EXPECTANCY, ADHERENCE, AND DEPRESSION AS PREDICTORS OF THERAPEUTIC OUTCOME AS MEASURED BY PTSD SYMPTOMS IN VETERANS WITH MST

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DEDICATION

I would like to thank the members of my Graduate Committee and my wonderful supportive family.

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by

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THESIS

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ABSTRACT

BACKGROUND: The aim of this study was to explore the association between treatment outcome expectancy, adherence to treatment, and depressive symptoms on symptom reduction in the treatment of PTSD in Veterans.

SUBJECTS: Participants were female and male veterans from a large Southwestern Veterans Administration Healthcare System. A total of 129 participants were randomized to receive cognitive processing therapy (CPT) or present-centered therapy (PCT). Participants completed baseline assessments prior to starting 12 sessions of therapy.

METHODS: Data from the Clinician Administered PTSD Scale (CAPS), the PTSD Checklist (PCL), Beck Depression Inventory II (BDI-II), the 16-Item Quick Inventory of Depression Symptomatology (QIDS), Expectancy of Therapeutic Outcome (ETO), homework assigned to the participants, and the number of therapy sessions completed were used in the analysis of the hypotheses. Spearman correlations and multiple regressions were used to analyze the data.

RESULTS: Both number of sessions attended in the CPT group and number of sessions attended in both groups combined were significantly associated with an improvement in depression symptoms as measured by change in the QIDS score (CPT $\beta = .31$, both $\beta = .29$). Attendance to sessions in the CPT group was not associated with change in the PCL score. The total average minutes spent on homework in the CPT group was significantly associated with worsening of PTSD symptoms as measured by an increase

in the CAPS score (β = -.51) in one model and by an increase in the PCL score (β = -.30) in a separate model. The percent of homework assignments completed in the CPT group was significantly associated with improvement in PTSD symptoms as measured by a decrease in the CAPS score (β = .32). A significant relationship was found between outcome expectancy and the number of sessions attended in the PCT group (β = .42;.39). The relationship between baseline depression symptom level as measured by the QIDS and the total average number of minutes spent on homework fell short of significance in the CPT group, $p = .07$. There were no significant associations between baseline depression and treatment outcome expectancy.

DISCUSSION: Greater outcome expectancy was associated with increased attendance to sessions in the PCT group, but not in the CPT group. However, greater expectancy did not predict adherence to homework and the amount of time spend doing homework. As expected, in the CPT group as well as both groups together, greater attendance to sessions was associated with an improvement in symptoms of depression. Greater adherence to homework assignments was associated with an improvement in PTSD symptoms. Contrary to predictions however, greater time spent doing the homework was associated with a worsening of PTSD symptoms and greater depression at baseline was associated with greater time spent completing homework. Furthermore, baseline depression did not predict treatment outcome expectancy, and expectancy did not predict PTSD and depression symptoms at treatment completion.

IMPLICATIONS: A greater expectation of benefit from treatment could be an indication that an individual is motivated to change. It is possible that expectations of treatment,

attendance to therapy sessions, and completing homework in between sessions, are the key to benefiting from therapy.

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LIST OF ABBREVIATIONS

MST – Military Sexual Trauma

PTSD – Post Traumatic Stress Disorder

CPT – Cognitive Processing Therapy

PCT – Present-Centered Therapy

CAPS – Clinician Administered PTSD Scale

PCL – PTSD Checklist

BDI-II – Beck Depression Inventory II

QIDS – The 16-Item Quick Inventory of Depressive Symptomatology

ETO – Expectancy of Therapeutic Outcome

CHAPTER ONE

Introduction

MILITARY SEXUAL TRAUMA

It is reported that about 1 in 10 women is sexually assaulted at least once in her lifetime (Resnick et al. 1993; Kessler et al. 1995). A national random sample of women Veterans Affairs (VA) healthcare users indicated that one in four women veterans experience sexual assault while on active duty, the rates being significantly higher than those of civilian women (Sadler et al. 2000; Skinner 2000). When attempted rape during military service is taken into account, the prevalence rate has been found to be 43% (Fontana & Rosenheck, 1998). Furthermore, the rates for military sexual assault are mostly based on a time period of two to six years, whereas studies of civilian sexual assault are based on lifetime prevalence (Suris & Lind, 2008). This suggests a markedly increased risk for sexual assault for women serving in the military (Suris & Lind, 2008).

Veterans who experience sexual assault may be at risk of developing military sexual trauma. Military Sexual Trauma (MST) is defined as psychological trauma, which in the clinical opinion of a VA mental health professional, resulted from a physical assault of a sexual nature, battery of a sexual nature, or sexual harassment [repeated, unsolicited verbal or physical contact of a sexual nature which is threatening in character] which occurred while the veteran was serving on active duty or active duty for training (U.S. Code 1720D of Title 38). According to the VA, as of September 2009, the Veteran population was approximately 23 million, with 1,824,198 being women veterans. More than 55% of female Veterans experience sexual harassment while on active duty (Skinner, 2000). Fontana and Rosenheck (1998) and Kang et al. (2004) reported that

sexual stress, stress related to sexual harassment and abuse, was nearly four times as influential as duty-related stress in the development of Posttraumatic Stress Disorder (PTSD).

It is well established that MST can lead to physical, psychological, and social problems (Suris et al., 2004; 2006, Hankin et al., 1999, Yaeger et al., 2006). A great number of veterans who experienced MST have a risk of developing PTSD when criterion A is met (Suris et al., 2004; 2006, Yaeger et al., 2006). It is crucial for those suffering from PTSD to receive effective treatment in alleviating symptoms that reduce quality of life and impair functioning. Research supports the efficacy of behavioral and cognitive therapies (Butler et al., 2006). However, several variables such as symptoms of depression, expectations of treatment, and adherence may impact the effectiveness and outcome of therapy. Depression may very well impact an individual's motivation to adhere to treatment, which may reduce the effectiveness of the treatment. To our knowledge there are no studies examining the impact of depression, expectations of treatment, and adherence on the outcomes of evidence based treatments in veterans with MST.

CHAPTER TWO

Review of the Literature

PTSD and Symptoms of Depression in Veterans with MST

Research has demonstrated a relationship between MST and its aftereffects, such as PTSD and depression. In their study comparing women with civilian sexual assault to women with MST, Suris et al. (2006) found that women veterans with MST had higher rates of PTSD, symptoms of depression, and alcohol abuse along with lower rates of physical functioning and quality of life (areas including family relationships, daily activities, and health satisfaction) compared to those with civilian sexual assault. Hankin et al. (1999) found that the odds of meeting criteria for current symptoms of depression were 3 times higher for women with MST compared to women with no MST. In comparing the rates of PTSD among military sexual assault and civilian sexual assault, Suris et al. (2004) found that rates of PTSD among female veterans or active duty members were higher than those found in national civilian studies. Research also indicates that PTSD is likely to become chronic and less susceptible to treatment when the symptoms have lasted for more than 3 months (Freedman et al., 1999). One study that examined the relationship between MST and PTSD in female veterans found that women with MST were almost 4.5 times more likely to develop PTSD compared to those with no MST (Yaeger et al., 2006).

The discrepancy in psychological consequences and quality of life between civilian assault and MST rates may be due to certain aspects of military service (Suris & Smith, 2011). As compared to civilian work environments, the military work environment differs with respect to the victim-perpetrator relationship (Suris & Smith,

2011). In the military, the relationship between the victim and the perpetrator may be sustained because of the victim's duty station, whereby he/she is subjected to repeated contact with the perpetrator who may serve as a coworker, supervisor, or a high ranking officer (Suris & Smith, 2011). It is possible that if the perpetrator is of higher rank, then the victim may struggle with feelings of betrayal, helplessness, and of fear of future victimization. The veteran may also refrain from reporting an offense in order to preserve unit cohesion (Suris & Smith, 2011). With regard to gender, male victims may refrain from reporting an assault because it may challenge their self-views regarding their masculinity, they may feel shame because they were not able to successfully defend themselves, and they may view themselves as less than a soldier (Suris & Smith, 2011).

It is reported that rates in MST among men and women are approximately the same; however, research related to MST with the male population is limited (Suris & Smith, 2011). In their study examining the relationship between alexithymia and trauma symptoms of men and women with MST, O'Brien et al. (2008) found that at baseline, men reported more trauma symptoms than women. After treatment, they found that men experienced longer lasting sexual problems and sexual abuse trauma symptoms compared with women; however, they did not differ on sleep disturbance, symptoms of depression, anxiety symptoms, or dissociative symptoms. In their study investigating the relationships between MST, post-traumatic stress symptoms, and perceived physical health, Shipherd et al. (2009) found that compared to women, men had more post-traumatic stress symptoms, and MST was more harmful to their perceived health than to women's perceived health.

In conclusion, the findings suggest that men and women veterans differ in symptom levels as well as in their experiences of dealing with the trauma. However, it is clear that PTSD and symptoms of depression are prevalent in both women and men veterans dealing with MST. It is therefore important to provide veterans with treatments that will have positive long lasting effects that address both PTSD and depressive symptoms, as well as to understand what factors affect the treatments.

Evidence Based Treatments

Studies have long supported the effectiveness of cognitive behavioral therapy (CBT) and the therapies that fall under the CBT rubric, for treatment of various psychiatric disorders (Butler et al., 2006). Several randomized controlled trials demonstrated the efficacy of CBT techniques for patients with PTSD, including veterans with combat-related trauma as well as sexual or physical assault victims (VA/DoD Clinical Practice Guidelines, 2010). According to the Department of Defense (DoD) and the VA's treatment guidelines, the goal of CBT techniques is to improve mood and behavior through a deliberate and explicit focus on modifying dysfunctional thoughts, beliefs, and expectations. According to CBT theory, traumatic events may lead to distorted beliefs regarding personal safety, self-efficacy, danger, future consequences of actions, and the availability of support (VA/DoD Clinical Practice Guidelines, 2010). These beliefs may maintain or later lead to symptoms of PTSD and impair the global functioning of an individual (VA/DoD Clinical Practice Guidelines, 2010). Therefore, through a systematic process, CBT is implemented through (a) identifying dysfunctional beliefs, (b) challenging these beliefs by examining the evidence for or against them, and

(c) restructuring or replacing the beliefs with those that are more functional, logical, and reality-based (VA/DoD Clinical Practice Guidelines, 2010).

Treatment with CBT typically begins with an introduction of how thoughts affect emotions and behavior, followed by the cognitive model of change (VA/DoD Clinical Practice Guidelines, 2010). The patient is then provided with a rationale and expectations for participation in therapy (VA/DoD Clinical Practice Guidelines, 2010). The techniques of therapy focus on capturing and recording thoughts about significant events, weighing the evidence in support of those thoughts, challenging distressing trauma-related thoughts, and replacing dysfunctional thoughts with more adaptive ones (VA/DoD Clinical Practice Guidelines, 2010). The patient is given assignments both during and in between sessions in order to examine, challenge, and replace dysfunctional thoughts (VA/DoD Clinical Practice Guidelines, 2010). By replacing dysfunctional thoughts with ones that are more logical and reality-based, symptoms decrease and global functioning improves (VA/DoD Clinical Practice Guidelines, 2010). CBT also emphasizes the identification and modification of distorted core beliefs regarding self, others, and the world, and teaches that improved accuracy of thoughts and beliefs leads to improved mood and functioning (VA/DoD Clinical Practice Guidelines, 2010).

Cognitive Processing Therapy

Cognitive Processing Therapy (CPT) is a CBT therapy that was developed by Resick and colleagues for the treatment of civilian rape-related PTSD (Resick et al., 1992), and has been manualized and validated for use with sexual assault-related PTSD in women (Resick et al., 2002) and in male and female veterans (Monson et al., 2006). It is developed based on information processing theory, which outlines the learning and

memory process by which information is encoded, stored, and recalled (Resick & Schnicke, 1992; 1993). It is also based on a social cognitive theory of PTSD with a focus on how the traumatic event is interpreted and coped with by the individual who is trying to regain control in his/her life (Resick et al., 2007). CPT has been shown to be effective in reducing comorbid depressive and anxiety disorders, as well as anger, guilt, and shame among rape victims (Resick et al., 2002; 2008, in Benedek & Wynn, 2011). It utilizes components of cognitive therapy in working to identify and restructure problematic cognitions, such as self-blame, as well as focusing on "stuck points" (conflicts between existing beliefs and traumatic events, or beliefs that were confirmed as a result of the traumatic event) (Rothbaum et al., 2000).

Cognitive Processing Therapy consists of 12 therapy sessions, which systematically build the patient's skills to deal with the traumatic event and its impact in other areas of life (Resick et al., 2007). After an introduction and an initial assessment, the patient is given the homework assignment to write an impact statement, describing what the trauma meant to him/her (Resick et al., 2007). This statement is used to begin to identify stuck points and to look for over-generalized beliefs about safety, trust, power and control, self esteem, and intimacy, along with self-blame statements or statements that may indicate that the patient has distorted the event (Resick et al., 2007).

During the second session, the patient reads the impact statement, and the meanings of the traumatic event are discussed (Resick et al., 2007). The relationship between thoughts, feelings, and behaviors are illustrated with the cognitive model through the use of A-B-C Worksheets (Resick et al., 2007). The worksheets provide columns for recording events, thoughts, and feelings that, with the help of the therapist,

aid the patient to begin noticing how different thoughts and interpretations may lead to different emotions. The patient is given several worksheets to complete for homework throughout therapy (Resick et al., 2007). In the third session the therapist helps the patient in challenging stuck points and asks the patient to write an account of the most traumatic event the patient has experienced, and to include sensory and emotional details (Resick et al., 2007). During the fourth session, the therapist uses cognitive therapy strategies to challenge the patient's stuck points regarding the event (Resick et al., 2007).

In the fifth session the notion of stuck points is reviewed and a list of challenging questions is presented to the patient to assist in challenging stuck points (such as those related to self-blame) independently (Resick et al., 2007). In session six, patterns of problematic thinking (e.g. minimization/exaggeration, all-or-nothing thinking) are introduced and illustrated using the patient's thinking regarding the traumatic event (Resick et al., 2007). In session seven the Challenging Beliefs Worksheet is introduced to aid in self-guided cognitive restructuring. In the later sessions, the focus of therapy is on helping the patient utilize cognitive skills learned to examine beliefs about safety, trust, power or control, self-esteem, and intimacy (Resick et al, 2008). After successfully challenging distorted beliefs, the patient is asked to rewrite his/her impact statement in order to see how he/she currently views his/her experience (Resick et al., 2007). During the final session, the patient and the therapist compare the new and old impact statements in order for the patient to notice the changes he/she has made during the treatment (Resick et al., 2007).

Present-Centered Therapy

Present-Centered Therapy (PCT) is a treatment that was designed to serve as a comparison treatment to control for the active components of CBT, such as breathing retraining, prolonged exposure, in vivo exposure, and cognitive restructuring, and has been used in previous VA PTSD studies with female veterans (Schnurr et al., 2007, McDonagh et al., 2005). It focuses largely on here-and-now problem solving and improving relationships, and like behavioral therapies, involves between-sessions homework time (McDonagh et al., 2005, Foa et al., 2006, Schnurr et al., 2007). In PCT, the therapist helps the patient to address current life difficulties by helping the patient recognize the impact of trauma history on his/her present coping style and by teaching a systematic approach to problem solving to enhance coping (McDonagh et al., 2005). Present Centered Therapy involves psychoeducation about PTSD and the common aftereffects of trauma, training in problem solving, and journal writing (McDonagh et al., 2005).

During the first two sessions of therapy, the treatment involves establishing rapport, presenting psychoeducational material, and establishing a treatment plan based on the patient's needs (McDonagh et al., 2005). Throughout therapy, the therapist is expected to use active listening, encourage expression of feelings, point out themes that the patient struggles with (e.g., relationship or trust issues), provide useful information, and encourage problem solving and application of formerly used or new coping methods (Foa et al., 2006). The therapist provides emotional support to help in the recovery process by helping the patient gain a better understanding of the nature of his/her problems and connections with PTSD (Foa et al., 2006). The focus of the following

sessions are determined based on the patient's current issues and are addressed with problem-solving skills (McDonagh et al., 2005). Present Centered Therapy sessions begin with a review of the contents of the daily diary (writings about the patient's problem-solving efforts completed between sessions for homework), which are designed to assist the patient in integrating the information gained in sessions (Foa et al., 2006, McDonagh et al., 2005). The therapist continues to provide unconditional support to the patient and attends to the issues that are important to the patient during each session (Foa et al., 2006). The final session focuses on reviewing the progress that was made during treatment with respect to the major issues that were identified by the patient (Foa et al., 2006).

Mediating Factors of Therapeutic Outcome

Various factors such as adherence to homework and therapy, expectations of treatment, and depressed mood can affect the outcome of treatment. It is important to investigate the impact of such factors on therapeutic treatment for the purpose of increasing positive treatment outcomes.

Adherence to homework assignments

Several studies have investigated the effect of adherence to homework assignments on the outcome of treatment. The findings in most studies support the positive impact of adherence to homework in both facilitating the treatment process as well as reducing symptoms (Thase & Callan, 2006, Keijsers et al., 2000, Mausbach et al., 2010). According to Kazantzis and Lampropoulos (2002), the use of skills learned in therapy and their application outside of therapy allows patients to master the skills believed to be necessary to positively affect symptoms, generalize the skills to their

natural settings, and promote prolonged symptom improvement through extending therapeutic aspects of the treatment beyond the completion of therapy. In their study involving cognitive-behavioral treatment of depression, Startup and Edmonds (1994) found that compliance with homework was predictive of improvements in symptoms by assessing Beck Depression Inventory scores at the end of treatment and at three-month follow-up. Furthermore, according to Thompson and Gallagher (1984) in their study with depressed elderly individuals, homework compliance was more predictive of improvement at follow-up than at treatment termination (cited in Startup & Edmonds, 1994).

Thase and Callan (2006) have noted that in CBT, the use of homework assignments provide a means to enhance mastery of newly learned coping strategies, facilitate generalization of skills to novel situations, increase self-efficacy, and ultimately reduce vulnerability to relapse. In their review of nine correlational studies, they found that homework adherence was associated with significantly better outcomes in eight of the studies (Thase & Callan, 2006). In a review article on the effects of homework compliance, Keijsers and colleagues found that homework compliance was significantly related to treatment outcome in four of seven studies (Keijsers et al., 2000). Based on inconsistencies across various studies, the authors hesitated to conclude whether or not the quality of homework assignments had a consistent impact on treatment outcome. A meta-analysis of 27 studies, all of which included measures of homework compliance as well as pretreatment and posttreatment outcome, suggested that greater compliance with homework is associated with improved treatment outcome (Mausbach et al., 2010). The results were consistent across a variety of target symptoms, including symptoms of

anxiety and depression, suggesting that compliance with homework may be important to the process of psychotherapy regardless of target symptoms (Mausbach et al., 2010).

Predictors of adherence to treatment

Several studies have also explored possible predictors of adherence to treatment. Most studies investigating the effect of depression and/or symptoms of depression on treatment adherence have largely focused on medication adherence. Studies investigating the effect of depression on adherence to psychological treatments were not found in a review of the current psychological literature, but there were several examples in the medical literature. Ciechanowski et al. (2000) performed a regression analysis to determine the impact of depressive symptoms as measured by the BDI, of diabetes patients to diabetes self-care and oral hypoglycemic regimens. The authors found that the severity of depressive symptoms was significantly associated with less adherence to the recommended treatments (Ciechanowski et al., 2000). In their study on asthma patients, Bosley et al. (1995) investigated the effect of psychological variables on treatment compliance and found a significant relationship between high depression scores and compliance. In a study measuring adherence to recommendations to reduce the risk of cardiac events after a myocardial infarction, patients with major depression and/or dysthymia reported adhering less often to a low-fat diet, regular exercise, and regularly socializing than did nondepressed patients (Ziegelstein et al., 2000). Carney et al. (1995) found similar results in patients with coronary artery disease with major depression. The authors found that patients with major depression adhered to a prescribed regimen of prophylactic aspirin on significantly fewer days than the nondepressed patients. In a

meta-analysis of 12 studies, DiMatteo et al. (2000) found that depressed patients were three times as likely as nondepressed patients to be noncompliant with medical treatment.

In sum, there is substantial evidence that suggests that adherence to treatment is likely an important factor in the positive outcome of treatment in non-psychological treatment interventions. Although there is empirical evidence supporting the effectiveness of cognitive therapies on depression and depressive symptoms, research on the effects of depression on adherence is lacking. Although many studies such as those cited above have found that depressive symptoms are associated with compliance to medication treatment, it is not yet known if depressive symptoms have a significant impact on homework adherence in the cognitive therapies designed to treat comorbid PTSD.

Expectancy of treatment

Client expectations and preferences have been thought to influence the client's willingness to engage in and be influenced by the therapy (Glass et al., 2001). DiMatteo et al. (2000) found that positive expectations and beliefs in the efficacy of treatment are essential to patient adherence. Based on their review of 76 studies, Glass et al. found that positive expectations of treatment were associated with better treatment outcomes in most of the studies reviewed. They considered that positive expectations can motivate clients to pay more attention to and comply with treatment procedures; however, the authors hesitated to conclude that expectancy of therapeutic gain influences the outcome of therapy (Glass et al., 2001).

In their study on outcome expectancy and treatment acceptability of school-based interventions in a sample of students, Waas and Anderson (1991) indicated that outcome

expectancy and treatment acceptability are related constructs, which possibly influence client cooperation and treatment efficacy. Elliot (1986), as cited in Waas and Anderson (1991), suggests that a client's evaluation of acceptability may significantly affect the use of intervention procedures, intervention integrity, and overall treatment efficacy. Waas and Anderson (1991) therefore concluded that the degree to which a client expects that a treatment intervention will result in positive outcomes and not result in negative side effects may play a significant role in determining the acceptability of the intervention and the likelihood that the client will fully cooperate with the intervention procedures. In their study of patients with symptoms of depression, Meyer et al. (2002) found that patients' pretreatement expectations of therapeutic effectiveness predicted their active engagement in therapy, which was associated with greater symptom reduction. DiMatteo et al. (2000) suggested that because depression often involves a considerable degree of hopelessness, compliance might be difficult for a patient who has little optimism that any action will be worthwhile.

Goossens et al. (2005) studied expectancy as it related to symptom reduction in a sample of patients with fibromyalgia and chronic low back pain being treated with a cognitive behavioral intervention. The authors obtained outcome measures that included pain coping and control, motoric behavior, negative affect, and quality of life, both before and after the intervention. Their results indicated that patients' expectancies regarding treatment success were significantly associated with all the outcome measures (Goossens et al., 2005). Safren et al. (1997) found that in a sample of clients with social phobia, lower expectancies for positive outcome were related to greater severity of social phobia and its duration, and depressive symptoms. A study on the treatment of social phobia

found that clients who at the beginning of treatment reported higher expectancy for benefit, found the treatment more credible and were more likely to improve and to remain improved on outcome measures (Chambless et al., 1997).

Based on these findings, it appears that positive expectations of treatment may not only be associated with adherence to treatment, but may also be correlated to symptom reduction in a variety of disorders. Although research on the effect of depressive symptoms on expectations of treatment is limited, it is likely that symptoms of depression as they relate to feelings such as hopelessness, may negatively impact an individual's expectation of benefiting from a given treatment and therefore impact adherence and symptom reduction.

Aim of Research

The aim of the proposed study is to explore the association between expectancy, adherence, and depressive symptoms and symptom reduction in the treatment of PTSD in CPT. If symptoms of depression have potential effects on adherence as measured by homework completion and attendance to sessions, then it may be important to treat the depression first, prior to the start of a cognitive behavioral therapeutic approach. Furthermore, if symptoms of depression reduce expectations of treatment, and expectancy of positive outcome has a potential impact on symptom reduction, this will further reinforce the possible need to treat depressive symptoms prior to initiating interventions in the treatment of PTSD.

Hypothesis

Hypothesis I: Positive outcome expectancy of treatment will be correlated with PTSD and depression symptom improvement at treatment completion.

Hypothesis II: Adherence to homework and attendance to sessions will be associated with a significant improvement of PTSD and depression symptoms at the end of treatment in the CPT group.

Hypothesis III: Symptoms severity of depression at baseline will be associated with significant inverse correlation in adherence to homework and attendance to sessions.

Hypothesis IV: Positive outcome expectancy of treatment will be positively associated with greater adherence to treatment as measured by session attendance and completed homework.

Hypothesis V: Symptom severity of depression at baseline will be inversely correlated with treatment outcome expectancy.

CHAPTER THREE

Methodology

Participants

The participants in this study were female and male veterans from a large Southwestern Veterans Administration Healthcare System. The study was approved by the Institutional Review Board (IRB). The participants were identified and recruited by clinician referrals, female veteran groups, and IRB approved advertising methods (via fliers posted throughout the facility). Qualification for participation was determined during an initial phone screening. To be included, participants needed to: a) be veterans with a current diagnosis of PTSD related to MST (for the purposes of this study, the trauma must have resulted only from sexual assault); b) have experienced MST no less than three months prior to entering the study; c) identify that MST was the trauma that was causing them the worst current distress; d) have at least one clear memory of the trauma; e) consent to be randomized into treatment; f) not receive other psychotherapy for PTSD during the active treatment (with the exception of brief check-ins with an existing therapist**,** and attendance in self-help groups); and g) be on a stable medication regimen for at least 6 weeks prior to entering the study. Potential participants were excluded for the following reasons: a) active substance dependence within the last three months; b) current psychotic symptoms; c) current unstable bipolar disorder; d) current prominent suicidal or homicidal intent; e) severe cognitive impairment; f) currently receiving other psychotherapy specifically for PTSD; and g) current involvement in a violent relationship.

The study originally included only women. However, with additional funding the study sample was expanded to include men as well.

Procedure

After initial eligibility for participation was determined, potential participants were scheduled for an appointment to discuss the study in detail. Informed consent was obtained from individuals who agreed to participate in the study.

Of the 481 individuals screened for the study, 161 were enrolled and 320 were excluded from participation after initial screening. Of the 161 individuals who were enrolled, 32 were withdrawn prior to randomization, and 129 were randomized to receive either CPT or PCT. Of the 32 individuals withdrawn 16 did not meet inclusion criteria at baseline assessment, 13 declined to participate, and 3 were withdrawn for reasons not specified (See Figure 1 for details). Participants were assigned sequential study identification numbers as they entered the study and were then randomly assigned to a therapist and treatment condition.

After informed consent, individuals were assessed by a doctoral level psychologist or a trained and supervised master's level technician. Data were obtained from these structured assessments and from written questionnaires that were completed as part of the baseline screening assessment for participation in the study. The baseline assessment included the Clinician Administered PTSD Scale (CAPS) and self-report questionnaires including the Beck Depression Inventory II (BDI-II), The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), and a demographic questionnaire. Then, participants who were eligible after completing the baseline assessment were assigned to and started 12 sessions of the assigned therapy. The therapy sessions

occurred either weekly or biweekly depending on participants' schedules. All participants were encouraged to complete follow-up assessments even if all 12 therapy sessions were not completed. Follow-up assessments included completion of the CAPS, PCL, and QIDS. Follow-up assessments occurred at the end of treatment (within seven days of the final therapy session), and at two, four, and six months after the final therapy session.

Treatment fidelity

Four masters or doctoral level female mental health providers provided treatment in the study. Each therapist was trained in both the CPT and PCT protocols. All therapy sessions were videotaped after obtaining informed consent. Over the course of the study one therapist provided treatment to 43 participants, one provided treatment to 42 participants, and two therapists provided treatment to 22 participants each. Of the 1,249 total sessions taped from the original 129 intent-to-treat sample, 12% from each treatment condition were randomly selected to be reviewed and rated by an independent expert reviewer. The reviewer rated the therapists on their competence in and adherence to manualized treatment delivery. Ratings were averaged across sessions for each therapist, for each condition. An overall competence score was also calculated for each condition.

Based on treatment fidelity analysis in the CPT group, the ratings for one therapist indicated below-average fidelity ratings (i.e., mean score > 1 S.D. below the combined mean). As a result, this therapist's data were excluded from study analyses, yielding a final sample of 87 participants. The treatment fidelity ratings for the remaining therapists in both the CPT and PCT conditions were in the acceptable range (i.e. means ranged from 4.25 - 5.53 on a scale of 1-7).

Measures

Clinician Administered PTSD Scale

The total score of the Clinician-Administered PTSD Scale (CAPS) (Blake et al., 1995) was used to determine PTSD diagnosis and severity of symptoms related to the MST event at treatment baseline, completion, two, four, and six-month follow-up assessments. The CAPS is a 20-item structured interview developed by Blake et al. (1995), and it provides full diagnostic assessment of PTSD using Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria. It measures the presence of, as well as the frequency and intensity of, the DSM-IV 17 symptoms of PTSD on a behaviorally anchored 5-point rating scale from 0 ("never") to 4 ("daily or almost daily") and intensity from 0 ("none") to 4 ("extreme") (Blake et al., 1990). According to the DSM-IV, diagnostic criteria for PTSD are met when Criterion A is present, (having experienced a traumatic event and responded to with intense fear, helplessness, or horror), criterion B is met (one or more re-experiencing symptoms are present), Criterion C is met (three or more avoidance symptoms are present), and Criterion D is met (two or more hyperarousal symptoms present). Furthermore, the duration of the symptoms must be more than one month resulting in clinically significant distress or impairment in social, occupational, or other important areas of life. Questions are included in the CAPS that specifically address the effect of these symptoms on social and occupational functioning, a validity indicator, a clinician-rated severity score of reported symptoms, and improvements since the previous assessment (for repeated administrations). The CAPS test-retest reliability is reported to range from .90 to .98, with internal consistency for the 17 symptoms at .94 (Blake et al., 1990). The total

severity score is reported to be highly correlated with other measures of PTSD symptoms including the Mississippi PTSD Scale (.91) and Post-Traumatic Stress Disorder-Keane (PK) scale of the MMPI-2 (.77) (Blake et al., 1990).

The PTSD Checklist

PTSD symptoms were also measured by the total score gathered from the 17-item PTSD Checklist (PCL) (Weathers et al., 1993), which was administered at baseline, sessions 1, 3, 5, 7, 9, 11, and at treatment completion, as well as at two, four, and six-month follow-up assessments. The 17-item PCL is a self-report instrument that was developed by Weathers and colleagues (1993) and is one of the most widely used self-report measures of PTSD (Wilkins et al., 2011). Each of the 17 items consists of five severity ratings ranging from "Not at all" to "Extremely." Scores are obtained by summing the ratings from the 17 items. A test-retest reliability of .96, with internal consistency has been reported with a range from .89 to .92 (Blanchard et al., 1996). The PCL's validity is indicated by a kappa of .64 for the diagnosis of PTSD from the SCID (Wilkins et al., 2011).

Beck Depression Inventory II

The total score of the Beck Depression Inventory II (BDI-II) (Beck et al., 1996) was used to measure depressive symptoms. It was administered at baseline, at the completion of treatment, as well as at two, four, and six-month follow-up assessments. Developed by Beck and colleagues in 1996, the BDI-II is a 21-item self-report instrument that has been widely used in research and clinical settings to assess the symptoms of depression and their severity. Each of the 21 items consists of four statements, listed in increasing severity, about a particular symptom of depression. Scores are obtained by

summing the ratings from the 21 items. A test-retest reliability of .90 and an average reliability coefficient of .86 have been reported (Beck et al., 1996). The BDI-II is reported to be significantly correlated with other indices of depressive symptoms and depression-related constructs, including the Beck Depression Inventory IA (BDI-IA) (r = .93; Beck et al., 1996; Dozois et al., 1998), the Hamilton Rating Scale for Depression (.71), and the Beck Hopelessness Scale (BHS) (r = .68; Beck et al., 1996) (Thomas & Hersen, 2003).

The 16-Item Quick Inventory of Depressive Symptomatology

Depression symptoms were also measured by the total score gathered from the 16-Item Quick Inventory of Depressive Symptomatology (QIDS) (Rush et al., 2003), which was administered at baseline, sessions 1, 3, 5, 7, 9, 11, and at treatment completion, as well as at two, four, and six-month follow-up assessments. The 16-item QIDS is a self-report instrument that was developed by Rush and colleagues (2003). It is a shortened version of the original 30-item QIDS developed in 1996. The short version was constructed by selecting only items from the 30-item scales that assessed DSM-IV criteria for major depression (Rush et al., 2003). The QIDS converts responses to the 16 items into the nine DSM-IV symptom domains (Rush et al., 2003). Scores are obtained by summing the 16 items. The QIDS is reported to have high internal consistency (.86) and is highly correlated with the Inventory of Depressive Symptomatology (IDS-SR) (.96) and the Hamilton Rating Scale for Depression (HAM-D) (.86) total scores (Rush et al., 2003). After analyzing data on suicide, Drs. Carol North and Alina Suris found that the BDI-II and the QIDS appeared to perform differently and capture different aspects of

depression. Based on these findings, the QIDS and BDI-II will both be used as measures of depressive symptoms in the analyses.

Expectancy of Therapeutic Outcomes

The Expectancy of Therapeutic Outcomes (ETO) (Foa et al., 1991) is a 4-item questionnaire that was administered after session one. After completion, it was placed in a sealed envelope identified only by the patient's unique study number so that all study personnel who did not have access to the master id list were blind to the participants' expectancy ratings, including therapists and assessment technicians. The ETO measures the perceived credibility of treatment after the therapy is explained to the participant. The questions include: (1) How logical does this type of treatment seem to you?; (2) How confident are you that this treatment will be successful in reducing your assault-related symptoms?; (3) How confident are you that this treatment will be successful in reducing other personal problems?, and (4) How confident would you be in recommending this treatment to a friend with similar problems? The questions are rated on a 9-point scale ranging from 1 ("not at all") to 9 ("extremely"). Question 2 on this questionnaire targets the expectation of the treatment, and is relevant to the current data analyses.

Adherence

Adherence to homework was documented at the start of each session by the therapist, excluding session one. In the PCT group, the percentage of the total number of homework assignments completed was used to measure adherence to homework. In the CPT group, adherence to homework was measured by the percentage of the homework total number of homework assignments completed and the total average minutes spent on

the homework. Adherence, as measured by attendance, was measured by the number of therapy sessions attended.

Statistical Analyses

Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS, 2011), version 19.0. Values of .05 or less were considered significant. Descriptive statistics including mean, standard deviations, and ranges were obtained for all the study measures. Prior to analyzing the hypotheses, Spearman's correlations were performed for ordinal variables and for non-normally distributed interval variables. Multiple linear regressions were performed for models that had normally distributed dependent variables. Log transformations were performed for dependent variables that were not normally distributed. Dependent variables that were not normally distributed were run according to the hypotheses and the results interpreted with caution. Outliers that fell 2.5 standard deviations outside of the mean were truncated to the 2.5 standard deviation mark.

CHAPTER FOUR

Results

Descriptive Statistics

Data were collected, entered, and managed by SPSS Version 19.0. Descriptive statistics were calculated for demographic variables, including age, gender, years of education, ethnicity, marital status, work status, and service branch in the military (see Table I). The sample consisted of 86 individuals. The average age of the sample was 45.81 years (SD = 9.85 years). The participants were 15.1% male and 84.9% female. The majority of the participants were African American (n = 37, 43.0%) with at least some college education (n = 57, 66.3%). At the time of the baseline assessment, nearly a third of the participants reported being divorced (n = 31, 36.0%) and unemployed (n = 33, 38.4%) and the most common branch of serve was in the Army (n = 44, 51.2%).

Table I

Demographic information for sample of veterans in current study

Variable	CPT Group	PCT Group	Both Groups
Age	N = 51 M = 44.37 SD = 10.50 Range = 24-68	N = 35 M = 47.91 SD = 8.54 Range = 30-60	N = 86 M = 45.81 SD = 9.85 Range = 24-68
Level of Education, N (Percent)			
High School	9 (17.6)	8 (22.9)	17 (19.8)
Some College/College	34 (66.7)	23 (65.7)	57 (66.3)
Post College	8 (15.7)	4 (11.4)	12 (14.0)
Gender, N (Percent)			
Male	10 (19.6)	3 (8.6)	13 (15.1)
Female	41 (80.4)	32 (91.4)	73 (84.9)
Ethnicity, N (Percent)			
White, Not Hispanic	22 (43.1)	14 (40.0)	36 (41.9)
African American, Not Hispanic	20 (39.2)	17 (48.6)	37 (43.0)
White, Hispanic	3 (5.9)	1 (2.9)	4 (4.7)
African American, Hispanic	1 (2.0)	0 (0.0)	1 (1.2)
American Indian/Alaska Native	1 (2.0)	0 (0.0)	1 (1.2)
Native Hawaiian/Pacific Islander	1 (2.0)	0 (0.0)	1 (1.2)
Other	3 (5.9)	3 (8.6)	6 (7.0)

(Table Continues)

Variable	CPT Group	PCT Group	Both Groups
Marital Status, N (Percent)			
Single/Never married	9 (17.6)	2 (5.7)	11 (12.8)
Married	13 (25.5)	8 (22.9)	21 (24.4)
Cohabitating	2 (3.9)	3 (8.6)	5 (5.8)
Separated	6 (11.8)	6 (17.1)	12 (14.0)
Divorced	17 (33.3)	14 (40.0)	31 (36.0)
Widowed	4 (7.8)	2 (5.7)	6 (7.0)
Employment, N (Percent)			
Employed Full Time	17 (33.3)	9 (25.7)	26 (30.2)
Employed Part Time	6 (11.8)	2 (5.7)	8 (9.3)
Retired	5 (9.8)	4 (11.4)	9 (10.5)
Unemployed	18 (35.3)	15 (42.9)	33 (38.4)
Other (including disability)	5 (9.8)	5 (14.3)	10 (11.6)
Branch in the Military, N (Percent)			
Air Force	9 (17.6)	6 (17.1)	15 (17.4)
Army	26 (51.0)	18 (51.4)	44 (51.2)
Marines	3 (5.9)	1 (2.9)	4 (4.7)
Navy	12 (23.5)	9 (25.7)	21 (24.4)
Other	1 (2.0)	1 (2.9)	2 (2.3)

Means, standard deviations, and ranges were calculated for study measures including both baseline and post treatment assessments (see Table II). Analyses for an interaction variable (i.e., the product of the percent of homework completed and attendance to sessions variables) were performed. The interaction variable did not provide additional significant contribution to the predictions of the dependent variables beyond what the two variables (percent of homework completed and attendance to sessions) predicted separately. Therefore, the interaction variables were not used in subsequent analyses.

Post-treatment assessments were conducted for 61 (70.9%) participants who completed therapy. The 25 (29.1%) participants who did not complete treatment did not complete post-treatment assessments. No significant differences were found in the baseline demographic information and baseline assessments between those who did and did not complete treatment, with the exception of gender. All of the male (N = 13) participants in the study completed treatment (df = 1, p =.01).

Table II

Means and standard deviations of study measures

	CPT Group				PCT Group				Both Groups			
Measures	N	Mean	SD	Range	N	Mean	SD	Range	N	Mean	SD	Range
BDI (Baseline)	51	25.92	10.20	4 – 50	35	29.34	10.84	4 – 61	86	27.31	10.54	4 - 61
BDI (Improvement)	33	7.45	9.23	(-8) - 27	28	6.11	11.20	(-17) - 31	61	6.84	10.11	(-17) - 31
QIDS (Baseline)	51	15.96	4.73	7 – 24	35	16.23	5.41	2 – 25	86	16.07	4.99	2 – 25
QIDS (Improvement)	32	2.94	5.26	(-9) - 14	28	2.46	6.20	(-10) - 17	60	2.72	5.68	(-10) - 17
QIDS (Improvement, LOCF)+	50	1.82	5.34	(-11) - 14	34	2.62	5.10	(-10) - 17	84	2.14	5.56	(-11) - 17
CAPS (Improvement)	33	22.21	24.15	(-35) - 78	28	15.93	23.37	(-18) - 81	61	19.33	23.81	(-35) - 81

(Table Continues)

	CPT Group				PCT Group				Both Groups			
Measures	N	Mean	SD	Range	N	Mean	SD	Range	N	Mean	SD	Range
PCL (Improvement)	31	15.10	12.95	(-10) - 42	28	7.68	16.12	(-28) - 52	59	11.58	14.89	(-28) - 52
PCL (Improvement, LOCF) †	48	11.44	14.27	(-16) - 42	34	9.06	15.85	(-28) - 52	82	10.45	14.90	(-28) - 52
Expectancy	49	6.10	1.62	2 - 8	35	5.69	1.81	0 - 8	84	5.93	1.71	0 - 8
Number of Sessions Attended	51	9.73	3.48	2 – 12	34	11.06	2.49	2 – 12	85	10.26	3.17	2 - 12
Percent of Homework Completed	51	76.58	13.09	42.90 - 100	34	75.65	27.48	0 – 100				
Average Total Minutes Spent Doing Homework	51	74.32	53.17	10.3 – 323.97								

Note: †The Last Observation Carried Forward (LOCF) variables were used to estimate symptom improvement of all the participants at the time of their last assessment, including the participants who dropped out of treatment prior to completion.

Hypothesis Testing

Hypothesis I: Positive outcome expectancy of treatment will be correlated with PTSD and depression symptom improvement at treatment completion.

Spearman's correlations were performed to test hypothesis I. The expectancy measure, both within groups and between groups, was correlated with the amount of improvement in symptoms from baseline to post-treatment of the BDI-II, QIDS, PCL, and CAPS (see Table III). Positive outcome expectancy in both the treatment groups combined (M = 5.93, SD = 1.79) was significantly correlated with improvement in PTSD symptoms as measured by the CAPS (M = 19.33, SD = 23.81) $r = 0.26$, $p = .04$. No significant correlations between treatment expectancy and PTSD and depression symptom improvement were found in separate analyses of the two treatment groups (CPT and PCT).

Table III

Correlation of expectancy with depressive and PTSD symptoms

	CPT Group			PCT Group			Both Groups		
Expectancy	N	r_s	*p*-value	N	r_s	*p*-value	N	r_s	*p*-value
BDI (Improvement)	33	.18	.33	28	.11	.56	61	.17	.20
QIDS (Improvement)	32	.12	.50	28	.29	.14	60	.19	.14
CAPS (Improvement)	33	.26	.14	28	.21	.29	61	.26*	.04
PCL (Improvement)	31	.31	.10	28	.02	.94	59	.22	.10

Note: *Indicates a significance level of ≤ .05.

Hypothesis II: Treatment adherence (homework completion and attendance at sessions) will be associated with a significant improvement of PTSD and depression symptoms at the end of treatment in the CPT group.

To begin to test hypothesis II, Spearman's correlations were first calculated between the adherence measures (operationalized as the percent of homework assignments completed, number of sessions attended, and average total number of minutes spent on homework) and amount of improvement in symptom scores from baseline to post-treatment of the BDI-II, QIDS, PCL, and CAPS within the CPT group (see Table IV). The average total number of minutes spent on CPT homework (M = 74.32, SD = 53.17) was significantly correlated with worsened PTSD symptoms as measured by an increase in the CAPS (M = 22.21, SD = 24.15; r = -.38, p = 0.03). The number of CPT sessions attended (M = 9.73, SD = 3.48) was significantly correlated with improvement in depression symptoms as measured by a decrease in the QIDS score (M = 1.82, SD = 5.34; r = .29, p = .04) and with an improvement in PTSD symptoms as measured by a decrease in the PCL score (M = 11.44, SD = 14.27; r = .31, p = 0.03). The number of sessions attended in both treatment groups combined (M = 10.26, SD = 3.17) was significantly correlated with improvement in depression symptoms as measured by a decrease in the QIDS score (M = 2.14, SD = 5.56; r = .27, p = .01). No other associations were found between any of the adherence measures and changes in the symptom measures in the CPT group. Correlations between the adherence measures and changes in symptom scores were also performed for the PCT group with no significant findings. Because the homework assignments were not the same for the two treatment groups, homework adherence measures were not comparable between the two treatment groups,

and thus analyses with the combined treatment groups for homework adherence could not be performed.

Table IV

Correlation of adherence measures with depressive and PTSD symptoms

		CPT Group			PCT Group			Both Groups		
		N	r_s	*p*-value	N	r_s	*p*-value	N	r_s	*p*-value
BDI (Improvement)	Percent of Homework Completed	33	.19	.51	28	.20	.31			
	Average Total Minutes Spent Doing Homework	33	-.20	.26						
QIDS (Improvement)	Percent of Homework Completed	32	.32	.08	28	.04	.84			
	Average Total Minutes Spent Doing Homework	32	.17	.36						
QIDS (Improvement, LOCF)†	Number of Sessions Attended	50	.29*	.04	34	.22	.22	84	.27*	.01
CAPS (Improvement)	Percent of Homework Completed	33	.27	.12	28	-.00	.99			
	Average Total Minutes Spent Doing Homework	33	-.38*	.03						
PCL (Improvement)	Percent of Homework Completed	31	.24	.19	28	.16	.41			
	Average Total Minutes Spent Doing Homework	31	-.15	.44						
PCL (Improvement, LOCF)†	Number of Sessions Attended	48	.31*	.03	34	-.01	.95	82	.19	.09

Note: †The Last Observation Carried Forward (LOCF) variables were used to estimate symptom improvement of all the participants at the time of their last assessment, including the participants who dropped out of treatment prior to completion.
*Indicates a significance level of ≤ .05.

Hypothesis II was further evaluated with multiple linear regression models to control for additional variables that may affect findings. These models were used to determine the effects of each independent variable separate of the effects of the other independent variables. Separate models were tested for changes in the four depression and PTSD symptom scores: BDI-II, QIDS, PCL, and CAPS symptom improvement. The independent variables (one for each model) were percent of homework assignments completed, number of sessions attended, and average total number of minutes spent on homework. Outcome expectancy was included in the regression models as an additional independent variable (see table V).

In these regression models, both number of sessions attended in the CPT group and number of sessions attended in both groups combined were significantly associated with an improvement in depression symptoms as measured by change in the QIDS score (CPT $\beta = .31$, both $\beta = .29$). Attendance to sessions in the CPT group was not associated with change in the PCL score. The total average minutes spent on homework in the CPT group was significantly associated with worsening of PTSD symptoms as measured by an increase in the CAPS score ($\beta = -.51$) in one model and by an increase in the PCL score ($\beta = -.30$) in a separate model. The percent of homework assignments completed in the CPT group was significantly associated with improvement in PTSD symptoms as measured by a decrease in the CAPS score ($\beta = .32$).

Table V

Regression model of depression and PTSD as predicted variables

		CPT Group			PCT Group			Both Groups		
Predicted		B	β	p	B	β	p	B	β	p
BDI (Improvement)	Percent of Homework Completed	.15	.21	.24	.10	.23	.22			
	Average Total Minutes Spent Doing Homework	-.08	-.33	.07						
	Expectancy	.88	.14	.42	1.93	.31	.11			
QIDS (Improvement)	Percent of Homework Completed	.14	.33	.08	.02	.09	.62			
	Average Total Minutes Spent Doing Homework	-.01	-.08	.68						
	Expectancy	.15	.04	.82	1.17	.34	.08			
QIDS (Improvement, LOCF)†	Percent of Homework Completed	.10	.24	.10	.01	.07	.71			
	Number of Sessions Attended	.47	.31*	.03	.64	.27	.17	.50	.29*	.01
	Average Total Minutes Spent Doing Homework	-.02	-.17	.25						
	Expectancy	.36	.11	.44	.37	.11	.56			

(Table Continues)

Predicted		CPT Group			PCT Group			Both Groups		
		B	β	p	B	β	p	B	β	p
CAPS (Improvement)	Percent of Homework Completed	.60	.32*	.05	.07	.08	.68			
	Average Total Minutes Spent Doing Homework	-.30	-.51*	.00						
	Expectancy	2.15	.13	.40	3.62	.28	.16			
PCL (Improvement)	Percent of Homework Completed	.25	.25	.16	.09	.15	.47			
	Average Total Minutes Spent Doing Homework	-.09	-.27	.15						
	Expectancy	2.30	.26	.14	.66	.07	.71			
PCL (Improvement, LOCF)†	Percent of Homework Completed	.25	.23	.11	.02	.04	.83			
	Number of Sessions Attended	1.01	.24	.08	.37	.06	.77	.88	.18	.11
	Average Total Minutes Spent Doing Homework	-.08	-.30*	.04						
	Expectancy	1.89	.22	.13	.03	.00	.99			

Note: †The Last Observation Carried Forward (LOCF) variables were used to estimate symptom improvement of all the participants, including the participants who dropped out of treatment prior to completion. *Indicates a significance level of ≤ .05.

***Hypothesis III*:** A higher level of symptoms of depression at baseline will be associated with significant inverse correlation in adherence to homework and attendance at sessions.

Hypothesis III was tested using Spearman's correlations. The correlations were performed between baseline depression as measured by the BDI-II and the QIDS and the adherence measures (operationalized as percent of homework assignments completed, number of sessions attended, and average total number of minutes spent on homework) within the CPT group and the adherence measures (percent of homework assignments completed and number of sessions attended) within the PCT group. The percent of homework assignments completed in the PCT group (M = 75.65, SD = 27.48) was significantly correlated with baseline depression symptom level as measured by the BDI (M = 29.34, SD = 10.84; $r = .37$, $p = .03$). Baseline depression as measured by the QIDS (M = 15.96, SD = 4.73) was significantly correlated with the total average number of minutes spent on homework (M = 74.32, SD = 53.17; $r = .26$, $p = .06$). No other associations were found between any of the adherence measures and symptoms of depression at baseline (see Table VI).

Table VI

Correlation of baseline depression and adherence measures

		CPT Group			PCT Group			Both Groups		
		N	r_s	*p*-value	N	r_s	*p*-value	N	r_s	*p*-value
BDI Baseline	Percent of Homework Completed	51	.13	.36	34	.37*	.03			
	Number of Sessions Attended	51	-.24	.09	34	.19	.30	85	-.07	.53
	Average Total Minutes Spent Doing Homework	51	.23	.11						
QIDS Baseline	Percent of Homework Completed	51	.20	.16	34	.24	.17			
	Number of Sessions Attended	51	-.18	.20	34	.02	.90	85	-.09	.44
	Average Total Minutes Spent Doing Homework	51	.27*	.05						

*Indicates a significance level of ≤ .05.

Hypothesis IV: Positive outcome expectancy of treatment will be associated with greater adherence to treatment as measured by session attendance and completed homework.

To begin to test hypothesis IV, Spearman's correlations were performed between outcome expectancy and adherence measures (percent of homework assignments completed, number of sessions attended, and average total number of minutes spent on homework) within the CPT group. Correlations between outcome expectancy and adherence measures were also performed for the PCT group, and no significant correlations were found (see Table VII).

Table VII

Correlation of outcome expectancy and adherence measures

	CPT Group			PCT Group			Both Groups		
Expectancy	N	r_s	*p*-value	N	r_s	*p*-value	N	r_s	*p*-value
Percent of Homework Completed	49	.22	.12	34	-.09	.61			
Number of Sessions Attended	49	.04	.78	34	.18	.31	83	.08	.49
Average Total Minutes Spent Doing Homework	49	-.10	.48						

Hypothesis IV was further evaluated with multiple linear regression models. Separate models were tested for the adherence measures of the CPT group: percent of homework assignments completed, number of sessions attended, and average total number of minutes spent on homework. Separate models were also tested for the adherence measures of the PCT group: percent of homework assignments completed and number of sessions attended. The independent variables represented baseline depression symptom level as measured by the BDI-II and the QIDS. Outcome expectancy was added to the regression models as an additional independent variable.

A significant relationship was found between outcome expectancy and the number of sessions attended in the PCT group (see table VIII). No other significant relationships were observed in the PCT group. The relationship between baseline depression symptom level as measured by the QIDS and the total average number of minutes spent on homework fell short of significance in the CPT group, $p = .07$. However, no significant associations were found between baseline symptom levels and adherence measures in the CPT group or in the treatment groups combined.

Table VIII

Regression model of adherence measures as predicted variables

Predicted		CPT Group			PCT Group			Both Groups		
		B	β	p	B	β	p	B	β	p
Percent of Homework Completed	Regression 1									
	BDI Baseline Total	.12	.09	.54	.71	.28	.11			
	Expectancy	1.29	.16	.28	-1.07	-.07	.69			
	Regression 2									
	QIDS Baseline Total	.33	.12	.42	1.02	.20	.25			
	Expectancy	1.20	.15	.30	-1.72	-.11	.52			
Number of Sessions Attended	Regression 1									
	BDI Baseline Total	-.08	-.22	.13	.04	.19	.25	-.01	-.05	.69
	Expectancy	.07	.03	.82	.57	.42*	.02	.26	.14	.22
	Regression 2									
	QIDS Baseline Total	-.11	-.15	.32	.01	.03	.88	-.05	-.08	.49
	Expectancy	.14	.06	.67	.53	.39*	.03	.27	.14	.20

Log 10 Average Total Minutes Spent Doing Homework	Regression 1			
	BDI Baseline Total	.00	.15	.30
	Expectancy	-.03	-.18	.23
	Regression 2			
	QIDS Baseline Total	.02	.26	.07
	Expectancy	-.03	-.20	.17

Note: *Indicates a significance level of ≤ .05.

Hypothesis V: A higher level of symptoms of depression at baseline will be inversely correlated with treatment outcome expectancy.

To test Hypothesis V, Spearman's correlations were calculated between baseline depression as measured by the BDI-II and the QIDS and outcome expectancy, both within groups and between groups. These analyses resulted in no significant findings in support of Hypothesis V (see Table IX).

Table IX

Correlation of outcome expectancy and baseline depression

	CPT Group			PCT Group			Both Groups		
Expectancy	N	r_s	*p*-value	N	r_s	*p*-value	N	r_s	*p*-value
BDI Baseline	49	-.14	.34	35	-.19	.27	84	-.18	.10
QIDS Baseline	49	-.02	.89	35	.01	.94	84	.00	.97

CHAPTER FIVE

Discussion

As predicted, greater expectancy of treatment outcome was associated with greater attendance to sessions. However, this finding was only evident in the PCT group. This could be because the nature of the individual interventions may be overriding the positive expectancy as CPT focuses on trauma during most sessions while PCT does not. Greater expectancy did not predict adherence to homework and the amount of time spent doing homework. It is possible that the assumptions about therapy and attitudes of the participants affected their motivation throughout treatment. The participants may have held assumptions that the therapist would "fix" them. Thus, they may have been overwhelmed or discouraged by the work they were assigned to do outside of therapy.

In the CPT group as well as both groups together, greater attendance to sessions was associated with an improvement in symptoms of depression as measured by the QIDS at the end of the intervention. However, because of the study limitations, it is unclear whether the participants' symptoms improved because they attended therapy or because they got better over time. Although not statistically significant, PTSD symptoms as measured by the PCL seemed to be somewhat affected by greater attendance to sessions in the CPT group. The results may have been significant if the sample size of this study were greater. Attendance did not significantly affect QIDS symptoms in the PCT group or across the other measures (BDI-II, CAPS, PCL).

As predicted for the CPT group, greater adherence to homework assignments was associated with an improvement in PTSD symptoms as measured by the CAPS, but not

the PCL, BDI-II, or the QIDS. Although not statistically significant, depression symptoms as measured by the QIDS did seem to be somewhat affected by adherence to homework assignments in the CPT group. Greater time spent doing the homework was associated with a worsening of PTSD symptoms as measured by both the CAPS and the PCL. Similarly, a trend was observed with depression symptoms as measured by the BDI, although not statistically significant. It was also predicted that greater depressive symptoms at baseline would be associated with decreased adherence to homework and attendance to sessions. Contrary to that prediction, greater depression at baseline was associated with greater time spent completing homework. Because greater depressive symptoms were associated with greater time spent on homework, and greater time spent on homework was associated with a worsening in PTSD symptoms, it is possible that greater time spent in completing homework may be an indication of inefficiency. It is possible that patients who are more symptomatic take longer to complete homework and possibly do not benefit from the homework assignments as is expected. Furthermore, if they are not understanding or benefiting from the assignments, any feelings of self-worth or inadequacy that they may have could worsen and therefore lead to a worsening of their symptoms. It is also possible that patients who take longer to complete homework have symptoms of avoidance linked to PTSD symptoms.

Contrary to the predictions, treatment outcome expectancy did not predict PTSD and depression symptoms at treatment completion. Again, it is possible that the participants' attitudes and motivations toward the therapy were affected by the nature of the therapy. In addition, baseline depression did not predict treatment outcome expectancy. Furthermore, baseline depression did not predict adherence to homework

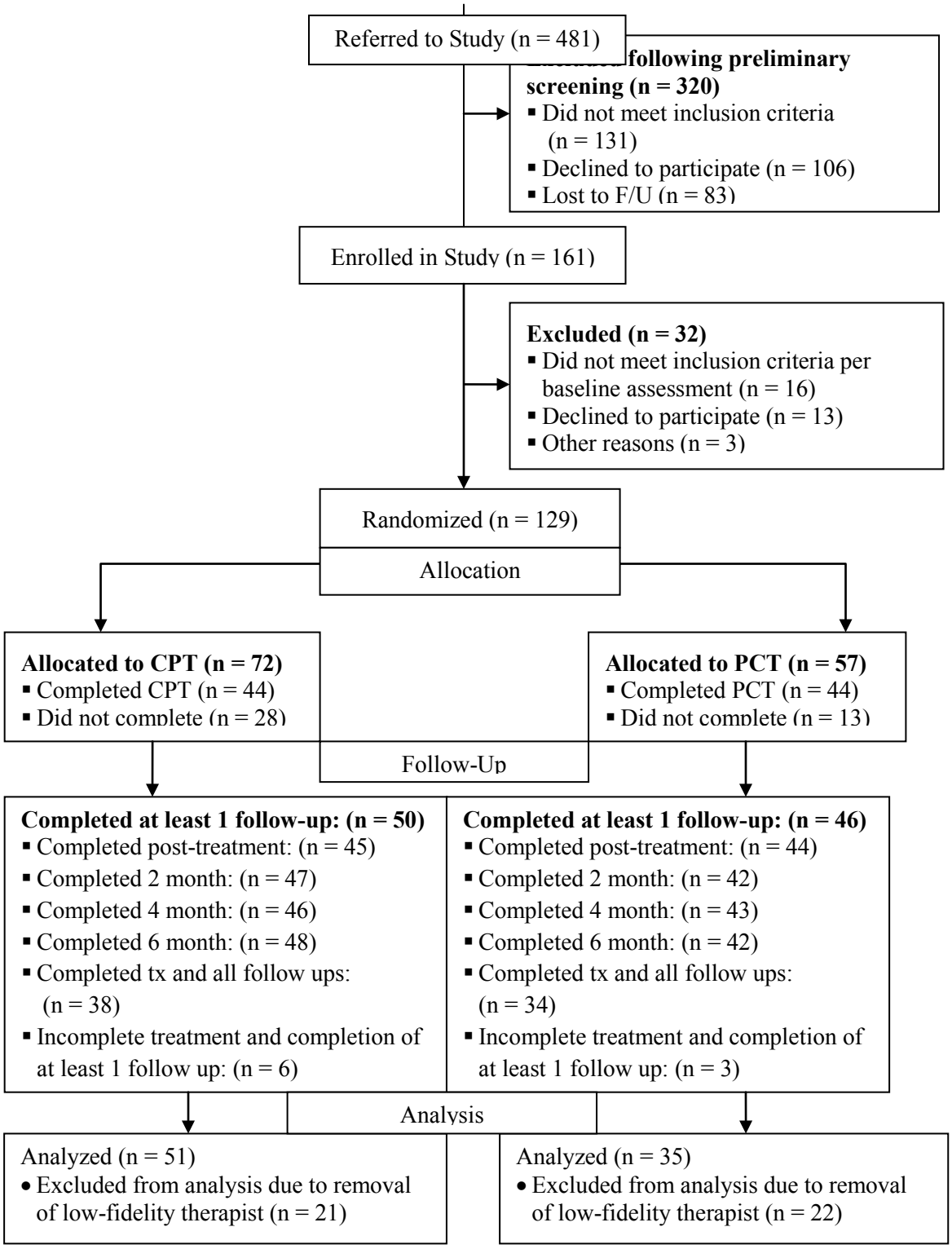
and attendance to sessions. This suggests that the level of depression of an individual does not necessarily affect an individual's attitude or expectations of what they may gain from therapy. Also, the level of depression prior to therapy does not predict the amount of effort one might put forth in homework that is assigned or whether or not they will attend therapy.

One of the strengths of this study was that it was a controlled, randomized study. Also, to our knowledge, this is the first study examining the impact of depression, expectations of treatment, and adherence on the outcomes of evidence based treatments in veterans with MST. The study had several limitations. For example, it was not possible to determine whether attendance in therapy was effective in improving symptoms of PTSD and depression. Specifically, if a participant missed a session, they were allowed to make it up the next week resulting in all study completers finishing all twelve study sessions. Therefore, it is unclear if they got better because they completed all twelve sessions or they simply got better over time. In addition, the measures of adherence were not normally distributed and therefore, it was difficult to determine if baseline depression and treatment outcome expectancy were not predictive of adherence to homework and attendance to sessions. Yet another limitation was the use of a single question ("How confident are you that this treatment will be successful in reducing your assault-related symptoms?") in determining the expectancy of therapeutic outcome. It may have been helpful to assess the participants' perception of the time that it would take to benefit from therapy and their willingness to work outside of therapy. Finally, because data from several participants were excluded from the analyses due to low fidelity ratings of one therapist, the sample size and the power of the study were reduced.

The findings from this study suggest that greater expectations of treatment may lead to greater attendance to therapy sessions. This suggests that greater motivation may be predictive for greater benefit from therapy. In addition, completing homework throughout therapy was shown to predict improvement in symptoms of PTSD. Although homework was shown to be effective, the amount of time spent on homework was not. These findings suggest that it is important to monitor whether or not patients are completing their homework outside of therapy. It also suggests that it may be helpful for therapists to explore the duration of time that patients spend doing homework to assess whether or not the patient is benefiting from the assignment.

A greater expectation of benefit from treatment may be an indication of motivation that may be useful throughout the therapeutic process. It is possible that expectations of treatment, attendance to therapy sessions, and completing homework in between sessions, are the key to benefiting from therapy. However, it is important that other research be done in order to strengthen such findings.

Figure 1. Flow chart of all study volunteers



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EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
The University of Texas at Dallas	B.A.	2007	Psychology
The University of Texas Southwestern Graduate School of Biomedical Sciences	M.S.	2012	Rehabilitation Counseling Psychology

Positions and Employment

2012 Testing specialist at the University of Texas Health Science Center.

Clinical Experience

2011 Administered tests including the WISC-IV, WCST, WIAT-IV, TOVA, BASC-2 and CAARS. Documented clinical observations, scored tests, and wrote reports.

2010-2011 Provided counseling under the supervision of a clinical psychologist and LPC-S.

2010-2011 Administered numerous tests, documented clinical observations, scored tests, and wrote reports.

Presentations and Publications

2011 Tajalizadekhoob, Y., Sharifi, F., Fakhrzadeh, H., Mirarefin, M., Ghaderpanahi, M., Badamchizade, Z., & Azimipour, S. (2011). The effect of low-dose omega 3 fatty acids on the treatment of mild to moderate depression in the elderly: a double-blind, randomized, placebo-controlled study. *European archives of psychiatry and clinical neuroscience,* 261(8), 539-549.