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Treatment Attendance among Veterans with Depression, Substance Use Disorder, and Trauma

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Abstract

Objective—Low attendance in psychotherapy, particularly among individuals with comorbid disorders, is a pervasive challenge. The present study examined predictors of treatment attendance in a sample of veterans with depression, substance use disorder, and trauma.

Methods—This is an analysis of data collected as part of a larger clinical trial involving outpatients at a Veterans Administration dual diagnosis clinic. Individuals were excluded if they had significant memory deficits, schizophrenia, bipolar disorder, or substantial travel constraints. Participants ($N = 146$) received 12 weeks of group-delivered Integrated Cognitive Behavioral Therapy for depression and substance use, followed by randomization to 12 additional weeks of individually-delivered Cognitive Behavioral Therapy ($n = 62$) or Cognitive Processing Therapy ($n = 61$) modified to address substance use and trauma. Participants, therapists, and researchers were not blinded to group assignment. For this study, we included only the 123 participants who were randomized into the second phase, analyzing predictors of treatment attendance categorized into predisposing factors, enabling factors, and need factors.

Results—Participants were primarily male (89%), Caucasian (76%), and averaged 47 years old ($SD = 12$). Forty-four percent had alcohol use disorder, 16% had drug use disorder, and 40% had polysubstance use disorder. Most met criteria for PTSD (82%), with 44% having combat-related trauma, 33% sexual trauma, and 28% other trauma. Treatment attendance did not differ between groups. More education was associated with increased group ($r = .19, p = .04$) and individual session attendance ($r = .28, p = .002$). Individuals with chronic housing problems attended fewer group sessions ($r = -.19, p = .04$), while individuals with sexual trauma, compared to those with

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other traumas, attended more individual sessions ($r = .23$, $p = .01$). Number of group sessions attended was positively associated with individual session attendance.

Conclusions—Few variables were significantly predictive of treatment attendance, possibly due to the complex nature of comorbid disorders. Including a focus on trauma was not associated with lower attendance. Special consideration may need to be given to education level, homelessness, and trauma when trying to engage and retain patients with comorbid disorders in treatment. This clinical trial is registered at www.ClinicalTrials.gov as NCT00958217.

Keywords

depression; substance use; trauma; PTSD; attendance; veterans

High attrition rates pose significant challenges to implementation of treatments for depression, substance use disorders, and posttraumatic stress disorder (PTSD). Attrition rates are high in substance use treatments (Dutra et al., 2008), with greater attrition associated with comorbid depression (Curran, Kirchner, Worley, Rookey, & Booth, 2002; Schaub et al., 2011) and PTSD (Roberts, Roberts, Jones, & Bisson, 2015; Spinazzola, Blaustein, & van der Kolk, 2005). Importantly, treatment attendance is a predictor of positive post-treatment outcomes (Dale et al., 2011; Hansen, Lambert, & Forman, 2002; Reardon, Cukrowicz, Reeves, & Joiner, 2002). Our prior research investigating psychotherapy attendance among individuals with co-occurring depression and substance use disorders found that individuals on average attended 50% of sessions, and greater attendance was associated with improvements in both depression and substance use (Lydecker et al., 2010; Tate et al., 2011).

In addition to attrition, co-occurring PTSD also impacts the successful treatment of depression and substance use disorders. PTSD is common in depression treatment settings (36%: Campbell et al., 2007), substance use treatment settings (37%: Bonin, Norton, Asmundson, Dicurzio, & Pidlubney, 2000), and among adult samples with co-occurring depression and substance use disorder (38%: Norman, Tate, Wilkins, Cummins, & Brown, 2010). PTSD has been associated with worse treatment outcomes among individuals with depression, substance use disorder, and co-occurring depression and substance use disorder (Driessen et al., 2008; Green et al., 2006; Norman et al., 2010).

A common concern among many clinicians and researchers is that addressing PTSD before or during substance use treatment may result in increased dropout (Souza & Spates, 2008), and higher attrition rates have been found among individuals with co-occurring PTSD and substance use in substance use interventions with a trauma focus (Roberts et al., 2015; Spinazzola et al., 2005). We found no studies that examined predictors of treatment attendance in individuals with co-occurring depression, substance use disorder, and trauma or examined whether explicitly addressing trauma among these individuals affected treatment retention.

Andersen's Behavioral Model of Health Care Utilization is a frequently-used framework for organizing and examining variables that may be associated with healthcare utilization. The model has characterized factors associated with treatment utilization into three categories:

predisposing characteristics, enabling resources, and need factors (Andersen, 1995). Predisposing characteristics include age, gender, ethnicity, years of education, and cognitive functioning. Enabling factors cover community resources and personal resources such as income, health insurance, distance traveled for treatment, housing, and social network. Need factors are conceptualized as both the individual's perception of illness severity and a professional evaluation of illness severity.

Most research has examined predisposing characteristics. Older participant age has been generally associated with increased retention in adult psychotherapy (Swift & Greenberg, 2012), while females, minorities, and individuals with less education have shown lower retention in substance use treatment (Aharonovich et al., 2006; McCaul, Svikis, & Moore, 2001; Sayre et al., 2002). Our prior research with a sample of adults with depression and substance use disorder indicated that younger adults and non-Caucasians attended fewer psychotherapy sessions (Tate et al., 2011).

Other studies demonstrated that several enabling resources were associated with treatment retention. Employment and higher socioeconomic status have been related to increased retention in mental health treatment (Barrett, Chua, Crits-Christoph, Gibbons, & Thompson, 2008; Mateyoke-Scrivner, Webster, Staton, & Leukefeld, 2004). Individuals prescribed antidepressants were more likely to complete depression treatment (Bech et al., 2003). Homeless individuals in substance use treatment attended more sessions if they were provided with housing (Milby, Schumacher, Wallace, Freedman, & Vuchinich, 2005).

Research findings regarding the impact of need factors upon patient attrition are mixed. A study conducted by Sayre et al. in 2002 found that individuals with lower psychiatric functioning remained in substance use treatment longer whereas a study conducted by Bech et al. in 2003 found that individuals with higher levels of depression were more likely to drop out of depression treatment. Experiencing a physical health problem proximal to treatment entry has been associated with increased treatment attendance among individuals with co-occurring depression and substance use disorder (Tate et al., 2011).

The present study was a preliminary exploration of predictors of treatment attendance in a sample of adult veterans with co-occurring depression, substance use disorder, and history of trauma. All participants received group-delivered Integrated Cognitive Behavioral Therapy for depression and substance use in Phase I (initial 12 weeks) of treatment. In Phase II (subsequent 12 weeks) of treatment, participants were randomized to receive either individually-delivered Integrated Cognitive Behavioral Therapy or Cognitive Processing Therapy - Modified to address substance use and PTSD.

Methods

Participants and Procedure

Participants were 123 outpatient veterans from the Veterans Administration San Diego Healthcare System (VASDHS) dual diagnosis clinic. All procedures were in accordance with the Declaration of Helsinki and were approved and monitored by the VASDHS and University of California, San Diego Institutional Review Boards.

Veterans presenting for treatment through the outpatient dual diagnosis clinic were told about our study and screened for eligibility. Interested participants who met study criteria provided written informed consent to participate in the study interventions and research assessments, randomization to treatment condition, and random toxicology screens. Inclusion criteria were: (a) current DSM-IV diagnostic criteria for alcohol, cannabis, and/or stimulant dependence, (b) current DSM-IV diagnostic criteria for major depressive disorder (substance independent), and (c) at least one traumatic event meeting DSM-IV diagnostic criterion A for PTSD (with or without a PTSD diagnosis). Veterans were excluded if they had (a) significant memory deficits, (b) schizophrenia or bipolar disorder, or (c) travel constraints that would prevent them from attending treatment.

A total of 154 participants were recruited of which eight participants did not start Phase I treatment, were not randomized, and were excluded from analyses (four participants did not meet study criteria following assessment and four participants did not respond to contact attempts and were lost) and 23 participants did not start Phase II treatment, were not randomized, and were excluded from analyses (three died during Phase I, six moved, six refused further participation, three were not psychiatrically stable, one was not medically stable, and four had recovery home requirements that precluded participation). Our final sample consisted of 123 participants who received randomization at the end of Phase I and were included in our analyses. Sixty-two participants were randomized to Integrated Cognitive Behavioral Therapy condition and 61 were randomized to Cognitive Processing Therapy - Modified condition. Figure 1 shows the flow of participants through each stage of the study. See Haller et al. (in press) for additional information.

Phase I: Group Treatment

Integrated Cognitive Behavioral Therapy group treatment consisted of 24 one-hour sessions delivered twice weekly that incorporated components of two empirically-validated manuals: Cognitive-Behavioral Depression Treatment manual (Muñoz & Miranda, 1996) and Cognitive-Behavioral Coping Skills Training manual for alcohol use disorders (Kadden et al., 1994). Treatment consisted of three modules aimed at reducing depression symptoms and substance use. Consistent with a cognitive behavioral therapy framework, the treatment focused on identifying and managing negative cognitions associated with depression and substance use, increasing pleasurable substance-free activities to increase positive mood and decrease risk of using substances, and improving interpersonal skills and relationships. This intervention has been shown to improve depression symptoms and substance use (Lydecker et al., 2010).

Phase II: Individual Treatment

Participants were subsequently randomized to receive either continued Integrated Cognitive Behavioral Therapy or Cognitive Processing Therapy - Modified, both delivered in individual, weekly one-hour sessions. In our previous study with co-occurring depression and substance use disorders, the second phase was also group-delivered (Lydecker et al., 2010). For the current study in which all participants had trauma histories, we provided Phase II of treatment in individual sessions to allow participants greater comfort in discussing a variety of trauma experiences and to allow for more flexibility in scheduling.

Phase II treatment began immediately upon completion of Phase I and lasted for 12 to 16 weeks (i.e., a total of 16 weeks were allowed to attend the 12 sessions of Cognitive Behavioral Therapy or Cognitive Processing Therapy).

Integrated Cognitive Behavioral Therapy—Participants randomized to a continuation of Integrated Cognitive Behavioral Therapy reviewed topics covered in the initial group sessions during the individual sessions.

Cognitive Processing Therapy – Modified—Cognitive Processing Therapy is based on the social cognitive theory of trauma and PTSD and focuses on trauma-related thoughts that are impacting the patients' emotional and behavioral status (Monson et al., 2006). Specifically, therapists work with patients to identify and challenge maladaptive thought patterns that are a result of the trauma and typically relate to common trauma response domains (e.g., safety, trust, power/control, esteem, and intimacy). Cognitive Processing Therapy has been shown to be effective for patients with a variety of different types of trauma including combat trauma and sexual trauma (e.g., Monson et al., 2006; Resick & Schnicke, 1992). Traditional Cognitive Processing Therapy was modified to incorporate substance-related cognitions and coping skills as well as relapse prevention. The relapse prevention component consisted of conducting brief check-ins regarding recent urges to use substances or recent substance use.

Phase I and Phase II Treatment Provision

Study therapy was delivered by 13 interventionists including the Principal Investigator, clinical psychology fellows, interns, and advanced (4th year) graduate students. All study therapists had previous experience with cognitive behavioral therapies, received training in Integrated Cognitive Behavioral Therapy and Cognitive Processing Therapy - Modified, and participated in individual and group supervision with licensed staff clinicians. Each session was recorded for supervision and 10% were randomly selected for fidelity review (more details are provided in Haller et al., *in press*).

Measures

Diagnostic measures and cognitive functioning were assessed at intake only. All other measures were assessed at intake, end of Phase I (midtreatment), and end of Phase II (end of treatment).

Depression and substance use disorder diagnoses—The Composite International Diagnostic Interview (CIDI; Robins et al., 1988) was conducted at intake to assess for depression and substance use disorders. The CIDI employs a structured format for assessing psychiatric symptoms that occur independent of substance use and medical conditions. A test-retest reliability coefficient of .71 for depressive disorders, .78 for alcohol use disorders, and .73 for other substance use disorders has been found using the CIDI (Wittchen, 1994).

PTSD diagnosis—The Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) is a semi-structured clinical interview conducted at intake to assess for PTSD diagnosis which was coded 1 for presence of diagnosis or 0 if diagnostic criteria were not met. The CAPS

assesses for type of trauma experienced and frequency and severity of PTSD symptoms. Interrater reliability coefficients close to .90 have been found for the CAPS (Weathers, Keane, & Davidson, 2001).

Cognitive functioning—A brief assessment of cognitive functioning included the National Adult Reading Test (Grober & Sliwinski, 1991), Wisconsin Card Sorting Test (Heaton, Chelune, Talley, Kay, & Curtis, 1993), WAIS-III Digit Symbol (Wechsler, 1997a), and Hopkins Verbal Learning Test (Brandt, 1991). The National Adult Reading Test has demonstrated a .98 correlation between errors during test re-test, indicating very high test-retest reliability (Crawford et al., 1989). The alternative forms reliability coefficient for the Wisconsin Card Sorting Test has ranged from .25 to .63 (Bowden et al., 1998). Across multiple age groups, the WAIS-III Digit Symbol subtest has demonstrated an average reliability coefficient of .84 (Psychological Corporation, 1997). The test-retest reliability coefficient for the Hopkins Verbal Learning Test has ranged from .55 to .78 (Benedict, Schretlen, Groninger, & Brandt, 1998). Each raw test score was transformed into a T-score ($M = 50$, and $SD = 10$) based on the degree of deviation from the normative age-referenced mean score. A global T-score was computed as the average of all available demographically corrected T-scores and was used as the measure of cognitive functioning.

Medications—The AIDS Clinical Trials Group Interview of Antiretroviral Medication Use (Chesney et al., 2000) is a self-report survey modified to assess for psychotropic medication usage. We coded for the presence (1) or absence (0) of depression, substance use, and sleep medication prescriptions.

Treatment motivation—Motivation for treatment was assessed by a single self-report question (moderately motivated or less, considerably motivated, or extremely motivated).

Guilt—The Attitudes about Guilt Survey (Kubany & Manke, 1995) is a self-report survey that assessed for the presence, intensity, and severity of trauma-related guilt. The presence of trauma-related guilt was assessed with one question and coded (1) for presence and (0) for absence of trauma related guilt.

Depression symptoms—Depression symptoms were evaluated with the Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960), a structured clinical interview assessing depression symptoms over the past week. The assessment comprised 21 items, each rated on a 0 (none) to 4 (most severe) scale. The inter-rater reliability coefficient for the HAM-D is .96 and the internal consistency reliability coefficient is .82 (Potts, Daniels, Burnam, & Wells, 1990).

Substance use—Participants' self-reported alcohol and drug use in the three months before treatment and during treatment was assessed using the Time Line Followback (Sobell & Sobell, 1992). The assessment evaluated daily frequency and quantity of alcohol use and frequency of drug use over a 90-day period. The test-retest reliability coefficient for the Time Line Followback has ranged from .73 to 1.00 (Carey, Carey, Maisto, & Henson, 2004). The percent days using for all substances was calculated from the assessment and used as a measure of substance use severity.

PTSD symptoms—The Posttraumatic Stress Disorder Checklist - Civilian version (Weathers, Litz, Herman, Huska, & Keane, 1994) is a self-report scale consisting of 17 items designed to assess participant's PTSD symptoms and did not restrict traumatic experiences to a military domain. Items were rated on a 1 (not at all) to 5 (extremely) scale. An internal consistency coefficient of .94 was obtained for the scale (Ruggiero, Del Ben, Scotti, & Rabalais, 2003).

Life stress assessment—Life stress was assessed with a multi-step process. Stressful experiences were assessed using the Psychiatric Epidemiology Research Interview (Hirschfield et al., 1977). Participants identified stressors experienced in the 90 days prior to treatment entry and during treatment from a self-report list of 133 stressors. Research staff recorded details of each endorsed stressor including duration and impact on life functioning. Stressors were then rated by two trained raters using standardized criteria from the Bedford College Life Events and Difficulties Schedule (Brown & Harris, 1978). Rates of interrater agreement for the Life Events Difficulties Schedule have ranged from 79% to 91% (Brown, & Harris, 1989). Stressors were categorized as either events (stressors with discrete date of onset and lasting for two weeks or less) or chronic difficulties (ongoing stressors lasting for more than two weeks). Housing, interpersonal, and physical health stressors were assessed and dichotomized to reflect presence (1) or absence (0) of acute events (e.g., evictions, break-ups, surgery) and chronic difficulties (e.g., chronic homelessness, chronic marital problems, diabetes). In addition, suicide-related hospitalizations were assessed and dichotomized to reflect presence (1) or absence (0) of hospitalizations.

Data Analytic Plan

A series of bivariate regression analyses tested whether predisposing, enabling, and need variables predicted group (Phase I) or individual (Phase II) session attendance. Predictors were first examined in separate analyses, followed by a combined regression model incorporating all significant predictors. This analytic approach allowed us to examine whether each predictor was individually associated with Phase I and II attendance, as well as whether significant predictors were uniquely associated with attendance when considered simultaneously. Further, this approach allowed us to examine the total variance accounted for by significant predictors. To predict Phase I attendance, we used baseline assessment variables. To predict Phase II attendance, we used mid-treatment (end of Phase I) assessments, treatment condition, and Phase I attendance.

Predisposing variables consisted of age, gender, ethnicity, years of education, type of current substance use disorder, type of trauma experienced, and cognitive functioning. Enabling variables consisted of monthly income, employment status, marital status, medication prescription, distance traveled to treatment, housing stressors (acute and chronic), and interpersonal stressors (acute and chronic). Need variables consisted of PTSD diagnosis, suicide-related hospitalizations, treatment motivation, depression symptom severity, substance use severity, PTSD symptom severity, physical health stressors (acute and chronic), and trauma-related guilt.

Results

As shown in Table 1, the final sample ($N = 123$) was primarily male (89%) and Caucasian (76%), with a mean age of 47 years ($SD = 12$) and approximately 13 years ($SD = 3$) of education. Forty-four percent had an alcohol use disorder, 16% had a drug use disorder, and 40% had polysubstance use involving alcohol and another drug. Participants used substances an average of 57% of days ($SD = .27$) and 76% experienced chronic physical health difficulties. Most met criteria for PTSD (82%); 44% reported having combat-related trauma, 33% sexual trauma, and 28% other trauma.

Participants attended an average of 14.5 group sessions ($SD = 6.6$) out of 24 sessions (60.4%) and 6.6 individual sessions ($SD = 4.4$) out of 12 sessions (55.0%). Participants' rates of attendance were similar to that of our prior clinical trial treating depression and substance use where individuals attended an average of 15.4 sessions ($SD = 6.6$) during the first 12 weeks of twice weekly group therapy and 5.5 sessions ($SD = 2.7$) during the subsequent 12 weeks of once weekly group therapy (Drapkin, Tate, McQuaid, & Brown, 2008). Table 2 lists the bivariate associations between each predictor (i.e., all predisposing, enabling, and need variables) and Phase I and II attendance. The table presents correlation statistics in order to facilitate interpretation (note that the correlation coefficient is the same as the standardized beta coefficient in a bivariate regression analysis).

Phase I: Group Attendance

Predisposing factors—Years of education ($M = 13.0$, $SD = 3.0$) was positively associated with number of group sessions attended ($r = .19$, $p = .04$), accounting for 4% of the variance. No other predisposing variables were significant predictors of Phase I attendance.

Enabling factors—Participants who experienced chronic housing difficulties in the three months prior to treatment entry attended fewer group sessions ($M = 11.5$, $SD = 7.9$) than participants without chronic housing difficulties ($M = 15.1$, $SD = 6.2$) accounting for 4% of the variance ($r = -.19$, $p = .04$). No other enabling variables were significant predictors of Phase I attendance.

Need factors—No need variables were significant predictors of Phase I attendance.

Combined model—A multiple regression model entering significant predictors (education and housing difficulties) indicated that these predictors together accounted for 8.2% of the variance in group attendance ($R^2 = .08$, $p < .01$), and that both education ($B = 0.48$, $SE = 0.19$, 95% CI[0.10, 0.86], $p = .01$) and housing difficulties ($B = -4.05$, $SE = 1.67$, 95% CI[-3.86, 13.90], $p = .02$) uniquely predicted group attendance.

Phase II: Individual Attendance

Treatment condition—The mean number of individual sessions attended was 6.7 ($SD = 4.5$) for Cognitive Behavioral Therapy condition and 6.5 ($SD = 4.3$) for Cognitive Processing Therapy condition. Treatment condition was not associated with number of individual sessions attended ($r = -.01$, $p = .90$). Number of group sessions attended was

positively associated with number of individual sessions attended ($r = .35, p < .01$), accounting for 13% of the variance in Phase II attendance. A multiple regression entering the effects of treatment condition, group session attendance, and interaction of treatment condition by group session attendance indicated a non-significant interaction ($B = 0.10, SE = 0.12, 95\% \text{ CI}[-0.13, 0.33], p = .38$), such that the association between group session attendance and later individual session attendance did not vary across treatment condition.

Predisposing factors—Years of education was also positively correlated with number of individual sessions attended ($r = .28, p = .002$), accounting for 8% of the variance. There was not a significant difference in years of education by treatment type ($r = .05, p = .59$) and no significant treatment by education interaction predicting Phase II attendance ($B = .22, SE = 0.28, 95\% \text{ CI}[-0.34, 0.77], p = .44$).

Participants who experienced a sexual trauma (32.5%) attended more individual sessions ($M = 8.1, SD = 4.3$) than participants without sexual trauma ($M = 6.0, SD = 4.3; r = .23, p = .01$). There was no significant difference in sexual trauma by treatment type ($\chi^2 = .72, p = .44$) and no significant treatment by sexual trauma interaction predicting Phase II attendance ($B = -2.40, SE = 1.68, 95\% \text{ CI}[-5.73, 0.93], p = .16$). No other predisposing variables were significant predictors of Phase II attendance.

Enabling factors and need factors—No enabling variables or need variables were significant predictors of Phase II session attendance.

Combined model—A multiple regression model entering significant predictors of individual attendance (group attendance, education, and sexual trauma) indicated that these predictors together accounted for 20% of the variance in individual attendance ($R^2 = .20, p < .01$). Group session attendance ($B = 0.20, SE = 0.06, 95\% \text{ CI}[0.09, 0.31], p < .01$) and years of education ($B = 0.29, SE = 0.12, 95\% \text{ CI}[0.05, 0.54], p = .02$) both had significant unique effects on individual attendance. The unique effect of sexual trauma on individual attendance approached significance ($B = 1.42, SE = 0.79, 95\% \text{ CI}[-0.15, 2.98], p = .08$).

Predictors by Low, Moderate, and High Group and Individual Session Attendance

Individuals who attended very few sessions may differ from individuals who attended the majority of sessions on one or more predisposing, enabling, or need factors. Consequently, follow up Analysis of Variance (ANOVA) analyses were conducted with group session attendance separated into three categories: low attendance (attended 0 - 8 sessions), moderate attendance (attended 9 - 16 sessions), and high attendance (attended 17 - 24 sessions). One-way ANOVA analyses compared these three groups on predictor variables. No predisposing, enabling, or need factors differentiated between low, moderate, and high group session attendance.

Follow-up ANOVA analyses were also conducted with individual session attendance separated into three categories: low attendance (attended 0 - 4 sessions), moderate attendance (attended 5 - 8 sessions), and high attendance (attended 9 - 12 sessions). Years of education differed by attendance category; $F(2, 119) = 5.52, p < .01$. Individuals in the moderate or high attendance category had more years of education as compared to

individuals in the low attendance category. No other predisposing, enabling, or need factors differentiated between low, moderate, and high individual session attendance.

Discussion

This study was a preliminary examination of predictors of treatment attendance among adults with co-occurring depression, substance use disorder, and trauma and whether addressing trauma in therapy is associated with treatment retention. Individuals received group-delivered sessions in the first phase of treatment followed by individually-delivered sessions in the second phase, the purpose of which was to provide greater privacy to discuss potentially sensitive trauma-related subjects as well as more flexibility in scheduling sessions. Individuals on average attended only 60% of group sessions during the first phase and 55% of individual sessions during the second phase of treatment. Session attendance was similar to our prior treatment study with adults with co-occurring depression and substance use disorders who received group-delivered sessions in both phases of treatment (Drapkin et al., 2008). In general, the low rates of attendance found in our study were consistent with previous research that has found attrition to be a significant barrier to mental health treatment (Dutra et al., 2008; Curran et al., 2002; Schaub et al., 2011; Roberts et al., 2015; Spinazzola et al., 2005).

Similar to our prior treatment study, we found predisposing factors to be the most predictive of treatment attendance. Specifically, individuals with more education attended more group and individual treatment sessions. The cognitively focused nature of structured manualized therapies with between session assignments may be more appealing to individuals with more education. For individuals with less education, other types of therapies such as a behaviorally focused therapy may be more desirable. Attendance in group treatment did not differ between individuals with and without a sexual trauma, however this was not the case in individual treatment. Individuals with a sexual trauma attended on average 68% of individual sessions while individuals with other types of trauma attended 50% of sessions. Individual therapy sessions may be more desirable to individuals with a sexual trauma as compared to individuals with other types of trauma. Individualized therapies that take into account an individual's preferences and predisposing characteristics may serve to improve treatment attendance.

A number of psychotherapy studies including our prior treatment study have found that predisposing factors of younger age, minority status, and polysubstance use were associated with lower treatment retention (Barrett et al., 2008; Schaub et al., 2011; Tate et al., 2011) and several addictions studies had similar findings with regard to predisposing factors of being female, having less years of education, and having cognitive impairments (Aharonovich et al., 2006; Brady, Dansky, Back, Foa, & Carroll, 2001; Sayre et al., 2002). Our study did not find any other predisposing factors including age, ethnicity, and type of substance use disorder to be associated with treatment attendance.

With respect to enabling factors, individuals with no chronic housing problems (e.g., homelessness) attended on average 63% of sessions in the initial group-delivered phase of therapy as compared to individuals with chronic housing problems, who only attended only

48% of these sessions. Linking individuals to housing programs and community resources at the start of treatment may mitigate the negative impact of unstable and/or poor living situations such as homelessness on an individual's ability to attend treatment. Homelessness should not serve as a barrier to receiving treatment for addiction or mental health disorders since such treatment can facilitate success in programs to transition individuals out of homelessness. Ideally, individuals will receive treatment and work with case managers to assist with housing concurrently (Hopper et al., 2010). Several treatment studies have found that being employed, married, and prescribed psychotropic medications were associated with higher treatment retention (Bech et al., 2003; McCaul et al., 2001; Sayre et al., 2002). No other enabling factors including employment status, marital status, and medication prescription were found to be associated with treatment attendance in our study.

Previous therapy studies have found that experiencing more severe depression was negatively associated with depression treatment retention (Bech et al., 2003) and experiencing depression and polysubstance abuse was negatively associated with substance use treatment retention (Schaub et al., 2011). Our previous treatment study found that physical health problems were associated with increased retention (Tate et al., 2011) and Bech et al. in their 2003 substance use study found that having a comorbid medical condition was associated with increased retention. A number of need factors were assessed in our study including mental and physical health problems and none were found to be significantly associated with treatment attendance.

Clinicians have expressed concern that addressing PTSD prior to or simultaneously with substance use may increase the risk of treatment termination (Souza & Spates, 2008). Our results indicated that addressing trauma in therapy after providing skills for managing depression and substance use did not increase or decrease attrition relative to continued psychotherapy focused on depression and substance relapse prevention. Our finding that trauma-focused treatment was not associated with lower attendance than non-trauma focused treatment during the second phase of treatment raises the question of whether the treatment provided during the first phase helped individuals better engage in trauma focused treatment during the second phase. It is unknown if participants' attendance in trauma focused treatment would have been comparable to participants' attendance in non-trauma focused treatment had participants not been provided with treatment during the first phase. As phase 1 treatment for depression and substance use was lengthy (24 sessions) and not all individuals are willing or able to engage in therapy for such a long period of time, it will be important to examine in future research if individuals would engage in as many sessions and benefit as much if they engaged directly in trauma focused treatment.

In regard to predictors of attendance in mental health treatment, there are many inconsistencies. Although several studies have found factors such as gender, ethnicity, employment, marital status, and psychiatric or medical status to be associated with treatment retention, other studies including our present study have not (McCaul et al., 2001; O'Toole, Pollini, Ford, & Bigelow, 2006; Swift & Greenberg, 2012). Overall, our findings suggest that it is difficult to identify factors that consistently predict treatment attendance, especially for individuals with multiple co-occurring mental health problems. This is notable, given that we evaluated many factors as potential predictors of attendance. Given the extant

literature suggesting low attendance in mental health treatment, future studies should evaluate ways in which psychotherapy could be revised to improve attendance. Future avenues of research may investigate whether simplifying the content presented in therapy, designing briefer therapies with fewer sessions, or utilizing a drop in group therapy format may improve rates of attendance in treatment.

Our findings should be interpreted in the context of several limitations. This study consisted of predominantly male and Caucasian veterans and thus results may not generalize to other individuals. Further, due to the comorbid nature of our sample, the results may not generalize to individuals with only depression, substance use, or trauma. Lastly, all participants had access to mental and physical health services including pharmacotherapy through the VASDHS at little or no cost and thus findings may not generalize to individuals without such access to health care.

In summary, we evaluated many potential predictors of treatment attendance, however only a few were found to be significantly related to attendance. Having more education was associated with increased group and individual treatment session attendance, while having a pre-treatment housing problem was associated with lower group attendance and having a past sexual trauma was associated with higher individual attendance. Focusing on trauma in therapy after addressing depression and substance use did not seem to have positive or negative effects on attendance for individuals with depression, substance use, and trauma. These findings indicate that it may be difficult to identify consistent predictors of attendance for individuals with multiple co-occurring mental health problems.

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Figure 1. Flow Chart of Participant Progression through Study Activities

Table 1
Characteristics of Participants entering Phase 1 (*N* = 123)

Characteristic	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
PREDISPOSING VARIABLES		
Age (years)		47.3 (12.0)
Gender		
Male	109 (89%)	
Female	14 (11%)	
Ethnicity (white)		
White	93 (76%)	
Non-white	30 (24%)	
Education (years)		13.0 (3.0)
Substance Use Disorder		
Alcohol only	48 (44%)	
Other Drug only	17 (16%)	
Alcohol and Other Drug	44 (40%)	
Type of Trauma		
Combat trauma	53 (44%)	
Sexual trauma	39 (33%)	
Other trauma	34 (28%)	
Cognitive functioning		45.0 (5.9)
ENABLING VARIABLES		
Monthly income (dollars)		2268.7 (2263.5)
Employment status		
Employed	23 (19%)	
Not employed	100 (81%)	
Marital status		
Married	26 (21%)	
Not married	97 (79%)	
Prescription Medication		
Depression	71 (65%)	
Substance use	23 (21%)	
Sleep	26 (24%)	
Distance traveled to treatment		18.2 (17.8)
Housing Stressor		
Acute event	56 (46%)	
Chronic difficulties	17 (14%)	
Interpersonal Stressor		
Acute event	45 (37%)	
Chronic difficulties	47 (39%)	

Characteristic	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
NEED VARIABLES		
PTSD diagnosis	101 (82%)	
Suicide-related hospitalizations	26 (21%)	
Treatment motivation		
Extreme	63 (55%)	
Considerable	30 (26%)	
Moderate or less	22 (19%)	
Trauma related guilt	85 (83%)	
Depression symptom severity		33.0 (10.9)
Substance use severity (% days using)		56.8 (.27.0)
PTSD symptom severity		57.0 (13.3)
Physical Health Stressors		
Acute events	16 (13%)	
Chronic difficulties	93 (76%)	

Note. PTSD = Posttraumatic Stress Disorder.

Table 2

Bivariate Associations with Phase I and Phase II Treatment Attendance

Predictors	Phase I Attendance Group Sessions		Phase II Attendance Individual Sessions	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
PREDISPOSING VARIABLES				
Age	.10	.28	.01	.95
Gender (male)	-.02	.85	-.15	.10
Ethnicity (white vs. non-white)	-.06	.49	.12	.20
Years of education	.19 [*]	.04	.28 ^{***}	.002
Combat trauma	.02	.86	.06	.53
Sexual trauma	.10	.29	.23 ^{**}	.01
Other trauma	.08	.40	.11	.25
Cognitive functioning	.07	.48	.02	.85
ENABLING VARIABLES				
Monthly income	.04	.63	.02	.84
Employment status (employed vs. not)	.10	.28	.08	.38
Marital status (married vs. not)	.07	.44	.00	.98
Depression medication prescription	.05	.64	.13	.19
Substance use medication prescription	.05	.64	.07	.45
Sleep medication prescription	.05	.58	.01	.96
Distance traveled to treatment	.07	.48	.09	.39
Acute housing events	.04	.70	-.04	.70
Chronic housing difficulties	-.19 [*]	.04	.09	.33
Acute interpersonal events	.07	.48	.05	.61
Chronic interpersonal difficulties	.00	.98	.08	.42
NEED VARIABLES				
PTSD diagnosis	.07	.45	.09	.34
Suicide related hospitalizations	.07	.43	.00	.99
Treatment motivation	.15	.12	.07	.48
Trauma related guilt	.11	.28	.06	.56
Depression symptom severity	.11	.25	.00	.99
Substance use severity	.03	.74	.14	.14
PTSD symptom severity	.02	.86	.13	.17
Acute health events	.00	.97	.09	.36
Chronic health difficulties	.13	.14	.01	.93

Note. PTSD = posttraumatic stress disorder.

^{*}
p < .05,

^{**}
p < .01,

^{***}
p < .001