social connectedness, the history of equine-assisted activities and therapies (EAAT), and research in EAAT. Finally, I will end this section with a discussion of the applicability of EAC in working with military veterans and the utility of Relational Equine-Partnered Counseling in treating PTSD in veterans.

Posttraumatic Stress Disorder (PTSD)

According to the Institute of Medicine (2012), posttraumatic stress disorder is one of the “signature injuries” of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) (p. xiii). Researchers and historians have documented examples of symptoms resembling PTSD in civilians and soldiers for over one hundred years (Institute of Medicine, 2012). Beginning with the Civil War, doctors diagnosed soldiers with symptoms resembling PTSD with a variety of conditions including exhaustion, excessive emotionality, and soldier’s heart. During this time period, the soldiers’ mental health received little attention in lieu of a focus on preventing additional war fatalities due to disease, infection, and injury. In World War I and World War II, doctors continued to observe PTSD-like symptoms such as tremors, difficulty sleeping, memory problems, and difficulty with concentration in veterans. These veterans received diagnoses of shellshock, neurotic disorders, battle fatigue, and “old sergeant syndrome” which professionals now believe to be delayed onset of PTSD (Institute of Medicine, 2012; Tanelian et al., 2008). The conflict in Vietnam was a turning point in military veteran mental health. Due to concerns
regarding the alarmingly high number of troops returning with “combat fatigue” and subsequent impairment in readjusting to civilian life, veteran mental health began to receive attention from the medical community. The National Vietnam Veterans Readjustment Survey clearly demonstrated the high incidence of PTSD and increased awareness of PTSD as a mental health disorder (Institute of Medicine, 2012).

The American Psychiatric Association’s (2013) Diagnostic and Statistical Manual of Mental Disorders-fifth edition (DSM-5) delineated criteria for meeting the diagnosis of PTSD. These criteria are endorsed by both the Veterans Administration (VA) and the Department of Defense (DoD) and utilized in assessment and diagnosis of PTSD (Institute of Medicine, 2012).

In order to qualify for a diagnosis of PTSD according to the American Psychiatric Association (2013), individuals must meet the following criteria: (a) exposure to a traumatic event, (b) one or more intrusion symptoms of reexperiencing the trauma, (c) one or more symptoms of avoidance of trauma-related stimuli, (d) two or more symptoms of negative alterations in cognitions and mood that began or worsened after the traumatic event, (e) two or more symptoms related to alterations in arousal and reactivity following the trauma, (f) symptoms duration lasting more than one month, (g) clinically significant distress or impairment, and (h) the disturbance is not related to medication, substance use, or other illness. The individual must have had direct exposure to, witnessed, been indirectly involved in, or had repeated or indirect exposure to trauma related to death, threat of death, actual or threatened serious injury, or actual or threatened sexual violence (American Psychological Association, 2013). Intrusion symptoms are associated with behavioral symptoms related to: (a) “recurrent, involuntary, and intrusive memories”, (b) “traumatic nightmares”, (c) “dissociative reactions”, (d) “intense or prolonged exposure to traumatic reminders”, and (e) “marked physiologic reactivity after exposure to
trauma-related stimuli” (American Psychological Association, 2013, p. 271). Avoidance symptoms are associated with symptoms related to avoidance of trauma-related stimuli including: (a) “trauma-related thoughts or feelings” and (b) “trauma-related external reminders “ (American Psychiatric Association, 2013, p. 271). Symptoms of negative alterations in cognitions and mood include: (a) “inability to recall key features of traumatic event”, (b) “persistent and negative beliefs about oneself or the world”, (c) “persistent distorted blame or self or others for causing traumatic event or consequences following event”, (d) “markedly diminished interest in activities significant prior to trauma” (e) “feelings of alienation”, and (f) “constricted affect” (American Psychiatric Association, 2013, p. 271-272). Arousal and reactivity symptoms include (a) “irritable or aggressive behavior”, (b) “self-destructive or reckless behavior”, (c) “hypervigilance”, (d) “exaggerated startle response”, (e) “problems in concentration”, and (f) “sleep disturbance” (American Psychological Association, 2013, p. 272).

It is important to note that PTSD differs from conditions such as acute stress reaction (ASR) and combat operational stress reaction (COSR) that may present similarly to PTSD in service-members (Tanelian et al., 2008). ASR is defined as a “severe, but transient disorder that develops in an individual in response to exceptional physical and mental stress” (Tanelian et al., 2008, p. 12). Symptoms of ASR usually remit within three days. COSR is defined as “any response to battle stress that renders a soldier (service-member) transiently unable to remain on duty” (Tanelian et al., 2008, p. 12). This reaction is transient and usually managed in the theater. Furthermore, psychotherapy and pharmacotherapy are not necessary for ASR or COSR.

Researchers have discussed neurobiological explanations for PTSD as developing after a form of stress (such as military combat) resulting from an individual’s experience of unpredictable and uncontrollable environmental conditions in which one is not able to respond
adequately (Institute of Medicine, 2012). They discussed the role of the hypothalamic-pituitary-adrenal (HPA) axis in mediating the PTSD response. As this neuroendocrine system is triggered by a stressful or traumatic event, it releases stress hormones such as cortisol. Upon the release of these hormones, fear conditioning and memory responses are activated in the limbic system and prefrontal cortex. Adaptive responses such as energy mobilization, hypervigilance, and increased memory functioning take place. In individuals with PTSD, researchers have hypothesized these responses become chronic and cannot be turned off (Institute of Medicine, 2012). This theory paralleled findings in animal models of conditioned fear responses. In individuals with PTSD, however, the conditioned response cannot be extinguished in the absence of an active intervention such as counseling (Institute of Medicine, 2012). Due to the dysregulation of the HPA axis, researchers have found individuals with PTSD to have abnormally high or abnormally low levels of cortisol (Bergen-Cico, Possemato, & Pigeon, 2014). Levels of cortisol are likely to vary based on individual cognitive appraisal and subjective response to trauma and other stressors (Bergen-Cico et al., 2014).

A traumatic experience may also alter the functioning of an individual’s brain (Van der Kolk, 2014). During a traumatic experience, the left hemisphere of the brain may shut down. This event can lead to lasting changes in brain functioning, such as decreased functioning in Broca’s area, influencing many trauma survivors’ experiences of difficulty in putting their experiences into words. Furthermore, the right hemisphere of the brain may have difficulty in discerning that the trauma happened in the past, influencing one’s experience of feeling that the trauma is happening again in the present when exposed to traumatic stimuli (Van der Kolk, 2014). This change may also be reflected in changes in the individual’s amygdala and medial prefrontal cortex (MPFC). Van der Kolk (2014) advocated the need for “top down” and “bottom
up” regulation strategies to treat PTSD based on these changes in the brain and overall functioning (Van der Kolk, 2014, p. 63). Activities, such as mindfulness and yoga, may assist in improving the functioning of the MPFC (top down), enabling the individual to be more aware of bodily responses to PTSD. Bottom up strategies included activities related to “breathing, movement, or touch” to target changes in the autonomic nervous system (Van der Kolk, 2014, p. 64).

Prevalence of PTSD in the Military Population

In the general population, the lifetime prevalence of PTSD in American adults is approximately 7.3% (Roberts, Gilman, Breslau, Breslau, & Koenen, 2011). The current PTSD prevalence in veterans aged 21 to 59 years is approximately 8% (Hoge & Warner, 2014). The estimated lifetime prevalence of PTSD in Vietnam veterans is 30.9% for men and 26.9% for women (Kulka et al., 1990). Kang, Natelson, Mahan, Lee, and Murphy (2003) estimated the prevalence of PTSD in Gulf War veterans to be 10.1%. Among the troops returning from Iraq and Afghanistan, approximately 5-30% return with PTSD (Hoge & Warner, 2014). However, the Institute of Medicine (2012) indicated that many rates are likely an underestimate of the true prevalence of PTSD. Furthermore, more than one third of recent veterans return with diagnoses of PTSD, major depression, and/or probable traumatic brain injury (TBI). In an examination of 60,000 Operation Iraqi Freedom and Operation Enduring Freedom era veterans (both deployed and non-deployed) Dursa, Reinhard, Barth, & Schneidermann (2014) found the population prevalence of PTSD to be 13.5%. Deployed veterans reported a PTSD prevalence rate of 15.8%, whereas non-deployed veterans reported a PTSD prevalence rate of 10.9%. Dursa et al. (2014) discussed how the sponsorship of their study may have increased veterans’ willingness to endorse PTSD symptoms at higher rates than studies that included active duty participants. The
highest rates of PTSD are found in service-members who are enlisted, reservist or National Guard, as well as individuals who have been deployed, are injured, and/or have a prior history of trauma (Schell & Marshall, 2008). Veterans who deployed to Iraq were more likely to experience PTSD due to the increased amount of combat in the Operation Iraqi Freedom theater than in the Operation Enduring Freedom (Afghanistan) theater (Ramchand et al., 2008). In comparing branches of service, Marine Corps and Army veterans demonstrated the highest prevalence rates of PTSD at 20.6% and 18.6%, respectively (Dursa et al., 2014). Although researchers have found conflicting evidence regarding the effect of gender on PTSD risk, women appear to have a moderately higher risk than men (Crum-Cianflone & Jacobson, 2014; Dursa et al., 2014; Institute of Medicine, 2012; Schell & Marshall, 2008).

Regarding Vietnam veterans, distress related to PTSD continues to manifest as a chronic problem within the Vietnam veteran population (Hermes, Fontana, & Rosenheck, 2015). These veterans account for the majority of veterans who seek care for PTSD through the VA (Hermes, Hoff, & Rosenheck, 2014). The rate of Vietnam veterans seeking treatment for PTSD has risen steadily over the past ten years with an increase of almost 10% per year (Hermes et al., 2014). Many Vietnam veterans experienced a delayed onset of symptoms of approximately five to six years after post-deployment. Other veterans did not become aware that their distress was the manifestation of PTSD symptoms until much later in their lives (Hermes et al., 2015). Veterans with untreated PTSD may experience a higher number of negative life events (Hermes et al., 2015). Increases in both new diagnoses of PTSD for existing patients and new patients seeking care may influence this increase of veterans seeking care (Hermes et al., 2014).

Tanelian et al. (2008) discussed unique characteristics of the current conflicts that may account for current increases in rates of PTSD in returning veterans. In Global War on Terrorism
(GWOT) veterans, there is an extremely high rate of invisible wounds as individuals who may not have survived previous wars are surviving due to improvements in equipment and medical technology. Many of these individuals return with traumatic injuries such as TBI and amputations. The rate of injured to killed is the highest of any war. In addition, the conflicts in Afghanistan and Iraq are unique as they mark the first time that an all-volunteer force has fought an extended conflict (Sollinger, Fisher, & Metscher, 2008). Additional stress has been placed on these troops as they are more likely to experience multiple deployments and shortened non-deployment periods (Sollinger et al., 2008). Within the current operational theater, troops have faced many of the same stressors as veterans of the Gulf War including potential exposure to biological and chemical weapons, lack of knowledge of enemy troops, harsh climate, family separation, and stressful living quarters (Institute of Medicine, 2012). GWOT troops also face additional stressors unique to the current wars such as insurgent attacks in the form of suicide and car bombs, improvised explosive devices (IEDs), sniper fire, and rocket-propelled grenades (Institute of Medicine, 2012). These stressors take an additional psychological toll as many occur in civilian areas, making it difficult to distinguish insurgents from civilians.

Tanelian et al. (2008) described several risk factors for PTSD in the operational theater. The most common stressors include exposure to roadside bombs, IEDs, suicide bombers, handling of human remains, killing an enemy, seeing fellow comrades killed or injured, feeling helpless to stop the violence, being taken captive or being tortured, and experiencing sexual assault or harassment (Institute of Medicine, 2012; Tanelian et al., 2008). The development of PTSD can also be influenced by factors such sex, age, ethnicity, sexual orientation, educational attainment, intelligence quotient, genes, income, childhood behavioral problems, and family history of psychiatric disorders (Institute of Medicine, 2012). In contrast, the Institute of
Medicine (2012) cited strong leadership, unit cohesion, and adequate training as protective factors against the development of PTSD.

**Comorbidity and Dual Diagnoses**

According to Karney, Ramchand, Osilla, Caldarone, and Burns (2008), at least 79% of individuals with PTSD are diagnosed with comorbid conditions, with as many as 50% receiving at least three comorbid diagnoses. Furthermore, the greater the severity of PTSD symptoms, the increased likelihood of comorbid disorders (Marshall et al., 2001). Conditions such as depression, alcohol use, and high-risk behaviors have a particularly high rate of comorbidity as they are found in at least 50% of veterans diagnosed with PTSD (Institute of Medicine, 2012).

According to Schell and Marshall (2008), PTSD and major depression co-occur in two thirds of veterans diagnosed with PTSD. Along with major depression, the heightened risk of suicide has become a major concern in the military veteran population. In 2012, more veterans died from suicide than from combat (Burns, 2013). Although this sample included both deployed and non-deployed veterans, the experience of PTSD increases veterans’ risk of suicide. According to the Jakupcak et al. (2009), veterans presenting at the VA for PTSD are four times more likely than other veterans to report suicidal ideation. Furthermore, Jakupcak et al. (2009) reported that this rate increased to over five times more likely with additional comorbid conditions. In the general population, a diagnosis of PTSD is also related to increased likelihood of suicide attempts (Oquendo et al., 2003). Guerra and Calhoun (2011) found that some veterans with PTSD may also experience suicidal ideation in the absence of major depression disorder. In a qualitative study on risk factors for suicide in military veterans, Brenner et al. (2008) found several emergent themes that parallel the symptoms and risk factors for PTSD. Risk factors included increased combat exposure, feeling of being burdensome to friends, family, and society,
and feelings of not belonging. Combat-related guilt may play a significant role in an increased risk for suicide (Hendin & Haas, 1991). Veterans who experience comorbid depression may experience higher rates of specific PTSD symptoms such as avoidance, detachment, and sleep problems (Holowka, Marx, Kaloupek, & Keane, 2012).

Another comorbid condition that has a high rate of prevalence is PTSD and probable TBI. Tanelian et al. (2008) described how TBI has become an area of increasing concern due to IEDs and the difficulty in diagnosing TBI. TBI and PTSD often present with overlapping symptoms, such as decreased consciousness and problems with memory and concentration. Karney et al. (2008) described high rates of occurrence between TBI and PTSD with at least one third of veterans diagnosed with TBI also meeting the criteria for PTSD. Veterans who have both TBI and PTSD experience greatly impaired functioning in comparison to individuals with only one diagnosis (Institute of Medicine, 2012). Furthermore, veterans with TBI are more likely to also receive diagnoses of PTSD, major depression, and/or substance abuse disorder.

McDevitt-Murphy et al. (2010) documented a significant relationship between PTSD and substance use disorder, specifically hazardous drinking. In a sample of OEF/OIF veterans presenting for mental health services, 39.1% met the criteria for PTSD with 15.9% meeting the criteria for PTSD and hazardous drinking. In veterans presenting for care at the VA, Jakupcak et al. (2010) found that veterans presenting with PTSD were twice as likely to report alcohol misuse. Furthermore, a significant relationship exists between the PTSD symptom cluster of avoidance and numbing and alcohol misuse (Jakupcak et al., 2010). Vietnam veterans diagnosed with PTSD tend to use alcohol, marijuana, heroin, and benzodiazepines in order to decrease symptoms of hyperarousal (Bremner, Southwick, Darnell, & Charney, 1996). Stimulants such as
cocaine were reported to make symptoms worse and thus found to not be utilized with the same frequency.

Corrigan and Cole (2008) described a model for the co-occurrence of PTSD and substance use disorders based on the self-medication hypothesis. As veterans with PTSD experience symptoms related to hyperarousal, they often engage in avoidance and numbing to cope. These veterans also experienced increased sleep problems (Holowka et al., 2012). Through the use of alcohol and other drugs, individuals with PTSD seek to minimize anxiety, increase focus and concentration, avoid traumatic memories and negative thoughts, and increase feelings of being numb. Chilcoat and Breslau’s results (1998) support the self-medication hypothesis in explaining the relationship between PTSD and substance use disorders in a general population sample of young adults.

**Co-Occurring Medical Conditions**

Overall, veterans with PTSD are more likely to experience poorer physical health and seek health care services with a higher frequency than veterans without PTSD (Karney et al., 2008). Nazarian, Kimerling, and Frayne (2012) found that veterans with PTSD experienced higher rates of a variety of co-occurring medical conditions than veterans with substance abuse disorders. Among the health problems that veterans may experience, chronic pain is one of the most debilitating concerns (Institute of Medicine, 2012). Veterans who have both PTSD and have sustained a traumatic injury are most likely to experience chronic pain and receive a poorer prognosis.

Veterans with PTSD also experience higher rates of cardiovascular disease, obesity, and overall mortality (Karney et al., 2008). An association exists between a higher risk for arteriosclerosis and combat-related PTSD in a sample of Croatian veterans (Solter, Thaller,
Karlovic, & Crnkovic, 2002). Furthermore, rates of obesity are much higher among veterans with PTSD than both the general population and veterans without PTSD (Vieweg, et al., 2006). Overall, veterans with PTSD have a higher level of mortality than veterans without PTSD and increased likelihood of death due to unnatural causes (Boscarino, 2006). Finally, veterans with PTSD are less likely to engage in self-care behaviors and more likely to engage in behaviors that compromise health including smoking, risky sexual behavior, lack of exercise, and poor eating (Beckham et al., 1997; Buckley, Mozley, Bedard, Dewulf, & Greif, 2004; Karney et al., 2008).

**Effects of PTSD**

Effects of PTSD affect not only the veteran, but also the veteran’s significant others and society at large. Many veterans with PTSD experience an overall poorer quality of life and less social support (Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012). For some veterans, occupational and social impairments can influence homelessness, unemployment, risky behaviors, and incarceration. According to the Institute of Medicine (2012), 52% of homeless veterans have mental health or substance use disorders. For veterans of the GWOT conflicts, unemployment rates are high due to both physical and psychological disabilities. Veterans with more severe symptoms of PTSD have difficulty attaining and maintaining jobs (Institute of Medicine, 2012). Veterans with PTSD may also engage in high-risk behaviors including alcohol misuse, gambling, and dangerous driving. Intensity of combat is often related to the propensity to engage in these behaviors (Institute of Medicine, 2012). More specifically, experiences related to violent combat, witnessing human trauma, and killing are more likely to predict aggression, hazardous drinking, and other risky behaviors. The Institute of Medicine (2012) described the results of several studies in which the authors had indicated the presence of excessive gambling in individuals experiencing symptoms of PTSD and other anxiety disorders. The engagement in
many of these risky behaviors places veterans with PTSD at a heightened risk for incarceration and legal problems (Institute of Medicine, 2012). The Institute of Medicine described the results of several studies that indicated combat experience and exposure to human trauma were most likely to influence risky behavior and later incarceration. Saxon et al. (2001) found that 39% of veterans had PTSD in a sample of incarcerated veterans. Furthermore, the veterans diagnosed with PTSD also reported more trauma, legal difficulties, and extensive history of drug use than veterans without PTSD.

Veterans with PTSD often experience difficulties in their significant relationships including divorce, intimate partner violence, and child maltreatment. Both veterans of GWOT and Vietnam experience higher rates of divorce than the general population (Institute of Medicine, 2012). In a sample of National Guard veterans who had been deployed to Iraq, Erbes, Meis, Polusny, Compton, and Wadsworth (2012) found that PTSD in veterans predicted lower partner-reported relational adjustment over time. In a phenomenological study on the impact of PTSD on family relationships in military families, Ray and Vanstone (2009) found two emergent themes: numbing and avoidance have a negative impact on relationships and withdrawal from the family impeded healing from trauma. Erbes et al.’ (2012) findings corroborated these results as the PTSD symptom cluster of avoidance and numbing was found to be related to poor relational adjustment. Renshaw and Caska (2012) supported this finding in their study of two veteran samples in which partners reported increased relationship distress in response to veterans’ PTSD symptoms related to avoidance and numbing. Finally, Ahmadi, Azampoor-Afshar, Karami, & Mokhtari (2011) found an association between secondary trauma in spouses and PTSD in veterans. The longer the duration of PTSD symptoms in the veteran, the increased risk for secondary trauma in the spouse.
The Institute of Medicine (2012) described the results of several studies in which the authors indicated an increasing rate of intimate partner violence (IPV). In interviewing Vietnam veterans, researchers found that the families of the veterans with PTSD experienced more overall violence in the home perpetrated by both the veteran and partner or significant other (Jordan et al., 1992). Miller et al. (2013) found that intimate relationships were characterized by more hostility and psychological abuse in veterans with PTSD than in veterans without PTSD. Veterans with PTSD experience heightened rates of anger, hostility, and aggression than veterans without PTSD (Jakupcak et al., 2007). Veterans who experienced co-occurring PTSD and alcohol misuse are more likely to engage in violence and physical aggression (Elbogen et al., 2014). Taft, Street, Marshall, Dowdall, & Riggs (2007) found a significant relationship between symptoms of PTSD and abuse in intimate relationships in Vietnam veterans. Furthermore, Taft et al. (2007) noted that higher levels of PTSD were strongly correlated with trait anger and may be the pathway through which PTSD can lead to partner violence. Feelings of shame, guilt, depression, and PTSD are also related to IPV (Hundt & Holohan, 2012). For PTSD alone, shame plays a significant role in mediating IPV. Finley, Baker, Pugh, and Peterson (2010) noted the implication of PTSD symptoms related to increased arousal in perpetuating IPV.

Regarding child maltreatment, Jordan et al. (1992) found that children of veterans with PTSD are more likely to demonstrate behavioral problems than children of veterans without PTSD. Galovski and Lyons (2004) found in a review of literature that PTSD in veterans was related not only child behavioral problems, but also to academic difficulties, self-doubt, distress, and poor social skills. In examining the father-child relationships in a sample of Vietnam veterans, the PTSD symptom cluster related to avoidance and numbing influenced the veteran fathers’ lack of desire to interact with their children and perceptions of a poorer quality of the
parent-child relationship (Ruscio, Weathers, King, & King, 2002). Increasing deployment periods may also be related to increased child neglect and maltreatment (Institute of Medicine, 2012).

**Treatments for PTSD**

The Institute of Medicine (2012) described three categories of treatments for PTSD in military veterans: (a) treatments with efficacy established through randomized controlled trials (RCTs), (b) treatments studied in open trials, and (c) emerging treatments. The majority of treatments with efficacy that have been established through RCTs fall in the cognitive therapy family of interventions. These interventions include exposure therapies, cognitive therapies, and eye movement desensitization and reprocessing (EMDR).

Exposure therapy is frequently the first line of treatment for PTSD in the VA and DoD healthcare systems (Institute of Medicine, 2012). The purpose of this form of therapy is to reduce symptoms of PTSD through the confrontation of trauma-related memories, feelings, and stimuli. This form of therapy may be delivered through imaginal exposure, in vivo exposure, or prolonged exposure. Prolonged exposure in particular has been demonstrated to be effective for PTSD in military veterans (Institute of Medicine, 2012; Schnurr et al., 2007). Prolonged exposure may also be faster and more effective than EMDR and relaxation training in reducing symptoms of PTSD and result in greater number of participants no longer meeting criteria for PTSD after treatment (Taylor et al., 2003). Although not endorsed as evidence-based therapy, virtual reality exposure therapy was effective in a case study in clinically significant improvement of PTSD (Geradi, Rothbaum, Kessler, Heekin, & Rizzo, 2008).

In cognitive therapy, clinicians work on assisting clients to identify and change negative automatic thoughts related to traumatic events. These negative thoughts may include feelings of
shame and guilt, feelings of inadequacy, and worrying about the future (Institute of Medicine, 2012). In cognitive processing therapy (CPT), clinicians incorporate aspects of both cognitive therapy and prolonged exposure. In this approach, clinicians utilize a manualized approach consisting of four components believed to facilitate reduction of PTSD symptoms: (a) education related to PTSD and nature of CPT, (b) increasing client awareness of thoughts and feelings, (c) development of skills to challenge negative thoughts, and (d) increasing insight into understanding the effect of traumatic events on belief systems (Institute of Medicine, 2012). Researchers have demonstrated the effectiveness of CPT in treating PTSD in military veterans in RCTs (Institute of Medicine, 2012; Monson et al., 2006).

The third treatment that the VA and DoD recommended is eye movement rapid desensitization or EMDR (Institute of Medicine, 2012). In this intervention, clinicians facilitate the assessment and processing of traumatic events. In accordance with a manualized approach, clinicians facilitate the client recall of traumatic events, sensory experiences, and negative thoughts while tracking the clinician’s hand moving in front of the client’s face until the association between the trauma and client’s negative feelings, thoughts, and experiences are gone (Institute of Medicine, 2012). Although several studies have cited the effectiveness of EMDR in reducing the symptoms of PTSD, this intervention has not been found to be as effective as exposure therapies such as prolonged exposure (Institute of Medicine, 2012).

Some researchers have expressed concerns about the use of evidence-based practice (EBP) in treating veterans (Holt & Beutler, 2014). More specifically, researchers have expressed concerns regarding the two most commonly administered interventions: prolonged exposure and cognitive processing therapy. Steenkamp and Litz (2014) stated that, although evidence may indicate that these interventions may reduce symptoms, they may not “work well” or work better.
than other non-trauma-focused therapies (Steenkamp & Litz, 2014, p. 706). Concerns regarding the use of these practices include the mechanistic nature of EBPs due to the fact that many clients may require adjustment of the practice. Holt and Beutler (2014) recommended that the VA become more flexible in allowing clinicians to find treatments best suited to meet individual needs and incorporate client feedback in making appropriate modifications.

Other therapies, such as imagery rehearsal therapy, psychodynamic psychotherapy hypnosis, relaxation training, interpersonal therapy, skills training in affect regulation and interpersonal regulation, and behavior activation have demonstrated mixed results of effectiveness and efficacy (Institute of Medicine, 2012). Although stress inoculation training has demonstrated effectiveness in reducing the symptoms of PTSD, researchers have hypothesized that the intervention’s success is due to the inclusion of an exposure component, rather than the intervention as a whole (Institute of Medicine, 2012). There are several therapies that have demonstrated success in open trials, but have not been recognized as evidence-based practice or recommended as a first line of treatment. These interventions include virtual reality exposure therapy, acceptance and commitment therapy (ACT), metacognitive therapy, and trauma management therapy (Institute of Medicine, 2012). Of these therapies, ACT has received increasing attention by the VA and is currently under review for the treatment of chronic PTSD. Finally, all current PTSD treatment guidelines in the VA and DoD recommended the use of pharmacotherapy (especially antidepressants) in the treatment of PTSD (Institute of Medicine, 2012). Unfortunately, results supporting the effectiveness of pharmacotherapy are mixed, and many researchers have opposing views on the use of these drugs in the treatment of PTSD (Institute of Medicine, 2012). More specifically, although drugs such as Prozac may benefit some individual with PTSD, this treatment had no effect on reducing PTSD for combat veterans
(Van der Kolk, 2014. Furthermore, the results of most pharmacological studies have shown that veterans with PTSD benefit little if at all from pharmacotherapy (Van der Kolk, 2014).

Emerging therapies, or interventions which do not have demonstrated effectiveness in RCTs or open trials, are becoming increasingly utilized in both the VA and the private sector. For this reason, the Institute of Medicine (2012) investigated the research on these therapies at the request of Congress. These emerging therapies include treatments without a substantial evidence base such as couple and family interventions and complementary and alternative medicine (CAM). CAM or “treatments not considered to be standard to the current practice of Western medicine” is one such approach under investigator (Strauss & Lang, 2012, p. 1). Many elements of CAM approaches are congruent with the treatment goals for cognitive-behavioral trauma-focused approaches to regulate arousal such as breathing regulation, mindfulness, and muscle relaxation (Strauss & Lang, 2012). Due to the broad appeal and increasing usage of CAM treatments, the VA has begun exploring the effectiveness of these treatments and has called for empirical research to examine their efficacy.

The Institute of Medicine (2012) reviewed several CAM treatments including yoga, contemplative approaches, emotional freedom technique, thought freedom technique, neurofeedback, art therapy, Eastern medicine, herbal and dietary supplements, homeopathy, and animal assisted therapy (AAT). The most utilized CAM approaches have been yoga, meditation and mindfulness, neurofeedback, and AAT. Due to the psychosomatic impact of PTSD (as evidenced by HPA dysregulation), Bergen-Cico et al. (2014) recommended the use of holistic approaches that address both mind and body.

Mindfulness is one of the most studied CAM approaches in reducing distress related to PTSD. Bergen-Cico et al. (2014) examined the effect of a brief mindfulness program on cortisol
levels in GWOT veterans with PTSD. The researchers found that participants experienced significant positive changes in cortisol levels after completing the treatment, indicating improved HPA functioning. By engaging in mindfulness, individuals are better able to respond to stressful experiences and gain awareness of emotions, enabling one to self-regulate (Bergen-Cico et al., 2014). Other researchers have also documented the benefits of mindfulness in reducing distress related to PTSD through Mantram Repetition Practice (MRP) (Bormann, Oman, Walter, & Johnson, 2014). In this form of mindfulness, individuals silently repeat a mantram or sacred word or phrase. After participating in MRP, veterans with PTSD experienced improvements in depression, PTSD, and psychological well being.

In 1986, the U.S. Army Surgeon General called for increased research into AAT and appointed an advisor to examine the human-animal bond (Institute of Medicine, 2012). Since these changes, AAT has been implemented in both the VA and the DoD. Today, AAT primarily takes place in the form of volunteer animal assisted activities at Veteran Centers and the training of service dogs to assist with the management of PTSD (Institute of Medicine, 2012). The Institute of Medicine (2012) cited the growing popularity of equine-assisted activities and therapies (EAAT) such as therapeutic riding, hippotherapy, and equine-facilitated psychotherapy (EFP), but noted the limited research demonstrating the effectiveness of therapeutic interventions with horses. As much of EAAT takes place outside, this intervention is unique in comparison to other forms of therapy. Based on the results of her study, Erickson (2011) suggested that conducting therapy outdoors may promote positive mental health in veterans with PTSD.

Veterans experiencing comorbid disorders with PTSD, such as depression, TBI, and substance use disorders, may receive concurrent treatment for both conditions (Institute of Medicine, 2012). Some comorbid conditions, such as depression, anger, guilt, and anxiety, can
benefit from treatments such as prolonged exposure (Foa, 2011). Presently, there are limited guidelines for best practice in treating comorbid PTSD and TBI. The VA is currently reviewing literature and developing recommendations for best practice (Institute of Medicine, 2012). Based on Bremner’s and colleague’s theory of the self-medication hypothesis connecting PTSD and substance abuse disorders, they recommended concurrent treatment of both disorders. However, Hruska and Delahanty (2013) encouraged clinicians to address PTSD prior to substance use disorders as this course of treatment can increase the effectiveness of later treatment for substance use disorders based on the tension-reduction hypothesis.

Despite the evidence supporting the effectiveness and efficacy of treatments such as prolonged exposure and CPT, there are limitations to these forms of therapy. Scurfield (2013) described a limitation of cognitive-behavioral therapies as being their emphasis on a narrow, rigid approach to therapy. According to Scurfield (2013), these therapies often dismiss factors unique to veterans and military-related trauma. Furthermore, many veterans dislike the rigidity of such approaches and do not seek treatment. Many who do seek treatment drop out prematurely. Approximately 50% of veterans needing mental health services either do not seek services or drop out prematurely (Scurfield, 2013). In a study examining the effectiveness of trauma-focused group therapy (TFGT) (which incorporated exposure therapy components) versus a present-centered group therapy (PCGT), Schnurr et al. (2003) found that TFGT had a higher dropout rate than PCGT. As the PCGT group appears to have a stronger relational component than the TFGT, it is possible that veterans felt safer and more secure in this group. Scurfield (2013) also suggested that CBT treatments may often be insufficient for veterans experiencing PTSD compounded with feelings of shame or guilt and too overwhelming for others with severe symptoms of PTSD.
Barriers to Treatment

As previously stated, the Institute of Medicine (2012) noted its belief that the current prevalence rates for PTSD are underestimates of true rates of PTSD within the veteran population. Burnam et al. (2008) described both gaps in access to services and in the quality of services available. One of the primary factors influencing gaps in access to services is underreporting of PTSD by veterans. Within the military culture, veterans are trained to be strong, tough, and able to take care of themselves in order to take care of others (Burnam et al., 2008). Therefore, many veterans avoid reporting of symptoms for fear that reporting PTSD will make them appear weak or inadequate. Veterans who experience anticipated enacted stigma (AES), or who believe that others’ responses will be hostile or discriminatory, are less likely to seek support for PTSD (Blais, Renshaw, & Jakupcak, 2014). Other stigmas against seeking mental health care include negative beliefs and attitudes about mental health care in general, assumptions that the care will be ineffective, and desires to not take medication (Burnam et al., 2008). Other veterans fear negative consequences on their military careers as the military mental health systems are not confidential and superiors may have access to their records. Still, other veterans avoid reporting PTSD symptoms at post-deployment screenings in order to avoid delays in their return trip home (Burnam et al., 2008).

Other barriers to access include a limited availability of military clinicians and general mistrust of civilian clinicians. Many veterans struggle in readjustment to postwar life and fear that a civilian clinician will not have an understanding of military culture, will be unable to help them, and may judge them (Burnam et al., 2008; Sheade et al., 2012). Additionally, many veterans experience difficulty accessing military health care and long wait times for services (Burnam et al., 2008). In a more recent study, Hoge et al. (2014a) found that only 41% of
soldiers returning from Afghanistan who were diagnosed with PTSD received care within 90 days. In another sample, only 48% of infantry who had been diagnosed with PTSD had received treatment in the past six months (Hoge et al., 2014a). Sareen et al. (2007) documented that many veterans who do receive care reported that they received less therapy than they needed. In Hoge et al.’s (2014a) sample, the median number of therapy visits was four. In a study conducted in 2008, Cully et al. reported that the majority of veterans seeking services received less than eight sessions. Furthermore, almost all of the veterans experienced a large delay between the time of PTSD diagnosis and first session.

Within the last few years, the VA has made the treatment of PTSD a priority for veterans as the organization has greatly increased funding for services and added more military providers and purchased care providers (Institute of Medicine, 2012). However, only 50% of veterans who meet the criteria for PTSD receive services. The Institute of Medicine (2012) cited continuing barriers for treatment on the part of the client including employment concerns, negative beliefs about mental health care, lack of knowledge on mental health resources, financial concerns, and logistical problems such as transportation to facilities to receive services (Institute of Medicine, 2012).

As Burnam et al. (2008) described, there are also gaps in quality of care for PTSD. There is currently a lack of high quality, evidence-based care to meet the needs of this growing population. Despite the increases in funding to train and hire practitioners, many clinicians lack training and time to receive training, and struggle to find adequate locations to provide treatment (Institute of Medicine, 2012). Moreover, many evidence-based practices are not implemented in accordance with best practice guidelines due to full caseloads, treatment settings, and time restrictions (Institute of Medicine, 2012).
A final barrier to care is the potential for veterans to drop out of treatment. Overall, approximately 24% of service-members may drop out of treatment (Hoge et al., 2014a). In randomized clinical trials to treat PTSD, only 40% of participants recover from PTSD due to these dropout rates. Service-members who drop out of treatment cited a variety of reasons including the belief that they can handle their problems on their own, work schedules, lack of time with the mental health professional, stigma around mental health issues, the belief the treatment is not working, concerns about confidentiality, and discomfort with the mental health professional (Hoge et al., 2014a). Discomfort with the mental health professional emerged as one of the strongest reasons for drop out with two thirds of soldiers surveyed reporting that they did not believe the mental health professional to be “suitably caring, communicative, or competent” (Hoge et al., 2014a, p. 1002). Hoge et al. (2014a) emphasized the need for mental health professionals to address engagement in therapy, build the therapeutic relationship, and identify retention strategies to be key elements in minimizing dropout.

**Relational Equine-Partnered Counseling**

As a number of returning veterans from past and current conflicts are continuing to seek mental health services, clinicians have developed many forms of therapy to meet their needs. Equine-assisted mental health interventions are one such form of therapy that clinicians are beginning to use to meet the demand of military veterans. Equine assisted counseling (EAC) is one of the fastest growing forms of animal assisted therapy (AAT) and is well poised to meet the mental health needs of veterans. In order to gain a deeper understanding of this particular intervention, one must first explore the history of human-animal social connectedness.
Human-Animal Social Connectedness

At its core, the field of AAT is based on the uniqueness of the human-animal bond (Fine & Beck, 2010). The human-animal bond is a well-documented phenomenon that has been witnessed since the beginnings of domestication (Turner, 2007). The relationship between humans and domesticated animals, such as dogs and cats, has been documented in ancient Egypt and early Greek and Roman empires (Walsh, 2009). These animals were treated with great respect as they served multiple roles as hunters, herders, guards, healers, and companions. Horses have a special place in ancient mythology of the Celts, Greeks, Indo-Europeans, Iberians, Berbers, and Asians and continue to be the subject of classical and popular literature (Frewin & Gardiner, 2005). Groups such as the Native Americans and Mongolians are well known for having had and continuing to have very strong human-horse relationships (Robinson, 2006).

The horse-human relationship was documented as early as 4000 B.C.E. in the Ukraine in the skeletal remains of a horse who appeared to have worn a bit (Hallberg, 2008). However, other historians place the origins of the horse-human relationship later either in the Botai people of Kazakhstan in 1500 B.C.E. or in finding burial of a horse and chariot remains from 2000 B.C.E. (Hallberg, 2008). Horses have played an integral role in human cultural evolution, by facilitating changes in travel, trade, warfare, language, and communication (Hallberg, 2008). There are numerous spiritual and religious references to the power of horses in Christianity, Greek mythology, Hinduism, and Celtic spiritual traditions (Hallberg, 2008).

Throughout history, many ancient and spiritual cultures have viewed animals as having spiritual and healing powers. Animals often hold a special place in hunter and forager societies through the form of animal spirits and associated healing, such as the Ojibwa tribe who saw animals as guarding spirits or manito (Serpell, 2010). Other cultures, such as the Inuit people,
have seen animals as extremely powerful in determining individual and community fate. These beliefs are still in existence in the indigenous Mayan culture (Serpell, 2010). Ancient cultures, such as Greece and Egypt, used animals as representations of Gods. Animals serving as these representations were often associated with having healing powers. In modern times, people have continued to include animals into various forms of animal assisted therapy (Serpell, 2010).

Within the field of mental health, Boris Levinson was the first to formally incorporate animals into therapy based on their power to form positive relationships, thus creating healing connections (Serpell, 2010).

Within the realm of equine assisted therapies, the Greeks were the first to have a documented healing tradition with horses (Chandler, 2012). Since the 17th century, horses have been formally utilized to heal both physical and psychological ills (Chandler, 2012). When Lis Hartel took home a medal in the equestrian competition in the 1952 Helsinki Olympics, despite being paralyzed below the knees, the therapeutic abilities of horses became formally recognized (Hallberg, 2008).

A variety of organizations arose in the 1960’s to utilize horses’ therapeutic abilities through riding. The Community Association for Riding for the Disabled (CARD) and the Cheff Center both provided treatment to individuals with physical disabilities by using the movement of the horse (Chandler, 2012). The North American Riding for the Handicapped (now the Professional Association of Therapeutic Horsemanship (PATH) International) was formed in 1969 to promote and develop the field of therapeutic horseback riding (Hallberg, 2008). Other organizations developed animal assisted activities and therapies in order to further promote and develop programs related the healing powers of horses and other animals such as Green Chimney’s Farm and Pet Partners (Chandler, 2012). Regarding equine assisted mental health,
PATH developed a special subsection called the Equine-Facilitated Mental Health Association (EFHMA) in 1996 that was integrated into PATH in 2010. Finally, the Equine Assisted Growth and Learning Association (EAGALA) was founded in 1999 by Greg Kersten and Lynn Thomas in order to promote and develop a model of practice for equine assisted psychotherapy and equine assisted learning (Hallberg, 2008).

Today, the human-animal relationship is most evident in people’s relationships with dogs, cats, horses, and other companion animals. Brown (2002) explained that keeping pets is a universal phenomenon spanning across cultures. Humans and their companion animals often form such strong bonds of love and friendship, that these relationships are comparable to those of a parent and child or husband and wife (Fine & Beck, 2010). Oftentimes, people find it easier to bond with animals than other humans (McNicolas & Collis, 2000). Odendaal and Meintjes (2003) offered support for the strength of this relationship in their findings on the positive changes in biological emotional health of both humans and animals through interaction. Through interaction with animals, humans experiences increases in oxytocin and decreases in cortisol pressure, and therefore have much to gain from interacting with animals (Odendaal, 2000; Odendaal & Meintjes, 2003). These interactions are mutually beneficial as the animals experience similar physiological benefits and both species are receiving the attention and social support that they are seeking.

Researchers have suggested numerous benefits of animal assisted therapy in working with a broad range of clients (Chandler, 2012; Lancia, 2008). Some of these benefits include, but are not limited to, facilitating and augmenting the counseling process, improved relationships and social skills, self-confidence, feelings of self-worth, and decreased impairment due to psychiatric disorders such as depression (Chandler, 2012). Other researchers have documented
numerous physiological benefits to the inclusion of animals in calming and reducing arousal, thus reducing anxiety (Chandler, 2012). In the veteran population, animal assisted therapy can also help in facilitating increased awareness of oneself and increase one’s ability to self-regulate (Carlsson, Ranta, Traeen, 2014; MacLean, 2011; Sheade et al., 2012).

Within the counseling process, the therapeutic relationship plays a major role in the likelihood of a positive outcome (Ackerman & Hilsenroth, 2003; Lambert & Barley, 2001). Although the client may form a strong therapeutic relationship with an individual counselor, having a therapy animal may magnify the positive effects obtained through the relationship as the client forms a relationship with the therapy animal as well. In examining the therapeutic relationship, Rogers (1957) stated that the core components of the therapeutic relationship should include genuineness, unconditional positive regard, and empathy. As therapy animals, horses are able to embody many aspects of the therapeutic relationship between a human counselor and client by being nonjudgmental and offering unconditional positive regard (Vidrine, Owen-Smith, & Faulkner, 2002). Through this relationship, animals can offer social support and also act as a buffer to stress, thus decreasing clients’ anxiety and facilitating the relationship with human counselor and client (Fine & Beck, 2010).

**History of Equine-Assisted Activities and Therapies**

Multiple proponents of animal assisted therapy have recognized equine assisted psychotherapy as a valid form of treatment for mental health concerns (Chandler, 2012; Delta Society, 2003; Equine Assisted Growth and Learning Association, 2010; NARHA, 2010). The two most prominent organizations specific to the inclusion of equines in therapy are the Professional Association of Therapeutic Horsemanship International (PATH) and the Equine Assisted Growth and Learning Association (EAGALA). Although these two groups both
promote the inclusion of equines in therapeutic interventions, their approaches and definitions of the therapy are very different. Both PATH and EAGALA’s counseling interventions require the involvement of a licensed mental health professional, but differ in their treatment modalities. EAGALA places emphasis on groundwork as the sole medium for experiential work with equines and includes a manual for treatment, whereas PATH permits the usage of all equine-assisted activities, including riding, driving, and vaulting, and allows the professional to determine the form of treatment. Unlike other models, PATH does not have manualized treatment approach but only a set of standards to promote ethical and safe practice.

Within the EAGALA model, certified mental health professionals work in teams with a certified equine specialist. Through this partnership, both the emotional and physical safety needs of both client and equine are met. In addition, the EAGALA model does not promote horsemanship, but instead enables clients the opportunity to gain experiential awareness about both oneself and others through activities designed to target the client’s presenting concern. By not focusing on horsemanship, the client is able to create one’s own meaning and assign one’s own attributions to the experience. The client’s reality is created through interaction with the horse and one’s experience through the activities. The model is focused only on groundwork in order to allow the horse and client’s interactions to be free and uninhibited by mechanisms to control or overpower the horse as in riding. Finally, the model is solution-oriented and allows the client to process experiences and frustrations in the here-and-now and practice new ways of being, thinking, feeling, and interacting (EAGALA, 2009). Although the EAGALA model has many benefits, in my opinion, informed by my clinical experiences, the EAGALA model has some limitations in its application. The model’s theoretical underpinnings may make it difficult to integrate other counseling theories into the model while still maintaining fidelity to the
EAGALA model. In addition, the model’s limited range of acceptable verbal responses to be used by the counselor may limit the freedom of the counselor to make adjustments in its administration to tailor the model to meet individual client needs.

**Research in EAAT**

The results of numerous research studies related to the inclusion of equines in therapeutic settings have demonstrated the benefits of partnering with equines to help individuals with mental health-related disabilities. Qualitative and quantitative studies regarding impacts of therapeutic horseback riding have shown improvements related to decreased anger and increased self-esteem, personal responsibility, self-concept, social skills, attention and behavioral problems, and decreased anger in children and adults in both quantitative and qualitative studies (Burgon, 2003; Kaiser, Spence, Lavergne, & Bosche, 2004; Kendall et al., 2015; Miller & Alston, 2004). The results of case studies in group work related to equine assisted interventions has been shown to facilitate trust, responsibility, peer and sibling relationships, and empathy in children with a variety of psychological disorders (Vidrine et al., 2002). Researchers have also found experiential groundwork in groups using the EAGALA model to promote multiple social, emotional, and behavioral improvements in a quasi-experimental study with at-risk children and adolescents, as well as adolescents with emotional disorders (Tetreault, 2006; Trotter, Chandler, Goodwin-Bond, & Casey, 2008). Regarding trauma research, equine assisted psychotherapy was found to increase global assessment of functioning scores in children exposed to family violence and to promote relaxation and behavioral self modulation in girls who had been sexually abused (Schultz, Remick-Barlow, & Robbins, 2007, Vidrine et al., 2002). Furthermore, Yorke, Adams, and Coady (2008) discussed the power of horse-human bond in promoting healing from trauma. Utilizing equines specifically in the treatment of eating disorders has also been suggested to
improve confidence, self-efficacy, self-concept, communication skills, trust, perspective, assertiveness, boundary awareness, creative freedom, spirituality, and reduce anxiety in ways that traditional talk therapy is unable to do (Christian, 2003; Marx & Cumella, 2003). Russell-Martin (2006) also showed equine-facilitated psychotherapy to aid in relational adjustment in couples. Finally, Glazer, Clark, and Stein (2004) found equine-assisted therapy to aid in the communication, self-confidence, and self-esteem in grieving children. Although the results of many of these studies indicated that equine assisted therapies show promise, the research designs are not rigorous enough to conclusively indicate effectiveness (Kendall et al., 2015). Kendall et al. (2015) recommended the use of controlled experimental designs but acknowledged that quasi-experimental studies may be used in addressing challenges related to participant randomization, small sample sizes, attrition, and measurement difficulties. Furthermore, Kendall et al. (2015) recommended studies featuring longer, more intensive interventions that are facilitated by mental health professionals.

Veterans and EAC

Regarding military veterans’ mental health needs, EAC can provide care options outside the VA and DoD. EAC is consistent with approaches for the treatment of the mental health needs of veterans that are focused on developing increased awareness, promoting applicability to real world experiences, and facilitating the development of new skills (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). In addition, EAC can help veterans increase self-awareness and self-regulation through mindfulness interventions that may be incorporated into this modality (Brenner et al., 2008; Carlsson et al., 2014, Sheade, 2013). The relational nature of EAC provides veterans the opportunity to work on interpersonal skills and relationships as recommended by Brenner et al. (2008). This approach is insight-oriented and can help veterans
to build resilience, self-efficacy, and work through traumatic events (Benda, 2001; Carlsson et al., 2014).

Through the relationship with the horse, veterans have the opportunity to form a safe relationship to confront their trauma and learn to manage their PTSD. Horses respond to humans based on physical contact, proximity, and even a person’s attitude and confidence level (Chamove, Crawley-Hartrick, & Stafford, 2002). As horses are capable of distinguishing and responding to different attitudes in people, they are able to provide valuable feedback to clients (Chamove et al., 2002; Hama, Yogo, & Matsuyama, 1996). Many veterans with PTSD struggle to accept social support due to experiences inherent to the disorder such as avoidance and detachment (Brancu et al., 2014). As many horses will show friendly behavior towards an unfamiliar human, a veteran may feel accepted by a horse and more willing to engage with the horse (Hausberger & Muller, 2002). Furthermore, as many people perceive horses to be more genuine than humans, veterans may find it easier to accept social support from a horse, enabling them to begin to address traumatic experiences in a safe environment (Carlsson et al., 2014; Irwin, 2005). Through interactions with horses, veterans have the opportunity to gain increased awareness into their own emotional experiences based on horse’s feedback through movement or mirroring of the veteran’s emotions. In this relationship, veterans may feel safer and more motivated to take risks to communicate with the horse, thereby increasing their emotional awareness and ability to self-regulate (Carlsson et al., 2014).

Horses can alter the dynamics of the overall therapeutic process by increasing clients’ motivation to participate in session, enabling clients to receive nurturing and genuine acceptance (Abrams, 2013; Chandler, 2012). For clients who have experienced trauma and are experiencing PTSD, the inclusion of a therapy animal may encourage clients to participate in and complete
treatment (Lefkowitz, Prout, Bleiberg, Paharia, & Debiak, 2005). The presence of an animal has been suggested to increase the client’s sense of emotional safety by decreasing client anxiety, increasing openness, and helping the client to express feelings (Chandler, 2012). As many veterans struggle to feel comfortable with mental health professionals, this presence can also facilitate the building of rapport between client and counselor as the client learns to trust the counselor through witnessing the interactions between counselor and therapy animal (Chandler, 2012; Hoge et al., 2014a). Furthermore, the presence of the horse can facilitate a more authentic relationship between client and counselor as each must be aware of one’s owns emotions and experiences, enabling the client to experience more trust and openness in the therapeutic relationship (Carlsson et al., 2014).

By observing the client’s interactions with the therapy animal, the counselor can gain valuable information regarding the client’s emotional state, attitude, and relational style and ability (Chandler, 2012). Furthermore, the horse’s response to the client can enable that counselor to gather valuable information about the client and in determining the course of the session (Abrams, 2013). The counselor may also reflect to the client the nature of the relationship between client and therapy animal to facilitate increased awareness and insight in the client (Fine et al., 2010). As animals are able to help in building the relationship between client and counselor, the veteran may feel safer by being able to witness counselor’s credibility through observation of the counselor-therapy animal relationship (Lefkowitz et al., 2005).

In addition, veterans can more easily relate to horses in ways in which they may have difficulties relating to people as a result of combat experience or experience in the military. Like horses, many veterans function in a fight-or-flight prey animal mentality similarly to horses. The hypervigilance and alertness associated with PTSD is a unique aspect of many veterans’
experiences in which they can relate to horses (Sheade et al., 2012). Additionally, veterans can relate to horses’ hierarchical organization within the herd and the experience of being an individual part of a larger group collaborating towards a common goal. In this way, veterans can form relationships with horses through a similar worldview. The experience of working with such a large animal can often enable individuals who believe that they have nothing left to fear to feel both intimidated and subsequently empowered through work with such a large animal (Sheade et al., 2012).

In a quasi-experimental study on the efficacy of a peer education group treatment, Kaczynski, Rosenheck, and Resnick (2009) found empowerment and confidence to play a key role in recovery from mental illness in veterans. Similarly, one can expect that increases in experiencing these same characteristics will also benefit the veteran in EAC. Because the development of empowerment and confidence is intrinsic to the interactions with the horse and developing the relationship, one can expect positive benefits from this intervention for mental health. As many veterans fear stigmatization and judgment for experiencing PTSD or for the actions they have taken while deployed, the experience of being with an accepting and nonjudgmental animal provides the opportunity for the veteran to feel free to form a genuine relationship (Blais et al., 2014; Chandler, 2012; Sheade et al., 2012).

As many veterans experience difficulty in connecting with other people and forming close relationships, veterans can benefit from forming relationships with a horse and learning to generalize new relational skills to significant others (MacLean, 2011; Perlman et al., 2010). The horse’s response to the veteran’s nonverbal body language can increase the client’s awareness of physiological and psychological experiences (Sheade et al., 2012). Through interaction with the horse, the veteran has the opportunity to engage in a mutually supportive relationship (Birke &
Hockenhull, 2015). Relational aspects inherent in human-human relationships, such as trust, confidence, cooperation, listening, paying attention, and relaxation, are also evident in horse-human relationships. The development of the human-horse relationship over time can enable the veteran to develop the emotional awareness and communication skills necessary to form a satisfying relationship that the veteran can later generalize to human relationships (Birke & Hockenhull, 2015; Sheade et al., 2012). Veterans can then begin to recognize communication patterns and interactions with people and can practice new social and relational skills with the horse. This intervention is congruent with researchers’ recommendations for interventions that specifically target veterans’ interpersonal domains focusing on coping skills and manageable goals, and deemphasizing the pathology of the presenting concerns (Perlman et al., 2010).

Odendaal (2000) found that through interactions with animals, people experienced increases in hormones such as oxytocin, which promotes health and social enhancement, and deceases in stress hormones such as cortisol. Other researchers have found animals to be helpful in decreasing anxiety. In a controlled experiment, Shiloh, Sorek, & Terkel (2003) found that petting an animal reduced state-anxiety. Should simply petting an animal lower a veteran’s anxiety, the client will be better able to engage in the process of therapy and also be able to learn to self-regulate when thinking about one’s traumatic experiences. In other quantitative studies, Barker, Knisely, McCain, Schubert, and Pandurangi (2010) found that owners interacting with their own dogs experienced less stress and task-related anxiety. Within families, Allen (1996) found the presence of a pet to moderate cardiovascular reactivity during stressful interactions between spouses. In children, researchers have found the presence of and interaction with therapy animals to decrease children’s perception of pain, increase positive feelings, and increase feelings of comfort (Sobo, Eng, & Kassity-Krich, 2006; Wu, Niedra, Pendergast, & McCrindle,
Furthermore, Kaminski, Pellino, and Wish (2002) found that children experienced more positive affect and happier mood when receiving play therapy or pet visitation, but that these benefits were higher in the children receiving pet visitation. Regarding horses specifically, Hama, Yogo, and Matsuyama (1996) found that both human and horse heart rate decreased after the human had stroked the horse for 90 seconds. Lefkowitz et al. (2005) reported anecdotal evidence that clients whose PTSD has been resistant to treatment may feel less anxious in the presence of a therapy animal.

**Relational Equine-Partnered Counseling**

Relational equine-partnered counseling (REPC) is an integrative, trans-theoretical approach, incorporating aspects of humanistic counseling with a focus on working within the relationship between participant and horse(s). The approach is developmental as the activities for each session are informed by progress made in the previous session and guided by the nature of the client’s relationship with the horse(s) over time. REPC is a counseling approach facilitated by a counselor with the addition of horse(s) and an equine specialist. This approach has four domains: (a) experiential, (b) relational, (c) physiological, and (d) spiritual.

The experiential domain refers to the belief that growth occurs through the client’s ability to experience the relationship with the horse(s) with emphasis placed on the client’s autonomy in creating meaning from the experience and on the sensory experience of PTSD and in interaction with the horse (DeMayo, 2009; Mandrell, 2006). The relational domain refers to the importance of the client-horse relationship as an integral agent of change. In therapeutic contact, horses inherently possess unconditional positive regard, congruency, and empathy (Rogers, 1957; Sheade et al., 2012). Regarding the physiological domain, the model is rooted in interpersonal neurobiology (Hamilton, 2011; Olmert, 2009; Panksepp, 1998). Within the client-horse
relationship, the client and horse both may experience hormonal changes in interaction such as increases in oxytocin and decreases in stress hormones such as cortisol (Odendaal, 2000). The counselor will also provide psychoeducation on the nature of the physiological aspects of PTSD and facilitate interventions intended to facilitate the veteran’s increased ability to self-regulate anxiety responses. Finally, the model has a spiritual domain in accounting for aspects of the relationship between the horse and client that cannot be accounted for by behavioral or physiological explanations (DeMayo, 2009; Kohanov, 2001; McCormick, McCormick, & McCormick, 2004; Sheldrake, 1999). The facilitation of mindfulness and meditative practices while in relationship with the horse can facilitate increased awareness and regulation (Irwin, 2005; Kohanov, 2001). Furthermore, the horse’s ability to detect emotions and incongruence in the client allow for the animal to provide regulatory feedback to the client. Finally, the spiritual domain is also influenced by biophilia or humans’ innate affinity for nature and the experience of calmness and tranquility that people experience by being in nature and interacting with animals (DeMayo, 2009; Kellert & Wilson, 1993). Through the relationship with the horse(s), veterans will engage in activities intended to develop relational skills, increase self-regulation and decrease arousal, facilitate the development of creativity and problem-solving skills, and increase feelings of confidence and self-efficacy.

Within this model, the counselor believes in the client’s tendency to seek to build positive and nurturing relationships that facilitate movement towards growth and healing from trauma (Sheade, 2013). Through the relationship with the horse, the client is afforded the opportunity to create a new pattern for relationships and experience the security necessary to process and heal from trauma. Through this model, the counselor views each client as a unique individual and focuses not only on deployment-related trauma, but also on the client’s entire life history. This
broad focus enables the counselor to address historical psychological trauma that may be influencing the manifestation of PTSD (Dursa et al., 2014). The client proceeds through this growth first by the formation of a safe relationship with the treatment team, followed by activities designed to facilitate increased understanding and awareness of one’s own internal state and the development of empathy towards others.

Activities may be used to target specific goals during the counseling session such as (a) relationship-building, (b) nurturing, (c) mastery and challenge, (d) self-regulation, stress inoculation, and mindfulness, and (e) creativity and free expression. These activities may include choosing a horse, haltering the horse, leading the horse, grooming the horse, being with the horse, moving the horse, bathing the horse, and stress inoculation or relaxation activities. Verbal responses from the treatment team include (a) tracking the client’s work with the horse, (b) reflecting the client’s feelings, (c) facilitating increased autonomy and decision-making, (d) utilizing immediacy, (e) providing psychoeducation pertaining to the nature of PTSD, (f) using encouragement and esteem-building responses, (g) reflecting on the relationship between horse and client, (h) reflecting the horse’s behaviors, (i) reflecting the horse’s potential feelings and intentions, (j) expanding the meaning to outside the counseling session, and (k) facilitating relaxation and mindfulness techniques in partnership with the horse to provide feedback. More information on the REPC model can be found in Appendix A.

REPC can be used in targeting trauma specifically in accordance with Van der Kolk’s (2014) recommendation for targeting the limbic system in healing from trauma. Van der Kolk (2014) emphasized focusing on six areas: (a) management of hyperarousal, (b) mindfulness, (c) relationships with others, (d) rhythms and synchrony, (e) touch, and (f) taking action. Interaction with horses can enable veterans to address all of these areas. Regarding management of arousal,
engagement with horses can enable veterans to have a safe place to engage in bottom up regulation strategies through breathing exercises. Furthermore, as the presence of the horse may decrease state anxiety, veterans may be better able to maintain a state of physical relaxation while in the contact with the horse while confronting traumatic stimuli. Veterans may also engage in specific mindfulness activities with the horse and can integrate the horse’s feedback to promote increased self and body awareness. Through relationships with others, veterans can experience the contact and attunement necessary to assist in developing increased self-regulation (Van der Kolk, 2014). As horses are naturally empathic, congruent, and able to offer unconditional positive regard, veterans can experience a relationship in which they can feel safe and not fear being judged for their experiences while deployed. A veteran may feel much safer in therapy with the presence of the horse than just a therapist alone (Chandler, 2012). Regarding rhythms and synchrony, the movement of horses through hands-on interaction or simply observation of horses’ movements can be healing and therapeutic, enabling a veteran to engage with their own bodies and become more attuned to others and the environment (Van der Kolk, 2014; Vidrine et al., 2002). Interaction with horses can also target the need for people to manage distress through touch. Veterans are able to reconnect with their own bodies through activities that involve touching the horse such as stroking or brushing. Through these activities, the veteran may determine the nature of the touch such as level of pressure or speed, enabling them to feel safe as they begin to relax and release tension (Hama et al., 1996; Odendaal, 2000). Finally, the veteran may find ways to “take action” through interacting with horses (Van der Kolk, 2014, p. 219). Unlike Van der Kolk’s specific example based in sensorimotor psychotherapy, veterans in REPC may not need to recall specific aspects of the trauma while taking action, but may receive similar benefits by initiating movement-related activities in partnership with the horse. By being
able realize certain physical impulses through movement with such a large animal, the veteran may internalize feelings of being strong rather than feeling vulnerable (Sheade et al., 2012).
CHAPTER THREE:

EXTENDED METHODOLOGY
EXTENDED METHODOLOGY

The purpose of this study was to examine whether Relational Equine-Partnered Counseling (REPC) was effective in reducing the symptoms of war zone-related posttraumatic stress disorder (PTSD), specifically the symptom clusters of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. In this study, I utilized a single case design with four volunteer military veteran participants who scored in the clinical range based on two instruments designed to assess symptoms of PTSD. Each participant participated in Relational Equine-Partnered Counseling (REPC) sessions and reported on their symptoms of PTSD each week. I will discuss the research questions, constructs, methods and procedures, research design and data collection, and data analysis. Following this discussion, I will discuss the strengths and limitations of the design as well as ethical, legal, and multicultural considerations.

Research Question

In the present study, the research question of concern is: does Relational Equine Partnered Counseling (REPC) reduce the symptoms of PTSD in military veterans? More specifically, does the REPC model of EAC reduce the war zone-related PTSD severity and symptoms of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity? I examined the total severity and symptoms of PTSD by attaining data regarding the participants’ symptoms of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity as measured on the Clinician-Administered PTSD Scale (CAPS) and the PTSD Checklist (Weathers et al., 2013b; Western Psychological Services, 2004).
**Definition of Terms**

For the purpose of this study, I will define the following terms:

*Military veteran.* Military veteran is defined as a person who has actively served in the United States military.

*War zone-related posttraumatic stress disorder (PTSD).* For this study, participants who seek counseling services for self-reported symptoms of war zone-related PTSD was included in the study. I chose to use the term “war zone” in order to satisfy *DSM-5* Criterion A of trauma exposure (Hoge, Rivere, Wilk, Herrell, and Weathers, 2014a). Participants qualified as having met the definition for PTSD upon meeting the criteria for diagnosis according to the PTSD Checklist (PCL-5) and the Clinician-Administered PTSD Scale (CAPS). Both instruments assess for PTSD in accordance with the *DSM-5* diagnosis of PTSD which is defined by the experiencing of symptoms related to intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity following exposure to a traumatic event for longer than one month and causing clinically significant distress or impairment. The CAPS is regarded as the “gold standard” for diagnosis (Western Psychological Services, 2004, p. 1).

*Relational Equine-Partnered Counseling (REPC).* The intervention is an equine assisted approach to counseling discussed in the literature review and operationalized in the *Relational Equine-Partnered Counseling Manual* (Appendix A).

**Participant Selection**

For the purpose of this study, I obtained approval to conduct research with human subjects from the University of North Texas’ Institutional Review Board (IRB) and the facility where the study was conducted. I recruited military veterans from referrals from other mental health professionals and through word-of-mouth. I obtained written permission by informed
consent from the participating clients to take part in the study (Appendix B). I conducted an initial consultation to discuss the nature of the study and determine interest in the study. For interested potential participants, I then reviewed the informed consent and described the nature of the study including participation in weekly counseling and assessment sessions, potential risks to participation, and potential benefits from participation. In addition, I reviewed the nature of the incentives. The incentives consisted of: (a) receipt of $50 upon completion of baseline assessments, (b) $10 following each counseling session and completion of assessments, and (c) receipt of $50 following completion of all post-intervention assessments. I screened interested clients to ensure that they met the criteria for an initial diagnosis of PTSD based on the PCL-5 and CAPS.

Following this assessment, participants who met the criteria for participation in the study had a formal intake session with me. During the intake, the participant completed a psychosocial background form in order to gain demographic information and mental health history such as current medications, history of substance abuse, and other traumatic experiences. During the intake procedure, I also assessed for any precautions or contraindications for participation in REPC such as comorbid health conditions that may have been exacerbated through interaction with animals or working outdoors, active substance use, and dissociative behaviors.

**Instruments**

**PTSD Checklist (PCL-5)**

The PCL-5 is the most extensively used screening instrument for PTSD (Hoge et al., 2014b). This instrument is a self-report assessment based on the DSM-5 symptoms of PTSD consisting of 20 items; it measures symptoms in response to stressful experiences (Weathers et al., 2013b). Clinicians may use the PCL-5 to screen individuals for PTSD, make a provisional
diagnosis of PTSD, and monitor symptoms both during and after treatment (Weathers et al., 2013b). In the current study, the PCL-5 was used in conjunction with the revised Life Events Checklist (LEC-5) and the extended Criterion A assessment to ensure that all participants met the initial screening criteria per recommendations by Weathers et al. (2013b). Using a five-point scale ranging from “Not at all” to “Extremely”, respondents selected how much they have been bothered by each symptom within the past month, yielding a total severity score and offering a presumptive diagnosis of PTSD (Weathers, Litz, Herman, Huska, & Keane, 1993). I determined if the respondent met criteria for PTSD based on the rating of symptoms as “moderately” or higher. The presumptive diagnosis is determined by this rating in at least one B item (intrusion), at least one C items (avoidance), at least two D items (negative alterations in cognitions and mood), and at least two E items (alterations in arousal and reactivity). The PCL is a relatively short assessment that takes approximately five to ten minutes to administer (Weathers et al., 2013b).

In reference to screening for or diagnosing PTSD, the PCL-5 offers guidelines for determining cut-point scores, recommending a lower cut-point when screening for PTSD or seeking to maximize detection of possible cases and recommending a higher cut-point score for diagnosing PTSD or minimizing false positives. Another factor for consideration in determining cut-point scores is the nature of the target setting. Until further psychometric work is available, Weathers et al. (2013b) recommended clinicians use a cut-point of 38. Researchers are still in the process of determining change scores for PCL-5 but expect change scores to be in a similar range to the PCL for DSM-IV. Monson et al. (2008) found a ten to 20 point change to be considered clinically significant for the PCL for DSM-IV, based on their assessment of the relationship
between patient and clinician ratings of PTSD according to the PCL. Weathers et al. (2013b) recommended a five-point change to be indicative of an individual’s response to treatment.

Weathers et al. (1993) conducted the original validation study in a sample of male Vietnam veterans using the DSM-III-R criteria. Test-retest reliability was found to be high at 0.96. Regarding internal consistency, Weathers et al. (1993) found the alpha coefficient to be .93 for B symptoms, .92 for C symptoms, .92 for D symptoms, and .97 for the total severity score. The item scale correlations ranged from .62 to .87. Convergent validity with other measures of PTSD was found to be .93 with the Mississippi Scale, .77 with the PK Scale of MMPI-2, .90 with the Impact of Event Scale, and .46 with the Combat Exposure Scale. Regarding the second study conducted with male and female veterans of the Persian Gulf theater, the internal consistency was .90 for B symptoms, .89 for C symptoms, .91 for D symptoms, and .96 for the total severity score. Total item correlations ranged from .52 to .80.

Although researchers have not yet completed psychometric studies on the PCL-5, Hoge, et al.’s (2014b) comparison of the PTSD Checklist-Specific (PCL-S) for DSM-IV-TR and the PCL-5 for DSM-5 yielded some preliminary information on the utility of the PCL-5. Hoge et al. (2014b) completed a head-to-head comparison of the two versions in a sample of 1,822 United States infantry soldiers. Of the 1,822 soldiers, 946 had previously deployed to Iraq or Afghanistan. The researchers found that the PCL-5 and PCL-S showed identical reliabilities with a Cronbach’s reliability score of 0.67. In addition, the researchers found substantial agreement between the two versions (κ = 0.67). However, the researchers also found that 45% of the soldiers, who met the criteria according to one version, did not meet the criteria according to the other version when controlling for order effects.
In 2008, Keen, Kutter, Niles, and Krinsley replicated Weathers et al.’ (1993) study with a sample of male veterans similar to the participants in the original study, using the most updated version of the PCL based on the DSM-IV criteria. Keen et al. (2008) summarized the findings of several studies providing strong evidence for the reliability and validity of the PCL. In their study, Keen et al. (2008) recruited 114 male veterans from the VA Boston Healthcare System and surrounding community in New England. Regarding internal consistency, the alpha coefficient was found to be .94 for B symptoms, .91 for C symptoms, .92 for D symptoms, and .96 for the total severity score. Regarding convergent validity, Keen et al. (2008) found the PCL to strongly correlate with other measures of PTSD such as the CAPS ($r = .79$), the Mississippi Scale ($r = .90$), and the Combat Exposure Scale ($r = .62$). Regarding diagnostic utility, Keen et al. (2008) examined PCL scores using the CAPS as the criterion measure. The researchers examined sensitivity, specificity, and diagnostic efficiency. The optimal efficient cutoff score was found to be 60, yielding a sensitivity of .56, a specificity of .92, and a diagnostic efficiency of .84.

More recently, Cohen et al. (2014) reported on the psychometrics for each of the four symptom clusters for PCL-5. Regarding Cluster B, Cohen et al. (2014) found that a single factor accounted for 71% of the variance with a Cronbach’s reliability of .89. Regarding Cluster C, a single factor accounted for 91% of the variance with a Cronbach’s reliability of .91. For Cluster D symptoms, a single factor accounted for 65% of the variance with a Cronbach’s reliability of .91. Finally, for Cluster E a single factor accounted for 60% of the variance with a Cronbach’s reliability of .87.
Clinician-Administered PTSD Scale

The Clinician-Administered PTSD Scale (CAPS) is a structured interview to diagnose and measure the severity of PTSD (Weathers, Blacke, Schnurr, Marx, & Keane, 2013a). This instrument is regarded as the “gold standard” as it allows for consistent administration and scoring, enables the collection of valid information regarding PTSD symptomatology, and provides flexible administration and scoring options (Weathers et al., 2013a). This instrument was developed in collaboration with PTSD experts and based on the DSM-5 criteria. The CAPS Interview Booklet consists of 30 items designed to measure the intensity and frequency of four PTSD symptom clusters: intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Of these 30 items, 20 measure core PTSD symptoms; others measure onset and duration, subjective distress, impact of symptoms on social and occupational functioning, improvement in symptoms since previous measurement, overall response validity, overall PTSD severity, and dissociation-related symptoms (Weathers et al., 2013). Symptom intensity and frequency are assessed based on a five-point rating scale to establish a single severity score for each cluster. The CAPS may be given in its complete administration or only using the 20 items assessing core PTSD symptoms. Administrators can focus on different time frames such as the past month, past week, or worst month (Weathers et al., 2013a). The CAPS may be given repeatedly and used for the purposes of diagnostic screening and monitoring of weekly assessment (Weathers et al., 2013a). As recommended by Weathers et al. (2013a), the Life Events Checklist was given to establish that Criterion A (presence of a traumatic event) was satisfied.

In conducting the assessment, I used clinical judgment in determining the appropriate ratings based on the participant’s responses. The CAPS booklet includes space for the clinician
to take notes on responses and ask clarifying questions if necessary (Blake et al., 2000). In my
notes, I documented all of the participants’ responses that pertained to a given question. I also
noted participants’ responses to questions in which they mentioned their time with me, their time
with the horse, or outside events that they believed influenced their answers. Therefore, I was
able to utilize these responses not only in making a CAPS score determination, but also in
helping to explain the effect. To score the CAPS, I first determined whether each symptom was
“present or absent” (Weathers et al., 2013a). A symptom was considered present if rated a “2”
(moderate/threshold) or higher (Weathers et al., 2013a). In order to meet the criteria for a
diagnosis of PTSD, the following requirements apply: (a) At least one Cluster B symptom, (b) at
least one Cluster C symptom, (c) at least two Cluster D symptoms, (d) at least two Cluster E
symptoms, (d) the duration of symptoms has lasted one month, and (e) the disturbance causes
clinically significant distress or impairment (Weathers et al., 2013a).

As psychometrics on the CAPS for DSM-5 are not yet available, psychometrics based on
DSM-IV are delineated below. According to Western Psychological Services (2004), the CAPS
has high internal consistency, test-retest reliability, and inter-rater reliability. Researchers have
reported internal consistency coefficient alphas ranging from .79 to .95 for the total symptom
severity score. Interclass correlations between clinicians were found to range from .92 to .95 (as
cited in Western Psychological Services, 2004). Other estimates of inter-rater reliability have
ranged from .92 to .98 for the total severity score (Western Psychological Services, 2004).

Western Psychological Services (2004) reported that the CAPS has high content validity
as it was written and revised by experts in the field of PTSD at the National Center for PTSD.
Using confirmatory factor analysis, two studies have demonstrated high construct validity. The
CAPS has also been found to have high correlation with other measures of trauma and PTSD.
The CAPS has been shown to correlate strongly with the Mississippi Scale ($r = .70-.91$) and the MMPI PK Scale ($r = .72-.84$), the Impact of Event Scale ($r = .81$), the PTSD symptoms on the SCID ($r = .89$), the Self-Rating Inventory for PTSD ($r = .73$), the Impact of Event Scale ($r = .37-.61$), the Davidson Trauma Scale ($r = .78$), and the PCL ($r = .94$). Regarding the Impact of Event Scale, the weaker correlation was found when the CAPS was administered weekly as opposed to monthly. The CAPS has been found to correlate less strongly with the Combat Exposure Scale ($r = .42-.53$), indicating that the CAPS measures something distinct from simply exposure to traumatic events (Western Psychological Services, 2004). Regarding criterion validity, diagnoses made using the CAPS correspond well with independently made diagnoses of PTSD using the $DSM-IV$ criteria and correspondence with other assessments offering diagnostic criteria for PTSD (Western Psychological Services, 2004).

Additional considerations for the use of the PCL and CAPS include that these instruments measure different aspects of symptomatology, with the CAPS assessing the frequency and intensity and the PCL assessing the degree to which the respondent feels “bothered” by the symptoms (Keen et al., 2008). However, the PCL and CAPS established in accordance with $DSM-IV$ have a high correlation with each other ranging from .93 to .94, indicating that both assessments are measuring the same construct (Western Psychological Services, 2004).

**Description of Treatment**

**Relational Equine-Partnered Counseling Treatment Team**

In this study, I, a Licensed Professional Counselor (LPC) and doctoral candidate who has received training in both EAC and treatment of PTSD in the military veteran population, facilitated the intervention. I am certified through the Professional Association of Therapeutic
Horsemanship (PATH) International as a Registered Therapeutic Horseback Riding Instructor and as an Equine Specialist in Mental Health and Learning (ESMHL). I developed the REPC model based on my four years of clinical experience in equine assisted counseling, my 6 years of experience in the therapeutic horsemanship industry, and my 25 years of experience in working with horses. I co-facilitated with certified equine specialists who have achieved PATH International ESMHL certification. All equine specialists also received prior training in administering the REPC model. Furthermore, all equine specialists completed CITI Humans Subject Protection Training.

Structure of REPC Sessions

In accordance to REPC model, clients were offered the opportunity to choose their own horse from a pasture or arena housing several horses from which to decide. The horses spanned in range of age, sex, size, breed, and personality characteristics. Although the horses may have demonstrated aggressive behaviors towards other horses, none of the horses were actively aggressive towards humans. All horses belonged to the therapy center where the study was conducted. Some were used only in counseling, whereas others were used in therapeutic riding lessons and counseling. By allowing clients to choose one’s own horse, each client played an active role in the therapeutic process and formation of the therapeutic relationship with the horse.

Sessions were conducted in a pasture, arena, or round pen depending on the client’s needs, weather conditions, and session activity. The study was conducted at therapeutic horseback riding facility in the southwestern United States. The facility is situated on approximately 24 acres. The facility included three separate pastures. The pastures may hold between one and 11 horses at any given time. The pasture terrain included both wooded areas and open grass areas. The arena also contained a variety of tools and obstacles that clients may
use to interact with the horse. Finally, the round pen was much smaller than the arena or pastures and was encircled by panels.

The participants engaged in up to 18 counseling sessions during the REPC intervention. The number of sessions was based upon the number of sessions I believe to be necessary in the treatment of PTSD while also considering the feasibility of being able to complete the study in a timely manner. Currently, Military OneSource provides 12 sessions of non-medical counseling per issue (Military OneSource, 2013). As veterans presenting for PTSD often experience psychiatric co-morbidities and other interpersonal concerns, I chose to extend beyond 12 sessions. Additionally, Hamblen (2010) recommended that treatment for PTSD should last a minimum of three to six months. Other researchers have found between 8 and 18 sessions to be necessary to see improvement in 50% of participants, whereas approximately 20 or more sessions are necessary to see improvement in at least 75% of participants (Hansen, Lambert, & Forman, 2002; Harnett, O’Donovan, & Lambert, 2010; Howard, Kopta, Krause, & Orlinsky, 1986). The sessions lasted approximately 50 minutes and were held once a week. The focus of the initial sessions was for the client to choose a horse and to begin to build a relationship with the chosen horse to facilitate the formation of a safe relationship. These early sessions assisted clients in decreasing symptoms related to negative alterations in cognitions and mood, as the client began to reconnect with others through the relationship with the horse. As the client and horse developed a working alliance, the equine specialist and I collaborated with the client to create activities in order to enable the client to process the trauma and become aware of physiological sensations, thoughts, and feelings through interaction with the horse. As the client gained this awareness, the equine specialist and I facilitated activities such as meditation, mindfulness, and other relaxation exercises to promote increased self-regulation and manage
arousal symptoms through practice with the horse. In the final sessions, the equine specialist and I assisted the client in generalizing these skills in managing PTSD to experiences outside of the counseling process. I administered the PCL-5 and CAPS each week prior to the start of each REPC session.

**Ethical and Legal Considerations**

As the participants in the study held a dual role as both counseling clients and research participants, the equine specialists and I had an ethical obligation to uphold the principle ethics in counseling: (a) nonmaleficence, (b) beneficence, (c) autonomy, (d) justice, and (e) fidelity (Heppner et al., 2008). As research participants, I honored participants’ autonomy by providing informed consent, highlighting the voluntary basis of participation, freedom to withdraw from the study, and describing the nature of the study (Robinson & Curry, 2008). Participants were informed that withdrawing from the study would not hinder their ability to receive REPC services. In order to avoid harm to the participants and promote well being, I informed the participants of the potential risks for participation and highlighted the heightened risk of physical harm or injury through working with horses (Robinson & Curry, 2008). In order to attend to this heightened risk, a certified equine specialist was present for all REPC sessions in order to manage safety risks for both the horse(s) and participant. In addition, due to the closeness of the relationship that the participant may form with the horse, I informed the participant of the risk of emotional harm should the animal suddenly become ill or die during the course of the study (Beck & Katcher, 2003). I also shared the potential benefits from participation such as decreased symptoms of PTSD, increased overall quality of life, and decreased impairment in work, family, and social functioning. I attended to promoting justice by administering the intervention based on the manualized approach in the REPC manual. Furthermore, I abided by the *ACA Code of Ethics*. 
during all phases of the study including baseline, intervention, and post-intervention phase (American Counseling Association, 2014). I designed and conducted the study in order to produce ethical, accurate research findings while also balancing the welfare of the participants and animals (Heppner, Wampold, & Kivlighan 2008).

I also attended to the ethical considerations regarding the horses involved in the REPC intervention. In order to protect both the participant and animal, I ensured that all horses included in the study have current vaccinations and are in good health (Chandler, 2012). Furthermore, only certified equine specialists helped facilitate the REPC intervention in order to ensure protection for both the participants and the horses. The equine specialist was responsible for monitoring equine stress levels, collaborating with me to determine appropriate activities, and setting limits to maintain the horse’s comfort during the session (EAGALA, 2009; NARHA, n.d; Sheade, 2013). Finally, the equine specialist and I enabled the horse to have as much autonomy during the session as possible by allowing the horse to set its own boundaries for participation and move away from the counseling area if desired (Sheade, 2013).

As the veterans are both clients and participants, I adhered to the requirements of the Health Insurance Portability and Accountability Act (HIPAA) in explaining the participants’ rights pertaining to privacy and records during the informed consent process. During this process, I explained how the participants’ personal information would be used for treatment and research purposes, reviewed the methods and procedures of dissemination of research results, informed the participant of one’s right to restrict usage of personal information and right to terminate participation in the study, the counseling process, or both, and attain written consent by the participant (Remley & Herlihy, 2007). In addition, I held both professional malpractice
liability insurance for counseling and equine liability insurance. The facility also maintained independent equine liability insurance.

**Multicultural Considerations**

During the study, I was aware of the influence of my cultural background, including racial and ethnic identity, religious identity, gender, sexual orientation, and socioeconomic class, on my experiences, beliefs, and comfort in interacting with horses (Sheade & Chandler, 2012). I was aware that participants’ past experiences and comfort with horses may have influenced the progress and effectiveness of the REPC intervention. I also attended to cultural considerations in reviewing the informed consent to ensure participant comprehension of the procedures and comfort with providing written consent (Robinson & Curry, 2008). I explored the interaction of participants’ cultural identities in interaction with their identity as a member of the military and in engaging in REPC. I am culturally competent in providing services for military veterans and am aware and knowledgeable regarding military cultural norms, stigmas related to mental health counseling and PTSD, and potential distrust of civilian counselors (Hall, 2008). I strived to provide culturally responsive REPC services.

**Design**

The design for the study is a single-case quasi-experimental design, an approach becoming increasingly utilized in counseling research to develop evidence-based practice (Ray, Barrio Minton, Schottelkorb, & Brown, 2010). The American Psychological Association (2006) has also endorsed single case design as a valid contributor to evidence-based practice through the ability to establish causal relationships. In the context of the current study, this approach was especially useful when working with the small sample size to manage threats to internal validity and to gain richer data to explain the effect of treatment (Kratochwill et al., 2010; Ray et al.,
2010). Through the use of this design, I examined how PTSD varies within individual participants over time. According to Kazdin (2011), the results of a single case design study can be generalized to individuals sharing similar characteristics as study participants based on the notion that “lawful relations would not be idiosyncratic” (p. 372). By providing a detailed description of the participants, the context of the study, and presentation of war zone-related PTSD, as well as including multiple participants, my ability to generalize to other like individuals is enhanced. (Kazdin, 2011). Participants served as their own control, allowing for comparison before, during, the after the intervention (Morgan & Morgan, 2003). Within the field of counseling, this approach is fitting as its emphasis on attaining rich data through detailed descriptions allows for increased complexity in investigating the therapeutic process and human growth (Heppner et al., 2008).

In the present study, there were three phases: (a) baseline, (b) REPC intervention, and (c) post-intervention. Throughout all three phases, the participants’ symptoms of PTSD were assessed with the PCL-5 and CAPS each week. In addition, the participants were asked to report on any changes in medication, other PTSD therapies, other forms of counseling for non-PTSD concerns, or any other events that the participant believed may have influenced his or her PTSD symptoms each week. This information was utilized as valuable data in explaining the effect and controlling for threats to internal validity.

During the first phase, I attempted to establish a stable baseline of PTSD symptoms for each participant to ensure a stable pattern of response for PTSD symptoms prior to the implementation of the intervention (Ray & Schottelkorb, 2010). The purpose of this baseline was to determine the effect of treatment following the establishment of a stable baseline prior to beginning treatment to be able to determine the effect of the intervention while managing threats
to internal validity. The baseline phase lasted five weeks with no intervention. During this phase, I administered the PCL-5 and the CAPS in person on a weekly basis in an effort to attain a stable baseline measure of PTSD as evidenced by the attainment of consistent scores each week (Ray & Schottelkorb, 2010). None of the four participants attained a stable baseline and all showed improvement during the baseline period. The participants all stated similar reasons for their belief for the improvement including trusting the counselor, looking forward to interacting with the horses, having increased knowledge of the symptoms of PTSD and thus normalizing their experiences, getting in the habit of tracking their own symptoms and thus more aware of their experiences, and feeling hopeful that they will experience positive changes. During consultation with my dissertation chair, Dr. Cynthia Chandler, she and I decided that it would be best to move forward without a stable baseline so as not to jeopardize my participants’ continued involvement in the study (Ray, in press).

During the second phase, the REPC intervention was administered and lasted up to 18 weeks. I believed that 18 weeks was the ideal amount of time needed to show the effect of the intervention. The intervention was weekly 50-minute REPC sessions according the manualized REPC approach with weekly administration of PCL-5 and CAPS prior to the beginning of each REPC session.

The post-intervention phase began one week after the intervention had ended. I assessed the participant’s symptoms of PTSD using the PCL-5 and CAPS in person or over the phone once a week for three weeks. The purpose of the post-intervention phase was to determine the stability of the effect on symptoms of PTSD after termination of REPC.
**Strengths of the Design**

The primary strength of single case design is its utility in examining both the effectiveness of the intervention and the causal relationship between the intervention and dependent variable in outcome studies (Kazdin, 2011; Ray et al., 2010). Furthermore, through the use of this design, I was able to experience a greater understanding of the mechanism of change (Ray, in press). As the usage of a randomized controlled trial would be implausible in the current study due to cost, availability of resources, and need for a large sample size, the use of a single case design examining the effect of REPC on PTSD symptoms enabled me to examine the effect of the intervention, while controlling for threats to internal validity through baseline assessments and repeated measures. Furthermore, as the REPC intervention was administered based on the unique needs of each participant, the single case design permitted me to attain a clear picture of the effect over time within each participant in the practice setting (Kazdin, 2011). In addition, I attained a more detailed picture of each participant’s experience of the REPC process through the inclusion of qualitative data collected from the intake regarding the participant background and context of the participant’s experience of PTSD as well as from the termination session in processing the overall experience of REPC during the termination session (Ray et al., 2010).

Another strength of the single case design is the use of multiple single cases in determining generality of the effect (Kazdin, 2011). Ray (in press) recommended a minimum of three participants. Through the inclusion of four participants, I replicated the study across multiple participants and increased the strength of the design. Through this replication process, I increased the ability to generalize the results to other individuals experiencing war zone-related PTSD who share similar characteristics to study participants (Kazdin, 2011).
The single case design was also beneficial in examining the effect of the REPC intervention on PTSD as the repeated assessment of symptoms enabled me to not only be able to see trends in the data, but also to be flexible to adjust the intervention while in progress by making extensions or adjusting treatment protocol based on the REPC manual (Kazdin, 2011; Kennedy, 2005). Furthermore, I accounted for historical events that may threaten internal validity such as medication or therapy changes or life events by notating these events. The nature of the single case design enabled me to receive detailed feedback during all points of the intervention (Kazdin, 2011).

**Data Analysis**

The primary method for data analysis in single case design is the use of visual analysis (Morgan & Morgan, 2003). In order to conduct visual analysis, I began by examining the patterns in the data and, more specifically, focused on investigating within-phases patterns including level, trend, variability, and between-phase patterns including overlap, immediacy of effect, and magnitude of change (Kratochwill et al., 2010). In examining the level, I examined the mean score of the data in each phase. Regarding trend, I examined the slope and direction of the data to determine the presence of systematic increases or decreases in scores over time. Based on criteria delineated by Cohen (1988), I identified an $r$ value of .10 as indicative of small effect, an $r$ value of .30 as indicative of a medium effect, and an $r$ value of .50 as indicative of a large effect. I examined variability of data within phases by visual inspection and standard deviation scores. Regarding between-phase patterns, I examined overlap or how many data points in one phase overlap with the data points from the previous phase. In examining the immediacy of the effect, I analyzed the difference in level between the last three points of the previous phase and the first three points of the next phase. I also used anecdotal data including
demographic information, historical information, and brief post-intervention discussions to help explain the effect of treatment (Ray & Schottelkorb; 2010). I also documented historical events that took place during the intervention such as medication changes, other forms of therapy, and life events. By attaining this information, I could account for potential threats to internal validity and gain a richer understanding of participants’ experiences and effect of the intervention.

Following the completion of the study, I examined the effect size or the effect of the intervention on the symptoms of PTSD in the participants. In following guidelines proposed by Lenz (2013), the effect size calculation was determined based on the characteristics of the baseline data set (such as outliers) and the size of the overall data set. In his review of the effect size calculations of Percentage of Nonoverlapping Data (PND), Percentage of Data Exceeding the Median (PEM), and Percentage of All Overlapping Data (PAND), Lenz (2013) noted that the different estimates examine different amounts of data and apply different levels of conservatism in calculating the effect. Using visual analysis, I determined that a baseline trend existed and chose to use the Percentage of Data Exceeding the Median Trend (PEM-T) nonparametric effect size calculation (Parker, Vannest, & Davis, 2011; Wolery, Busick, Reichow, & Barton, 2010). This method is also known as the Extended Celeration Line (ECL) or Extended Split Middle Line (Rakap, 2015). The PEM-T is one of the only overlap methods that can account for baseline trend and detect changes in trends across phases (Wolery et al., 2010). Therefore, the PEM-T is one of the preferred methods in evaluating effectiveness when the baseline phase shows a trend towards the therapeutic side (Rakap, 2015). This method also has the lowest error percentage in comparison to other overlap methods (Wolery et al., 2010).

Wolery et al. (2010) described the steps in calculating the PEM-T effect size. First, I identified the intended change. Next, I graphed the data on a semi-logarithmic chart and then
calculated and drew a split middle line of trend estimation through the baseline phase. I extended this line through the intervention and post-intervention phases. Following this step, I counted the number of data points in intervention phase that fell below the trendline (towards the therapeutic side). Finally, I divided this count by the total number of data points in the intervention phase and multiplied by 100 in order to attain the percentage score. The scores found according to PEM-T can range between 0-100%. As there are no criteria to evaluate PEM-T scores specifically, Rakap (2015) recommended using benchmarks of 90% or higher to indicate high effectiveness, 70-90% to indicate moderate effectiveness, 50-70% to indicate questionable effectiveness, and 50% or lower to indicate ineffectiveness.

**Individual Participant Treatment**

For this study, two of the participants completed the entire 25 weeks of the study, one participant completed 17 weeks, and one participant dropped out. One of the strengths of the single-case design was the flexibility afforded to me in adjusting the design based upon needs of the participant (Kennedy, 2005). Due to the needs of one participant to terminate participation early, I was able to shorten the intervention phase and still gather the post-intervention data. In the following section, I will discuss each individual participant case with the representation of associated data in Tables 1-16. Each participant’s actual name was replaced with a pseudonym and military rank was omitted to help maintain confidentiality.

**Sam’s Treatment**

Sam was a Caucasian male and retired high-ranking Special Forces Marine who served in both Operation Desert Storm and multiple deployments in the Global War on Terrorism. Sam resides with his wife and child and works in the human resources field. He self-referred for the study after learning about it from another health professional and qualified for the study based on
self-report of war zone-related trauma and scores on the PCL-5 and CAPS. At the start of the study, Sam was receiving concurrent individual talk therapy with another mental health professional. Sam identified symptoms related to physiological reactions, detachment, difficulty concentrating, and sleep problems to be his primary concerns. Sam participated in five consecutive weeks of baseline assessments to examine his PTSD symptoms based on the PCL-5 and CAPS after which the baseline ended and intervention phase began. Sam began to demonstrate incremental improvement throughout the baseline period and did not achieve a stable baseline before proceeding to the intervention phase. The weekly PCL-5 and CAPS assessments continued throughout the entire duration of the study. Sam participated in 18 weeks of REPC during the intervention phase. Following the intervention phase, Sam participated in three weeks of post-intervention assessment with the PCL-5 and CAPS.

**David’s Treatment**

David was a Black male and former Army Combat Engineer who served in the Vietnam War. David had retired from work in law enforcement and was active in his faith community. He was divorced and lives alone. He self-referred after learning about the study from outside resources and qualified for the study based on self-report of war zone-related trauma and scores on the PCL-5 and CAPS. David identified symptoms related nightmares and negative alterations in cognitions and mood including loss of interest, detachment, and inability to experience positive emotions to be his primary concerns. David reported receiving individual and group therapy for the past several years but that he had not experienced much relief from his symptoms. At the start of the study, David was receiving concurrent group therapy with other veterans. David participated in five consecutive weeks of baseline assessments to examine his PTSD symptoms based on the PCL-5 and CAPS after which the baseline ended and intervention
phase began. David began to demonstrate incremental improvement throughout the baseline period and did not achieve a stable baseline before proceeding to the intervention phase. The weekly PCL-5 and CAPS assessments continued throughout the entire duration of the study. David participated in 18 weeks of REPC during the intervention phase. Following the intervention phase, David participated in three weeks of post-intervention assessment with the PCL-5 and CAPS.

**Matt’s Treatment**

Matt was a former Army Petroleum Supply Specialist of mixed ethnicity who identified as male and served in Operation Iraqi Freedom. He does not work and lives with his significant other. He self-referred for the study after learning about it from another health professional and qualified for the study based on self-report of war zone-related trauma and scores on the PCL-5 and CAPS. Matt identified symptoms related to anger and irritability, detachment, loss of interest, intrusive memories, and sleep problems to be his primary concerns. At the start of the study, Matt was receiving concurrent individual talk therapy. Matt participated in five consecutive weeks of baseline assessments to examine his PTSD symptoms based on the PCL-5 and CAPS scores after which the baseline ended and intervention phase began. Matt began to demonstrate incremental improvement throughout the baseline period and did not achieve a stable baseline before proceeding to the intervention phase. The weekly PCL-5 and CAPS assessments continued throughout the entire duration of the study. During the course of the study, Matt learned that he had been accepted into a residential PTSD program and would need to terminate his participation in the study early. At this time, Matt began experiencing a worsening of symptoms that he attributed to anxiety and uneasiness about entering the residential program. Matt participated in only 10 weeks of REPC during the intervention phase. Following
the intervention phase, Matt participated in three weeks of post-intervention assessment with the PCL-5 and CAPS.

**Abigail’s Treatment**

Abigail was a Caucasian female and former Army medic who served in Operation Enduring Freedom. Abigail works during the day and lives with her children. She identified her faith to be a strong support in her life. She self-referred for the study after learning about it from another health professional and qualified for the study based on self-report of war zone-related trauma and scores on the PCL-5 and CAPS. During the study, Abigail received concurrent individual talk therapy. She identified symptoms related to anger and irritability, sleep problems, avoidance, and difficulty with concentration to be her primary concerns. Abigail participated in five consecutive weeks of baseline assessments to examine her PTSD symptoms based on the PCL-5 and CAPS after which the baseline ended and intervention phase began. Abigail began to demonstrate incremental improvement throughout the baseline period and did not achieve a stable baseline before proceeding to the intervention phase. The weekly PCL-5 and CAPS assessments continued throughout the entire duration of the study. Abigail participated in six weeks of EAC during the intervention phase before dropping out of the study. Abigail’s treatment differed slightly from the other participants due to her work schedule and the need for her appointment to be in the evening. Due to this factor, as all of her sessions were held in the arena with a pre-selected herd of horses due to the lack of daylight.
CHAPTER FOUR:

UNABRIDGED RESULTS
UNABRIDGED RESULTS

In the current study, I utilized a single-case design to examine the effectiveness of relational equine-partnered counseling (REPC) in reducing the symptoms of posttraumatic stress disorder (PTSD) in military veterans. I used the PTSD Checklist (PCL-5) and the Clinician-Administered PTSD Scale (CAPS) in order to assess both symptom severity and number of symptoms. In this section, I will present the findings for each individual participant. I will discuss the results of visual analysis and findings from interviews. I also graphed each participant’s scores for total severity and number of symptoms across all symptoms and across individual symptom clusters for both the PCL-5 and the CAPS. The symptom clusters included: intrusion (Cluster B), avoidance (Cluster C), negative alterations in cognitions and mood (Cluster D), and alterations in arousal and reactivity (Cluster E). I will present the results for each of the participants. Finally, I calculated the effect sizes for the severity and number of symptoms across total symptoms and each symptom cluster using the Percentage of Data Exceeding the Median Trend (PEM-T).

Participant 1: Sam

Sam participated in five weeks of a baseline phase with no intervention, 23 weeks of intervention phase in which Sam received 18 sessions of REPC, and three weeks of post-intervention phase. Sam’s 18 counseling sessions were spread across 23 weeks as four inconsecutive weeks were skipped due to illness or travel. Sam missed one week between weeks six and seven, one week between weeks 14 and 15, one week between weeks 15 and 16, and one week between weeks 18 and 19. Sam’s total participation in the study was 30 weeks.
Clinician-Administered PTSD Scale (CAPS)

For the CAPS, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Table 1 and Table 2, respectively.

Table 1

Means and Standard Deviations for Sam’s CAPS Severity Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
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<tr>
<td>Total</td>
<td>43.00</td>
<td>3.08</td>
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<tr>
<td>Cluster B</td>
<td>11.40</td>
<td>1.95</td>
<td>6.59</td>
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<tr>
<td>Cluster C</td>
<td>5.60</td>
<td>0.89</td>
<td>2.59</td>
</tr>
<tr>
<td>Cluster D</td>
<td>14.60</td>
<td>0.55</td>
<td>6.47</td>
</tr>
<tr>
<td>Cluster E</td>
<td>11.40</td>
<td>1.52</td>
<td>6.82</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement

Table 2

Means and Standard Deviations for Sam’s CAPS Number of Symptoms Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
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<tr>
<td>Total</td>
<td>15.60</td>
<td>0.55</td>
<td>7.29</td>
</tr>
<tr>
<td>Cluster B</td>
<td>3.80</td>
<td>0.84</td>
<td>2.24</td>
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<tr>
<td>Cluster C</td>
<td>2.00</td>
<td>0.00</td>
<td>0.76</td>
</tr>
<tr>
<td>Cluster D</td>
<td>6.00</td>
<td>0.00</td>
<td>2.06</td>
</tr>
<tr>
<td>Cluster E</td>
<td>3.80</td>
<td>0.45</td>
<td>2.24</td>
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Note: Decreased scores indicate improvement
Sam completed the CAPS each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and overlapping data for the total severity and for each cluster. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 1. Based on level analysis of the graph, Sam’s mean total severity score decreased from a mean of 43.00 during the baseline phase to a mean of 22.47 in the intervention phase and decreased again to 15.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases of the study and an upward trend in the post-intervention phase. The baseline phase indicated a large effect size \( r = -.97, R^2 = .95 \) and the presence of large relationship between completing assessments and Sam’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a large effect size \( r = -.92, R^2 = .85 \) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the severity of his PTSD symptoms. However, the post-intervention phase indicated large effect size \( r = .5, R^2 = .25 \) and the presence of a large relationship between the termination of REPC and Sam’s increase in the severity of his PTSD symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation \( SD \) of 3.08, a large amount of variability in the intervention phase with \( SD = 10.37 \), and large variability in the post-intervention phase with \( SD = 3.00 \). The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. However, the mean of the last three data points in the baseline phase \( M = 41.00 \) was slightly
higher than the first three data points in the intervention phase ($M = 36.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 1. Sam’s CAPS Total Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 2. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of eight data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 47%, indicating that REPC was ineffective in reducing the total severity.
Total number of symptoms. The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 3. Based on level analysis, Sam’s mean total number of symptoms score decreased from a mean of 15.60 during the baseline phase to a mean of 7.29 in the intervention phase and decreased again to 5.33 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases of the study and an upward trend in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.86, R^2 = .75$) and the presence of large relationship between completing assessments and Sam’s reduction in the total number of his PTSD symptoms. The intervention phase indicated a slightly larger effect size ($r = -.89, R^2 = .79$) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total number of his PTSD symptoms, indicating that the addition of REPC may have had a larger effect than continued assessments alone. However, the post-intervention phase indicated a
medium effect size \((r = .32, R^2 = .11)\) and the presence of a moderate relationship between the termination of REPC and Sam’s increase in the total number of his PTSD symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \((SD)\) of 0.55, a large amount of variability in the intervention phase with \(SD = 4.82\), and small variability in the post-intervention phase with \(SD = 1.53\). The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. However, the mean of the last three data points in the baseline phase \((M = 15.33)\) was slightly higher than the first three data points in the intervention phase \((M = 13.33)\). Finally, based on visual analysis, there was a single overlapping data point between the baseline and intervention phases.

![Figure 3](image.png)

*Figure 3. Sam’s CAPS Total Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 4. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 16 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 94%, indicating that REPC was highly effective in reducing the total number of symptoms.

![Figure 4. Sam’s CAPS Total Symptoms Effect Size (PEM-T).](image)

**Cluster B (Intrusion) total severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 5. Based on level analysis, Sam’s mean Cluster B severity score decreased from a mean of 11.40 during the baseline phase to a mean of 6.59 in the intervention phase and slightly increased to 6.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across the all phases of the study. The baseline phase indicated a large effect size \( r = -.73, R^2 = .53 \) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster B severity. The intervention phase indicated a large effect size \( r = -.70, R^2 = .50 \) and the presence of large relationship
between continued assessment and REPC and Sam’s reduction in Cluster B severity. The post-intervention phase indicated large effect size ($r = - .65, R^2 = .43$) and the presence of a large relationship between the termination of REPC and Sam’s reduction in the severity of his B Cluster symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of $1.95$, a moderate amount of variability in the intervention phase with $SD = 2.83$, and small variability in the post-intervention phase with $SD = 1.53$. The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. However, the mean of the last three data points in the baseline phase ($M = 10.33$) was slightly higher than the first three data points in the intervention phase ($M = 9.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 5. Sam’s CAPS B Cluster Severity Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 6. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 2 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 12%, indicating that REPC was ineffective in reducing the Cluster B severity.

![Figure 6. Sam’s CAPS Cluster B Severity Effect Size (PEM-T).](image)

**Cluster B (Intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 7. Based on level analysis, Sam’s mean number of Cluster B symptoms score decreased from a mean of 3.80 during the baseline phase to a mean of 2.24 in the intervention phase and slightly increased to 2.67 in the post-intervention phase. An analysis of the trend revealed a downward trend across the all phases of the study. The baseline phase indicated a large effect size \( r = -.76, R^2 = .57 \)
and the presence of large relationship between completing assessments and Sam’s reduction in
the number of his Cluster B symptoms. The intervention phase indicated a large effect size \( r = -.69, R^2 = .48 \) and the presence of large relationship between continued assessment and REPC
and Sam’s reduction in the total number of his Cluster B symptoms. The post-intervention phase
indicated large effect size \( r = -.66, R^2 = .43 \) and the presence of a large relationship between
the termination of REPC and Sam’s reduction in the number of his Cluster B symptoms.
Analysis of variability indicated a small amount of variability in the baseline phase with a
standard deviation (SD) of 0.84, a small amount of variability in the intervention phase with SD
= 1.30, and small variability in the post-intervention phase with SD = 0.58. The decrease in
Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the
baseline data. The mean of the last three data points in the baseline phase \( M = 3.33 \) was equal
to the first three data points in the intervention phase \( M = 3.33 \). Finally, based on visual
analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 8. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.

*Figure 7. Sam’s CAPS Cluster B Symptom Scores. (Decreased scores indicate improvement).*
Cluster C (avoidance) severity. The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 9. Based on level analysis, Sam’s mean Cluster C severity score decreased from a mean of 5.60 during the baseline phase to a mean of 2.59 in the intervention phase and deceased again to 0.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and stability across the post-intervention phase. The baseline phase indicated a large effect size ($r = - .70$, $R^2 = .50$) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster C severity. The intervention phase indicated a larger effect size ($r = -.89$, $R^2 = .79$) and the presence of larger relationship between continued assessment and REPC and Sam’s reduction in Cluster C severity, indicating that the addition of REPC may have resulted in a larger effect than continued assessments alone. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and the no relationship between the termination of REPC and
Sam’s severity of Cluster C symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 0.89, a small amount of variability in the intervention phase with $SD = 1.94$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. The mean of the last three data points in the baseline phase ($M = 5.33$) was equal to the first three data points in the intervention phase ($M = 5.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 9. Sam’s CAPS Cluster C Severity Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 10. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 12%, indicating that REPC was ineffective in reducing the Cluster C severity.

Figure 10. Sam’s CAPS Cluster C Severity Effect Size (PEM-T).

**Cluster C (avoidance) number of symptoms.** The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 11. Based on level analysis, Sam’s mean number of Cluster C symptoms score decreased from a mean of 2.00 during the baseline phase to a mean of 0.76 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed stability across the baseline phase, a downward trend across the intervention phase, and stability across the post-intervention phase. The baseline phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between completing assessments and Sam’s reduction in the number of his Cluster C symptoms. The intervention phase indicated a large effect size ($r = -.74, R^2 = .55$) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total
number of his Cluster C symptoms, indicating that the addition of REPC had an effect on the reduction of Sam’s Cluster C symptoms. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between the termination of REPC and Sam’s reduction of Cluster C symptoms. Analysis of variability indicated a no variability in the baseline phase with a standard deviation ($SD$) of 0.00, a small amount of variability in the intervention phase with $SD = 0.75$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in Sam’s scores was initially immediate as one data point decreased but then increased until decreasing again after the fourth REPC session. The mean of the last three data points in the baseline phase ($M = 2.00$) was higher than first three data points in the intervention phase ($M = 1.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 11. Sam’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement).*
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 12. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 14 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 82%, indicating that REPC was moderately effective in reducing the number of Cluster C symptoms.

Figure 12. Sam’s CAPS Cluster C Symptoms Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) severity. The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 13. Based on level analysis, Sam’s mean Cluster D severity score decreased from a mean of 14.60 during the baseline phase to a mean of 6.47 in the intervention phase and deceased again to 3.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and a slight upward trend across the post-intervention phase. The
baseline phase indicated a small effect size \( r = -.29, R^2 = .08 \) and the presence of small relationship between completing assessments and Sam’s reduction in Cluster D severity. The intervention phase indicated a large effect size \( r = -.92, R^2 = .85 \) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in Cluster D severity, indicating that the addition of REPC may have had a larger effect on reduction of Cluster D severity than continued assessments alone. However, the post-intervention phase indicated large effect size \( r = .87, R^2 = .75 \) and the presence of a large relationship between the termination of REPC and Sam’s increase in the severity of his Cluster D symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \( (SD) \) of 0.55, a large amount of variability in the intervention phase with \( SD = 4.17 \), and moderate variability in the post-intervention phase with \( SD = 2.31 \). The decrease in Sam’s scores was immediate as the data began to decrease once the intervention phase began. The mean of the last three data points in the baseline phase \( (M = 14.33) \) was higher than the first three data points in the intervention phase \( (M = 12.67) \). Finally, based on visual analysis, there were no overlapping data between the baseline and intervention phases.
Figure 13. Sam’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 14. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 17 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 100%, indicating that REPC was highly effective in reducing the Cluster D severity.
Figure 14. Sam’s CAPS Cluster D Severity Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) number of symptoms. The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 15. Based on level analysis, Sam’s mean number of Cluster D symptoms score decreased from a mean of 6.00 during the baseline phase to a mean of 2.06 in the intervention phase and decreased again to 1.00 in the post-intervention phase. An analysis of the trend revealed stability in the baseline phase, a downward trend in the intervention phase, and a slight upward trend in the post-intervention phase. The baseline phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between completing assessments and Sam’s reduction in the number of his Cluster D symptoms. The intervention phase indicated a large effect size ($r = -.89$, $R^2 = .79$) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total number of his Cluster D symptoms, indicating that the addition of REPC had an effect on Sam’s reduction in Cluster D symptoms. However, the post-
intervention phase indicated large effect size ($r = .5, R^2 = .25$) and the presence of a large relationship between the termination of REPC and Sam’s increase in his Cluster D symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated no variability in the baseline phase with a standard deviation ($SD$) of 0.00, a moderate amount of variability in the intervention phase with $SD = 2.28$, and a small amount of variability in the post-intervention phase with $SD = 1.00$. The decrease in Sam’s scores was immediate as the data began to decrease once beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 6.00$) was higher than first three data points in the intervention phase ($M = 5.33$). Finally, based on visual analysis, there was one overlapping data point between the baseline and intervention phases.

![Figure 15. Sam’s CAPS Cluster D Symptoms. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 16. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 16 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 94%, indicating that REPC was highly effective in reducing the number of Cluster D symptoms.

Figure 16. Sam’s CAPS Cluster D Symptoms Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) severity. The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 17. Based on level analysis, Sam’s mean Cluster E severity score decreased from a mean of 11.40 during the baseline phase to a mean of 6.82 in the intervention phase and deceased again to 4.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and a slight upward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.52, R^2 = .27$) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster E severity. The intervention
phase indicated a larger effect size \((r = -.92, R^2 = .85)\) and the presence of larger relationship between continued assessment and REPC and Sam’s reduction in Cluster E severity, indicating that the addition of REPC had a larger effect on the reduction of Cluster E severity than continued assessments alone. However, the post-intervention phase indicated large effect size \((r = .87, R^2 = .75)\) and the presence of a large relationship between the termination of REPC and Sam’s increase in the severity of his Cluster E symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \((SD)\) of 1.52, a moderate amount of variability in the intervention phase with \(SD = 2.16\), and low variability in the post-intervention phase with \(SD = 0.58\). The decrease in Sam’s scores was immediate as the data began to slightly decrease once the intervention phase began. The mean of the last three data points in the baseline phase \((M = 11.00)\) was higher than the first three data points in the intervention phase \((M = 9.00)\). Finally, based on visual analysis, there were no overlapping data between the baseline and intervention phases.
Figure 17. Sam’s CAPS Cluster E Severity Scores (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 18. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 12%, indicating that REPC was ineffective in reducing the Cluster E severity.
Figure 18. Sam’s CAPS Cluster E Severity Effect Size (PEM-T).

**Cluster E (alterations in arousal and reactivity) number of symptoms.** The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 19. Based on level analysis, Sam’s mean number of Cluster E symptoms score decreased from a mean of 3.80 during the baseline phase to a mean of 2.24 in the intervention phase and decreased again to 1.67 in the post-intervention phase. An analysis of the trend revealed a slight upward trend in the baseline phase, a downward trend in the intervention phase, and a slight upward trend in the post-intervention phase. The baseline phase indicated a medium effect size \( (r = .35, R^2 = .13) \) and a medium relationship between completing assessments and Sam’s increase in the number of his Cluster E symptoms. The intervention phase indicated a large effect size \( (r = -.92, R^2 = .56) \) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total number of his Cluster E symptoms, indicating that REPC had an effect on the reduction of Sam’s Cluster E symptoms.
However, the post-intervention phase indicated large effect size \( (r = .87, R^2 = .75) \) and the presence of a large relationship between the termination of REPC and Sam’s increase in his Cluster E symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation (SD) of 0.45, a small amount of variability in the intervention phase with SD = 1.09, and a small amount of variability in the post-intervention phase with SD = 0.58. The decrease in Sam’s scores was immediate as the data began to decrease once beginning the intervention phase. The mean of the last three data points in the baseline phase \( (M = 4.00) \) was higher than first three data points in the intervention phase \( (M = 3.00) \). Finally, based on visual analysis, there was one overlapping data point between the baseline and intervention phases.

![Sam’s CAPS Cluster E Symptoms Scores](image)

*Figure 19. Sam’s CAPS Cluster E Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 20. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 17 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 100%, indicating that REPC was highly effective in reducing the number of Cluster E symptoms.

![Line graph showing trendline and data points](image)

**Figure 20.** Sam’s CAPS Cluster E Symptoms Effect Size (PEM-T).

**PTSD Checklist (PCL-5)** For the PCL-5, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Tables 3 and Table 4, respectively.
Table 3

*Means and Standard Deviations for Sam’s PCL-5 Severity Scores*

<table>
<thead>
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<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
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<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>35.80</td>
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<td>21.76</td>
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<td>Cluster B</td>
<td>10.20</td>
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<td>7.18</td>
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<tr>
<td>Cluster C</td>
<td>3.40</td>
<td>1.67</td>
<td>1.94</td>
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<td>Cluster D</td>
<td>12.20</td>
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<td>5.18</td>
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<tr>
<td>Cluster E</td>
<td>10.00</td>
<td>3.16</td>
<td>7.47</td>
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*Note:* Decreased scores indicate improvement.

Table 4

*Means and Standard Deviations for Sam’s PCL-5 Number of Symptoms Scores*

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<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
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<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>11.80</td>
<td>4.76</td>
<td>6.06</td>
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<tr>
<td>Cluster B</td>
<td>3.20</td>
<td>1.48</td>
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<td>Cluster C</td>
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<td>Cluster D</td>
<td>4.00</td>
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<td>Cluster E</td>
<td>3.60</td>
<td>0.89</td>
<td>2.29</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement.

*Figure 4.* Sam’s PCL-5 scores during Baseline, Intervention, and Post-Intervention Phases. (Decreased scores indicate improvement.)
Sam completed the PCL-5 each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and overlapping data for each of these constructs. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 21. Based on level analysis of the graph, Sam’s mean total severity score decreased from a mean of 35.80 during the baseline phase to a mean of 21.76 in the intervention phase and decreased again to 12.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases of the study and a slight upward trend across the post-intervention phase. The baseline phase indicated a large effect size \((r = -.97, R^2 = .94)\) and the presence of large relationship between completing assessments and Sam’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a large effect size \((r = -.75, R^2 = .56)\) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the severity of his PTSD symptoms. However, the post-intervention phase indicated large effect size \((r = .87, R^2 = .75)\) and the presence of a large relationship between the termination of REPC and Sam’s increase in the severity of his PTSD symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation \((SD)\) of 14.17, a large amount of variability in the intervention phase with \(SD = 7.77\), and low variability in the post-intervention phase with \(SD = 0.58\). The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. However, the mean of the last three data points in the baseline phase \((M = \)
26.67) was slightly higher than the first three data points in the intervention phase ($M = 26.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

**Figure 21.** Sam’s PCL-5 Total Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 22. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total severity.
Figure 22. Sam’s PCL-5 Total Severity Effect Size (PEM-T).

**Total number of symptoms.** The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 23. Based on level analysis, Sam’s mean total number of symptoms score decreased from a mean of 11.80 during the baseline phase to a mean of 6.06 in the intervention phase and decreased again to 3.33 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases of the study and a slight upward trend in the post-intervention phase. The baseline phase indicated a large effect size \( r = -0.97, R^2 = .93 \) and the presence of large relationship between completing assessments and Sam’s reduction in the total number of his PTSD symptoms. The intervention phase indicated a large effect size \( r = -0.69, R^2 = .47 \) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total number of his PTSD symptoms. However, the post-intervention phase indicated large effect size \( r = 0.87, R^2 = .75 \) and the presence of a large relationship between the termination of REPC and Sam’s
increase in his total PTSD symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 4.76, a large amount of variability in the intervention phase with SD = 3.27, and a small amount variability in the post-intervention phase with SD = 0.58.

The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. However, the mean of the last three data points in the baseline phase ($M = 9.00$) was slightly higher than the first three data points in the intervention phase ($M = 7.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 23. Sam’s PCL-5 Total Symptoms Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 24. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a
total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0\%, indicating that REPC was ineffective in reducing the total number of symptoms.

**Figure 24.** Sam’s PCL-5 Total Symptoms Effect Size (PEM-T).

**Cluster B (intrusion) severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 25. Based on level analysis, Sam’s mean Cluster B severity score decreased from a mean of 10.20 during the baseline phase to a mean of 7.18 in the intervention phase and decreased again to 5.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across the all phases of the study. The baseline phase indicated a large effect size ($r = -.93, R^2 = .86$) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster B severity. The intervention phase indicated a medium effect size ($r = -.44, R^2 = .19$) and the presence of moderate relationship between continued assessment and REPC and Sam’s reduction in Cluster B severity.
The post-intervention phase indicated large effect size \((r = -0.87, R^2 = 0.75)\) and the presence of a large relationship between the termination of REPC and Sam’s reduction in the severity of his Cluster B symptoms. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation \((SD)\) of 4.44, a large amount of variability in the intervention phase with \(SD = 3.15\), and small variability in the post-intervention phase with \(SD = 1.15\). The decrease in Sam’s scores was not immediate as the data initially increased and then decreased once beginning the intervention phase. However, the mean of the last three data points in the baseline phase \((M = 7.33)\) was slightly higher than the first three data points in the intervention phase \((M = 7.00)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 25. Sam’s PCL-5 Cluster B Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 26. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster B severity.

Figure 26. Sam’s PCL-5 Cluster B Severity Effect Size (PEM-T).

Cluster B (intrusion) number of symptoms. The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 27. Based on level analysis, Sam’s mean number of Cluster B symptoms score decreased from a mean of 3.20 during the baseline phase to a mean of 2.47 in the intervention phase and decreased again to 2.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases and stability across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.75, R^2 = .56$) and the presence of large relationship between completing assessments and Sam’s reduction in the number of his Cluster B symptoms.
The intervention phase indicated a medium effect size ($r = -.32$, $R^2 = .10$) and the presence of moderate relationship between continued assessment and REPC and Sam’s reduction in the total number of his Cluster B symptoms. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between the termination of REPC and Sam’s reduction in the severity of his PTSD symptoms, indicating Sam’s symptoms remained stable after terminating REPC. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 1.48, a moderate amount of variability in the intervention phase with $SD = 1.33$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data with the exception of a decrease in the first data point of the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 2.33$) was slightly higher than the first three data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 27. Sam’s PCL-5 Cluster B Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 28. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 6%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.
Cluster C (avoidance) severity. The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 29. Based on level analysis, Sam’s mean Cluster C severity score decreased from a mean of 3.40 during the baseline phase to a mean of 1.94 in the intervention phase and deceased again to 0.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the all the baseline and intervention phases and stability in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.85, R^2 = .72$) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster C severity. The intervention phase indicated a medium effect size ($r = -.57, R^2 = .32$) and the presence of a moderate relationship between continued assessment and REPC and Sam’s reduction in Cluster C severity. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between the termination of REPC and Sam’s reduction in the severity of his Cluster C symptoms, indicating that his severity remained stable.
after terminating REPC. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation (SD) of 1.67, a small amount of variability in the intervention phase with $SD = 0.89$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in Sam’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. The mean of the last three data points in the baseline phase ($M = 2.67$) was equal to the first three data points in the intervention phase ($M = 2.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph](image)

**Figure 29.** Sam’s PCL-5 Cluster C Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 30. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster C severity.

![Graph showing PTSD Cluster C Severity over weeks](image)

**Figure 30.** Sam’s PCL-5 Cluster C Severity Effect Size (PEM-T).

**Cluster C (avoidance) number of symptoms.** The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 31. Based on level analysis, Sam’s mean number of Cluster C symptoms score decreased from a mean of 1.00 during the baseline phase to a mean of 0.53 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend during a baseline phase, a slight downward trend during the intervention phase, and stability during the post-intervention phase. The baseline phase indicated a large effect size ($r = -.80, R^2 = .63$) and a large relationship between completing assessments and Sam’s reduction in the number of his Cluster C symptoms. The intervention phase indicated a small effect size ($r = -.14, R^2 = .02$) and the presence of small relationship between continued assessment and REPC and Sam’s reduction
in the total number of his Cluster C symptoms. The post-intervention phase indicated zero effect size \((r = .00, R^2 = .00)\) and no relationship between the termination of REPC and Sam’s reduction in the severity of his PTSD symptoms, indicating that Sam’s Cluster C symptoms remained stable upon termination. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \((SD)\) of 1.00, a small amount of variability in the intervention phase with \(SD = 0.72\), and no variability in the post-intervention phase with \(SD = 0.00\). The decrease in Sam’s scores was not immediate as the data became more variable during the intervention phase. The mean of the last three data points in the baseline phase \((M = 0.67)\) was equal to the first three data points in the intervention phase \((M = 0.67)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph](image)

*Figure 31. Sam’s PCL-5 Cluster C Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 32. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.

*Figure 32. Sam’s PCL-5 Cluster Symptoms Effect Size (PEM-T).*

**Cluster D (negative alterations in cognitions and mood) severity.** The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 33. Based on level analysis, Sam’s mean Cluster D severity score decreased from a mean of 12.20 during the baseline phase to a mean of 5.18 in the intervention phase and deceased again to 2.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and a slight upward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.99, R^2 = .98$) and the presence of large relationship between completing assessments and Sam’s reduction in Cluster D severity. The
intervention phase indicated a large effect size \( r = -.88, R^2 = .77 \) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in Cluster D severity. However, the post-intervention phase indicated large effect size \( r = .87, R^2 = .75 \) and the presence of a large relationship between the termination of REPC and Sam’s increase in the severity of his Cluster D symptoms, indicating that the removal of REPC may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 5.26, a moderate amount of variability in the intervention phase with SD = 2.63, and a small amount of variability in the post-intervention phase with SD = 1.73. Cluster D severity data did not immediately decrease as the data continued to decrease following the decrease in the baseline phase. However, the mean of the last three data points in the baseline phase \( M = 8.67 \) was slightly higher than the first three data points in the intervention phase \( M = 8.00 \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 34. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster D severity.
Figure 34. Sam’s PCL-5 Cluster D Severity Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) number of symptoms. The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 35. Based on level analysis, Sam’s mean number of Cluster D symptoms score decreased from a mean of 4.00 during the baseline phase to a mean of 1.59 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend in the baseline and intervention phases and stability in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.95, R^2 = .90$) and a large relationship between completing assessments and Sam’s reduction in the number of his Cluster D symptoms. The intervention phase indicated a large effect size ($r = -.65, R^2 = .42$) and the presence of large relationship between continued assessment and REPC and Sam’s reduction in the total number of his Cluster D symptoms. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between the termination of REPC and
Sam’s reduction in Cluster D PTSD symptoms, indicating that his symptoms remained stable upon termination. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 5.26, a moderate amount of variability in the intervention phase with SD = 2.63, and a small amount of variability in the post-intervention phase with SD = 1.73. The decrease in Sam’s scores was not immediate as the data continued to decrease. However, the mean of the last three data points in the baseline phase (M = 3.00) was slightly higher than first three data points in the intervention phase (M = 2.33). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 35. Sam’s PCL-5 Cluster D Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 36. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 0% indicating that
REPC was ineffective in reducing the number of Cluster D symptoms.

Figure 36. Sam’s PCL-5 Cluster D Symptoms Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) severity. The data levels and trend for
the Cluster E severity across all phases of the study are presented in Figure 37. Based on level
analysis, Sam’s mean Cluster E severity score decreased from a mean of 10.00 during the
baseline phase to a mean of 7.47 in the intervention phase and deceased again to 5.00 in the post-
intervention phase. An analysis of the trend indicated a downward trend across the baseline and
intervention phases and stability across the post-intervention phase. The baseline phase indicated
a large effect size ($r = -.95$, $R^2 = .90$) and the presence of large relationship between completing
assessments and Sam’s reduction in Cluster E severity. The intervention phase indicated a large
effect size ($r = -.66$, $R^2 = .44$) and the presence of large relationship between continued
assessment and REPC and Sam’s reduction in Cluster E severity. The post-intervention phase
indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between the termination of REPC and Sam’s reduction in the severity of his Cluster E symptoms, indicating that Sam’s Cluster E severity remained stable upon termination. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 3.16, a moderate amount of variability in the intervention phase with $SD = 2.03$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in Sam’s scores was not immediate as the data continued to decrease with increased variability. The mean of the last three data points in the baseline phase ($M = 8.00$) was lower than the mean of the first three data points in the intervention phase ($M = 8.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 37. Sam’s PCL-5 Cluster E Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 38. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster E severity.

![Graph showing trendlines for baseline, intervention, and post-intervention phases](image.png)

*Figure 38. Sam’s PCL-5 Cluster E Severity Effect Size (PEM-T).*

**Cluster E (alterations in arousal and reactivity) number of symptoms.** The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 39. Based on level analysis, Sam’s mean number of Cluster E symptoms score decreased from a mean of 3.60 during the baseline phase to a mean of 2.29 in the intervention phase and decreased again to 1.33 in the post-intervention phase. An analysis of the trend revealed a downward trend in the baseline phase, a slight downward trend in the intervention phase, and an upward trend in the post-intervention phase. The baseline phase indicated a large effect size ($r = .88$, $R^2 = .78$) and a large relationship between completing
assessments and Sam’s reduction in the number of his Cluster E symptoms. The intervention phase indicated a small effect size \( r = -.23, R^2 = .06 \) and the presence of small relationship between continued assessment and REPC and Sam’s reduction in the total number of his Cluster E symptoms. However, the post-intervention phase indicated large effect size \( r = .87, R^2 = .75 \) and the presence of a large relationship between the termination of REPC and Sam’s increase in Cluster E symptoms, indicating that the removal of REPC may have influenced deterioration.

Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation (SD) of 0.89, a moderate amount of variability in the intervention phase with SD = 1.16, and a small amount of variability in the post-intervention phase with SD = 0.58. The slight decrease in Sam’s scores was initially immediate as the data began to decrease once beginning the intervention phase but then increased again. However, the mean of the last three data points in the baseline phase \( M = 3.00 \) was higher than first three data points in the intervention phase \( M = 2.33 \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 40. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 6%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.

*Figure 39.* Sam’s PCL-5 Cluster E Symptoms Scores. (Decreased scores indicate improvement).
Participant 2: David

David participated in five weeks of a baseline phase with no intervention, 20 weeks of intervention phase in which David received 18 sessions of REPC, and three weeks of post-intervention phase. David missed one week between weeks one and two during the baseline phase. David’s 18 counseling sessions were spread across 20 weeks as David missed one week between weeks 13 and 14 and one week between weeks 21 and 22. David’s total participation in the study was 28 weeks.

Clinician-Administered PTSD Scale (CAPS)

For the CAPS, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Table 5 and Table 6, respectively.
Table 5

Means and Standard Deviations for David’s CAPS Severity Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline $M$</th>
<th>Baseline $SD$</th>
<th>Intervention $M$</th>
<th>Intervention $SD$</th>
<th>Post-Intervention $M$</th>
<th>Post-Intervention $SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>34.60</td>
<td>4.39</td>
<td>29.71</td>
<td>6.56</td>
<td>29.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Cluster B</td>
<td>7.80</td>
<td>2.95</td>
<td>5.18</td>
<td>2.30</td>
<td>6.33</td>
<td>0.58</td>
</tr>
<tr>
<td>Cluster C</td>
<td>4.40</td>
<td>2.51</td>
<td>3.76</td>
<td>1.82</td>
<td>1.33</td>
<td>2.31</td>
</tr>
<tr>
<td>Cluster D</td>
<td>15.20</td>
<td>1.31</td>
<td>14.41</td>
<td>2.27</td>
<td>13.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Cluster E</td>
<td>7.20</td>
<td>1.64</td>
<td>6.35</td>
<td>2.71</td>
<td>8.33</td>
<td>1.53</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement

Table 6

Means and Standard Deviations for David’s CAPS Number of Symptoms Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline $M$</th>
<th>Baseline $SD$</th>
<th>Intervention $M$</th>
<th>Intervention $SD$</th>
<th>Post-Intervention $M$</th>
<th>Post-Intervention $SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>12.20</td>
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<td>3.03</td>
<td>10.00</td>
<td>1.73</td>
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<td>Cluster B</td>
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<td>2.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Cluster C</td>
<td>1.60</td>
<td>0.89</td>
<td>1.24</td>
<td>0.90</td>
<td>0.33</td>
<td>0.58</td>
</tr>
<tr>
<td>Cluster D</td>
<td>4.80</td>
<td>0.44</td>
<td>4.65</td>
<td>0.71</td>
<td>4.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cluster E</td>
<td>2.60</td>
<td>0.55</td>
<td>2.24</td>
<td>1.20</td>
<td>3.67</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement

David completed the CAPS each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and
overlapping data for the total severity and for each cluster. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 41. Based on level analysis of the graph, David’s mean total severity score decreased from a mean of 34.60 during the baseline phase to a mean of 29.71 in the intervention phase and decreased again to 29.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline, a slight downward trend across the intervention phases of the study, and a downward trend in the post-intervention phase. The baseline phase indicated a medium effect size ($r = -.47, R^2 = .22$) and the presence of moderate relationship between completing assessments and David’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a small effect size ($r = -.16, R^2 = .02$) and the presence of small relationship between continued assessment and REPC and David’s reduction in the severity of his PTSD symptoms. The post-intervention phase indicated large effect size ($r = -.5, R^2 = .25$) and the presence of a large relationship between the termination of REPC and David’s continued reduction in the severity of his PTSD symptoms. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 4.39, a large amount of variability in the intervention phase with $SD = 6.56$, and moderate variability in the post-intervention phase with $SD = 2.00$. The decrease in David’s scores was not immediate as the data continued to decrease like the data in the baseline phase. However, the mean of the last three data points in the baseline phase ($M = 34.67$) was slightly lower than the first three data points in the intervention phase ($M = 35.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 41. David’s CAPS Total Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 42. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 12% indicating that REPC was ineffective in reducing the total severity.
**Figure 42.** David’s CAPS Total Severity Scores Effect Size (PEM-T).

**Total number of symptoms.** The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 43. Based on level analysis, David’s mean total number of symptoms score decreased from a mean of 12.20 during the baseline phase to a mean of 10.06 in the intervention phase and decreased again to 10.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases of the study and stability across the post-intervention phase. The baseline phase indicated a small effect size \( r = -.29, R^2 = .08 \) and the presence of small relationship between completing assessments and David’s reduction in the total number of his PTSD symptoms. The intervention phase indicated a small effect size \( r = -.22, R^2 = .05 \) and the presence of large relationship between continued assessment and REPC and David’s reduction in the total number of his PTSD symptoms. The post-intervention phase indicated zero effect size \( r = .00, R^2 = .00 \) and no relationship between the termination of REPC and David’s continued reduction in the severity of
his PTSD symptoms, indicating that David’s symptoms remained stable after termination.

Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 1.64, a moderate amount of variability in the intervention phase with SD = 3.03, and small variability in the post-intervention phase with SD = 1.73. The decrease in David’s scores was not immediate as the data continued to decrease similarly to the decrease in the baseline data. The mean of the last three data points in the baseline phase (M = 12.33) was equal to the first three data points in the intervention phase (M = 12.33). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 43. David’s CAPS Total Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 44. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a
total of seven data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 41%, indicating that REPC was ineffective in reducing the total number of symptoms.

**Figure 44.** David’s CAPS Total Symptoms Effect Size (PEM-T).

**Cluster B (intrusion) severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 45. Based on level analysis, David’s mean Cluster B severity score decreased from a mean of 7.80 during the baseline phase to a mean of 5.18 in the intervention phase, and increased to 6.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight downward trend across the intervention phase, and stability across the post-intervention phase. The baseline phase indicated a small effect size ($r = -.21$, $R^2 = .05$) and the presence of small relationship between completing assessments and David’s reduction in Cluster B severity. The intervention phase indicated no effect size ($r = -.06$, $R^2 = .00$) and no relationship between continued assessment
and REPC and David’s reduction in Cluster B severity. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) no relationship between the termination of REPC and David’s continued reduction in the severity of his PTSD symptoms, indicating that Cluster B severity remained stable after termination. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 2.95, a moderate amount of variability in the intervention phase with $SD = 2.30$, and low variability in the post-intervention phase with $SD = 0.58$. The decrease in David’s scores was not immediate as the data continued to decrease. However, the mean of the last three data points in the baseline phase ($M = 8.33$) was slightly higher than the first three data points in the intervention phase ($M = 6.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 45](image_url)

**Figure 45.** David’s CAPS B Cluster Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 46. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 6 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 35%, indicating that REPC was ineffective in reducing the Cluster B severity.

Figure 46. David’s CAPS Cluster B Severity Effect Size (PEM-T).

**Cluster B (intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 47. Based on level analysis, David’s mean number of Cluster B symptoms score decreased from a mean of 3.20 during the baseline phase to a mean of 1.94 in the intervention phase and slightly increased to 2.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight upward trend across the intervention phase, and stability across the post-intervention phase. The baseline phase indicated a small effect size ($r = -.19, R^2 = .04$) and the presence of a small relationship between completing assessments and David’s reduction in
the number of his Cluster B symptoms. The intervention phase indicated no effect size \((r = .06, R^2 = .00)\) and no relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster B symptoms. The post-intervention phase indicated zero effect size \((r = .00, R^2 = .00)\) and no relationship between the termination of REPC and David’s continued reduction in Cluster B symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \((SD)\) of 0.84, a small amount of variability in the intervention phase with \(SD = 1.20\), and no variability in the post-intervention phase with \(SD = 0.00\). The decrease in David’s scores was not immediate except for the first data point of the intervention phase, which decreased from the last data point in the baseline phase. However, the mean of the last three data points in the baseline phase \((M = 3.33)\) was higher than the first three data points in the intervention phase \((M = 2.00)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 47. David’s CAPS Cluster B Symptom Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 48. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of ten data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 59%, indicating that REPC was questionable in reducing the number of Cluster B symptoms.

![Figure 48](image.png)

**Figure 48.** David’s CAPS Cluster B Symptoms Effect Size (PEM-T).

**Cluster C (avoidance) severity.** The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 49. Based on level analysis, David’s mean Cluster C severity score decreased from a mean of 4.40 during the baseline phase to a mean of 3.76 in the intervention phase and deceased again to 1.33 in the post-intervention phase. An analysis of the trend indicated an upward trend across the baseline phase, a downward trend across the intervention phase, and an upward trend across the post-intervention phase. The
baseline phase indicated a medium effect size \((r = .31, R^2 = .10)\) and the presence of moderate relationship between completing assessments and David’s increase in Cluster C severity. The intervention phase indicated medium effect size the baseline phase \((r = -.33, R^2 = .11)\) and the presence of medium relationship between continued assessment and REPC and David’s reduction in Cluster C severity, indicating that REPC had an effect on David’s reduction in Cluster C severity. The post-intervention phase indicated large effect size \((r = .87, R^2 = .75)\) and the presence of a large relationship between the termination of REPC and David’s increase in the severity of his PTSD symptoms, indicating that termination of equine assisted may have influenced deterioration. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation \((SD)\) of 2.51, a small amount of variability in the intervention phase with \(SD = 1.82\), and moderate variability in the post-intervention phase with \(SD = 2.31\). The decrease in David’s scores was not immediate as the first three data points in the intervention phase were similar to the data in the baseline phase. The mean of the last three data points in the baseline phase \((M = 5.33)\) was slightly lower than the first three data points in the intervention phase \((M = 5.67)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 50. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 16 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 94%, indicating that REPC was highly effective in reducing the Cluster C severity.
Figure 50. David’s CAPS Cluster C Severity Effect Size (PEM-T).

**Cluster C (avoidance) number of symptoms.** The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 51. Based on level analysis, David’s mean number of Cluster C symptoms score decreased from a mean of 1.60 during the baseline phase to a mean of 1.24 in the intervention phase and decreased again to 0.33 in the post-intervention phase. An analysis of the trend revealed an upward trend in the baseline phase, a downward trend in the intervention phase, and an upward trend in the post-intervention phase. The baseline phase indicated a medium effect size \((r = .35, R^2 = .13)\) and a moderate relationship between completing assessments and David’s increase in the number of his Cluster C symptoms. The intervention phase indicated a large effect size \((r = -.34, R^2 = .0.12)\) and the presence of a medium relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster C symptoms, indicating that REPC had an effect on the reduction of Cluster C symptoms. The post-intervention phase indicated large effect size \((r = \)
.87, $R^2 = .75$) and the presence of a large relationship between termination of REPC and David’s increase in Cluster C Symptoms, indicating the termination may have influenced deterioration. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 0.89, a small amount of variability in the intervention phase with $SD = 0.90$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. The decrease in David’s scores was not immediate as the first three data points of the intervention phase were equal to the last three data points of the baseline phase. The mean of the last three data points in the baseline phase ($M = 2.00$) was equal to the first three data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 51. David’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement).*
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 52. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 17 data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 100%, indicating that REPC was highly effective in reducing the number of Cluster C symptoms.

![Figure 52. David’s CAPS Cluster C Symptoms Effect Size (PEM-T).](image)

**Cluster D (negative alterations in cognitions and mood) severity.** The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 53. Based on level analysis, David’s mean Cluster D severity score decreased from a mean of 15.20 during the baseline phase to a mean of 14.41 in the intervention phase and deceased again to 13.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight upward trend across the intervention phase, and a downward trend across
the post-intervention phase. The baseline phase indicated a large effect size \( r = -.85, R^2 = .72 \) and the presence of large relationship between completing assessments and David’s reduction in Cluster D severity. The intervention phase indicated no effect size \( r = .05, R^2 = .00 \) and no relationship between continued assessment and REPC and David’s reduction in Cluster D severity. The post-intervention phase indicated large effect size \( r = -1.00, R^2 = 1.00 \) and the presence of a large relationship between termination of REPC and David’s reduction in Cluster D severity. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \( (SD) \) of 1.33, a moderate amount of variability in the intervention phase with \( SD = 2.27 \), and moderate variability in the post-intervention phase with \( SD = 2.00 \). The decrease in David’s scores was not immediate, as the data initially appeared similar to the data in the baseline phase. The mean of the last three data points in the baseline phase \( (M = 15.33) \) was equal to the first three data points in the intervention phase \( (M = 15.33) \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 54. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster D severity.

*Figure 53.* David’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement).
Figure 5. David’s CAPS Cluster D Severity Effect Size (PEM-T).

**Cluster D (negative alterations in cognitions and mood) number of symptoms.** The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 5. Based on level analysis, David’s mean number of Cluster D symptoms score decreased from a mean of 4.80 during the baseline phase to a mean of 4.64 in the intervention phase and decreased again to 4.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across all phases of the study. The baseline phase indicated a large effect size ($r = -.71, R^2 = .50$) and a large relationship between completing assessments and David’s reduction in the number of his Cluster D symptoms. The intervention phase indicated a small effect size ($r = -.26, R^2 = .07$) and the presence of small relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster D symptoms. The post-intervention phase indicated large effect size ($r = -.50, R^2 = .25$) and the presence of a large relationship between termination of REPC and David’s reduction in Cluster D symptoms.
Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 0.45, a small amount of variability in the intervention phase with $SD = .71$, and a small amount of variability in the post-intervention phase with $SD = 1.00$. The decrease in David’s scores was not immediate as the data increased at the start of the intervention phase. The mean of the last three data points in the baseline phase ($M = 4.67$) was lower than first three data points in the intervention phase ($M = 5.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph of David’s CAPS Cluster D Symptoms](image)

*Figure 55. David’s CAPS Cluster D Symptoms. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 56. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 5.9%, indicating that REPC was ineffective in reducing the number of Cluster D symptoms.

**Figure 56.** David’s CAPS Cluster D Symptoms Effect Size (PEM-T).

**Cluster E (alterations in arousal and reactivity) severity.** The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 57. Based on level analysis, David’s mean Cluster E severity score decreased from a mean of 7.20 during the baseline phase to a mean of 6.35 in the intervention phase and increased to 8.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases of the study. The baseline phase indicated a large effect size ($r = -0.69, R^2 = .45$) and the presence of large relationship between completing assessments and David’s reduction in Cluster E severity. The intervention phase indicated a small effect size ($r = -0.15, R^2 = .02$) and the presence of a small relationship between continued assessment and REPC and David’s reduction in Cluster E severity. The post-intervention phase indicated large effect size ($r = -0.65, R^2 = .43$) and the
presence of a large relationship between termination of REPC and David’s reduction in Cluster E severity. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 1.64, a moderate amount of variability in the intervention phase with \( SD = 2.71 \), and low variability in the post-intervention phase with \( SD = 1.53 \). The decrease in David’s scores was not immediate as the data began to increase upon beginning the intervention phase. The mean of the last three data points in the baseline phase \( (M = 6.33) \) was lower than the first three data points in the intervention phase \( (M = 8.33) \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 57. David’s CAPS Cluster E Severity Scores (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 58. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster E severity.

Figure 58. David’s CAPS Cluster E Severity Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) number of symptoms. The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 59. Based on level analysis, David’s mean number of Cluster E symptoms score decreased from a mean of 2.60 during the baseline phase to a mean of 2.24 in the intervention phase and increased to 3.67 in the post-intervention phase. An analysis of the trend revealed a downward trend in the baseline and intervention phases and stability across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.57, R^2 = .33$) and a medium relationship between completing assessments and David’s reduction in the number of his Cluster E symptoms. The intervention phase indicated a small effect size ($r = -.21, R^2 = .04$) and the presence of small relationship between continued assessment and REPC and
David’s reduction in the total number of his Cluster E symptoms. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster E symptoms, indicating stability after termination. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation ($SD$) of 0.55, a small amount of variability in the intervention phase with $SD = 1.20$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. The decrease in David’s scores was not immediate as the data increased at the beginning of the intervention phase. The mean of the last three data points in the baseline phase ($M = 2.33$) was lower than first three data points in the intervention phase ($M = 3.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 59.* David’s CAPS Cluster E Symptoms Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 60. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 5.9%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.

Figure 60. David’s CAPS Cluster E Symptoms Effect Size (PEM-T).

PTSD Checklist (PCL-5)

For the PCL-5, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Table 7 and Table 8, respectively.
Table 7

*Means and Standard Deviations for David’s PCL-5 Severity Scores*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Total</td>
<td>29.40</td>
<td>15.66</td>
<td>14.24</td>
</tr>
<tr>
<td>Cluster B</td>
<td>6.00</td>
<td>3.94</td>
<td>1.71</td>
</tr>
<tr>
<td>Cluster C</td>
<td>4.00</td>
<td>2.35</td>
<td>1.82</td>
</tr>
<tr>
<td>Cluster D</td>
<td>10.60</td>
<td>4.62</td>
<td>6.76</td>
</tr>
<tr>
<td>Cluster E</td>
<td>9.20</td>
<td>5.36</td>
<td>3.94</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement

Table 8

*Means and Standard Deviations for David’s PCL-5 Number of Symptoms Scores*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Total</td>
<td>8.00</td>
<td>7.11</td>
<td>0.94</td>
</tr>
<tr>
<td>Cluster B</td>
<td>1.80</td>
<td>1.64</td>
<td>0.06</td>
</tr>
<tr>
<td>Cluster C</td>
<td>1.20</td>
<td>1.10</td>
<td>0.00</td>
</tr>
<tr>
<td>Cluster D</td>
<td>2.80</td>
<td>2.28</td>
<td>0.59</td>
</tr>
<tr>
<td>Cluster E</td>
<td>2.20</td>
<td>2.28</td>
<td>0.29</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement

David completed the PCL-5 each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and
overlapping data for each of the constructs. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 61. Based on level analysis of the graph, David’s mean total severity score decreased from a mean of 29.40 during the baseline phase to a mean of 14.24 in the intervention phase and decreased again to 13.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight downward trend across the intervention phase, and a downward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.93$, $R^2 = .86$) and the presence of large relationship between completing assessments and David’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a medium effect size ($r = -.41$, $R^2 = .17$) and the presence of moderate relationship between continued assessment and REPC and David’s reduction in the severity of his PTSD symptoms. The post-intervention phase indicated a large effect size ($r = -1.00$, $R^2 = 1.00$) and a large relationship between termination of REPC and David’s reduction in total severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 15.66, a moderate amount of variability in the intervention phase with $SD = 2.25$, and low variability in the post-intervention phase with $SD = 1.00$. The decrease in David’s scores was not immediate, as the data did not decrease upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 19.67$) was slightly higher than the first three data points in the intervention phase ($M = 17.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 6. David’s PCL-5 Total Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 62. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total severity.
Total number of symptoms. The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 63. Based on level analysis, David’s mean total number of symptoms score decreased from a mean of 8.00 during the baseline phase to a mean of 0.94 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases of the study and stability across the post-intervention phase. The baseline phase indicated a large effect size ($r = -0.93$, $R^2 = 0.87$) and the presence of large relationship between completing assessments and David’s reduction in the total number of his PTSD symptoms. The intervention phase indicated a medium effect size ($r = -0.37$, $R^2 = 0.14$) and the presence of a moderate relationship between continued assessment and REPC and David’s reduction in the total number of his PTSD symptoms. The post-intervention phase indicated zero effect size ($r = 0.00$, $R^2 = 0.00$) and no relationship between termination of REPC and David’s reduction in total symptoms,
indicating stability after termination. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation \( (SD) \) of 7.11, a small amount of variability in the intervention phase with \( SD = 1.39 \), and no variability in the post-intervention phase with \( SD = 0.00 \). The decrease in David’s scores was not immediate, as the data did not decrease upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase \( (M = 3.67) \) was slightly higher than the first three data points in the intervention phase \( (M = 3.00) \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 6. David’s PCL-5 Total Symptoms Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 64. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total number of symptoms.

Figure 6.4. David’s PCL-5 Total Symptoms Effect Size (PEM-T).

**Cluster B (intrusion) severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 65. Based on level analysis, David’s mean Cluster B severity score decreased from a mean of 6.00 during the baseline phase to a mean of 1.71 in the intervention phase and decreased again to 1.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, stability across the intervention phase, and a downward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.84$, $R^2 = .71$) and the presence of large relationship between completing assessments and David’s reduction in Cluster B severity. The intervention phase indicated no effect size ($r = .01$, $R^2 = .00$) and no relationship between continued assessment and REPC and David’s reduction in Cluster B severity. The post-intervention phase indicated a large
effect size ($r = -0.87, R^2 = 0.75$) and the presence of a large relationship between termination of REPC and David’s reduction in Cluster B severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 3.94, a small amount of variability in the intervention phase with $SD = 1.10$, and small variability in the post-intervention phase with $SD = 1.15$. The decrease in David’s scores was not immediate as the data initially increased and then decreased once beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 4.33$) was slightly higher than the first three data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing David's PCL-5 Cluster B Severity Scores](image)

**Figure 6.** David’s PCL-5 Cluster B Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 66. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a
total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster B severity.

![Graph showing PTSD Cluster B Severity](image)

**Figure 6.** David’s PCL-5 Cluster B Severity Effect Size (PEM-T).

**Cluster B (intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 67. Based on level analysis, David’s mean number of Cluster B symptoms score decreased from a mean of 1.80 during the baseline phase to a mean of 0.06 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline, a slight downward trend across the intervention phase, and a stable trend in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.87, R^2 = .75$) and the presence of large relationship between completing assessments and David’s reduction in the number of his Cluster B symptoms. The intervention phase indicated a medium effect size ($r = -$
.31, $R^2 = .09$) and the presence of moderate relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster B symptoms. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster B symptoms, indicating stability after termination. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.64, a small amount of variability in the intervention phase with $SD = 1.24$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in David’s scores was not immediate his data at the end of the baseline reflected a zero score. However, the mean of the last three data points in the baseline phase ($M = 0.00$) was slightly lower than the first three data points in the intervention phase ($M = 0.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 67. David’s PCL-5 Cluster B Symptoms Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 6.8. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.

![Figure 6.8. David’s PCL-5 Cluster B Symptoms Effect Size (PEM-T).](image)

**Cluster C (avoidance) severity.** The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 6.9. Based on level analysis, David’s mean Cluster C severity score decreased from a mean of 4.00 during the baseline phase to a mean of 1.82 in the intervention phase and increased to 2.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the all the baseline and intervention phases and stability in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.94$,
$R^2 = .89$) and the presence of large relationship between completing assessments and David’s reduction in Cluster C severity. The intervention phase indicated a small effect size ($r = -.23, R^2 = .05$) and the presence of a small relationship between continued assessment and REPC and David’s reduction in Cluster C severity. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster C severity, indicating stability after termination. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 2.35, a moderate amount of variability in the intervention phase with $SD = 2.17$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in David’s scores was not immediate, as the data did not immediately decrease at the start of the intervention phase. The mean of the last three data points in the baseline phase ($M = 2.67$) was slightly higher than the first three data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 69. David’s PCL-5 Cluster C Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 70. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster C severity.
Cluster C (avoidance) number of symptoms. The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 71. Based on level analysis, David’s mean number of Cluster C symptoms score decreased from a mean of 1.80 during the baseline phase to a mean of 0.06 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline phase and stability in the intervention and post-intervention phases. The baseline phase indicated a large effect size ($r = -.87, R^2 = .75$) and a large relationship between completing assessments and David's reduction in the number of his Cluster C symptoms. The intervention phase indicated a zero effect size ($r = .00, R^2 = .00$) and no relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster C symptoms. The
post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster C symptoms, indicating stability after termination. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.10, no variability in the intervention phase with $SD = 0.00$, and no variability in the post-intervention phase with $SD = 0.00$. The decrease in David’s scores was not immediate, as the data had already decreased to zero at the end of the baseline phase. The mean of the last three data points in the baseline phase ($M = .67$) was higher than the mean of first three data points in the intervention phase ($M = 0.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing baseline, intervention, and post-intervention phases with R^2 values.]  

*Figure 71.* David’s PCL-5 Cluster C Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 72. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.

**Figure 7.2.** David’s PCL-5 Cluster Symptoms Effect Size (PEM-T).

**Cluster D (negative alterations in cognitions and mood) severity.** The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 7.3. Based on level analysis, David’s mean Cluster D severity score decreased from a mean of 10.60 during the baseline phase to a mean of 6.76 in the intervention phase and deceased again to 5.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase and stability across the intervention and post-intervention phases. The baseline phase indicated a large effect size \( r = -.93, R^2 = .86 \) and the presence of large relationship between completing assessments and David’s reduction in Cluster D severity. The intervention phase
indicated a medium effect size ($r = -.31$, $R^2 = .10$) and the presence of a moderate relationship between continued assessment and REPC and David’s reduction in Cluster D severity. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster D severity, indicating stability after termination. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 4.62, a small amount of variability in the intervention phase with $SD = 1.30$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. Cluster D severity data did not immediately decrease as the data increased and then decreased at the beginning of the intervention phase. The mean of the last three data points in the baseline phase ($M = 7.67$) was slightly lower than the first three data points in the intervention phase ($M = 8.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 73](image.png)

*Figure 73.* David’s PCL-5 Cluster D Severity Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 74. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster D severity.

![Figure 74](image)

*Figure 74. David’s PCL-5 Cluster D Severity Effect Size (PEM-T).*

**Cluster D (negative alterations in cognitions and mood) number of symptoms.** The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 75. Based on level analysis, David’s mean number of Cluster D symptoms score decreased from a mean of 2.80 during the baseline phase to a mean of 0.59 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend in the baseline phase, a slight downward trend across the
intervention phase, and stability in the post-intervention phase. The baseline phase indicated a large effect size \( r = -.97, R^2 = .94 \) and a large relationship between completing assessments and David’s reduction in the number of his Cluster D symptoms. The intervention phase indicated a small effect size \( r = -.16, R^2 = .02 \) and the presence of small relationship between continued assessment and REPC and David’s reduction in the total number of his Cluster D symptoms. The post-intervention phase indicated zero effect size \( r = .00, R^2 = .00 \) and no relationship between termination of REPC and David’s reduction in Cluster D symptoms, indicating stability after termination. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation \( (SD) \) of 2.28, a small amount of variability in the intervention phase with \( SD = 0.87 \), and no variability in the post-intervention phase with \( SD = 0.00 \). The decrease in David’s scores was not immediate as the data initially increased and then fluctuated during the intervention phase. However, the mean of the last three data points in the baseline phase \( (M = 1.33) \) was equal to the first three data points in the intervention phase \( (M = 1.33) \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 7.6. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster D symptoms.

*Figure 7.5.* David’s PCL-5 Cluster D Symptoms Scores. (Decreased scores indicate improvement).
Figure 7. David’s PCL-5 Cluster D Symptoms Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) severity. The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 77. Based on level analysis, David’s mean Cluster E severity score decreased from a mean of 9.20 during the baseline phase to a mean of 3.94 in the intervention phase and increased slightly to 4.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight downward trend across the intervention phase, and stability across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.89$, $R^2 = .78$) and the presence of large relationship between completing assessments and David’s reduction in Cluster E severity. The intervention phase indicated a medium effect size ($r = -.36$, $R^2 = .13$) and the presence of a moderate relationship between continued assessment and REPC and David’s reduction in Cluster E severity. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster E severity.
severity, indicating stability after termination. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 5.36, a small amount of variability in the intervention phase with SD = 1.30, and no variability in the post-intervention phase with SD = 0.00. The decrease in David’s scores was not immediate as the first data point during the intervention phase increased followed by a decrease and stabilization of the data. The mean of the last three data points in the baseline phase (M = 5.67) was slightly higher than the mean of the first three data points in the intervention phase (M = 5.33). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 7. David’s PCL-5 Cluster E Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 78. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster E severity.

Figure 78. David’s PCL-5 Cluster E Severity Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) number of symptoms. The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 79. Based on level analysis, David’s mean number of Cluster E symptoms score decreased from a mean of 2.20 during the baseline phase to a mean of 0.29 in the intervention phase and decreased again to 0.00 in the post-intervention phase. An analysis of the trend revealed a downward trend in the baseline and intervention phases and stability across post-intervention phase. The baseline phase indicated a large effect size ($r = -.90, R^2 = .81$) and a large relationship between completing assessments and David’s reduction in the number of his Cluster E symptoms. The intervention phase indicated a medium effect size ($r = -.31, R^2 = .10$) and the presence of a moderate relationship between continued assessment and REPC and
David’s reduction in the total number of his Cluster E symptoms. The post-intervention phase indicated zero effect size ($r = .00$, $R^2 = .00$) and no relationship between termination of REPC and David’s reduction in Cluster E symptoms, indicating stability after termination. Analysis of variability indicated a medium amount variability in the baseline phase with a standard deviation ($SD$) of 2.28, a small amount of variability in the intervention phase with $SD = 0.99$, and a no variability in the post-intervention phase with $SD = 0.00$. The data did not immediately decrease upon beginning the intervention phase but increased followed by stability at zero. However, the mean of the last three data points in the baseline phase ($M = 0.67$) was lower than first three data points in the intervention phase ($M = 1.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 79. David’s PCL-5 Cluster E Symptoms Scores. (Decreased scores indicate improvement).*
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 80. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of 17 data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.

![Figure 80. David’s PCL-5 Cluster E Symptoms Effect Size (PEM-T).](image)

**Participant 3: Matt**

Matt participated in five weeks of a baseline phase with no intervention, 10 weeks of intervention phase in which Matt received nine sessions of REPC, and three weeks of post-intervention phase. Matt’s nine counseling sessions were spread across 10 weeks as Matt missed one week between weeks nine and ten. Matt also missed one week between weeks 13 and 14 and
one week between weeks 14 and 15 during the post-intervention phase. Matt participated in the study for a total of 19 weeks.

**Clinician-Administered PTSD Scale (CAPS)**

For the CAPS, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Table 9 and Table 10, respectively.

Table 9

*Means and Standard Deviations for Matt’s CAPS Severity Scores*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Total</td>
<td>43.40</td>
<td>9.37</td>
<td>43.63</td>
</tr>
<tr>
<td>Cluster B</td>
<td>5.80</td>
<td>4.09</td>
<td>8.75</td>
</tr>
<tr>
<td>Cluster C</td>
<td>6.0</td>
<td>2.35</td>
<td>5.13</td>
</tr>
<tr>
<td>Cluster D</td>
<td>17.00</td>
<td>2.74</td>
<td>16.38</td>
</tr>
<tr>
<td>Cluster E</td>
<td>14.60</td>
<td>1.95</td>
<td>13.38</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement
Table 10

Mean and Standard Deviations for Matt’s CAPS Number of Symptoms Scores

| Cluster | Baseline | | | Intervention | | | | Post-Intervention | | |
|---------|----------|----------|----------|----------|----------|----------|----------|------------------|----------|
|         | M        | SD       | M        | SD       | M        | SD       |
| Total   | 14.40    | 2.51     | 14.50    | 2.51     | 13.67    | 2.08     |
| Cluster B | 1.80    | 1.31     | 3.13     | 0.83     | 3.00     | 2.00     |
| Cluster C | 1.60    | 0.55     | 1.50     | 0.53     | 1.67     | 0.58     |
| Cluster D | 5.60    | 0.55     | 5.00     | 0.76     | 5.33     | 0.58     |
| Cluster E | 5.40    | 0.55     | 4.88     | 1.36     | 3.67     | 1.15     |

Note: Decreased scores indicate improvement

Matt completed the CAPS each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and overlapping data for the each construct. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 81. Based on level analysis of the graph, Matt’s mean total severity score slightly increased from a mean of 43.40 during the baseline phase to a mean of 43.63 in the intervention phase and slightly increased again to 44.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and an upward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.74, R^2 = .55$) and the presence of large relationship between completing assessments and Matt’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a
medium effect size \( (r = -.30, R^2 = .09) \) and the presence of moderate relationship between continued assessment and REPC and Matt’s reduction in the severity of his PTSD symptoms. The post-intervention phase indicated a large effect size \( (r = .50, R^2 = .25) \) and the presence of a large relationship between termination of REPC and Matt’s increase in total severity, indicating that termination may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation \((SD)\) of 9.37, a large amount of variability in the intervention phase with \(SD = 7.35\), and large variability in the post-intervention phase with \(SD = 6.00\). The decrease in Matt’s scores was not immediate, as the data did not immediately decrease. However, the mean of the last three data points in the baseline phase \((M = 37.33)\) was lower than the first three data points in the intervention phase \((M = 44.00)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 81.* Matt’s CAPS Total Severity Scores. (Decreased scores indicate improvement).
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 8.2. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total severity.

![Figure 8.2](image)

**Figure 8.2.** Matt’s CAPS Total Severity Scores Effect Size (PEM-T).

**Total number of symptoms.** The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 8.3. Based on level analysis, Matt’s mean total number of symptoms score slightly increased from a mean of 14.40 during the baseline phase to a mean of 14.50 in the intervention phase and then decreased to 13.67 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases of the study and an upward trend across the post-intervention phase. The
baseline phase indicated a large effect size ($r = -.57, R^2 = .32$) and the presence of large
relationship between completing assessments and Matt’s reduction in the total number of his
PTSD symptoms. The intervention phase indicated a medium effect size ($r = -.37, R^2 = .14$) and
the presence of a moderate relationship between continued assessment and REPC and Matt’s
reduction in the total number of his PTSD symptoms. The post-intervention phase indicated a
large effect size ($r = .72, R^2 = .52$) and the presence of a large relationship between termination
of REPC and Matt’s increase in total symptoms, indicating that termination may have influenced
deterioration. Analysis of variability indicated a moderate amount of variability in the baseline
phase with a standard deviation ($SD$) of 2.51, a moderate amount of variability in the
intervention phase with $SD = 2.51$, and moderate variability in the post-intervention phase with
$SD = 2.08$. The decrease in Matt’s scores was not immediate as the data continued to vary. The
mean of the last three data points in the baseline phase ($M = 13.00$) was lower than the first three
data points in the intervention phase ($M = 15.00$). Finally, based on visual analysis, there were
overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 8. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total number of symptoms.
Cluster B (intrusion) severity. The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 85. Based on level analysis, Matt’s mean Cluster B severity score increased from a mean of 5.80 during the baseline phase to a mean of 8.75 in the intervention phase, and slightly decreased to 8.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and an upward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.74, R^2 = .54$) and the presence of a large relationship between completing assessments and Matt’s reduction in Cluster B severity. The intervention phase indicated a medium effect size ($r = -.34, R^2 = .11$) and a moderate relationship between continued assessment and REPC and Matt’s reduction in Cluster B severity. The post-intervention phase indicated a medium effect size ($r = .45, R^2 = .21$) and the presence of a moderate relationship between termination of REPC and Matt’s increase in Cluster B severity, indicating that termination may have influenced
deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 4.09, a moderate amount of variability in the intervention phase with $SD = 2.60$, and high variability in the post-intervention phase with $SD = 5.51$. The decrease in Matt’s scores was not immediate as the data initially increased and then fluctuated. However, the mean of the last three data points in the baseline phase ($M = 4.00$) was lower than the first three data points in the intervention phase ($M = 9.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 8.5. Matt’s CAPS B Cluster Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 8.6. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in
the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster B severity.

![Graph showing PTSD Cluster B Severity](image)

**Figure 86.** Matt’s CAPS Cluster B Severity Effect Size (PEM-T).

**Cluster B (intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 87. Based on level analysis, Matt’s mean number of Cluster B symptoms score increased from a mean of 1.80 during the baseline phase to a mean of 3.13 in the intervention phase and slightly decreased to 3.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, stability across the intervention phase, and an upward trend across the post-intervention phase. The baseline phase indicated a medium effect size ($r = -.48$, $R^2 = .24$) and the presence of a moderate relationship between completing assessments and Matt’s reduction in the number of his Cluster B symptoms. The intervention phase indicated no effect size ($r = -.03$, $R^2 = .00$) and no relationship between continued assessment and REPC and Matt’s reduction in the
total number of his Cluster B symptoms. The post-intervention phase indicated a large effect size
\( r = .50, R^2 = .25 \) and the presence of a large relationship between termination of REPC and
Matt’s increase in Cluster B symptoms, indicating that termination may have influenced
deterioration. Analysis of variability indicated a small amount of variability in the baseline phase
with a standard deviation (SD) of 1.30, a small amount of variability in the intervention phase
with SD = 0.83 and moderate variability in the post-intervention phase with SD = 2.00. The
decrease in Matt’s scores was not immediate as the data increased upon beginning the
intervention phase. However, the mean of the last three data points in the baseline phase \( (M = 1.33) \) was lower than the first three data points in the intervention phase \( (M = 3.00) \). Finally,
based on visual analysis, there were overlapping data between the baseline and intervention
phases.

![Figure 87. Matt’s CAPS Cluster B Symptom Scores. (Decreased scores indicate improvement).](image-url)
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 88. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.

![Figure 88. Matt’s CAPS Cluster B Symptoms Effect Size (PEM-T).](image)

**Cluster C (avoidance) severity.** The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 89. Based on level analysis, Matt’s mean Cluster C severity score decreased from a mean of 6.00 during the baseline phase to a mean of 5.13 in the intervention phase and slightly increased to 5.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases. The baseline phase indicated a medium effect size ($r = -.40, R^2 = .16$) and the presence of moderate relationship between
completing assessments and Matt’s reduction in Cluster C severity. The intervention phase indicated a small effect size the baseline phase ($r = -.24$, $R^2 = .06$) and the presence of a small relationship between continued assessment and REPC and Matt’s reduction in Cluster C severity. The post-intervention phase indicated a large effect size ($r = -.87$, $R^2 = .25$) and the presence of a large relationship between termination of REPC and Matt’s reduction in Cluster C severity. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 2.35, a small amount of variability in the intervention phase with $SD = 1.81$, and moderate variability in the post-intervention phase with $SD = 1.15$. The decrease in Matt’s scores was not immediate as the first three data points in the intervention phase were similar to the data in the baseline phase. The mean of the last three data points in the baseline phase ($M = 4.67$) was slightly lower than the first three data points in the intervention phase ($M = 5.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 90. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 1 data point below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 13%, indicating that REPC was ineffective in reducing the Cluster C severity.
Cluster C (avoidance) number of symptoms. The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 91. Based on level analysis, Matt’s mean number of Cluster B symptoms score slightly decreased from a mean of 1.60 during the baseline phase to a mean of 1.50 in the intervention phase and slightly increased to 1.67 in the post-intervention phase. An analysis of the trend revealed a downward trend across all phases. The baseline phase indicated a small effect size ($r = -.29$, $R^2 = .08$) and a small relationship between completing assessments and Matt’s reduction in the number of his Cluster C symptoms. The intervention phase indicated a small effect size ($r = -.22$, $R^2 = .05$) and the presence of a small relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster C symptoms. The post-intervention phase indicated a large effect size ($r = -.87$, $R^2 = .75$) and the presence of a large relationship between termination of REPC and Matt’s reduction in Cluster C symptoms. Analysis of variability indicated a small
amount of variability in the baseline phase with a standard deviation ($SD$) of 0.55, a small amount of variability in the intervention phase with $SD = 0.53$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. The decrease in Matt’s scores was not immediate as data continued to fluctuate. The mean of the last three data points in the baseline phase ($M = 1.33$) was slightly lower than the first three data points in the intervention phase ($M = 1.76$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing Matt’s CAPS Cluster C Symptoms Scores.](image)

*Figure 91.* Matt’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 92. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 1 data point below the line. When divided by the total number of eight data points in the
intervention phase and then multiplied by 100, I calculated an effect size of 13%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.

**Figure 92.** Matt’s CAPS Cluster C Symptoms Effect Size (PEM-T).

**Cluster D (negative alterations in cognitions and mood) severity.** The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 93. Based on level analysis, Matt’s mean Cluster D severity score decreased from a mean of 17.00 during the baseline phase to a mean of 16.38 in the intervention phase and increased to 19.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases. The baseline phase indicated a large effect size ($r = -.64$, $R^2 = .40$) and the presence of large relationship between completing assessments and Matt’s reduction in Cluster D severity. The intervention phase indicated a medium effect size ($r = -.30$, $R^2 = .09$) and the presence of a moderate relationship between continued assessment and REPC and Matt’s reduction in Cluster D severity. The post-intervention phase indicated a large effect size ($r = -.50$, $R^2 = .25$) and the
presence of a large relationship between termination of REPC and Matt’s reduction in Cluster D severity. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation (SD) of 2.74, a moderate amount of variability in the intervention phase with SD = 2.62, and moderate variability in the post-intervention phase with SD = 2.00. Matt’s scores initially decreased and then increased upon beginning the intervention phase. The mean of the last three data points in the baseline phase (M = 15.33) was lower than the first three data points in the intervention phase (M = 16.33). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 93. Matt’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 94. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in
the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster D severity.

*Figure 94.* Matt’s CAPS Cluster D Severity Effect Size (PEM-T).

**Cluster D (negative alterations in cognitions and mood) number of symptoms.** The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 95. Based on level analysis, Matt’s mean number of Cluster D symptoms score decreased from a mean of 5.60 during the baseline phase to a mean of 5.00 in the intervention phase and slightly increased to 5.33 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline phase and stability across the intervention and post-intervention phases. The baseline phase indicated a small effect size ($r = -.29$, $R^2 = .08$) and a small relationship between completing assessments and Matt’s reduction in the number of his Cluster D symptoms. The intervention phase indicated no effect size ($r = -.08$, $R^2 = .01$) and no relationship between continued assessment and REPC and Matt’s reduction in
the total number of his Cluster D symptoms. The post-intervention phase indicated a zero effect size \((r = .00, R^2 = .00)\) and no relationship between termination of REPC and Matt’s increase in Cluster D symptoms, indicating stability after termination. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation \((SD)\) of 0.55, a small amount of variability in the intervention phase with \(SD = 0.76\), and a small amount of variability in the post-intervention phase with \(SD = 0.58\). Matt’s first two data points initially decreased upon beginning the intervention phase but then increased. The mean of the last three data points in the baseline phase \((M = 5.33)\) was slightly higher than first three data points in the intervention phase \((M = 5.00)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph of PTSD Cluster D Symptoms](image)

**Figure 9.** Matt’s CAPS Cluster D Symptoms. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 96. I drew a split-middle
trendline for the baseline phase and extended the line through the intervention phase. I counted a total of four data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 55%, indicating that REPC’s effectiveness was questionable in reducing the number of Cluster D symptoms.

![Graph showing trendlines for baseline, intervention, and post-intervention phases.](image)

*Figure 96. Matt’s CAPS Cluster D Symptoms Effect Size (PEM-T).*

**Cluster E (alterations in arousal and reactivity) severity.** The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 97. Based on level analysis, Matt’s mean Cluster E severity score decreased from a mean of 14.60 during the baseline phase to a mean of 13.38 in the intervention phase and decreased to 11.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, stability across the intervention phase, and an upward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.65, R^2 = .42$) and the presence of large relationship between completing assessments and Matt’s reduction in Cluster E severity.
The intervention phase indicated no effect size ($r = -.04, R^2 = .00$) and no relationship between continued assessment and REPC and Matt’s reduction in Cluster E severity. The post-intervention phase indicated a large effect size ($r = .66, R^2 = .43$) and the presence of a large relationship between termination of REPC and Matt’s increase in Cluster E severity, indicating that termination may have influenced deterioration. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.95, a large amount of variability in the intervention phase with $SD = 3.25$, and a large amount of variability in the post-intervention phase with $SD = 3.61$. Matt’s data initially decreased upon beginning the intervention phase before increasing. The mean of the last three data points in the baseline phase ($M = 13.33$) was higher than the first three data points in the intervention phase ($M = 12.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 98. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 13%, indicating that REPC was ineffective in reducing the Cluster E severity.

Cluster E (alterations in arousal and reactivity) number of symptoms. The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 99. Based on level analysis, Matt’s mean number of Cluster E symptoms score decreased from a mean of 5.40 during the baseline phase to a mean of 4.88 in the intervention phase and decreased again to 3.67 in the post-intervention phase. An analysis of the
trend revealed a downward trend in the baseline and intervention phases and an upward in the post-intervention phase. The baseline phase indicated a large effect size ($r = -0.87, R^2 = .75$) and a large relationship between completing assessments and Matt’s reduction in the number of his Cluster E symptoms. The intervention phase indicated a large effect size ($r = -0.54, R^2 = .0.29$) and the presence of large relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster E symptoms. The post-intervention phase indicated a large effect size ($r = .87, R^2 = .75$) and the presence of a large relationship between termination of REPC and Matt’s increase in Cluster E symptoms, indicating that termination may have influenced deterioration. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation (SD) of 0.55, a small amount of variability in the intervention phase with $SD = 1.36$, and a small amount of variability in the post-intervention phase with $SD = 1.15$. The decrease in Matt’s scores was immediate as the stayed the same and then increased. The mean of the last three data points in the baseline phase ($M = 5.00$) was slightly lower than first three data points in the intervention phase ($M = 5.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 100. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 13%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.
Figure 10. Matt’s CAPS Cluster E Symptoms Effect Size (PEM-T).

PTSD Checklist (PCL-5)

For the PCL-5, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Table 11 and Table 12, respectively.
Table 11

Means and Standard Deviations for Matt’s PCL-5 Severity Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th></th>
<th>Intervention</th>
<th></th>
<th>Post-Intervention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Total</td>
<td>48.60</td>
<td>9.24</td>
<td>49.25</td>
<td>6.56</td>
<td>42.33</td>
<td>5.86</td>
</tr>
<tr>
<td>Cluster B</td>
<td>7.80</td>
<td>4.87</td>
<td>9.88</td>
<td>4.49</td>
<td>8.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Cluster C</td>
<td>4.20</td>
<td>2.77</td>
<td>5.13</td>
<td>0.83</td>
<td>4.33</td>
<td>0.58</td>
</tr>
<tr>
<td>Cluster D</td>
<td>20.80</td>
<td>2.77</td>
<td>18.38</td>
<td>1.69</td>
<td>19.33</td>
<td>3.06</td>
</tr>
<tr>
<td>Cluster E</td>
<td>15.80</td>
<td>2.17</td>
<td>15.88</td>
<td>2.70</td>
<td>10.67</td>
<td>2.89</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement

Table 12

Means and Standard Deviations for Matt’s PCL-5 Number of Symptoms Scores

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th></th>
<th>Intervention</th>
<th></th>
<th>Post-Intervention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<td>2.71</td>
<td>15.88</td>
<td>2.36</td>
<td>13.67</td>
<td>3.06</td>
</tr>
<tr>
<td>Cluster B</td>
<td>2.60</td>
<td>1.52</td>
<td>3.50</td>
<td>1.51</td>
<td>2.33</td>
<td>1.53</td>
</tr>
<tr>
<td>Cluster C</td>
<td>1.20</td>
<td>1.10</td>
<td>1.75</td>
<td>0.46</td>
<td>1.67</td>
<td>0.58</td>
</tr>
<tr>
<td>Cluster D</td>
<td>6.40</td>
<td>0.89</td>
<td>6.00</td>
<td>0.76</td>
<td>6.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cluster E</td>
<td>5.20</td>
<td>0.84</td>
<td>4.88</td>
<td>1.13</td>
<td>4.00</td>
<td>1.73</td>
</tr>
</tbody>
</table>

Note: Decreased scores indicate improvement

Matt completed the PCL-5 each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and
overlapping data for each construct. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 101. Based on level analysis of the graph, Matt’s mean total severity score increased slightly from a mean of 48.60 during the baseline phase to a mean of 49.25 in the intervention phase and decreased to 42.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases. The baseline phase indicated a large effect size ($r = -.80, R^2 = .65$) and the presence of large relationship between completing assessments and Matt’s reduction in the severity of his PTSD symptoms. The intervention phase indicated a large effect size ($r = -.56, R^2 = .31$) and the presence of large relationship between continued assessment and REPC and Matt’s reduction in the severity of his PTSD symptoms. The post-intervention phase indicated a large effect size ($r = -.77, R^2 = .59$) and the presence of a large relationship between termination of REPC and Matt’s reduction in total severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 9.24, a large amount of variability in the intervention phase with $SD = 6.56$, and a large amount of variability in the post-intervention phase with $SD = 5.86$. The decrease in Matt’s scores was not immediate, as the data did not decrease upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 43.00$) was lower than the first three data points in the intervention phase ($M = 52.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 102. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total severity.

Figure 101. Matt’s PCL-5 Total Severity Scores. (Decreased scores indicate improvement).
Figure 10.2. Matt’s PCL-5 Total Severity Effect Size (PEM-T).

**Total number of symptoms.** The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 103. Based on level analysis, Matt’s mean total number of symptoms score increased slightly from a mean of 15.60 during the baseline phase to a mean of 15.88 in the intervention phase and decreased to 13.67 in the post-intervention phase. An analysis of the trend revealed a downward trend across all phases. The baseline phase indicated a large effect size \((r = -.76, R^2 = .58)\) and the presence of a large relationship between completing assessments and Matt’s reduction in the total number of his PTSD symptoms. The intervention phase indicated a large effect size \((r = -.71, R^2 = .50)\) and the presence of a large relationship between continued assessment and REPC and Matt’s reduction in the total number of his PTSD symptoms. The post-intervention phase indicated a large effect size \((r = -.65, R^2 = .43)\) and the presence of a large relationship between termination of REPC and Matt’s reduction in total symptoms. Analysis of variability indicated a medium amount of
variability in the baseline phase with a standard deviation ($SD$) of 2.70, a medium amount of variability in the intervention phase with $SD = 2.36$, and a large amount of variability in the post-intervention phase with $SD = 3.06$. The decrease in Matt’s scores was not immediate, as the data increased upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 14.00$) was lower than the first three data points in the intervention phase ($M = 17.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 10. Matt’s PCL-5 Total Symptoms Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 104. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data
points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total number of symptoms.

![Figure 104. Matt’s PCL-5 Total Symptoms Effect Size (PEM-T).](image)

**Cluster B (intrusion) severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 105. Based on level analysis, Matt’s mean Cluster B severity score increased from a mean of 7.80 during the baseline phase to a mean of 9.88 in the intervention phase and decreased to 8.00 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline and intervention phases and an upward trend across the post-intervention phase. The baseline phase indicated a large effect size \((r = -.88, R^2 = .77)\) and the presence of a large relationship between completing assessments and Matt’s reduction in Cluster B severity. The intervention phase indicated a large size \((r = -.54, R^2 = .29)\) and the presence of a large relationship between continued assessment and REPC and Matt’s reduction in Cluster B severity. The post-intervention phase indicated a large effect size \((r\)
=.50, \( R^2 = .25 \) and the presence of a large relationship between termination of REPC and Matt’s increase in Cluster B severity, indicating that termination may have influenced deterioration. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 4.87, a large amount of variability in the intervention phase with \( SD = 4.49 \), and large variability in the post-intervention phase with \( SD = 3.00 \). The decrease in Matt’s scores was not immediate as the data increased once beginning the intervention phase. However, the mean of the last three data points in the baseline phase (\( M = 5.67 \)) was lower than the first three data points in the intervention phase (\( M = 10.67 \)). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 105. Matt’s PCL-5 Cluster B Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 106. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I
counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster B severity.

*Figure 106.* Matt’s PCL-5 Cluster B Severity Effect Size (PEM-T).

**Cluster B (intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 107. Based on level analysis, Matt’s mean number of Cluster B symptoms score increased from a mean of 2.60 during the baseline phase to a mean of 3.50 in the intervention phase and decreased to 2.33 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases and an upward trend in the post-intervention phase. The baseline phase indicated a large effect size ($r = -.83, R^2 = .70$) and the presence of large relationship between completing assessments and Matt’s reduction in the number of his Cluster B symptoms. The intervention phase indicated a medium effect size ($r = -.42, R^2 = .18$) and the presence of
moderate relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster B symptoms. The post-intervention phase indicated a large effect size ($r = .65, R^2 = .43$) and the presence of a large relationship between termination of REPC and Matt’s increase in Cluster B symptoms, indicating that termination may have influenced deterioration.

Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.52, a small amount of variability in the intervention phase with $SD = 1.51$, and a small amount of variability in the post-intervention phase with $SD = 1.53$. The decrease in Matt’s scores was not immediate his data increased at the start of the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 2.00$) was lower than the first three data points in the intervention phase ($M = 3.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 107. Matt’s PCL-5 Cluster B Symptoms Scores. (Decreased scores indicate improvement).*
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 108. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.

![Figure 108. Matt’s PCL-5 Cluster B Symptoms Effect Size (PEM-T).](image)

**Cluster C (avoidance) severity.** The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 109. Based on level analysis, Matt’s mean Cluster C severity score increased from a mean of 4.20 during the baseline phase to a mean of 5.13 in the intervention phase and deceased to 4.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases. The baseline phase indicated a medium effect size ($r = -.40$, $R^2 = .16$) and the presence of a medium relationship between completing
assessments and Matt’s reduction in Cluster C severity. The intervention phase indicated a larger effect size ($r = -0.52$, $R^2 = 0.27$) and the presence of a larger relationship between continued assessment and REPC and Matt’s reduction in Cluster C severity, indicating that the addition of REPC may have had a greater effect than continued assessments alone. The post-intervention phase indicated a large effect size ($r = -0.87$, $R^2 = 0.75$) and the presence of a large relationship between termination of REPC and Matt’s reduction in Cluster C severity. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 2.77, a small amount of variability in the intervention phase with $SD = 0.83$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. The decrease in Matt’s scores was not immediate as the data increased at the start of the intervention phase. The mean of the last three data points in the baseline phase ($M = 2.67$) was lower than the first three data points in the intervention phase ($M = 5.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 109. Matt’s PCL-5 Cluster C Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 110. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster C severity.
Cluster C (avoidance) number of symptoms. The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 111. Based on level analysis, Matt’s mean number of Cluster C symptoms score slightly increased from a mean of 1.20 during the baseline phase to a mean of 1.75 in the intervention phase and decreased to 1.67 in the post-intervention phase. An analysis of the trend revealed a downward trend across the baseline and intervention phases and stability across the post-intervention phase. The baseline phase indicated a small effect size ($r = -.29, R^2 = .08$) and a small relationship between completing assessments and Matt’s reduction in the number of his Cluster C symptoms. The intervention phase indicated a small effect size ($r = -.25, R^2 = .06$) and the presence of a small relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster C symptoms. The post-intervention phase indicated zero effect size ($r = .00, R^2 = .00$) and no relationship between termination of REPC and Matt’s reduction in Cluster C,
indicating stability after termination. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.10, a small amount of variability in the intervention phase with $SD = 0.46$, and a small amount of variability in the post-intervention phase with $SD = 0.58$. The decrease in Matt’s scores was not immediate as the data initially stayed the same as the end of the baseline phase. The mean of the last three data points in the baseline phase ($M = 0.67$) was lower than the mean of first three data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 11. Matt’s PCL-5 Cluster C Symptoms Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 112. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I
counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.

![Cluster D (negative alterations in cognitions and mood) severity.](image)

**Figure 112.** Matt’s PCL-5 Cluster Symptoms Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) severity. The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 113. Based on level analysis, Matt’s mean Cluster D severity score decreased from a mean of 20.80 during the baseline phase to a mean of 18.38 in the intervention phase and increased to 19.33 in the post-intervention phase. An analysis of the trend indicated a downward trend across the baseline phase, a slight upward trend across the intervention phase, and a downward trend across the post-intervention phase. The baseline phase indicated a large effect size ($r = -.57, R^2 = .32$) and the presence of large relationship between completing assessments and Matt’s reduction in Cluster D severity. The intervention phase indicated a medium effect size ($r = .43, R^2 = .19$) and the
presence of a moderate relationship between continued assessment and REPC and Matt’s increase in Cluster D severity. The post-intervention phase indicated a large effect size ($r = -.98$, $R^2 = .96$) and the presence of a large relationship between termination of REPC and Matt’s reduction in total severity. Analysis of variability indicated a medium amount of variability in the baseline phase with a standard deviation ($SD$) of 2.77, a small amount of variability in the intervention phase with $SD = 1.69$, and a large amount of variability in the post-intervention phase with $SD = 3.06$. The data did immediately decrease upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 19.00$) was higher than the first three data points in the intervention phase ($M = 17.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

Figure 113. Matt’s PCL-5 Cluster D Severity Scores. (Decreased scored indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 114. I drew a split-
middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 25%, indicating that REPC was ineffective in reducing the Cluster D severity.

Figure 114. Matt’s PCL-5 Cluster D Severity Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) number of symptoms. The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 115. Based on level analysis, Matt’s mean number of Cluster D symptoms score decreased from a mean of 6.40 during the baseline phase to a mean of 6.00 in the intervention phase and stayed at 6.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across all phases. The baseline phase indicated a small effect size ($r = -.18, R^2 = .03$) and a small relationship between completing assessments and Matt’s reduction in the number of his Cluster D symptoms. The intervention phase indicated a small effect size ($r$
and the presence of small relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster D symptoms. The post-intervention phase indicated a large effect size ($r = -1.00, R^2 = 1.00$) and the presence of a large relationship between termination of REPC and Matt’s reduction in Cluster D symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 0.89, a small amount of variability in the intervention phase with $SD = 0.76$, and a small amount of variability in the post-intervention phase with $SD = 1.00$. The decrease in Matt’s scores was initially immediate but then increased and then fluctuated during the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 6.00$) was equal to the first three data points in the intervention phase ($M = 6.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 115. Matt’s PCL-5 Cluster D Symptoms Scores. (Decreased scores indicate improvement).*
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 116. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of three data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 38%, indicating that REPC was ineffective in reducing the number of Cluster D symptoms.

![Figure 116. Matt’s PCL-5 Cluster D Symptoms Effect Size (PEM-T).](image)

**Cluster E (alterations in arousal and reactivity) severity.** The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 117. Based on level analysis, Matt’s mean Cluster E severity score increased slightly from a mean of 15.80 during the baseline phase to a mean of 15.88 in the intervention phase and decreased to 10.67 in the post-intervention phase. An analysis of the trend indicated a downward trend across all phases. The baseline phase indicated a small effect size \( r = -.22, R^2 = .05 \) and the presence of small
relationship between completing assessments and Matt’s reduction in Cluster E severity. The intervention phase indicated a large effect size ($r = -.57, R^2 = .33$) and the presence of a large relationship between continued assessment and REPC and Matt’s reduction in Cluster E severity, indicating that the addition of the REPC may have had a larger effect than continued assessments alone. The post-intervention phase indicated a large effect size ($r = -.66, R^2 = .43$) and the presence of a large relationship between termination of REPC and Matt’s reduction in Cluster E severity. Analysis of variability indicated a moderate amount of variability in the baseline phase with a standard deviation ($SD$) of 2.17, a medium amount of variability in the intervention phase with $SD = 2.70$, and a medium amount of variability in the post-intervention phase with $SD = 2.89$. The decrease in Matt’s scores was not immediate as the data increased upon beginning the intervention phase before decreasing. The mean of the last three data points in the baseline phase ($M = 15.67$) was lower than the mean of the first three data points in the intervention phase ($M = 17.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
Figure 117. Matt’s PCL-5 Cluster E Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 118. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 25%, indicating that REPC was ineffective in reducing the Cluster E severity.
Figure 118. Matt’s PCL-5 Cluster E Severity Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) number of symptoms. The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 119. Based on level analysis, Matt’s mean number of Cluster E symptoms score decreased from a mean of 5.20 during the baseline phase to a mean of 4.88 in the intervention phase and decreased again to 4.00 in the post-intervention phase. An analysis of the trend revealed a downward trend across all phases. The baseline phase indicated a large effect size ($r = -.57, R^2 = .32$) and a large relationship between completing assessments and Matt’s reduction in the number of his Cluster E symptoms. The intervention phase indicated a large effect size ($r = -.75, R^2 = .56$) and the presence of a large relationship between continued assessment and REPC and Matt’s reduction in the total number of his Cluster E symptoms, indicating that the addition of REPC may have had a larger effect than assessments alone. The post-intervention phase indicated a large effect size ($r = -.87, R^2 = .75$) and the presence of a
large relationship between termination of REPC and Matt’s reduction in Cluster E symptoms. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation (SD) of 0.84, a small amount of variability in the intervention phase with SD = 1.13, and a small amount of variability in the post-intervention phase with SD = 0.73. The data increased upon beginning the intervention phase before decreasing. However, the mean of the last three data points in the baseline phase (M = 5.00) was lower than first three data points in the intervention phase (M = 5.67). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing data points and trendlines for Baseline, Intervention, and Post-Intervention phases.](image)

*Figure 119.* Matt’s PCL-5 Cluster E Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 120. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I
counted a total of zero data points below the line. When divided by the total number of eight data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.

![Figure 120. Matt’s PCL-5 Cluster E Symptoms Effect Size (PEM-T).](image)

**Participant 4: Abigail**

Abigail participated in five weeks of a baseline phase with no intervention and six weeks of intervention phase before dropping out of the study. Abigail’s six counseling sessions were spread across 12 weeks as several weeks were skipped due to travel or child care issues. Abigail missed one week between weeks six and seven, three weeks between weeks eight and nine, one week between weeks nine and ten, and one week between weeks ten and 11. Abigail participated in the study for a total of 18 weeks.
Clinician-Administered PTSD Scale (CAPS)

For the CAPS, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Tables 13 and Table 14, respectively.

Table 13

*Means and Standard Deviations for Abigail’s CAPS Severity Scores*

| Cluster | Baseline |  | Intervention |  |
|---------|----------|-----------------|-----------------|
|         | $M$      | $SD$            | $M$             | $SD$          |
| Total   | 44.60    | 2.07            | 38.17           | 4.45          |
| Cluster B | 10.40    | 0.55            | 6.17            | 1.94          |
| Cluster C | 6.00     | 0.00            | 5.50            | 0.55          |
| Cluster D | 15.40    | 1.14            | 13.67           | 1.37          |
| Cluster E | 12.80    | 1.48            | 12.83           | 2.40          |

*Note:* Decreased scores indicate improvement

Table 14

*Means and Standard Deviations for Abigail’s CAPS Number of Symptoms Scores*

| Cluster | Baseline |  | Intervention |  |
|---------|----------|-----------------|-----------------|
|         | $M$      | $SD$            | $M$             | $SD$          |
| Total   | 15.80    | 1.30            | 13.50           | 2.07          |
| Cluster B | 4.40     | 0.55            | 2.17            | 0.98          |
| Cluster C | 2.00     | 0.00            | 2.00            | 0.00          |
| Cluster D | 5.00     | 0.00            | 4.83            | 0.41          |
| Cluster E | 4.40     | 1.14            | 4.50            | 1.22          |

*Note:* Decreased scores indicate improvement
Abigail completed the CAPS each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and overlapping data for each construct. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 121. Based on level analysis of the graph, Abigail’s mean total severity score slightly decreased from a mean of 44.60 during the baseline phase to a mean of 38.17 in the intervention phase. An analysis of the trend indicated a downward trend all phases. The baseline phase indicated a large effect size ($r = -.84, R^2 = .71$) and the presence of large relationship between completing assessments and Abigail’s reduction in the severity of her PTSD symptoms. The intervention phase indicated a large effect size ($r = -.52, R^2 = .27$) and the presence of large relationship between continued assessment and REPC and Abigail’s reduction in the severity of her PTSD symptoms. Analysis of variability indicated a medium amount of variability in the baseline phase with a standard deviation ($SD$) of 2.07 and a large amount of variability in the intervention phase with $SD = 4.45$. The decrease in Abigail’s scores was not immediate, as the data initially remained stable. However, the mean of the last three data points in the baseline phase ($M = 43.33$) was higher than the first three data points in the intervention phase ($M = 39.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 12. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 33%, indicating that REPC was ineffective in reducing the total severity.

*Figure 121. Abigail’s CAPS Total Severity Scores. (Decreased scores indicate improvement).*
Total number of symptoms. The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 123. Based on level analysis, Abigail’s mean total number of symptoms score decreased from a mean of 15.80 during the baseline phase to a mean of 13.50 in the intervention phase. An analysis of the trend revealed a downward trend both phases. The baseline phase indicated a large effect size ($r = -.61, R^2 = .37$) and the presence of large relationship between completing assessments and Abigail’s reduction in the total number of her PTSD symptoms. The intervention phase indicated a slightly larger effect size ($r = -.64, R^2 = .42$) and the presence of a larger relationship between continued assessment and REPC and Abigail’s reduction in the total number of her PTSD symptoms, indicating that the addition of REPC may have had a larger effect than assessments alone. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.30 and a moderate amount of variability in the intervention phase with $SD = 2.07$. The decrease in
Abigail’s scores was not immediate as the data increased and then decreased upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 15.67$) was higher than the first three data points in the intervention phase ($M = 14.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing CAPS Total Symptoms Scores](image)

*Figure 123. Abigail’s CAPS Total Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 124. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 33%, indicating that REPC was ineffective in reducing the total number of symptoms.
Cluster B (intrusion) severity. The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 125. Based on level analysis, Abigail’s mean Cluster B severity score decreased from a mean of 10.40 during the baseline phase to a mean of 6.17 in the intervention phase. An analysis of the trend indicated a slight downward trend across both phases. The baseline phase indicated a small effect size ($r = -0.29$, $R^2 = 0.08$) and the presence of a small relationship between completing assessments and Abigail’s reduction in Cluster B severity. The intervention phase indicated a small effect size ($r = -0.25$, $R^2 = 0.06$) and a small relationship between continued assessment and REPC and Abigail’s reduction in Cluster B severity. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 0.54 and a small amount of variability in the intervention phase with $SD = 1.94$. The decrease in Abigail’s scores was immediate as the data decreased upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 10.33$)
was higher than the first three data points in the intervention phase ($M = 6.00$). Finally, based on visual analysis, there was no overlapping data between the baseline and intervention phases.

![Figure 12](image)

*Figure 125. Abigail’s CAPS Cluster B Severity Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 126. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 6 data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 100%, indicating that REPC was highly effective in reducing the Cluster B severity.
Figure 126. Abigail’s CAPS Cluster B Severity Effect Size (PEM-T).

**Cluster B (intrusion) number of symptoms.** The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 127. Based on level analysis, Abigail’s mean number of Cluster B symptoms score decreased from a mean of 4.40 during the baseline phase to a mean of 2.17 in the intervention phase. An analysis of the trend indicated an upward trend across the baseline phase and a downward trend across the intervention phase. The baseline phase indicated a small effect size \( r = .29, R^2 = .08 \) and the presence of a small relationship between completing assessments and Abigail’s increase in the number of her Cluster B symptoms. The intervention phase indicated a medium effect size \( r = -.49, R^2 = .24 \) and a moderate relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster B symptoms, indicating that REPC may have had an effect on the reduction Cluster B symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 0.55 and a small
amount of variability in the intervention phase with $SD = 0.98$. The decrease in Abigail’s scores was immediate as the data decreased upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 4.67$) was higher than the first three data points in the intervention phase ($M = 2.33$). Finally, based on visual analysis, there was no overlapping data between the baseline and intervention phases.

![Figure 127. Abigail’s CAPS Cluster B Symptom Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 128. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of six data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 100%, indicating that REPC was highly effective in reducing the number of Cluster B symptoms.
Figure 128. Abigail’s CAPS Cluster B Symptoms Effect Size (PEM-T).

**Cluster C (avoidance) severity.** The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 129. Based on level analysis, Abigail’s mean Cluster C severity score decreased from a mean of 6.00 during the baseline phase to a mean of 5.50 in the intervention phase. An analysis of the trend indicated a stable trend across both phases. The baseline phase indicated no effect size ($r = .00, R^2 = .00$) and no relationship between completing assessments and Abigail’s increase in Cluster C severity. The intervention phase indicated no effect size the baseline phase ($r = .01, R^2 = .01$) and no relationship between continued assessment and REPC and Abigail’s reduction in Cluster C severity. Analysis of variability indicated no variability in the baseline phase with a standard deviation (SD) of 0.00 and a small amount of variability in the intervention phase with $SD = 0.55$. The decrease in Abigail’s scores was only immediate with the first data point of the intervention phase before the data increased. The mean of the last three data points in the baseline phase ($M = 6.00$) was
slightly higher than the first three data points in the intervention phase \((M = 5.67)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

**Figure 129.** Abigail’s CAPS Cluster C Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 130. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of 3 data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 50\%, indicating that REPC was ineffective to questionably effective in reducing the Cluster C severity.
Figure 13. Abigail’s CAPS Cluster C Severity Effect Size (PEM-T).

Cluster C (avoidance) number of symptoms. The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 131. Based on level analysis, Abigail’s mean number of Cluster C symptoms score remained stable at a mean of 2.00 during the baseline and intervention phases. An analysis of the trend indicated stability across both phases. The baseline phase indicated no effect size \( r = 0.00, R^2 = 0.00 \) and no relationship between completing assessments and Abigail’s increase in the number of her Cluster C symptoms. The intervention phase indicated no effect size \( r = 0.00, R^2 = 0.00 \) and no relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster C symptoms. Analysis of variability indicated a no variability in the baseline phase with a standard deviation (SD) of 0.00 and no variability in the intervention phase with \( SD = 0.00 \). The decrease in Abigail’s scores was not immediate as remained stable at 2.00. The mean of the last three data points in the baseline phase \( M = 2.00 \) was equal to the first three
data points in the intervention phase ($M = 2.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

*Figure 13.1. Abigail’s CAPS Cluster C Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 132. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.
Cluster D (negative alterations in cognitions and mood) severity. The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 133. Based on level analysis, Abigail’s mean Cluster D severity score decreased from a mean of 15.40 during the baseline phase to a mean of 13.67 in the intervention phase. An analysis of the trend indicated a slight downward trend across the baseline and intervention phases. The baseline phase indicated a small effect size ($r = -.14$, $R^2 = .02$) and the presence of a small relationship between completing assessments and Abigail’s decrease in Cluster D severity. The intervention phase indicated a large effect size ($r = -.55$, $R^2 = .30$) and the presence of a large relationship between continued assessment and REPC and Abigail’s reduction in Cluster D severity, indicating that the addition of REPC had a larger effect than assessments alone. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.14 and a small amount of variability in the intervention phase with $SD = 1.37$. 

Figure 13.2. Abigail’s CAPS Cluster C Symptoms Effect Size (PEM-T).
Abigail’s scores remained mostly stable upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 15.00$) was higher than the first three data points in the intervention phase ($M = 14.33$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing PTSD Cluster D Severity Scores with baseline and intervention phases, showing a trendline with $R^2 = 0.3$.](image)

**Figure 133.** Abigail’s CAPS Cluster D Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 134. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of five data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 83%, indicating that REPC was moderately effective in reducing the Cluster D severity.
Figure 134. Abigail’s CAPS Cluster D Severity Effect Size (PEM-T).

Cluster D (negative alterations in cognitions and mood) number of symptoms. The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 135. Based on level analysis, Abigail’s mean number of Cluster D symptoms score decreased from a mean of 5.00 during the baseline phase to a mean of 4.83 in the intervention phase. An analysis of the trend revealed stability across the baseline phase and a slight downward trend across the intervention phase. The baseline phase indicated no effect size ($r = .00$, $R^2 = .00$) and no relationship between completing assessments and Abigail’s reduction in the number of her Cluster D symptoms. The intervention phase indicated a medium effect size ($r = -.39$, $R^2 = .15$) and the presence of a medium relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster D symptoms, indicating that the addition of REPC had an effect on the reduction of Cluster D symptoms. Analysis of variability indicated no variability in the baseline phase with a standard deviation ($SD$) of 0.00
and a small amount of variability in the intervention phase with $SD = 0.41$. Abigail’s first several data points remained stable upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 5.00$) was equal to the first three data points in the intervention phase ($M = 5.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 135. Abigail’s CAPS Cluster D Symptoms. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 136. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 17%, indicating that REPC was ineffective in reducing the number of Cluster D symptoms.
Figure 13. Abigail’s CAPS Cluster D Symptoms Effect Size (PEM-T).

Cluster E (alterations in arousal and reactivity) severity. The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 137. Based on level analysis, Abigail’s mean Cluster E severity score slightly increased from a mean of 12.80 during the baseline phase to a mean of 12.83 in the intervention phase. An analysis of the trend indicated a downward trend across both phases. The baseline phase indicated a large effect size ($r = -.96, R^2 = .92$) and the presence of large relationship between completing assessments and Abigail’s reduction in Cluster E severity. The intervention phase indicated a medium effect size ($r = -.45, R^2 = .22$) and the presence of a medium relationship between continued assessment and REPC and Abigail’s reduction in Cluster E severity. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 1.48 and a medium amount of variability in the intervention phase with $SD = 2.40$. Abigail’s data initially increased upon beginning the intervention phase before decreasing. The mean of the last three data points
in the baseline phase ($M = 12.00$) was lower than the first three data points in the intervention phase ($M = 13.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

**Figure 13.** Abigail’s CAPS Cluster E Severity Scores (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 138. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster E severity.
Abigail’s mean number of Cluster E symptoms score slightly increased from a mean of 4.40 during the baseline phase to a mean of 4.50 in the intervention phase. An analysis of the trend revealed a downward trend in both phases. The baseline phase indicated a large effect size ($r = -.83, R^2 = .69$) and a large relationship between completing assessments and Abigail’s reduction in the number of her Cluster E symptoms. The intervention phase indicated a large effect size ($r = -.57, R^2 = .32$) and the presence of large relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster E symptoms. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation ($SD$) of 1.14 and a small amount of variability in the intervention phase with $SD = 1.22$. The decrease in Abigail’s scores was not immediate as
her scores initially increased upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 4.00$) was lower than first three data points in the intervention phase ($M = 4.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 139](chart.png)

*Figure 139. Abigail’s CAPS Cluster E Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 140. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.
Figure 140. Abigail’s CAPS Cluster E Symptoms Effect Size (PEM-T).

**PTSD Checklist (PCL-5)**

For the PCL-5, the means and standard deviations for the total and cluster severity and total and cluster number of symptoms can be found in Tables 15 and Table 16, respectively.
### Table 15

*Means and Standard Deviations for Abigail’s PCL-5 Severity Scores*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
</tr>
<tr>
<td>Total</td>
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<td>14.78</td>
</tr>
<tr>
<td>Cluster B</td>
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<td>4.09</td>
</tr>
<tr>
<td>Cluster C</td>
<td>6.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cluster D</td>
<td>14.00</td>
<td>5.60</td>
</tr>
<tr>
<td>Cluster E</td>
<td>12.80</td>
<td>5.17</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement

### Table 16

*Means and Standard Deviations for Abigail’s PCL-5 Number of Symptoms Scores*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Baseline</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
</tr>
<tr>
<td>Total</td>
<td>12.00</td>
<td>3.50</td>
</tr>
<tr>
<td>Cluster B</td>
<td>1.80</td>
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<tr>
<td>Cluster C</td>
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<td>0.00</td>
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<tr>
<td>Cluster D</td>
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</tr>
<tr>
<td>Cluster E</td>
<td>3.80</td>
<td>1.30</td>
</tr>
</tbody>
</table>

*Note:* Decreased scores indicate improvement

Abigail completed the PCL-5 each week and was scored on total severity and on the severity of each of the symptom clusters as well as total number of symptoms and number of symptoms in each cluster. I evaluated the level, trend, variability, immediacy of effect, and
overlapping data for each construct. I also calculated an effect size using the Percentage of Data Exceeding the Median Trend (PEM-T).

**Total severity.** The data levels and trend for the total severity across all phases of the study are presented in Figure 141. Based on level analysis of the graph, Abigail’s mean total severity score decreased from a mean of 40.00 during the baseline phase to a mean of 27.67 in the intervention phase. An analysis of the trend indicated a downward trend across the baseline phase and a slight upward trend across the intervention phase. The baseline phase indicated a large effect size ($r = -.91, R^2 = .83$) and the presence of large relationship between completing assessments and Abigail’s reduction in the severity of her PTSD symptoms. The intervention phase indicated a small effect size ($r = .22, R^2 = .05$) and the presence of a small relationship between continued assessment and REPC and Abigail’s increase in the severity of her PTSD symptoms. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation (SD) of 14.78 and a large amount of variability in the intervention phase with $SD = 3.83$. The decrease in Abigail’s scores was not immediate as the data initially remained stable upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 30.67$) was higher than the first three data points in the intervention phase ($M = 25.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.
In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 14.2. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total severity.

*Figure 14.1*. Abigail’s PCL-5 Total Severity Scores. (Decreased scores indicate improvement).
**Figure 14.** Abigail’s PCL-5 Total Severity Effect Size (PEM-T).

**Total number of symptoms.** The data levels and trend for the total number of symptoms across all phases of the study are presented in Figure 143. Based on level analysis, Abigail’s mean total number of symptoms score decreased from a mean of 12.00 during the baseline phase to a mean of 9.00 in the intervention phase. An analysis of the trend revealed a downward trend across the baseline phase and a slight upward trend across the intervention phase. The baseline phase indicated a large effect size ($r = -.85$, $R^2 = .72$) and the presence of large relationship between completing assessments and Abigail’s reduction in the total number of her PTSD symptoms. The intervention phase indicated a medium effect size ($r = .32$, $R^2 = .10$) and the presence of a medium relationship between continued assessment and REPC and Abigail’s increase in the total number of her PTSD symptoms. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 3.54 and a large amount of variability in the intervention phase with $SD = 3.56$. The decrease in Abigail’s scores
was not immediate upon beginning the intervention phase. However, the mean of the last three data points in the baseline phase ($M = 9.00$) was higher than the first three data points in the intervention phase ($M = 8.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing baseline and intervention phases for PTSD symptoms](image)

**Figure 14.** Abigail’s PCL-5 Total Symptoms Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 144. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the total number of symptoms.
Figure 144. Abigail’s PCL-5 Total Symptoms Effect Size (PEM-T).

**Cluster B (intrusion) severity.** The data levels and trend for the Cluster B severity across all phases of the study are presented in Figure 145. Based on level analysis, Abigail’s mean Cluster B severity score decreased from a mean of 6.80 during the baseline phase to a mean of 2.83 in the intervention phase. An analysis of the trend indicated a downward trend across both phases. The baseline phase indicated a large effect size ($r = -.74$, $R^2 = .54$) and the presence of large relationship between completing assessments and Abigail’s reduction in Cluster B severity. The intervention phase indicated a large size ($r = -.59$, $R^2 = .35$) and the presence of a large relationship between continued assessment and REPC and Abigail’s reduction in Cluster B severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 4.09 and a small amount of variability in the intervention phase with $SD = 1.17$. Abigail’s scores began decreasing after the first data point of the intervention phase. The mean of the last three data points in the baseline phase ($M = 4.67$)
was higher than the first three data points in the intervention phase ($M = 3.33$). Finally, based on visual analysis, there was one overlapping data point between the baseline and intervention phases.

\[ R^2 = 0.54042 \]
\[ R^2 = 0.35331 \]

**Figure 145.** Abigail’s PCL-5 Cluster B Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 146. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster B severity.
Figure 146. Abigail’s PCL-5 Cluster B Severity Effect Size (PEM-T).

Cluster B (intrusion) number of symptoms. The data levels and trend for the number of Cluster B symptoms across all phases of the study are presented in Figure 147. Based on level analysis, Abigail’s mean number of Cluster B symptoms score decreased from a mean of 1.80 during the baseline phase to a mean of 0.50 in the intervention phase. An analysis of the trend revealed a downward trend across both phases. The baseline phase indicated a large effect size ($r = -0.71$, $R^2 = 0.50$) and the presence of large relationship between completing assessments and Abigail’s reduction in the number of her Cluster B symptoms. The intervention phase indicated a larger effect size ($r = -0.83$, $R^2 = 0.69$) and the presence of larger relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster B symptoms, indicating that the addition of REPC may have a larger effect than assessments alone. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation ($SD$) of 1.52 and a small amount of variability in the intervention phase with $SD =$
0.84. The decrease in Abigail’s scores was not immediate as the data increased and then decreased upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 1.00$) was equal to the mean of the first three data points in the intervention phase ($M = 1.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 147. Abigail’s PCL-5 Cluster B Symptoms Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 148. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster B symptoms.
Figure 14. Abigail’s PCL-5 Cluster B Symptoms Effect Size (PEM-T).

Cluster C (avoidance) severity. The data levels and trend for the Cluster C severity across all phases of the study are presented in Figure 149. Based on level analysis, Abigail’s mean Cluster C severity score decreased from a mean of 6.00 during the baseline phase to a mean of 5.50 in the intervention phase. An analysis of the trend indicated a downward trend across the baseline phase and an upward trend across the intervention phase. The baseline phase indicated a large effect size ($r = -.79, R^2 = .62$) and the presence of a large relationship between completing assessments and Abigail’s reduction in Cluster C severity. The intervention phase indicated a large effect size ($r = .51, R^2 = .25$) and the presence of a large relationship between continued assessment and REPC and Abigail’s increase in Cluster C severity. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 1.00 and a small amount of variability in the intervention phase with $SD = 1.17$. The decrease in Abigail’s scores was immediate as the data decreased at the start of the intervention.
phase. The mean of the last three data points in the baseline phase \((M = 5.33)\) was higher than the first three data points in the intervention phase \((M = 3.33)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph](image.png)

**Figure 149.** Abigail’s PCL-5 Cluster C Severity Scores. (Decreased scores indicate improvement).

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 150. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 33%, indicating that REPC was ineffective in reducing the Cluster C severity.
Cluster C (avoidance) number of symptoms. The data levels and trend for the number of Cluster C symptoms across all phases of the study are presented in Figure 151. Based on level analysis, Abigail’s mean number of Cluster C symptoms score slightly decreased from a mean of 2.00 during the baseline phase to a mean of 1.67 in the intervention phase. An analysis of the trend revealed stability across the baseline phase and an upward trend across the intervention phase. The baseline phase indicated no effect size ($r = .00$, $R^2 = .00$) and no relationship between completing assessments and Abigail’s reduction in the number of her Cluster C symptoms. The intervention phase indicated a small effect size ($r = .62$, $R^2 = .39$) and the presence of a large relationship between continued assessment and REPC and Abigail’s increase in the total number of her Cluster C symptoms. Analysis of variability indicated no variability in the baseline phase with a standard deviation ($SD$) of 0.00 and a small amount of variability in the intervention phase with $SD = 0.52$. The decrease in Abigail’s scores was not immediate in the first data point of the
intervention phase. The mean of the last three data points in the baseline phase \((M = 2.00)\) was higher than the mean of first three data points in the intervention phase \((M = 1.33)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing baseline and intervention phases with data points]

*Figure 151. Abigail’s PCL-5 Cluster C Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 152. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of two data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 33\%, indicating that REPC was ineffective in reducing the number of Cluster C symptoms.
Figure 152. Abigail’s PCL-5 Cluster Symptoms Effect Size (PEM-T).

**Cluster D (negative alterations in cognitions and mood) severity.** The data levels and trend for the Cluster D severity across all phases of the study are presented in Figure 153. Based on level analysis, Abigail’s mean Cluster D severity score decreased from a mean of 14.00 during the baseline phase to a mean of 10.00 in the intervention phase. An analysis of the trend indicated a downward trend across the baseline phase and a slight upward trend across the intervention phase. The baseline phase indicated a large effect size ($r = -.90$, $R^2 = .81$) and the presence of a large relationship between completing assessments and Abigail’s reduction in Cluster D severity. The intervention phase indicated a medium effect size ($r = .43$, $R^2 = .18$) and the presence of a moderate relationship between continued assessment and REPC and Abigail’s increase in Cluster D severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 5.61 and a medium amount of variability in the intervention phase with $SD = 2.00$. The data did immediately decrease upon beginning the
intervention phase. The mean of the last three data points in the baseline phase ($M = 10.33$) was higher than the first three data points in the intervention phase ($M = 9.00$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 154. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster D severity.

Figure 153. Abigail’s PCL-5 Cluster D Severity Scores. (Decreased scored indicate improvement).
Cluster D (negative alterations in cognitions and mood) number of symptoms. The data levels and trend for the number of Cluster D symptoms across all phases of the study are presented in Figure 155. Based on level analysis, Abigail’s mean number of Cluster D symptoms score decreased from a mean of 4.60 during the baseline phase to a mean of 3.50 in the intervention phase. An analysis of the trend revealed a downward trend across the baseline phase and an upward trend across the intervention phase. The baseline phase indicated a large effect size ($r = -0.83$, $R^2 = 0.69$) and a large relationship between completing assessments and Abigail’s reduction in the number of her Cluster D symptoms. The intervention phase indicated a large effect size ($r = 0.87$, $R^2 = 0.75$) and the presence of large relationship between continued assessment and REPC and Abigail’s increase in the total number of her Cluster D symptoms. Analysis of variability indicated a small amount of variability in the baseline phase with a standard deviation (SD) of 1.14 and a small amount of variability in the intervention phase with
The decrease in Abigail’s scores was initially immediate but then increased during the intervention phase. However, the mean of the last three data points in the baseline phase \( (M = 4.00) \) was higher than the first three data points in the intervention phase \( (M = 2.67) \). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 156. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of one data point below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 17%, indicating that REPC was ineffective in reducing the number of Cluster D symptoms.
Figure 156. Abigail’s PCL-5 Cluster D Symptoms Effect Size (PEM-T).

**Cluster E (alterations in arousal and reactivity) severity.** The data levels and trend for the Cluster E severity across all phases of the study are presented in Figure 157. Based on level analysis, Abigail’s mean Cluster E severity score decreased from a mean of 12.80 during the baseline phase to a mean of 10.50 in the intervention phase. An analysis of the trend indicated a downward trend across the baseline phase and stability across the intervention phase. The baseline phase indicated a large effect size ($r = -0.95$, $R^2 = 0.90$) and the presence of large relationship between completing assessments and Abigail’s reduction in Cluster E severity. The intervention phase indicated no effect size ($r = -0.09$, $R^2 = 0.01$) and no relationship between continued assessment and REPC and Abigail’s reduction in Cluster E severity. Analysis of variability indicated a large amount of variability in the baseline phase with a standard deviation ($SD$) of 5.17 and a small amount of variability in the intervention phase with $SD = 1.87$. The decrease in Abigail’s scores was not immediate upon beginning the intervention phase. The
mean of the last three data points in the baseline phase \((M = 9.67)\) was slightly lower than the mean of the first three data points in the intervention phase \((M = 10.00)\). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Figure 15. Abigail’s PCL-5 Cluster E Severity Scores. (Decreased scores indicate improvement).](image)

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 158. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the Cluster E severity.
Cluster E (alterations in arousal and reactivity) number of symptoms. The data levels and trend for the number of Cluster E symptoms across all phases of the study are presented in Figure 159. Based on level analysis, Abigail’s mean number of Cluster E symptoms score decreased from a mean of 3.80 during the baseline phase to a mean of 3.17 in the intervention phase. An analysis of the trend revealed a downward trend across the baseline phase and stability across the intervention phase. The baseline phase indicated a large effect size ($r = -0.85$, $R^2 = .72$) and a large relationship between completing assessments and Abigail’s reduction in the number of her Cluster E symptoms. The intervention phase indicated no effect size ($r = -0.07$, $R^2 = .01$) and no relationship between continued assessment and REPC and Abigail’s reduction in the total number of her Cluster E symptoms. Analysis of variability indicated a small amount variability in the baseline phase with a standard deviation ($SD$) of 1.30 and a small amount of variability in the intervention phase with $SD = 0.75$. The data did not immediately
decrease, instead remaining stable upon beginning the intervention phase. The mean of the last three data points in the baseline phase ($M = 3.00$) was equal to the mean of the first three data points in the intervention phase ($M = 3.67$). Finally, based on visual analysis, there were overlapping data between the baseline and intervention phases.

![Graph showing data points](image)

*Figure 159. Abigail’s PCL-5 Cluster E Symptoms Scores. (Decreased scores indicate improvement).*

In addition to the analysis above, I also calculated the PEM-T effect size to examine the degree of effectiveness of REPC. This calculation is reflected in Figure 160. I drew a split-middle trendline for the baseline phase and extended the line through the intervention phase. I counted a total of zero data points below the line. When divided by the total number of six data points in the intervention phase and then multiplied by 100, I calculated an effect size of 0%, indicating that REPC was ineffective in reducing the number of Cluster E symptoms.
Summary of Results

I have compiled a summary of the results for all participants in Tables 17 through 26. All participants demonstrated results that indicated participation in the study was beneficial for them. One participant showed that the addition of REPC specifically was beneficial and the other three participants had mixed results regarding the benefits of REPC specifically. Mean scores for the severity and number of symptoms for Cluster D (negative alterations in mood and cognitions) improved for all participants according to both the CAPS and PCL-5. Mean scores for Cluster C (avoidance) severity and symptoms and Cluster E (alterations in arousal and reactivity) improved for all participants based on the results of at least one of the two assessments. Graphical representations of each participant’s scores are demonstrated in Figures 161-176.

Figure 160. Abigail’s PCL-5 Cluster E Symptoms Effect Size (PEM-T).
### Table 17

**Summary of All Participants’ Total Severity Results**

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*Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5

$B_{I}$ = comparison between baseline and intervention phases; $I_{P}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend

Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.

$I^{1}$ = Improvement with rate lesser than rate of previous phase; $I^{2}$ = Improvement with rate greater than rate of previous phase; $I^{3}$ = Improvement with rate much greater than rate of previous phase;

NIS = No improvement; flat slope in comparison phase; D = Deterioration
Table 18

Summary of All Participants’ Total Symptoms Results

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Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$^{bi} = \text{comparison between baseline and intervention phases};$ $^{ip} = \text{comparison between intervention and post-intervention phases};$ PEM = Percentage of data exceeding the median trend
Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.
I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase;
NIS = No improvement; flat slope in comparison phase; D = Deterioration
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*Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$M_{BI}$ = comparison between baseline and intervention phases; $M_{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend
Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.
I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase;
NIS = No improvement; flat slope in comparison phase; D = Deterioration.*
Table 20

Summary of All Participants’ Cluster B Symptoms Results

| Participant | CAPS | | | | | | | | PCL-5 | | | | | |
|-------------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|             | $M_{BL}$ | $M_{IP}$ | $R^2_{BL}$ | $R^2_{IP}$ | PEM | $M_{BI}$ | $M_{IP}$ | $R^2_{BI}$ | $R^2_{IP}$ | PEM |
| Sam         | Y     | N   | I$^1$ | I$^1$ | 0   | Y     | Y   | I$^1$ | NIS | 6   |
| David       | Y     | N   | D   | NIS  | 59  | Y     | Y   | I$^1$ | NIS | 0   |
| Matt        | N     | Y   | I$^1$ | D   | 0   | N     | Y   | I$^1$ | D   | 0   |
| Abigail     | Y     | N/A | I$^3$ | N/A | 100 | Y     | N/A | I$^2$ | N/A | 0   |

Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5

$^bI$ = comparison between baseline and intervention phases; $^iP$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend

Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.

I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase;

NIS = No improvement; flat slope in comparison phase; D = Deterioration
Table 21

**Summary of All Participants’ Cluster C Severity Results**

| Participant | CAPS | | | PCL-5 | | | | |
|-------------|-----|---|---|------|---|---|---|---|---|
|             | $M_{BI}$ | $M_{IP}$ | $R^2_{BI}$ | $R^2_{IP}$ | PEM | | | $M_{BI}$ | $M_{IP}$ | $R^2_{BI}$ | $R^2_{IP}$ | PEM |
| Sam         | Y    | Y  | $I^2$ | NIS | 12 | Y  | Y  | $I^1$ | D  | 0  |
| David       | Y    | Y  | $I^3$ | D   | 94 | Y  | N  | $I^1$ | NIS | 0  |
| Matt        | Y    | N  | $I^1$ | $I^2$ | 13 | N  | Y  | $I^2$ | $I^2$ | 0  |
| Abigail     | Y    | N/A | D   | N/A | 50 | Y  | N/A | D   | N/A | 33 |

*Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$M_{BI}$ = comparison between baseline and intervention phases; $M_{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend
$Y$ = Mean was higher than mean of previous phase; $N$ = Mean was lower than mean of previous phase.
$I^1$ = Improvement with rate lesser than rate of previous phase; $I^2$ = Improvement with rate greater than rate of previous phase; $I^3$ = Improvement with rate much greater than rate of previous phase; NIS = No improvement; flat slope in comparison phase; D = Deterioration*
Table 22

**Summary of All Participants’ Cluster C Symptoms Results**

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*Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$^{BI}$ = comparison between baseline and intervention phases; $^{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend
Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.
I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase; NIS = No improvement; flat slope in comparison phase; D = Deterioration*
Table 23

Summary of All Participants’ Cluster D Severity Results

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Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$^{bi}$ = comparison between baseline and intervention phases; $^{ip}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend
$Y$ = Mean was higher than mean of previous phase; $N$ = Mean was lower than mean of previous phase.
$I^1$ = Improvement with rate lesser than rate of previous phase; $I^2$ = Improvement with rate greater than rate of previous phase; $I^3$ = Improvement with rate much greater than rate of previous phase;
NIS = No improvement; flat slope in comparison phase; D = Deterioration
Table 24

Summary of All Participants’ Cluster D Symptoms Results

<table>
<thead>
<tr>
<th>Participant</th>
<th>CAPS</th>
<th>PCL-5</th>
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<tbody>
<tr>
<td></td>
<td>$M_{BI}$</td>
<td>$M_{IP}$</td>
</tr>
<tr>
<td>Sam</td>
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<td>Y</td>
</tr>
<tr>
<td>David</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Matt</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Abigail</td>
<td>Y</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5

$M_{BI}$ = comparison between baseline and intervention phases; $M_{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend.

Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.

I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase; NIS = No improvement; flat slope in comparison phase; D = Deterioration.
Table 25

Summary of All Participants’ Cluster E Severity Results

<table>
<thead>
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<th>Participant</th>
<th>CAPS</th>
<th>PCL-5</th>
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<tr>
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<tr>
<td>David</td>
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<td>N</td>
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<tr>
<td>Matt</td>
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<td>Y</td>
</tr>
<tr>
<td>Abigail</td>
<td>N</td>
<td>N/A</td>
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</tbody>
</table>

Note. CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5
$\text{BI}$ = comparison between baseline and intervention phases; $\text{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend
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### Table 26

**Summary of All Participants’ Cluster E Symptoms Results**

<table>
<thead>
<tr>
<th>Participant</th>
<th>CAPS</th>
<th>PCL-5</th>
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<tr>
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<td>Sam</td>
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<tr>
<td>David</td>
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<tr>
<td>Matt</td>
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</tr>
<tr>
<td>Abigail</td>
<td>N</td>
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</tr>
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**Note.** CAPS = Clinician-Administered PTSD Scale; PCL-5 = PTSD Checklist-5

$^{BI}$ = comparison between baseline and intervention phases; $^{IP}$ = comparison between intervention and post-intervention phases; PEM = Percentage of data exceeding the median trend.

Y = Mean was higher than mean of previous phase; N = Mean was lower than mean of previous phase.

I$^1$ = Improvement with rate lesser than rate of previous phase; I$^2$ = Improvement with rate greater than rate of previous phase; I$^3$ = Improvement with rate much greater than rate of previous phase; NIS = No improvement; flat slope in comparison phase; D = Deterioration.
Figure 161. Sam’s CAPS Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 162. Sam’s CAPS Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 163. Sam’s PCL-5 Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 164. Sam’s PCL-5 Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 165. David’s CAPS Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 166. David’s CAPS Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 167. David’s PCL-5 Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 168. David’s PCL-5 Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 169. Matt’s CAPS Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 170. Matt’s CAPS Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 171. Matt’s PCL-5 Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 172. Matt’s PCL-5 Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 173. Abigail’s CAPS Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 174. Abigail’s CAPS Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
Figure 175. Abigail’s PCL-5 Severity Scores Across Phases. (Decreased scores indicate improvement.)
Figure 176. Abigail’s PCL-5 Number of Symptoms Scores Across All Phases. (Decreased scores indicate improvement.)
CHAPTER FIVE:
EXTENDED DISCUSSION
EXTENDED DISCUSSION

The purpose of this study was to examine the effectiveness of Relational Equine-Partnered Counseling (REPC) on the reduction of posttraumatic stress disorder (PTSD) severity and symptoms. I examined the effect of REPC on PTSD total severity and total symptoms, as well as the severity and total symptoms of each PTSD symptom cluster. These clusters included intrusion (Cluster B), avoidance (Cluster C), negative alterations in cognitions and mood (Cluster D), and alterations in arousal and reactivity (Cluster E). I used a single-case design and collected data throughout all phases of the study including baseline, intervention, and post-intervention phases.

The results indicated that participation in the study may have been beneficial for all participants as all experienced mean improvements in each area. For Sam, the results indicated that the addition of REPC yielded greater benefits than continued assessments alone in multiple areas. The other participants responded to REPC with mixed results. All three participants who participated in the post-intervention phase experienced deterioration in one or more areas when REPC was terminated. Across all participants, the intervention appeared to show the largest gains in avoidance severity and symptoms, followed by negative alterations in cognitions and mood severity and symptoms.

REPC and Individual PTSD Symptom Clusters

In the present study, I observed differences in the participants based on symptom clusters. The results for each participant also supported these differences. Therefore, it is important to understand how REPC may have influenced the participants’ experiences with regards to each of the PTSD symptom clusters. Regarding total severity and symptoms, REPC may have been beneficial in reducing distress for Sam, David, and Abigail as all three experienced decreased
means during the intervention phase. Sam experienced the greatest benefits as he experienced both a greater rate of improvement during the intervention phase and a PEM-T value indicating that the intervention was highly effective in reducing Total symptoms. REPC may have been beneficial in reducing Total symptoms for Abigail as she experienced a greater rate of improvement during the intervention phase.

All of the participants experienced events throughout the study that appeared to influence an increase in their symptoms and severity during specific weeks. During the intervention phase, Sam experienced increased scores during weeks 11-12 and weeks 18-19 based on CAPS and PCL-5 scores across both Total and several of the clusters. Based on notes taken during Sam’s CAPS interview, these increases may have been influenced by outside events. In the week 11 interview, Sam reported more anxiety and worrying about “what’s around the next corner.” He also reported a higher rate of intrusive memories and that he was “thinking more” after spending time at home during the holidays. During week 12, Sam’s total scores continued to increase higher. During the week 12 CAPS interview, Sam reported on the death of an employee in the company where he works. Sam reported that assisting the surviving family reminded him of delivering notices of death to the families of fallen service-members. Sam’s scores then began to decrease until increasing again during week 18. During weeks 18 and 19, Sam frequently reported on stress related to having to deliver layoff news to other employees and fear of workplace violence as retaliation. Sam reported that delivering layoff news also reminded him of delivering notices of death. Sam’s scores then began to decrease after week 20. Sam’s recovery from these incidents may be indicative of REPC’s effectiveness in helping to bring Sam’s scores back down after being triggered. During the post-intervention phase, Sam experienced increased scores and upward trend according to the CAPS and PCL-5. During the week 23 CAPS
interview, Sam reported feeling uneasy after an incident during which a stranger in a parking lot had approached him. At the start of the week 24 CAPS interview, Sam reported feeling “down” since no longer having the time with the horse. Sam reported that it was “not coincidental” that he was feeling that way after not seeing the horse for several weeks. Finally, during the week 25 CAPS interview, Sam reported on how he missed having time to “ground” himself with the horse multiple times throughout the interview.

David experienced increased symptoms during week 13 and weeks 19-20. During David’s week 13 CAPS interview, he reported on attending a funeral that had influenced him “feeling down.” During David’s CAPS interviews during weeks 19-20, he reported having increased distress due to the cold weather and the release of the American Sniper movie. In the week 21 CAPS interview, David reported that he was letting me “see the real picture.” Due to David’s increased openness about his symptoms, his Cluster D scores increased as I was able to score his symptoms based on new and more detailed information from David.

Matt reported increased distress during weeks 8, 9, 10, and 16. During the week 8 CAPS interview, Matt reported hearing a loud noise while sleeping. He reported that this noise was especially distressing to him because he could not differentiate between whether the noise was real or something he had heard in a dream. During week 9, Matt reported on fracking near his neighborhood that had been especially distressing to him. Matt cited the fracking as the reason for his symptoms during several of the CAPS interview questions. During week 10, Matt reported having received news about his acceptance in the residential PTSD program. Finally, during week 16, Matt reported increases in Total, Cluster B, and Cluster E during his final CAPS interview.
Abigail scores appeared to increase after her attendance in the study became sporadic. After her longest absence of three weeks, Abigail reported increased symptoms during the week 9 CAPS interview. During week 6, Abigail reported going off her medication and appeared to have an increase in Cluster E symptoms based on her responses on the CAPS interview.

**REPC and Intrusion (Cluster B)**

According to the American Psychiatric Association (2013), intrusion symptoms may consist of recurrent, involuntary, and intrusive memories, traumatic nightmares, dissociative reactions or flashbacks, distress after exposure to traumatic reminders, and physiological reactivity after exposure to trauma-related stimuli. Veterans with intrusion symptoms are more likely to experience other problems such as alcohol misuse, suicidal ideation, and aggression (Blais, Hoerster, Malte, & Jakupcak, 2014). Veterans with higher levels of intrusion symptoms are more likely to utilize treatment (Blais et al., 2014).

In REPC, veterans can target intrusion symptoms through interaction with the horse. As horses are able to perceive human internal experiences, they may respond differently to clients experiencing different emotional states (Chamove et al., 2002; Hama et al., 1996). The horse’s feedback to the veteran can help the veteran gain awareness into his or her own emotional and physiological responses to reminders of traumatic events. This increased awareness can enable a veteran to gain insight into potential triggers and identify earlier signs of emotional distress or physiological reactivity. Furthermore, the veteran may engage in talking about traumatic events while in the presence of the horse. By engaging in stress inoculation activities with the horse such as intentional stroking, muscle relaxation, or horse-human matched breathing, the veteran may start to feel a sense of control over emotional and physiological responses. These activities can assist with top down regulation as the veteran can become more aware of how thoughts,
feelings, and bodily sensations manifest in response to traumatic stimuli (Van der Kolk, 2014). Furthermore, the veteran may feel safer to talk about the traumatic event while in the presence of the horse by decreasing anxiety (Chandler, 2012; Lefkowitz et al., 2005). The veteran may later face the same stimuli outside of session with less distress.

In this study, REPC may have been beneficial in reducing distress related to intrusion symptoms as Sam, David, and Abigail all experienced decreased means during the intervention phase. Matt, whose means did not decrease, cited events such as recent neighborhood fracking that frequently triggered him while at home. However, the results regarding effectiveness across participants were mixed. For Sam, the PEM-T effect size indicated that REPC was ineffective in reducing Cluster B distress severity and symptoms according to both assessments. Sam experienced increased Cluster B distress as his scores began to increase and as evidenced by higher means during the post-intervention phase.

For David, the PEM-T effect size indicated that REPC was questionably effective in reducing Cluster B symptoms according to the CAPS. Results indicated that REPC was ineffective in reducing Cluster B severity according to the CAPS and PCL-5 and was ineffective in reducing Cluster B symptoms according to the PCL-5. David experienced increased Cluster B distress as evidenced by higher means during the post-intervention phase.

For Abigail, results indicated that REPC was highly effective in reducing Cluster B severity and symptoms according to the CAPS but was ineffective in reducing severity and symptoms according to the PCL-5. Abigail experienced greater rates of improvement regarding Cluster B symptoms according to the CAPS across the intervention phase than across the baseline phase.
For Matt, the PEM-T effect size indicated that REPC was ineffective in reducing Cluster B distress severity and symptoms according to both assessments. Matt experienced increased Cluster B distress as evidenced by an upward trend across Cluster B severity and symptoms post-intervention phases. Matt’s scores reflected worsening of intrusion symptoms after termination of REPC. However, it is difficult to separate impact of termination of REPC from Matt’s reported increase in overall stress regarding entry into a residential PTSD program on the worsening of intrusion symptoms.

Regarding unwanted memories, Sam and David reported decreases in the frequency of unwanted memories after beginning participation in the study. In the week 12 CAPS interview, Sam reported that, when he had the memories, he thought of the horse and feeling “calm and soothed”. Sam also reported feeling calm and assessing the situation during the week 13 CAPS interview. During the week 16 CAPS interview, Sam reported that being outside helps him to be “grounded.” During the week 24 CAPS interview, Sam reported using “grounding memories” of his time with the horse to manage his intrusion symptoms. The other two participants did not report any overall changes in the frequency or severity of unwanted memories.

Regarding nightmares, all participants reported decreases in nightmares once beginning the study based on their responses to the CAPS interview. Sam reported that he would intentionally try to think about being with the horse while trying to fall asleep. He reported that he was experiencing the best sleep that he had had in years according to his CAPS interview during week 9. During the week 6 CAPS interview, Sam reported dreaming of the horse after his first REPC session. During week 17, Sam reported on a dream about him and the horse during his CAPS interview. Sam reported feeling a sense of unity and collaboration with the horse
during a war zone-related dream. David’s nightmares appeared to decrease upon beginning to spend time with the horse as evidenced by decreasing scores on the CAPS interview.

Only Matt reported symptoms related to flashbacks or dissociative reactions. He reported infrequent flashbacks during his CAPS interviews. As the study progressed, Matt reported decreased dissociation associated with the flashbacks during the CAPS interviews.

All participants reported the presence of emotional distress in response to traumatic stimuli during the course of the study. Sam reported that, by spending time with the horse, he had learned to focus on simpler things and become “more present” during his week 26 CAPS interview. Through these experiences, he reported that he had learned to “let go” of becoming upset about things that had happened in the past. David’s severity of his emotional responses appeared to decrease based on his scores on the CAPS interviews over time.

All participants reported distress related to physiological reactions at the start of the study. Sam reported this symptom to be his greatest concern during the first CAPS interview. He reported that his job frequently reminded him of experiences that he had in the military resulting in experiences of shakiness, pounding heart, sweating, and physical illness much of time while at work or while thinking about being at work. After engaging in several weeks of stress inoculation exercises with the horse, Sam reported great improvement in managing his physiological reactions. During the week 13 CAPS interview, Sam reported that the CAPS interviews and time with the horse had enabled him to process and have confidence in himself, thus decreasing his physiological reactions. As REPC progressed, the equine specialist and I observed Sam becoming more autonomous in determining his own interactions and activities with the horse during REPC sessions. Upon termination of REPC, Sam reported deterioration in his ability to manage these physiological reactions and stated that the reactions had started
getting worse during the week 24 CAPS interview. David reported stomach pains to be associated with traumatic reminders and worked with the horse in a stress inoculation exercise to specifically address this symptom during the week 17 REPC session. Matt reported during the week 12 REPC session that the exercise related to matching his breathing to the horse’s breathing was especially helpful in assisting him to control his physiological responses to reminders outside of session and decreasing the severity of his physiological reactions. Matt continued to engage in this activity with the horse during later REPC sessions. Finally, Abigail reported feeling more calm and relaxed while with the horse and immediately after session during her first and second REPC sessions. The effect of interaction with the horse on decreasing distress related to physiological reactions may be explained by the effect of animals’ presence and physical contact with animals in promoting physiological benefits such as decreases in cortisol and heart rate (Allen, 1996; Hama et al., 1996; Odendaal, 2000; Shiloh et al., 2003).

Sam reported an increase in distress related to physiological reactions upon termination of REPC during his week 24 and week 25 CAPS interviews. Since terminating REPC, he reported that he had been experiencing more intense physiological reactions and had experienced more difficulty in self-regulating. Sam stated that the time with the horse enabled him to calm himself and feel grounded again during his week 25 CAPS interview. He attributed the loss of this time as detrimental to his ability to self-regulate in response to stressors throughout the week.

**REPC and Avoidance (Cluster C)**

According to the American Psychiatric Association (2013), avoidance symptoms may consist of avoidance-related thoughts and feelings and avoidance-related external reminders such as people, places, or situations. The presence of avoidance-related symptoms may be a barrier to
treatment as individuals may seek to avoid having to talk about their trauma in therapy. These veterans may be more reluctant to leave their homes and travel to attend appointments. Veterans with higher levels of avoidance symptoms are less likely to utilize treatment (Blais et al., 2014).

In the present study, the participants were able to target avoidance symptoms through participation in the study. Due to the nature of the CAPS as a structured interview, the participants answered questions regarding the severity and frequency of each of his or her PTSD symptoms. Through this interview, the participants frequently chose to discuss traumatic events in order to help explain their symptoms. Therefore, the participants engaged in activity that elicited specific thoughts and feelings about traumatic events while completing the interview. During the week 4 CAPS interview, Sam reported that talking “helped”. As REPC does not require clients to disclose or retell traumatic experiences during the session, not all of the participants chose to discuss traumatic events while with the horse during every session. However, when participants chose to talk about traumatic events, the presence of the horse may have produced a calming effect enabling the participant to feel safer when processing such events.

In this study, REPC may have been beneficial in reducing distress related to avoidance severity and symptoms as all four of the participants experienced decreased means during the intervention phase. All participants experienced greater rates of improvement in some areas of Cluster C once REPC was added. Regarding PEM-T effect sizes, the results were mixed across participants. For Sam, results indicated that REPC was moderately effective in reducing Cluster C symptoms according to the CAPS. However, the intervention was ineffective in reducing Cluster C severity according to both assessments and Cluster C symptoms according to the PCL-5. For David, the results indicated that REPC was highly effective in reducing Cluster C severity
and symptoms according to the CAPS and ineffective in reducing Cluster C severity and symptoms according to the PCL-5. For Matt, results indicated that REPC was ineffective in reducing Cluster C across both constructs according to both assessments. Finally, Abigail’s results indicated that REPC was ineffective to questionably effective in reducing Cluster C severity according to the CAPS. Results indicated that REPC was ineffective in reducing Cluster C symptoms according to both assessments and Cluster C severity according to the PCL-5. Sam, David, and Matt all experienced greater rates of improvement during the intervention than during the baseline phase regarding Cluster C severity. Sam and David also experienced greater rates of improvement regarding Cluster C symptoms during the intervention phase. Matt and David experienced worsening of Cluster C severity once REPC was terminated as evidenced by higher post-intervention means and a positive trend across the post-intervention phase. David experienced a positive trend regarding Cluster C symptoms across the post-intervention phase and Matt experienced higher Cluster C symptom means during the post-intervention phase. Therefore, it is possible that the removal of the horse or termination of time spent in the pasture had a negative impact on distress related to avoidance.

Regarding avoidance of thoughts and feelings, David and Matt chose to address specific traumatic events during sessions. David reported during the week 12 CAPS interview, that “interaction with Shiloh [the horse] helps” as he was not “suppressing feelings as much”. During REPC session 17, David reported that he felt less upset and anxious when discussing traumatic events while stroking the horse. Matt processed trauma related to distrust of other military personnel by observing how the horses in the herd interacted with each other during his REPC session during week 8. Sam did not discuss any traumatic events during the REPC session but reported much less distress related to avoidance as evidenced by decreasing scores on his CAPS
interviews after week 5. During the week 10 CAPS interview, Sam reported that he had begun to reflect on “why I am the way I am” since spending time with the horse. All participants reported that engaging in the CAPS helped them to be less avoidant of trauma-related thoughts and feelings.

Sam, David, and Matt reported improvements in avoidance of external reminders. David reported having more of an interest in interacting with people since working with the horse and no longer sought to avoid people who might want to discuss his service with him as often based on his report during his REPC termination session. Matt reported that, since learning to calm himself and manage his physiological responses, he no longer felt as “paranoid” going out and being around people who might trigger reminders based on his report during the week 16 CAPS interview.

**REPC and Negative Alterations in Cognitions and Mood (Cluster D)**

According to the American Psychiatric Association (2013), negative alterations in cognitions and mood symptoms may consist of difficulty remembering certain aspects of the traumatic event, strong negative beliefs about self, others, and the world, distorted blame towards self or others for the traumatic event, strong negative emotions (such as fear, horror, anger, guilt, or shame), disinterest in activities, feeling detached from others, and difficulty experiencing positive emotions. Veterans with higher levels of Cluster D (also referred to as dysphoria) severity and symptoms may be less willing to seek social support (Blais et al., 2014). Because of the heightened amount of perceived distress related to these symptoms, veterans may therefore be more likely to seek and utilize mental health treatment. The lack of social support may influence the veteran’s desire to engage in treatment (Blais et al., 2014).
Through interaction with horses, veterans can target negative alterations in cognitions and mood. As many people feel more comfortable trusting an animal than trusting another person, the participants had the opportunity to engage in relationships that may have felt safer to them (Chandler, 2012). As horses naturally embody the core conditions of being empathic, congruent, and able to offer unconditional positive regard, veterans have an opportunity to experience a relationship in which they feel accepted (Carlsson et al., 2014). As horses are inherently genuine and cannot lie, a veteran may feel safer in taking a risk to be in a relationship with a horse (Irwin, 2005). Through interaction with the horses, such as stroking the horse and finding humor in the horses’ behaviors and interactions with each other, veterans can experience positive feelings and physiological benefits. The act of stroking the horse alone can facilitate social connection as oxytocin (a social connection hormone) may be released through activity, thus enabling a veteran to feel less detached and more connected to another (Odendaal, 2000). Furthermore, interaction with animals can promote increased feelings of comfort, a more positive mood, and happier feelings (Kaminski et al., 2002; Sobo et al., 2006; Wu et al., 2002).

In this study, REPC may have been beneficial in reducing distress related to negative alterations in cognitions and mood as all four of the participants experienced decreased means for both severity and symptoms during the intervention phase. Results regarding effectiveness using the PEM-T effect size were mixed across participants. For Sam, results according to the CAPS indicated that REPC was highly effective and moderately effective in reducing Cluster D severity and symptoms, respectively. However, results according to the PCL-5 indicated that REPC was ineffective in reducing Cluster D severity and symptoms. For David, results indicated that REPC was ineffective in reducing Cluster D severity and symptoms according to both assessments. For Matt, results indicated that REPC was questionably effective in reducing
Cluster D symptoms according to the CAPS and ineffective in reducing Cluster D symptoms according to the PCL-5. Matt’s results indicated that REPC was ineffective in reducing Cluster D severity according to both assessments. Abigail’s results indicated that REPC was moderately effective in reducing Cluster D severity according to the CAPS and ineffective in reducing Cluster D severity according to the PCL-5. Results indicated that REPC was ineffective in reducing Cluster D symptoms according to both assessments. Sam and Abigail both experienced greater rates of improvement for Cluster D severity during the intervention phase. Sam also experienced a greater rate of improvement during the intervention phase for Cluster D symptoms. Matt experienced a worsening Cluster D severity and symptoms during the post-intervention phase as evidenced by increased means. Sam experienced worsening of Cluster D distress during the post-intervention phase as evidenced by an upward trend for both severity and symptoms. Anecdotally, David reported the greatest improvement in Cluster D distress, as he believed that REPC had made a difference in reducing his depression and he felt better than he had felt in years.

Regarding the symptom related to difficulty remembering important parts of the traumatic event, only Matt reported distress related to this symptom during his CAPS interviews. As I suspected that he also had an undiagnosed probable traumatic brain injury from exposure to blasts, it was difficult to discern how much of his distress was related to the probable brain injury and how much could be attributed to PTSD. He did not report any significant changes or improvements in this symptom through the course of the study based on his responses to the CAPS interview.

Of the four participants, Sam and David reported improvements in distress related to strong negative feelings. After beginning REPC, Sam reported that he believed he was
“compassionate” during the week 12 CAP interview. Sam reported that observing the horse doing simple things, such as grazing in the pasture, enabled him to “let it go” when he began to have negative thoughts during his week 14 CAPS interview. Interestingly, once REPC was terminated, Sam reported an increase in his negative thoughts during the week 24 and 25 CAPS interviews and attributed the increase to not having the time to experience peace and feel grounded while with the horse. David reported gradual decreases in his negative thoughts throughout the course of the study based on his responses to the CAPS interview.

Regarding strong negative feelings, Sam, David, and Matt reported decreases in strong negative feelings based on the CAPS interview throughout the course of the study. All three participants reported feeling less upset or distressed in general once they had started spending time with the horse. David reported noticing that his “depression” was not as strong anymore during his final REPC session.

Only Sam reported initial distress related to distorted blame during the CAPS interview. His report of distorted blame drastically decreased to zero after the first weeks of REPC based on his responses to the CAPS interview. Sam reported that he had accepted his responsibility for events that had happened but to no longer blame himself for aspects that were out of his control during the week 15 CAPS interview.

At the start of the study, all of the participants reported distress related to feeling detached from others. The participants all reported a common of feeling trust towards and from their chosen horse during their REPC sessions. The participants also all reported feeling understood and accepted by the horse during the REPC sessions. Sam reported that he felt trust with the horse that was different than in his human relationships during his second REPC session. During this session, the equine specialist and I observed him allowing himself to become
emotionally vulnerable with the horse. Sam reported that he believed he could be vulnerable around the horse and trusted the horse to protect him. As REPC progressed, he began to report more and more interest in forming relationships with other people and trying to make new friends based on his CAPS interview responses beginning in week 9 interview in which he reported “starting to try to bond”. Sam reported that, by trusting the horse, he believed he could begin to trust people again during the REPC session of that week. David reported a similar experience and reported that he felt close to no one at the start of the study based on his CAPS interview responses. He appeared somewhat hesitant to initially interact with the horse during his first REPC session but began to feel more and more comfortable over time. He began to report that he could tell that the horse understood him based on the horse’s behavioral feedback to him during different times during the week 17 REPC session. David reported that knew that the horse trusted him and that he was surprised that he could trust such a large animal during his third REPC session. As he spent more time with the horse, he reported that the “connecting” part of his brain had been turned back on and that he wanted to experience this connection with other humans during his week 12 CAPS interview. By the end of the study, David reported in his final REPC session that he had made travel plans to visit family and expressed interest in getting involved with other veteran-related organizations to provide peer support to other veterans. Matt reported that by being with the horses, he allowed himself to acknowledge that he wanted to experience being part of a “herd” again during his fourth REPC session. Matt reported that, prior to his service, he had been very social and outgoing but no longer trusted others due to distrust he experienced in the military. In observing the interactions of the herd during this REPC session, Matt reported that he realized that he did want to experience closeness and safety of being connected to others. He also reported that he saw the horse as a source of comfort and
would seek out opportunities to see horses outside of session. Finally, Abigail reported feeling connected to her chosen horse, a feeling that she reported she was unable to experience in the same way in her other relationships and interactions with people during her second REPC session.

Regarding disinterest, all participants reported distress related to this symptom. Sam, David, and Matt reported an increase in their interest in participating in activities as REPC progressed based on changes in their CAPS responses. As the study progressed, these participants reported increasing plans to engage in different activities or make future plans during the CAPS interview responses to this particular question. In addition, Sam and David reported an increasing interest in being around and learning about horses and made plans to continue involvement with horses after the conclusion of the study during their final CAPS interview.

Finally, all of the participants reported distress related to difficulty experiencing positive feelings at the start of the study. Beginning with the first REPC session, all participants reported experiencing positive feelings while with the horses. As the study progressed, Sam, David, and Matt reported that their positive feelings outside of session had begun to increase. Sam reported that he made an effort to think about the horse outside of session in order to experience positive feelings when he felt stressed during the CAPS interview of week 15. David reported that spending time with the horse was the best day of his week and one of the only times that he felt “content” during his week 17 CAPS interview. He reported decreasing difficulty in experiencing positive feelings outside of session and began reading and researching about horses during his final REPC session. Matt reported that experiencing positive feelings while with the horse
enabled him to feel less scared about allowing himself to experience positive feelings outside of session during his CAPS interview and REPC session during week 8.

Sam reported an increase in distress related to negative feelings and thoughts upon termination of REPC during his week 24 and week 25 CAPS interviews. Since terminating REPC, he reported that he had noticed that he had difficulty managing these symptoms. Sam stated that he found the time in the pasture with the horse to very valuable in helping him to feel grounded and at ease, which helped to mitigate both negative thoughts and feelings.

**REPC and Alterations in Arousal and Reactivity (Cluster E)**

According to the American Psychiatric Association (2013), symptoms related to alterations in arousal and reactivity consist of irritable or aggressive behavior, risk-taking or reckless behavior, hypervigilance, exaggerated startle response, concentration problems, and sleep problems. Veterans who experience symptoms related to arousal and reactivity may often attribute their symptoms to other stressors rather than the traumatic event or other medical conditions (Blais et al., 2014). Therefore, these veterans may be less inclined to seek mental health treatment for these symptoms. Symptoms related to hypervigilance may be more resistant to treatment or natural processes of recovery (Holowka et al., 2012).

By engaging in REPC, veterans can target alterations in arousal and reactivity. As horses are prey animals, they are highly attuned to their environment (Irwin, 2005). This level of awareness enables the horses to perceive different levels of arousal in the humans in their environment (Chamove et al., 2002; Irwin, 2005). For this reason, horses are likely to respond to humans who are experiencing increased arousal or reactivity in the environment around them by moving towards, moving away, or mirroring the humans who they are in contact with at a given moment. The immediate feedback provided by the horse provides the veteran with an
opportunity to recognize and process their current state and level of arousal. By working with the horse, the veteran may become more aware of the early indications of an increase in reactivity than he or she would otherwise. This knowledge enables the veteran to take action to decrease levels of arousal and reactivity before the experience feels unmanageable. Many veterans are able to identify with the horse’s natural state of heightened arousal and reactivity based on both military training experience and response to traumatic events. For this reason, the horse’s way of being can serve a metaphor through which the veteran can identify adaptive and maladaptive states of arousal. Due to their intensive military training, many veterans believe their heightened state of awareness to be beneficial in protecting themselves and others. Therefore, many veterans may seek to find ways to retain a heightened level of arousal and reactivity that does not impair their daily lives. By observing the horses’ responses to potential threats in the environment, the veteran has an example how to maintain a heightened awareness with minimal impairment or distress. As the Cluster E symptoms may be indications of overall autonomic nervous system functioning, veterans may experience improvement in Cluster E symptoms simply by being in the horse’s presence and engaging in breathing-related exercises, activities involving movement with the horse, and stroking and brushing activities (Van der Kolk, 2014).

In this study, REPC may have been beneficial in reducing distress related to alterations in arousal and reactivity as all four of the participants experienced decreased means for both severity and symptoms during the intervention phase. For Sam, results indicated that REPC was highly effective in reducing Cluster E symptoms according to the CAPS but ineffective in reducing Cluster E symptoms according to the PCL-5. Results indicated that REPC was ineffective in reducing Cluster E severity according to both assessments. For David, Matt, and Abigail, results indicated that REPC was ineffective in reducing distress related to Cluster E
severity and symptoms according to both assessments. For Sam, the benefits were especially pronounced as he experienced greater rates of improvement during the intervention than during the baseline phase for both severity and symptoms. Furthermore, Sam experienced worsening of both severity and symptoms once REPC was terminated as evidenced by a positive trend across the post-intervention phases. Matt experienced an increased rate of improvement across the intervention phase for Cluster E severity but not symptoms. David experienced a worsening of distress related to Cluster E as evidenced by increased means in the post-intervention phase as compared to the intervention phase.

At the start of the study, Matt and Abigail reported concerns related to irritable and aggressive behavior based on their responses to the CAPS interview. Both reported that they believed that working with the horses had helped them to better manage this symptom during their REPC sessions. Matt reported that being able to receive concrete feedback from the horses based on their movements towards or away from him had enabled him to become more aware of how his mood and attitudes may affect how others feel during his week 10 REPC session. He reported that this knowledge had made him pay more attention to how he felt when interacting with others and empathic to how his mood may affect them. Matt reported making a concerted effort to be aware of his mood and take steps to calm himself or leave the situation when he felt irritable. Abigail reported during her week 9 REPC session that observing the horse’s response to aggressive behaviors by other horses had influenced her desire to try to react less strongly to things that irritated her. She stated that she needed to “be more like Shiloh” in responding to people and situations that made her feel irritable or angry.

Of the four participants, Matt and Abigail reported concerns related to risk-taking behavior. For Matt, the behavior appeared to be related to feelings of depression and
worthlessness based on his responses during the CAPS interview. Abigail reported these behaviors to be in response to frustration and anger that the participant felt when driving based on her responses to the CAPS interview. These participants did not report any significant changes in this symptom during the course of the study.

Regarding hypervigilance, all four participants reported that they did not feel the need to be as “on guard” when with the horses during session as they did outside of session during their REPC sessions. David acknowledged during his week 8 REPC session that, because he knew the horses were always alert, he could let his guard down knowing the horses would notice and respond to any potential threats. Abigail reported that the watchfulness of the horses was comforting and enabled her to feel more relaxed during her fourth REPC session. Sam reported that he no longer felt that his heightened awareness was as impairing or disruptive as he could feel more relaxed in public since finding ways to manage feelings of anxiety by thinking about the horse during his week 15 CAPS interview. Finally, Matt reported that that he had experienced the most benefits from REPC in reducing his hypervigilance during his termination session of REPC. He reported during his final CAPS interview that, prior to engaging in REPC, his heightened awareness had felt like paranoia that disrupted his ability to go out in public or enjoy himself outside of his home. Matt reported during his REPC termination session that by watching the horses’ responses to their environment, he had found ways to adapt their way of being to enable himself to notice and respond to the environment and then resume focusing on whatever he had been doing prior to an environmental event. Matt reported that he knew he would always be watchful but no longer felt paranoid and therefore felt more confident in going out into public places.
All of the participants reported distress related to difficulty with concentration. Sam reported meaningful improvement in difficulty with concentration and attributed the improvement to his increased sense of peace overall based on his CAPS responses over time. He reported that he felt better able to calm himself as his confidence increased and his ability to concentrate improved during his week 15 CAPS interview.

Finally, all participants reported sleep problems at the start of the study. Of the four participants, Sam and David reported meaningful change in their sleep based on CAPS interview responses. David reported that due to his increased interest in doing more activities and increased overall sense of peace that he felt more tired at the end of the day and was better able to sleep during the week 14 CAPS interview. Sam reported that he believed that simply having weekly time with the horse enabled him to feel more grounded and at ease, enabling him to sleep better and become less reliant on sleep medication during the week 15 CAP interview.

Sam in particular reported an increase in distress related to sleep problems and concentration problems upon termination of REPC based on his week 25 CAPS interview. Since terminating REPC, he reported that he had noticed that he felt less relaxed and more stressed. Sam stated that he found the time in the pasture with the horse to very valuable in helping him to feel grounded and at ease. He reported that he missed the horse and found it comforting to be around the horse.

**Clinical Implications**

In the present study, one clinical implication is that the participants perceived interaction with the horses to be beneficial to them based on statements made during the CAPS interview and during REPC sessions. Some participants reported specific symptom benefits due to this interaction during the CAPS interview or during REPC sessions. For example, Sam reported that
he perceived a close, trusting relationship with the horse during his second REPC session. David reported that the horse was “softening” him and increasing his interest in interacting with people during his week 12 REPC session. Matt reported that he believed that the horse trusted him during his week 7 REPC session. Abigail reported feeling safe with the horse during her week 6 REPC session.

A second implication is that REPC may be beneficial in reducing severity and symptoms following a triggering event. During the course of the study, a number of the participants experienced events that triggered an increase in severity and symptoms. However, the severity and symptoms decreased fairly rapidly with continued REPC. For example, Sam experienced increased scores during weeks 11-12 and weeks 18-19 based on CAPS and PCL-5 scores across both Total and several of the clusters. Based on notes taken during Sam’s CAPS interview, these increases may have been influenced by outside events. During weeks 18 and 19, Sam frequently reported on stress related to having to deliver layoff news to other employees and fear of workplace violence as retaliation. Sam’s recovery from these incidents may be indicative of REPC’s effectiveness in helping to bring Sam’s scores back down after being triggered. David experienced increased symptoms during week 13 and weeks 19-20. During David’s week 13 CAPS interview, he reported on attending a funeral that had influenced him “feeling down.”

Finally, statements made by the participants during the CAPS interviews and REPC sessions may be indicative of high motivation to attend REPC sessions. In the first CAPS interview, Sam reported disinterest in most activities but an interest in attending equine assisted counseling. David reported that coming to REPC was the “brightest day of the week is coming here” during his week 20 CAPS interview.
A final clinical implication pertains to the participants’ regression following termination of REPC. Most participants experienced some regression following termination. For example, Sam experienced regression as evidenced by increasing scores on the CAPS and PCL-5 during the post-intervention period. Sam also reported worsening of symptoms during his CAPS interviews during the post-intervention phase. Abigail’s scores increased following her three-week break from REPC as evidenced by scores on the CAPS interviews. Matt’s and David’s scores increased in some areas on the assessments during the post-intervention phase.

**Limitations of the Design**

The limitations of the study included limitations regarding threats to both internal and external validity of the design. Regarding internal validity, one of the largest limitations of the study was the presence of the baseline phase trend towards the therapeutic side prior to beginning the intervention. This phenomenon interfered with the interpretation of the effect in the intervention and post-intervention phases (Ray, in press). The presence of this trend makes it difficult to separate the effect of REPC from the effect of continued assessment. Based on the participants’ responses during the CAPS interview, they stated several factors that may account for this baseline trend including perceiving a trusting therapeutic relationship with me prior to beginning REPC, learning about the symptoms of PTSD, and unintentionally monitoring their own PTSD symptoms in preparation for the weekly assessment.

Another potential explanation for the participants’ improvement was the effect of outside concurrent therapies. At the start of the study, all of the participants were currently engaged in concurrent psychotherapy based on their reports during screening. Given the participants’ varying lengths of time receiving concurrent therapies, it is difficult to discern the impact that
these therapies may have had on the results of the study. In addition, all participants reported taking medication at the start of and throughout the duration of the study.

Another potential limitation was the accuracy of the data interpretation due to subjective observer bias in interpreting the results in the visual analysis process in single case design. This limitation was also present in determining the accuracy of the data collection as the scoring of the CAPS ratings was based on my clinical judgment and my role as researcher and counselor may have interfered with data collection. However, it should be noted that this bias may have been somewhat mitigated by the fact that my rating based on the CAPS typically indicated higher severity and higher number of symptoms than the participants’ own ratings of themselves according to the PCL-5.

Furthermore, there are other threats to internal validity associated with the accuracy of the participants’ PTSD scores. Due to the repeated assessment of PTSD symptoms using the CAPS and PCL-5, participants may have experienced testing bias and become habituated to the instrument. As I administered both the assessments and the intervention, the participants’ therapeutic relationship with me may have influenced them responding more favorably during the assessments in order to please me. In addition, some of the participants may have intentionally minimized their symptoms based on internalized stigmas about PTSD. One participant reported that he did not “really” tell me how he felt until the study was well underway and he knew that he could trust me.

In addition, for some participants, the scores reflected on the CAPS and PCL-5 often did not match. As the PCL-5 is a self-report measure exploring how “bothered” an individual is by his or her PTSD symptoms, the participant’s perception of symptoms may have been very different than my evaluation of their symptoms during the CAPS based on clinical judgment in
examining overall severity. Furthermore, participants’ perceptions may have been influenced by other factors such as internalized stigmas regarding PTSD that may have influenced some participants’ tendency to minimize symptoms on the PCL-5. Another factor that could explain the discrepancy is the fact that most of the participants had lived with their PTSD symptoms for a minimum of several years before entering the study. Therefore, the participants may perceive their experiences as their own version of “normal” since returning from their deployments. Therefore, the participants may have interpreted their improvements in their distress as being much more significant than my interpretation of their improvement based on the CAPS ratings criteria. Finally, as both assessments were designed to match recent changes to meet new DSM-5 criteria, researchers have not yet published psychometrics on the reliability or validity of either assessment. Furthermore, I was unable to find an updated CAPS manual in accordance with DSM-5. Instead, I used the manual for the CAPS based on DSM-IV, which may pose limits in its accuracy in administering the CAPS developed in accordance with

In addition, the current lack of researcher agreement concerning acceptable effect size calculations presented a limitation in determining the true effect of the intervention. Furthermore, the PEM-T effect size method has several limitations associated with its use (Wolery et al., 2010). First, researchers have found that the PEM-T does not always discriminate well between charts with and without changes in data patterns (Wolery et al., 2010). Potential extreme outliers in the baseline phase will likely influence the split middle line and may steepen the trend in the therapeutic direction. This phenomenon may result in a PEM-T value indicating that the intervention was ineffective while visual analysis may indicate that the intervention was effective (Rakap, 2015). Furthermore, outliers who are close to the therapeutic ceiling or floor may compromise the PEM-T score (Rakap, 2015). In addition, the number of data points in the
intervention phase may have influenced the percent of overlap. Finally, the method may be more representative of the change in magnitude between the baseline and intervention phases rather than the change in magnitude of the effect specifically.

Finally, as many veterans present with co-morbid and dual-diagnoses, it may be difficult to determine the impact of these additional conditions and thus may present a threat to internal validity. The interaction of the unique characteristics of individual participants with the intervention may also present a limitation in the generality of the results. It is possible that participants will not respond to the intervention in the same ways and therefore decrease the generality of the results (Kazdin, 2011).

Regarding external validity, the limited sample size decreases the ability to generalize the results of this study to veterans of other war eras and other civilian populations. In addition, the current sample was a convenience sample and therefore participants who chose to engage in the study may possess inherent biases that differentiate them from other veterans with PTSD. Attrition through the dropout of the one female participant further decreases the ability to generalize the results. Finally, the use of a new, previously untested model, REPC, limits the generalizability of these results to other forms of equine assisted counseling and other forms of equine assisted therapies and activities.

**Implications for Future Research**

The current study is only one of a few studies that have examined the relationship between equine assisted therapies and activities and military veterans. As there are no other published studies examining the effectiveness of any type of equine assisted therapy in treating military veterans, this study can serve as a foundation for other studies in this area. Future researchers can use the results of this study as a jumping off point in further exploring the
relationship between equine assisted therapies and improvement in military veteran health concerns. Regarding equine assisted counseling and PTSD specifically, there are several recommendations for future research in light of the results of this study.

First, researchers should design a study that can isolate the effect of equine assisted counseling from the effect of the assessments. The most powerful method to accomplish this goal would be the use of a randomized clinical trial that would not require ongoing assessment during the baseline or intervention phases in order to minimize benefits attained through assessment or meeting with a mental health professional prior to the start of the intervention. Using a large sample size, the researcher could compare the participants receiving equine assisted counseling to a wait-list control group or to a group receiving an established treatment for PTSD such as prolonged exposure, cognitive processing therapy, or EMDR. To make the study stronger, only participants who are not receiving any concurrent therapies for PTSD would be included.

A second direction for future research is to examine the mechanism through which the relationship with the horse enables participants to experience increased motivation and improvements in the PTSD symptoms. As the mechanisms for how interaction with animals can promote healing from trauma is still largely theoretical, studies focusing on participants’ perceptions of the benefits could shed some light on better understanding the value of the interaction with the horse. Researchers may explore participants’ experiences of motivation and improvement through a constructive, qualitative study.

Some participants experienced regression or worsening of symptoms in certain areas following termination of REPC. A future research could examine this regression in comparison to regression in other trauma-focused therapies.
Conclusion

The purpose of this study was to examine the effectiveness of REPC in reducing PTSD severity and symptoms in military veterans. I examined this effectiveness across total PTSD distress and individual PTSD cluster distress. Although the results showed some small measure of effectiveness for some of the participants, as a general matter, this study did not prove the effectiveness of REPC. However, a great deal was learned in this study. I learned that most participants perceived themselves to be improving at a greater rate than I perceived them to be improving based on differences in PTSD scores between my assessment of them according to the CAPS and their assessment of themselves according to the PCL-5. I also learned that the participants perceived their relationship with the horse to be an important contributor to their improvement as evidenced by the participants’ statements made during the CAPS interviews and REPC sessions. Furthermore, there is some evidence from statements made by participants that would indicate higher motivation to attend REPC sessions. Most importantly, I identified future directions for continued research to further attempt to establish the effectiveness of REPC.
Relational Equine-Partnered Counseling:

A Model for Practice

An Abbreviated Version

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Relational equine-partnered counseling (REPC) is an integrative approach, incorporating aspects of humanistic counseling with a focus on working within the relationship between participant and horse(s). The approach is developmental as the activities for each session are informed by progress made in the previous session and guided by the nature of the client’s relationship with the horse(s) over time. REPC is a counseling approach facilitated by a counselor with the addition of horse(s) and an equine specialist. This approach has four domains: (a) experiential, (b) relational, (c) physiological, and (d) spiritual. The experiential domain refers to the belief that growth occurs through the client’s ability to experience the relationship with the horse(s) with emphasis placed on the client’s autonomy in creating meaning from the experience and on the sensory experience of PTSD and in interaction with the horse. The relational domain refers to the primacy of the client-horse relationship as the primary agent of change. In therapeutic contact, horses inherently possess unconditional positive regard, congruency, and empathy. Regarding the physiological domain, the model is rooted in neurobiology. Within the client-horse relationship, the client and horse both may experience hormonal changes in interaction such as increases in oxytocin and decreases in stress hormones such as cortisol (Odendaal, 2000). The counselor will also provide psychoeducation on the nature of the physiological aspects of PTSD and facilitate interventions intended to facilitate the veteran’s increased ability to self-regulate anxiety responses. Finally, the model has a spiritual domain in accounting for aspects of the relationship between the horse and client that cannot be accounted for by behavioral or physiological explanations. The facilitation of mindfulness and meditative practices while in relationship with the horse can facilitate increased awareness and regulation. Furthermore, the horse’s ability to detect emotions and incongruencies in the client allow for the animal to provide regulatory feedback to the client. Finally, the spiritual domain is also
influenced by biophilia or humans’ innate affinity for nature and the experience of calmness and tranquility that people experience by being in nature and interacting with animals (Kellert & Wilson, 1993). Through the relationship with the horse(s), veterans will engage in activities intended to develop relational skills, increase self-regulation and decrease arousal, facilitate the development of creativity and problem-solving skills, and increase feelings of confidence and self-efficacy.
General Guidelines

• Activities are intended to supplement and augment the relational process occurring between the horse and client as needed, but not to be the primary focus.

• Basic verbal responses to be utilized (but not limited to) during session by:
  o Equine specialist: tracking observable client and horse behavior, setting appropriate limits to protect physical and emotional safety of the horse(s), setting limits to protect physical safety of the client, returning responsibility, and providing encouragement.
  o Clinician: tracking observable client and horse behavior, setting limits to protect the emotional safety of the client, reflections of feeling, reflections of content, reflections of meaning, identifying themes and enlarging the meaning, facilitating autonomy and decision-making, facilitating creativity, identifying incongruencies, providing encouragement, and facilitating the relationship between the client, horse(s), and treatment team.

• Regarding client physical safety, the equine specialist should continuously assess the need to intervene in a true safety emergency versus actions that may not appear to be “good horsemanship.” The treatment team should only intervene in true safety emergencies based on equine specialist’s judgment of horse(s)’ behavior in the present moment.

• Emphasis on specific clinical observations and subsequent processing should be based on client’s presenting concern, clinician’s theoretical orientation, and clinical judgment.

• Equine specialist should avoid answering questions about the horses unless previously agreed upon with the clinician based on clinical judgment, theoretical orientation, and needs of the client in order to promote client autonomy and to allow the client to create own meaning of the experience.

• A treatment team consisting of a licensed mental health professional and competent equine specialist should practice this approach. The mental health professional is responsible for creating an emotionally safe environment, treatment planning, insight-oriented processing, and debriefing with the equine specialist. The equine specialist is responsible for monitoring care and stress level of the horse(s), managing physical safety concerns, and observations of the horse(s)’ behavior.

• Teaching or horsemanship should be minimized in order to honor the client’s autonomy in developing problem-solving and coping skills, and creating one’s own meaning. Additionally, the treatment team should avoid “rescuing” the client or giving advice on how to work through the activity, instead returning responsibility to the client in order to allow the client to utilize one’s inherent creativity.
  o A sample response to client’s desire for answers may be: “Out here, we don’t teach horsemanship. Instead, you get to decide what works best for you and for your horse.
If, based on clinical judgment, the clinician determines a particular client does need assistance, a sample response may be: “Show me how I can help you.”

- Interpretative responses of the meaning, intention, or significance of the horse(s)’ behaviors should be used sparingly and based on clinical judgment as related to the client’s presenting problem and clinician’s theoretical orientation, thus allowing the client the freedom to create one’s own meaning or attribute significance of interactions with the horse(s).

- When appropriate, the clinician should facilitate processing related to enlarging the meaning of the client’s work with the horse to other relationships and experiences that the client has had outside of the counseling process.

- Activities involving mindfulness, relaxation, and self-regulation related to traumatic events should only be facilitated by clinicians trained in trauma work.

- Horses should be allowed to respond freely and organically in the moment. In this approach, the immediate and authentic reactions of the horse(s) involved in the session are respected and viewed as valuable data about the client, as well as valuable opportunities for processing.

- As the client-horse(s) relationship is regarded as an integral agent of change, this approach is inherently humanistic. However, the approach is intended to be atheoretical and applicable within many counseling theory frameworks for practice.

- Above all, the clinician’s clinical judgment in acting in the best interest of a particular client should always override the recommendations and guidelines contained in this manual.
**Working Areas**

*Pasture:* The pasture is defined as a large, grassy area that contains several horses who are able to behave freely in their natural living environment. This working area is especially beneficial for activities involving choosing a horse, observing herd dynamics, receiving multiple sources of feedback from different horses, and observing relationships among horses. This environment will likely be the most comfortable working area for most horses as it is their natural environment and allows for the most room to create space from the client. This working area may also reduce the pressure on the client of being observed by the treatment team. Precautions may include: decreased safety felt by some clients in large space and/or with multiple horses and higher risk to physical safety when interacting with multiple horses.

*Arena:* The arena is defined as a large enclosed space that is smaller than the pasture. Unlike the pasture, which contains grass and other horses, the arena is composed of dirt or sand so that distractions to the horse are minimized. One or more horses may be brought to the arena based on clinical judgment by the treatment team. This space is ideal for the use of other materials or “props” such as cones, hose, water trough, poles, ramps, etc.

*Round pen:* The round pen is defined as a smaller area enclosed by round fencing, typically only large enough for one horse, client, and possibly treatment team. This working area minimizes distraction for the horse and is beneficial in activities focused on building or enhancing the relationship. Precautions may include: client’s feelings of being trapped or confined in such a small space with the horse.
Categories of Activities

Relationship-building activities (R): Activities intended to facilitate client’s formation of safe relationships through practicing relational and communication skills, building trust, becoming congruent and authentic, and developing empathy in relationship with the horse. Activities intended to facilitate client’s development of self-nurturing, assertiveness, and boundary setting through relationship with the horse.

Nurturing activities (N): Activities intended to foster and facilitate client’s ability to provide nurturing and receive nurturing through various caretaking and nurturing activities in relationship with the horse.

Mastery/Challenge activities (M): Activities intended to challenge client’s mistaken beliefs about self, others, and the world through interaction with the horse. Goal of activities is to build confidence and facilitate insight.

Self-regulation, stress inoculation, and mindfulness activities (S): Activities intended to assist client’s development of sensory awareness of internal emotional and physiological states. Through interaction with the horse, the client gains the ability to self-regulate based on feedback from horse regarding client’s physiological and emotional responses.

Creativity and free expression (C): Activities intended to further develop client’s innate creativity and movement towards growth. Facilitates client’s free expression of thoughts, feelings, and experiences, as well increased trust in oneself.
Session Activities

Choose a Horse

Category: Relationship-building; creativity and free expression

Location: Pasture

Goal(s):
- Allow client opportunity to meet several horses in order to choose horse(s) that one will want to work with through duration of counseling session

Structure of Session: Client is introduced to horses in the pasture by the equine specialist. Little information is offered to client regarding the horses in the pasture, except per client’s request. In answering questions, treatment team provides little information in order to facilitate client’s ability to create own meaning and make own assessments of the individual horses in order to make a choice. Client is given freedom to interact with the horses however one may choose based on comfort level and own goals for interaction.

Special Considerations: For clients who present as more anxious or uncertain around horses, treatment team may provide more information on horses to increase initial comfort level and feelings of connection with the herd.

Possible Clinical Observations:
- Client’s initial level of comfort entering the pasture
- Client’s sense of safety and fear
- Client’s confidence in interacting with horses
- Nature of client’s interaction with horses
- Client’s reaction to feedback from horse(s)
- Client’s amount of questioning and/or need for reassurance
- Client’s experience of interacting with new people
**Grooming**

**Category:** Relationship-building; nurturing; emotional regulation

**Location:** Pasture, arena, round pen

**Goal(s):**
- Client begins to form a deeper relationship with the horse(s) and learn about the unique aspects of chosen horse(s) (R)
- Client is given the opportunity to provide nurturing. At times, client may also receive nurturing from potential for horse to engage in mutual grooming with client (N)
- Client may be taught rhythmic grooming activities intended to promote relaxation and mindfulness, leading to increased ability to control arousal and self-regulate

**Structure of Session:** Client may approach horse(s) in area chosen by client and/or treatment team. Client is allowed to choose from a selection of brushes consisting of a minimum of curry comb, hard brush, soft brush, hoof pick, and mane/tail comb. Depending on nature of activity, client may choose selection or be encouraged to use all brushes.

**Variations:**
- Hand-grooming: allows client to experience a closer, more intimate relationship with horse. This variation is also useful for developing self-regulation skills
- “Cowboy” grooming (100 strokes per side of horse): promotes mindfulness, attention, as well as self-regulation
- Rhythmic or two-handed grooming: facilitates increased mindfulness and decreases arousal

**Special Considerations:** This activity may be used as a standalone activity to begin to develop or work on the relationship, or as an adjunct to other activities throughout session. For goals related to self-regulation, this activity may be utilized when client is experiencing increased arousal in order to promote regulation before continuing the session.

**Possible Clinical Observations:**
- Client’s proximity to horse while grooming
- Client’s choice of which parts to groom
- Client’s choice of and comfort with different brushes
- Client’s observation/attributions of horse’s experience
- Client’s experience of grooming
- Client’s attention to emotional and physiological arousal responses (muscle tension, chest tightness, abdominal discomfort, etc)
- Client’s experience of intimate relationships with people
**Halting**

*Category:* Relationship-building; mastery/challenge

*Location:* Pasture, arena, round pen

*Goal(s):*
- Client interacts with horse in a novel way that may or may not be familiar to client by introduction of potential power dynamic (R)
- Client may experience sense of competency and achievement (M)
- Client may gain increased confidence in oneself (M)
- Client is given opportunity to practice making mistakes in safe environment (M)
- Client has opportunity to assert oneself and set appropriate boundaries with horse (R)

*Structure of Session:* Client is allowed to choose halter and lead rope from a variety of nylon and rope halters of several lengths and sizes. Client is asked to halter horse. When client feels stuck, treatment team can process with client what is working, what isn’t working, and how the horse is responding to the client.

*Special Considerations:*
- Should client ask treatment team to demonstrate or explain how to halter, an appropriate response may be “Out here we don’t focus on horsemanship. Instead you can decide what works for you and what works for your horse.”
- For clients who present as highly anxious, clinician may utilize clinical judgment to determine amount of help to offer. A sample response may be: “Show me how I can help you.”

*Possible Clinical Observations:*
- Client’s reaction to having “control” over the horse
- Client’s attribution or perception of horse’s response
- Client’s flexibility or rigidity of thinking
- Client’s frustration tolerance
- Client’s level of inherent creativity
- Client’s focus on “right” way to halter
- Client’s thoughts/feelings/behaviors/sensory experience to process of haltering
- Client’s level of need for help or reassurance
- Client’s response to the horse’s level of cooperation
- Ease or difficulty of the activity
Leading

Category: Relationship-building; mastery/challenge; personal growth; self-regulation

Location: Pasture, arena, round pen

Goal(s):
- Client has opportunity to develop increased trust with the horse (R)
- Client has opportunity to build competency and experience a sense of achievement (M)
- Client may experience increased self-confidence (M)
- Client may develop improved communication skills (R)
- Client may practice assertiveness and boundary setting (R)
- Client may learn to improve self-regulation and decrease arousal (S)
- Client may gain increased insight into incongruencies between thoughts and feelings (R)
- Client may gain increased empathy towards others (R)

Structure of Session: Client is instructed to connect the lead rope to the horse and lead the horse around the arena.

Variations:
- Trauma-walk: For clients who have experienced different forms of traumatic events, the client may be asked to recount the event while walking with the horse in order to process the trauma while simultaneously working on self-regulation and managing arousal. This activity should be conducted only by clinicians competent in trauma-work and based on clinical judgment of client’s readiness for an activity of this nature.

Special Considerations:
- For cases in which the horse is reluctant to walk with the client, the treatment team should avoid “rescuing” the client and, instead, allow the client to work through the challenge of communicating the client’s wish for the horse to walk to the horse.

Possible Clinical Observations:
- Client’s reaction to having control or power over the horse
- Client’s attribution or perception of horse’s response
- Client’s frustration tolerance
- Client’s level of problem-solving skills
- Client’s level of inherent creativity
- Client’s thoughts/feelings/behaviors/sensory experience to process of walking
- Client’s level of need for help or reassurance
- Client’s reaction to being the “leader”
- Fluidity or discontinuity of walking with the horse
- Client’s ability to communicate clearly and calmly to the horse
- Ease or difficulty of the activity
Follow the Leader

Category: Relationship-building; mastery/challenge

Location: Pasture, arena, round pen

Goal(s):
• Client has opportunity to develop increased trust and connection with the horse (R)
• Client has opportunity to build competency and experience a sense of achievement (M)
• Client may experience increased self-confidence (M)
• Client may develop improved communication skills (R)
• Client may practice assertiveness and boundary setting (R)
• Client may gain increased insight into incongruencies between thoughts and feelings (R)
• Client may gain increased empathy towards others (R)

Structure of Session: Client is to place finger in ring of halter on the side of the horse’s nose and to grip loosely. Client is instructed to begin walking with horse and, when the client feels ready, the let go of the horse and try to communicate to the horse to continue walking with the client.

Variations:
• Treatment team may determine length of walk to be a completion of the activity or allow the client to decide what would feel satisfying to them.

Special Considerations:
• Equine specialist should be aware and continuously assess client’s level of safety while finger is hooked in the halter.

Possible Clinical Observations:
• Client’s attribution or perception of horse’s response
• Client’s frustration tolerance
• Client’s level of problem-solving skills
• Client’s level of inherent creativity
• Client’s thoughts/feelings/behaviors/sensory experience to process of activity
• Client’s level of need for help or reassurance
• Fluidity or discontinuity of walking with the horse
• Client’s ability to communicate clearly and calmly to the horse
• Client’s feelings of connectedness with the horse
• Horse’s level of cooperation
• Horse’s behavioral responses to client and to activity
• Ease or difficulty of the activity

Adapted from EAGALA, 2009
**Backing**

*Category:* Relationship-building; mastery/challenge

*Location:* Pasture, arena, round pen

*Goal(s):*
  - Client has opportunity to develop increased trust with the horse (R)
  - Client has opportunity to build competency and experience a sense of achievement (M)
  - Client may experience increased self-confidence (M)
  - Client may develop improved communication skills (R)
  - Client may practice assertiveness and boundary setting (R)
  - Client may gain increased empathy towards others (R)

*Structure of Session:* Client is instructed to communicate to the horse to move backwards

*Variations:*
  - Client may be instructed to use a lead rope, halter, hands, or without touch

*Possible Clinical Observations:*
  - Client’s attribution or perception of horse’s response
  - Client’s frustration tolerance
  - Client’s level of problem-solving skills
  - Client’s level of inherent creativity
  - Client’s thoughts/feelings/behaviors/sensory experience to process
  - Client’s level of need for help or reassurance
  - Fluidity or discontinuity of walking with the horse
  - Client’s ability to communicate clearly and calmly to the horse
  - Ease or difficulty of the activity
  - Client’s degree of empathy towards horse
  - Horse’s nonverbal behaviors and reactions
**Being With**

*Category:* Relationship-building; nurturing; self-regulation

*Location:* Pasture, arena, round pen

*Goal(s):*
- Client has opportunity to learn more about oneself while in relationship with another (R)
- Client may identify mistaken beliefs regarding relationships (R)
- Client may gain increased awareness of one’s level of arousal and ability to regulate (S)
- Client may be able to receive and provide nurturing (N)
- Client may experience a sense of peace and calm (R) (N)

*Structure of Session:* Client is instructed to be in proximity to the horse and simply “be with” the horse, paying attention to one’s own thoughts, feelings, and sensory experiences, as well as what one notices about oneself, the horse, and the relationship.

*Variations:*
- Belly-breathing: Client is encouraged to put their hands under the horse’s belly to feel the horse’s breathing through the movement of the horse’s stomach and then try to match their breathing to the horse’s breathing
- Progressive muscle relaxation: Client is encouraged to engage in progressive muscle relaxation through the entire body or specific muscle groups while stroking the horse

*Possible Clinical Observations:*
- Client’s awareness of own strengths
- Client’s assessment of the relationship
- Client’s observed behaviors towards the horse
- The horse’s observed behaviors with the client
- Client’s experiences of being with significant others
- Client’s ability to become aware of and regulate arousal
Gaining Insight

Category: Relationship-building; self-regulation

Location: Pasture, arena, round pen

Goal(s):
- Client has opportunity to develop increased trust with the horse (R)
- Client may gain increased insight of the incongruence between thoughts and feelings (R)
- Client may gain increased awareness of one’s state of arousal (S)
- Client may develop increased ability for self-regulation (S)
- Client may experience increased authenticity and genuineness (R)
- Client may gain increased empathy towards others (R)

Structure of Session: Client is invited to talk about something on one’s mind or to process a session activity. During the conversation, close attention is paid the horse(s)’ reactions (walking away, walking towards, swishing tail, stomping, etc) by the treatment team. The horse(s)’ reactions are utilized as data in assisting the client to gain insight into incongruencies and suppressed thoughts and feelings. The horse(s)’ attunement to the client’s experience is integrated throughout the session, facilitating deeper processing and exploration.

Variations:
- After utilizing this exercise in several sessions in which the client has developed trust with the horse(s) and horse(s)’ attunement, the client may be asked to practice talking to the horse privately and notice the horse(s)’ reactions during this exercise.

Special Considerations:
- This activity can be utilized as a standalone activity (especially for clients who may not be as able to take part in more physical activities).
- It is best used when integrated naturally into any discussion or processing taking place in each session.

Possible Clinical Observations:
- Client’s thoughts, feelings, and/or observable behaviors
- Horse’s observable behaviors
- Client’s reaction to horse’s behaviors
- Client’s willingness or avoidance of acknowledging incongruencies
**Herd Observation**

*Category:* Relationship-building

*Location:* Pasture, arena

*Goal(s):*
- Client has the opportunity to observe the interactional patterns and behaviors among two or more horses
- Client may gain insight into one’s own mistaken beliefs regarding relationships with others
- Client may gain skills for healthier communication, assertiveness, and boundary-setting
- Client may identify healthy and unhealthy relational patterns

*Structure of Session:* Client is instructed to observe the horses’ interactions with each other and make meaning of these interactions in the horses’ relationships and in one’s own relationships.

*Possible Clinical Observations:*
- Client’s thoughts and feelings in response to the horses
- Client’s insight into similarities and differences in relationships experienced with people
- Client’s feelings towards or thoughts about individual horses within the herd
- Client’s identification or dis-identification with specific horses
- Horses’ observable behaviors and interaction patterns
**Obstacle Course**

**Category:** Relationship-building; self-regulation; mastery/challenge; creativity/free expression

**Location:** Arena

**Goal(s):**
- Client has opportunity to develop increased trust with the horse (R)
- Client may gain increased insight of the incongruence between thoughts and feelings (R)
- Client may gain increased awareness of one’s state of arousal (S)
- Client may develop increased ability for self-regulation (S)
- Client may gain increased empathy towards others (R)
- Client may experienced an increased sense of competency and feelings of achievement (M)
- Client may experience increased self-confidence (M)
- Client may express oneself freely through design of course and choice of obstacles (C)

**Structure of Session:** Client is instructed to create an obstacle course to complete with the horse(s) with the use of provided materials such as water, buckets, cones, poles, ramps, cavalleti, and other materials

**Variations:**
- Client may be asked to create a specific obstacle course representative of specific challenge(s) in the client’s life as a metaphor for processing

**Possible Clinical Observations:**
- Client’s thoughts, feelings, and/or observable behaviors
- Horse’s observable behaviors
- Client’s reaction to horse’s behaviors
- Client’s creation of meaning of the specific obstacles and completion of course as a whole
- Characteristics of the course (size, number of obstacles, ease/difficulty of the course, etc)
- Client’s level of frustration
- Client’s inherent creativity
- Client’s problem-solving skills
APPENDIX B

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study:** The Effectiveness of Relational Equine-Partnered Counseling (REPC) on Reduction of Symptoms of PTSD in Military Veterans: A Series of Single Case Designs

**Student Investigator:** Hallie Sheade, University of North Texas (UNT) Department of Counseling and Higher Education. **Supervising Investigator:** Dr. Cynthia Chandler.

**Purpose of the Study:** You are being asked to participate in a research study which involves testing the effectiveness of equine assisted counseling in reducing the symptoms of PTSD in military veterans

**Study Procedures:** You will be first asked to participate in two initial screening activities to determine your level of PTSD symptoms. These activities include an interview and a questionnaire. These activities are anticipated to take approximately 30 minutes to complete. You will be asked to participate in a shorter interview and take the same questionnaire for a minimum of three weeks prior to beginning counseling in order to identify any patterns in your current PTSD symptoms. We do not anticipate that this period will exceed five weeks. After this period, you will participate in 18 weekly sessions of equine assisted counseling, as well as participate in short weekly interviews and take a weekly PTSD questionnaire. After completion of your 18 sessions, you will complete three final weekly short interviews and questionnaires to examine your PTSD symptoms after treatment. The short interview and questionnaire is anticipated to take approximately 15-20 minutes per week.

**Foreseeable Risks:** The potential risks involved in this study are a risk of harm or injury from working with horses. Although horses are domesticated animals, their behavior cannot always be predicted or guaranteed. In order to minimize this risk, a Certified Equine Specialist will be present for every session in which you will be interacting with horses. Additionally, there is a risk that you may experience some or all of your symptoms of PTSD while working with the horses or while on the Wings of Hope Equitherapy property. Intensification or exacerbation of your PTSD symptoms is a bonafide risk. In order to minimize this risk, the counselor who will facilitate the counseling sessions are experienced in working with the military veteran population and in treating PTSD. Your counselor will help you to minimize any discomfort associated with experiencing your symptoms of PTSD while in session. Finally, this treatment has not yet been tested and may not be effective for you based on the timing, fit, or nature of the treatment. By participating in this study, you are voluntarily excluding yourself from the opportunity to participate in other forms of counseling for PTSD that have been established as effective.
Benefits to the Subjects or Others: Likely benefits may be a reduction of your symptoms of PTSD and, therefore, decreased difficulty in your social relationships, work, and/or educational goals. You may also experience an increased overall quality of life.

Compensation for Participants: You will receive financial compensation for your participation and time spent taking assessments. You will receive $50.00 upon completion of the three weekly baseline assessments. Following this activity, you will receive $10.00 following each equine assisted counseling session, up to a total of $180 for participation in equine assisted counseling sessions and weekly assessments. Finally, you will receive $50.00 following completion of the final three weekly post-intervention assessments. If you choose to withdraw from the study, you will only receive compensation for the activities which you have completed.

Procedures for Maintaining Confidentiality of Research Records: Your records as a client and participant at Wings of Hope Equitherapy will be maintained in a file in locked cabinet in an office that will also be locked. These records will only be accessible by the research team. The confidentiality of your individual information will be maintained in any publications or presentations regarding this study. The research data for the purpose of the study will not include any of your private health information that could identify you. This data will be stored at the University of North Texas.

Questions about the Study: If you have any questions about the study, you may contact Hallie Sheade at 682-334-3784 or Dr. Cynthia Chandler at 940-565-2914.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants’ Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Hallie Sheade has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.
Printed Name of Participant

Signature of Participant    Date

For the Student Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

Signature of Student Investigator    Date


_American Behavioral Scientist, 47_(1), 79-93.


Sheade, H., Box, L., & Knox, B. (2012). The power of equine assisted psychotherapy in working with military veterans. Presentation presented at the annual meeting of the Texas Counseling Association, Galveston, TX.


