Interdisciplinary Residential Treatment of Posttraumatic Stress Disorder and Traumatic Brain Injury: Effects on Symptom Severity and Occupational Performance and Satisfaction

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MeSH TERMS

- activities of daily living
- brain injuries
- depression
- outcome and process assessment (health care)
- residential treatment
- stress disorders, post-traumatic
- veterans

OBJECTIVE. This study examined outcomes of an 8-wk residential treatment program for veterans with posttraumatic stress disorder (PTSD) and a history of traumatic brain injury (TBI).

METHOD. Twenty-six veterans completed the Canadian Occupational Performance Measure, Clinician-Administered PTSD Scale, Beck Depression Inventory–2nd Edition, and PTSD Checklist before and after treatment.

RESULTS. Veterans demonstrated significant improvements in occupational performance and satisfaction with their performance, as well as in PTSD and depression symptom severity after residential PTSD/TBI treatment. Additionally, improvements in occupational performance and satisfaction were associated with decreases in depression symptom severity.

CONCLUSION. Although preliminary, results suggest that veterans with PTSD and a history of TBI experienced significant decreases in PTSD and depression symptom severity and improvement in self-perception of performance and satisfaction in problematic occupational areas. Changes in occupational areas and depression symptom severity were related, highlighting the importance of interdisciplinary treatment.

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Advancements in modern medicine and technology have significantly decreased the number of combat-related deaths in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) compared with previous conflicts (Tanielian & Jaycox, 2008). As service member survival rates have increased, so have rates of physical, cognitive, and psychological injuries, resulting in decreased quality of life, increased functional impairments, elevated risk for additional comorbidities, and societal costs (Tanielian & Jaycox, 2008). More than 1.64 million service members have been deployed since 2001, and the majority have reintegrated into their precombat roles and communities without observable problems; however, a sizable number return home experiencing “invisible wounds” such as posttraumatic stress disorder (PTSD), major depressive disorder (MDD), and traumatic brain injury (TBI; Tanielian & Jaycox, 2008). Schell and Marshall (2008) showed that among 1,938 returning service members, 14% had probable PTSD, 14% had probable MDD, 19% had experienced one or multiple probable TBIs, and 6% experienced all three conditions.

Because conditions such as PTSD, MDD, and a history of TBI often co-occur, their physical, cognitive, and psychological symptoms may overlap. For

example, insomnia, low motivation, anger and frustration, and memory and concentration problems are symptoms commonly associated with all three conditions. Because of symptom overlap, the interaction among PTSD, MDD, and a history of TBI is complicated and not fully understood, making overall functional improvement perhaps a greater priority than specialty treatment of individual symptoms (Wilk, Herrell, Wynn, Riviere, & Hoge, 2012). Providing the most comprehensive evidence-based care in the treatment of these combined conditions requires collaboration among disciplines, which preliminary research has suggested improves outcomes for people with chronic conditions (Hand, Letts, & von Zweck, 2011).

In addition to the multiple physical, cognitive, and psychological symptoms associated with PTSD, MDD, and a history of TBI, people may experience a combination of deficits that lower their ability to successfully engage in once meaningful and important activities. Further, these conditions can be related to diminished performance in meaningful occupations for active-duty service members both in periods of combat and during the transition and reintegration into civilian life. Plach and Sells (2013) conducted a study of young (age 20–29 yr) veterans reintegrating into the community and found that the most commonly reported problematic occupational areas were socialization, school, physical health, sleeping, and driving. The researchers also introduced the term *occupational freedom*, which they defined as “the opportunity and ability to choose and participate in activities that are meaningful to an individual” (p. 79), and suggested that during the transition from active-duty military roles to civilian roles, service members may experience a diminished sense of occupational freedom.

Research studies have shown that PTSD and TBI can negatively affect functional performance and quality of life (Carlson et al., 2011; Devitt et al., 2006; Lopez, 2011; Phipps & Richardson, 2007; Plach & Sells, 2013). Additionally, several studies have found that both actual participation and self-perceived satisfaction with participation in meaningful occupations are associated with increased psychological health and subjective well-being (Bejerholm & Eklund, 2007; Christiansen, Backman, Little, & Nguyen, 1999; Eklund & Leufstadius, 2007; Iannelli & Wildin, 2007). Thus, participation in client-centered, goal-specific occupational therapy has resulted in significant functional performance improvements among adults with a history of TBI. Trombly and colleagues found that after occupational therapy, participants accomplished self-identified goals created in collaboration with their occupational therapists and ex-

perienced significant improvement in self-perceived performance and satisfaction with performance in occupational areas (Trombly, Radomski, & Davis, 1998; Trombly, Radomski, Trexel, & Burnett-Smith, 2002). However, no study to date has examined change in occupational performance and satisfaction in relation to improvements in PTSD and depression symptom severity.

The psychological and physical injuries sustained by military personnel may influence their ability to perform within their current and previously meaningful roles. The complex needs of veterans who have experienced symptoms resulting from PTSD, a history of TBI, and other comorbid conditions (e.g., MDD) may be most successfully addressed through a collaborative approach to care within a structured environment designed to facilitate learning of new skills, development of healthy habits, and performance in healthy occupational areas and skills (e.g., Wilk et al., 2012). The current study had three primary aims: (1) to evaluate outcomes of an interdisciplinary residential treatment program in terms of occupational performance and satisfaction with self-identified important problematic occupational areas, (2) to examine the effects of an interdisciplinary residential treatment program on PTSD and depression symptom severity, and (3) to evaluate whether improvements in occupational performance and satisfaction were related to decreases in PTSD and depression symptom severity.

Method

Research Design

The quantitative study design (nonexperimental correlational) used interdisciplinary data collected for veterans who received treatment in a residential PTSD/TBI program. All data were collected as part of routine clinical care at a midwestern U.S. Department of Veterans Affairs (VA) PTSD specialty clinic. A waiver of written consent to enable use of archival data was obtained from the University of Cincinnati Institutional Review Board and the VA Research and Development Office. Data used for analysis were obtained during the first and last weeks of a residential treatment program and gathered in retrospective chart reviews from two assessment time points; as a result, item-level data were unavailable.

Participants

The sample consisted of male veterans who met criteria for current PTSD, as determined by the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995), and had a history of TBI, as determined by a VA medical

record review and a clinical interview with a neuropsychologist. Furthermore, all participants received occupational therapy, completed the Canadian Occupational Performance Measure (COPM; Law et al., 2005), and received cognitive processing therapy (CPT; Chard, Resick, Monson, & Kattar, 2009) while in a VA PTSD/TBI residential program between April 2011 and May 2013. Participants were ineligible for the treatment program if they met the following exclusion criteria related to inappropriateness for care: active substance dependence requiring detoxification, current unmanaged psychosis or bipolar mania, serious interfering medical condition (e.g., unmedicated seizure disorder), or presence of suicidal or homicidal intentions (participants with ideation but not intention were included).

Instruments

The COPM is a semistructured interview used to measure change in a person's self-perceived occupational performance and satisfaction over time. The first step is to identify problematic occupational areas, and then people rate their current level of performance on a scale ranging from 1 (*extremely poor/cannot do*) to 10 (*do extremely well*) and their satisfaction with their current level of performance on a scale ranging from 1 (*not satisfied at all*) to 10 (*extremely satisfied*) for each area. The total performance (COPM-P) and total satisfaction (COPM-S) ratings are calculated by summing individual performance and satisfaction ratings and dividing by the total number of problems. Change in performance and satisfaction is measured by the difference in total scores over a period of time (Law et al., 1994; Phipps & Richardson, 2007). The COPM has sound construct and criterion validity and test-retest reliability of $>.80$ (Law et al., 1994, 2005; McColl, Paterson, Davies, Doubt, & Law, 2000).

The CAPS is a structured clinical interview designed to assess PTSD diagnostic criteria. A symptom counted toward meeting diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR*; American Psychiatric Association, 2000) if the frequency was rated at least 1 (*symptoms occur at least monthly*) and intensity was rated at least 2 (*moderate distress*). The frequency and intensity of each PTSD symptom are rated and then summed for a severity score (score range = 0–136; higher scores indicate greater symptom severity). Prior research has demonstrated that the CAPS has strong psychometric properties (Blake et al., 1995; Weathers, Ruscio, & Keane, 1999), such as an internal consistency of $\alpha = .73-.85$ and interrater reliability of $.77-.98$ among

samples of veterans (Blake et al., 1990; Weathers, Keane, & Davidson, 2001; Weathers & Litz, 1994).

The PTSD Checklist–Stressor Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) is a 17-item self-report measure of PTSD symptoms that corresponds with diagnostic criteria in the *DSM-IV-TR*. The PCL-S was used to assess PTSD symptom severity in relation to participants' reported index trauma. PCL-S scale items are rated on a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*extremely*); higher scores indicate greater distress. The PCL-S has been shown to be reliable and valid among various populations (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), with internal consistency of $\alpha = .94-.97$ and test-retest reliability of $.96$ for a 2- to 3-day interval among Vietnam veterans (Weathers et al., 1993). The PCL also has demonstrated sensitivity to change after psychological treatment (McDonald & Calhoun, 2010).

The Beck Depression Inventory–II (BDI-II; Beck, Steer, & Brown, 1996) is a well-established 21-item self-report measure used to assess depression symptom severity. Items are rated on a 4-point Likert-type scale ranging from 0 to 3 and are summed to yield a total severity score (score range = 0–63; higher scores indicate greater symptom severity). Research has demonstrated that the BDI-II has strong psychometric properties, including internal reliability of $\alpha = .92$ for an outpatient sample and test-retest reliability of $.93$ over a 1-wk interval (Beck et al., 1996).

The Structured Clinical Interview for *DSM-IV* Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) is a semistructured interview designed to evaluate the presence of Axis I disorders. Research on the SCID-I has shown the instrument to be valid and reliable among various samples, including a test-retest reliability of $.61$ for MDD over a 7- to 10-day interval (e.g., Shear et al., 2000; Zanarini et al., 2000). The SCID-I was used in the current study to assess current MDD for descriptive purposes.

Data Collection

On admission to the PTSD/TBI residential program, veterans completed comprehensive assessments (e.g., psychological, neuropsychological, occupational therapy) to evaluate their symptoms and determine appropriateness for care. All assessments were conducted by clinicians with extensive experience in the provision of psychological tests. The COPM was completed in reference to identified occupational areas that were the focus of individual occupational therapy intervention; however, these sessions

were delivered within a comprehensive treatment program, so results on the COPM, along with the other discipline assessments, represent the overall program outcome.

Residential Treatment Program Setting

The treatment facility is located at a satellite campus of a main VA hospital that also houses several other residential programs. The PTSD residential program has a designated group room, exercise area, and social lounge. Veterans in the program share a personal living space with one other veteran for the length of their stay. The program is 8 wk in duration, and veterans are expected to participate in programming from 8:00 a.m. to 4:30 p.m., Monday through Friday. Programming during evening hours and weekends is also available on occasion. Additionally, veterans are provided with opportunities and encouragement to participate in activities that support their personal goals during the evening and weekend hours.

Trauma-Focused Treatment. The primary goals of the program are to decrease PTSD symptoms and increase functional performance. Psychologists and social workers facilitate the CPT groups and individual sessions; however, treatment team members across disciplines support veterans' participation in CPT throughout both group and individual programming (i.e., identifying maladaptive beliefs; encouraging patients to complete related worksheets designed to increase self-awareness of thoughts and feelings and to challenge problematic thinking and beliefs; and providing opportunities to successfully engage in activities that challenge maladaptive beliefs in a safe, supportive environment).

The PTSD/TBI residential program uses the veteran/military version of CPT (Chard et al., 2009) as the primary trauma-focused treatment approach. During its history, the program has used both CPT and cognitive processing therapy—cognitive only (CPT–C), which is a version of the CPT protocol without the written trauma account (Resick et al., 2008), but in the current study, all veterans received CPT as the trauma-focused treatment approach. CPT was provided in the combined individual and group protocol; this format provides the opportunity to learn and practice skill development in a group setting while individual sessions focus on processing traumatic events. Veterans received two individual and two group CPT sessions per week lasting 60 and 90 min, respectively. For further description of the CPT protocol, please see Chard et al. (2009).

Group and Adjunctive Programming. In addition to CPT treatment, veterans attended other psychoeducation groups, such as communication skills, anger management,

and relapse prevention. CogSmart (Twamley, Noonan, Savla, Schiehser, & Jak, 2008), a cognitive enhancement group, was also offered to enhance skills designed to compensate for cognitive impairments. Veterans received adjunctive treatment, which included a morning sensory regulation group, yoga, spirituality, nutrition, and art expression. In total, veterans attended approximately 15 groups per week (members within each cohort attended the same groups), each of which lasted approximately 60 min.

Additional Individual Treatment. Veterans received individualized occupational therapy once per week and speech therapy 2–3 times per week. Occupational therapy focused on each veteran's unique set of self-identified goals that the COPM helped to identify. Treatment incorporated preparatory methods (e.g., biofeedback, sensory input), purposeful activities (e.g., simulated budgeting, role-playing), and self-directed occupations (e.g., applying for a volunteer position or educational program). Specific individual interventions included education and guided opportunities to practice coping and social interaction skills, self-awareness and regulation tools, and cognitive compensatory strategies during challenging functional tasks in various environments.

On completion of the treatment program, veterans were reassessed with the same measures administered at pretreatment. Posttreatment psychological assessments were administered by a clinician other than the participant's individual therapy clinician; however, the COPM was administered by the same occupational therapist because only one therapist worked in the program. The assessments were completed as part of routine clinical care to evaluate patient progress in the treatment program; no compensation was provided.

Data Analysis

Data were obtained via chart review and hard copies of the COPM assessment, which were entered into a data set. Continuous summary scores were available for the COPM performance and satisfaction ratings and for the psychological symptom severity measures (PCL–S, CAPS, and BDI–II). Individual problematic occupational performance areas were also reviewed and placed into categories according to the COPM assessment form design and definitions of areas of occupation as stated in the *Occupational Therapy Practice Framework: Domain and Process* (2nd ed.; American Occupational Therapy Association, 2008).

Bivariate correlations and *t* tests were first conducted to examine the relationship between pretreatment variables and to investigate whether any demographic variables were required as covariates. Paired-sample *t* tests were

then conducted to evaluate change in occupational satisfaction, occupational performance, self-reported and clinician-assessed PTSD symptom severity, and self-reported depression symptom severity. Finally, change in the occupational and psychological symptom severity variables was derived by creating residualized values for each variable in a regression analysis that predicted post-treatment scores from pretreatment scores. The residualized variables were then correlated to determine the relationships among changes in the occupational and psychological symptom severity variables.

Results

Participants

The sample included 26 veterans, who on average were 39 yr old (standard deviation [*SD*] = 11.86) and had completed 13.2 yr of education (*SD* = 1.42). All participants met current diagnostic criteria for PTSD, and 62% met current diagnostic criteria for MDD. Severity of TBI (mild, moderate, or severe) was classified on the basis of the most severe injury using practice guidelines developed by the VA and the U.S. Department of Defense (2009). Time since injury ranged from 9 to 408 mo, with an average of 96.4 mo since injury (*SD* = 97.74 mo; see Table 1).

Veterans identified an average of 3.85 occupational areas to focus on over the course of treatment (*SD* = 0.88). Health management and maintenance (e.g., physical fitness, nutrition routine), social participation (e.g., emotional regulation during interactions with others), and rest (e.g., relaxation, energy regulation) were the three most frequently self-reported problematic occupational areas (Table 2).

Change in Occupational Satisfaction and Performance and in Symptom Severity

Means and standard deviations for major study variables can be found in Table 3. Study variables were all continuous and normally distributed. Paired *t*-test results demonstrated significant improvement on all outcome measures (CAPS, PCL-S, BDI-II, COPM-P, and COPM-S) and yielded large effect sizes using the G*Power 3 program and accounting for the correlated design (Faul, Erdfelder, Lang, & Buchner, 2007).

Demographic and Residualized Variables

Bivariate Pearson correlation results showed that age was not significantly correlated with change in scores on the CAPS ($r = -.16, p = .45$), PCL-S ($r = -.19, p = .36$),

Table 1. Participant Characteristics (*N* = 26)

Characteristic	<i>n</i>	%
Marital status		
Married or remarried	10	38
Divorced	10	38
Single or never married	6	23
Employment status		
Employed	2	8
Unemployed	8	31
Disabled	14	54
Retired	2	8
Race or ethnicity		
White	21	81
African American	5	19
Service era		
OEF, OIF, OND	16	62
Vietnam	3	12
Persian Gulf	4	15
Post-Vietnam	3	12
Exposure to combat		
Served in combat	22	85
Did not serve in combat	4	15
Index trauma ^a		
Combat	18	69
Adult sexual assault	2	8
Physical assault	1	4
Assault with a weapon	1	4
Witness to death	1	4
Childhood sexual abuse	1	4
Childhood physical abuse	1	4
Other stressful event	1	4
Diagnosis of MDD		
Current MDD	16	62
MDD in remission	4	15
Did not meet criteria for MDD	6	23
Severity of TBI		
Mild	21	81
Moderate	3	12
Severe	2	8

Note. MDD = major depressive disorder; OEF = Operation Enduring Freedom; OIF = Operation Iraqi Freedom; OND = Operation New Dawn; TBI = traumatic brain injury. Percentages may total >100 because of rounding.

^aMost frequently reported types of *index trauma*, or trauma reported by the veteran as affecting them the most or causing the most distress.

COPM-P ($r = .07, p = .72$), or COPM-S ($r = -.01, p = .98$). Similarly, education was not significantly associated with change in scores on the CAPS ($r = .30, p = .13$), PCL-S ($r = .01, p = .95$), or COPM-S ($r = -.27, p = .18$). A trend was found between education and COPM-P ($r = -.38, p = .05$).

To investigate whether categorical demographic factors influenced the dependent variables, we collapsed and dichotomized groups because of small sample sizes. Independent-sample *t* tests did not demonstrate significant differences by service era (OEF–OIF vs. other era) in change in scores on the CAPS, $t(24) = -0.04, p = .97$;

Table 2. Problematic Occupational Performance Areas Identified on the Canadian Occupational Performance Measure (*N* = 26)

Occupational Area	<i>n</i>
Self-care	
Health management and maintenance	19
Rest	16
Sleep	6
Community mobility	5
Meal planning	4
Financial management	3
Shopping	1
Spirituality	1
Child rearing	1
Productivity	
Informal personal education participation	8
Informal personal work participation	8
Household management tasks	6
Volunteer exploration	3
Formal education exploration	3
Formal employment exploration	1
Leisure	
Social participation	17
Leisure participation	3
Total	105

PCL-S, $t(24) = 0.80$, $p = .43$; BDI-II, $t(24) = 1.68$, $p = .11$; COPM-P, $t(24) = -0.46$, $p = .65$; or COPM-S, $t(24) = -1.49$, $p = .15$. Significant differences also were not evident for marital status (married vs. other) in change in scores on the CAPS, $t(24) = 0.15$, $p = .89$; PCL-S, $t(24) = 0.14$, $p = .89$; BDI-II, $t(24) = 0.64$, $p = .53$; or COPM-P, $t(24) = -0.61$, $p = .55$. The difference in COPM-S scores trended toward significance for marital status, $t(24) = -2.11$, $p = .05$. Because of the discrepancy in employment status (2 employed, 24 unemployed), these findings are not presented.

Associations Among Changes in Occupational Satisfaction and Performance and in Symptom Severity

Correlation results show that between COPM variables, performance and satisfaction scores were positively associated (Table 4). Among psychological symptom severity

measures, change in CAPS and PCL-S scores, PCL-S and BDI-II scores, and CAPS and BDI-II scores were significantly positively related. Among occupational and psychological variables, change in COPM-S scores was significantly negatively related to PCL-S and BDI-II scores. Improvement in COPM-P scores was significantly negatively associated with BDI-II scores; however, change in COPM-P scores was not significantly related to decreases in either self-reported or clinician-assessed PTSD symptom severity scores. All significant correlation results indicated strong but not multicollinear (i.e., redundant) relationships ($rs = -.43-.71$) among the examined variables.

Discussion

The current study evaluated whether occupational performance improved and psychological symptom severity decreased over the course of interdisciplinary treatment received in a residential PTSD-TBI program. Study results demonstrated that all outcome variables (PTSD symptoms, depression symptoms, occupational performance, and satisfaction with occupational performance) significantly improved over the course of residential treatment. Furthermore, reductions in all outcome variables were clinically significant as reflected in CAPS score changes of ≥ 15 and PCL-S score changes of ≥ 10 (Monson et al., 2006), BDI-II average score changes from severe (29–63) to mild (14–19) depression (Beck et al., 1996), and changes in COPM levels of ≥ 2 (Law et al., 1994; Phipps & Richardson, 2007). In sum, changes were both statistically significant and clinically meaningful. The intervention provided had a large effect on both symptom change (improvement in psychological symptoms) and self-perception of participation in meaningful life activities and roles (improvements in performance and satisfaction with performance in occupational areas). These large effects suggest that the treatment program improved veterans' mental health, engagement in meaningful occupations, and personal satisfaction with their performance in these occupations.

Table 3. Pre- and Posttreatment Means, Standard Deviations, and Paired *t*-Test Results for Major Study Variables

Measure	Pretreatment		Posttreatment		$t(26)$	p	Cohen's d
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
PTSD Checklist	63.00	11.04	44.27	15.90	8.41	<.001	1.37
Clinician-Administered PTSD Scale	74.69	17.38	39.69	17.45	4.97	<.001	2.01
Beck Depression Inventory-II	37.00	13.02	19.27	10.43	6.76	<.001	1.50
COPM-Performance	2.80	1.41	5.50	1.84	-7.79	<.001	-1.65
COPM-Satisfaction	2.10	1.52	5.19	1.81	-8.34	<.001	-1.85

Note. COPM = Canadian Occupational Performance Measure; PTSD = posttraumatic stress disorder.

Table 4. Intercorrelations Among Residualized Change Variables (N = 26)

Measure	1	2	3	4	5
1. PTSD Checklist	—	.71**	.50**	-.27	-.48*
2. Clinician-Administered PTSD Scale		—	.53**	-.24	-.39
3. Beck Depression Inventory-II			—	-.43*	-.40*
4. COPM-Performance				—	.65**
5. COPM-Satisfaction					—

Note. COPM = Canadian Occupational Performance Measure; PTSD = post-traumatic stress disorder.

* $p < .05$. ** $p < .01$.

These results are similar to those of previous studies investigating client-centered, goal-specific occupational therapy outcomes for people who have experienced a TBI (Phipps & Richardson, 2007; Trombly et al., 1998, 2002).

Additionally, we were particularly interested in examining whether improvements in occupational variables and psychological symptom severity were associated. We predicted that increases in occupational performance and satisfaction would be associated with decreases in PTSD and depression symptom severity. Results generally supported this hypothesis. Specifically, significant improvement in occupational satisfaction was strongly positively associated with occupational performance and strongly negatively related to self-reported PTSD and depression symptom severity. Thus, improvement in occupational satisfaction was related to reductions in self-reported PTSD and depression symptom severity. However, findings differed slightly for occupational performance. Improvements in occupational performance were associated with decreases in depression symptom severity but not with either of the PTSD symptom severity measures. These results highlight the importance of considering depression when addressing occupation-centered goals because the decrease in depression severity was related to an increase in both occupational performance and satisfaction. Thus, these results suggest that occupational engagement and depression symptom severity may serve as indicators for one another.

The study suggests that when combined with other treatment offered in a residential program, providing veterans with supportive opportunities to safely and successfully engage in their self-identified problematic occupational areas while practicing new skills and compensatory strategies improves both their performance and their satisfaction with performance in these areas. Occupational therapy practitioners have expertise in occupational analysis and in the cognitive, emotional,

sensory, and motor skills required for participation in occupation, expertise that is valuable when assessing and treating overlapping cognitive, emotional, sensory, and motor symptoms. The findings of this study indicate the importance of referrals between mental health providers and occupational therapy practitioners in reducing symptoms and disability while improving function and satisfaction with function. Even more optimal than referral is integrated assessment and treatment with open communication among multiple disciplines when providing care to veterans with PTSD, MDD, and a history of TBI. These associations support the interdisciplinary treatment model and previous recommendations to make functional improvement a greater priority than treatment of individual symptoms (Wilk et al., 2012).

The current study contributes to the literature in several ways. First, data collection involved interdisciplinary efforts, validated measures were used for occupational and psychological assessment, and longitudinal change in outcome variables was examined. Longitudinal data collection allowed for a more comprehensive evaluation of treatment outcomes and examination of improvements in occupational satisfaction and performance related to changes in psychological symptom severity variables. Additionally, the study evaluated progress toward personalized goals set by each veteran and summarized the most frequently reported occupational areas, which furthers understanding of occupational areas that are important to the population of returning veterans.

Limitations and Future Research

Although this study contributes to the literature, it has limitations. Generalizability may be a concern, because the sample consisted of veterans in a specialized residential program. Moreover, the heterogeneous sample (in age, service era, index trauma, and TBI severity) may be considered a limitation to the ability to generalize to a specific group of veterans; however, for the purpose of this study, the demographic differences may suggest increased generalizability of findings; despite the heterogeneity of the sample, statistically significant and clinically meaningful decreases in PTSD and depression symptom severity were evident, as was improvement in self-perception of performance and satisfaction in problematic occupational areas and skills over the course of treatment.

Another potential limitation is that the program provided trauma-focused therapy in a structured environment, which may affect ecological validity. Programming also included psychoeducation groups and other individualized

programming, so it is difficult to ascertain the relative contribution of each component. In addition, the study was not a randomized controlled trial that minimized threats to internal validity; as a result, other factors may have contributed to changes in the outcome variables. That said, the COPM measured progress on goals specified by each veteran, and occupational therapy worked specifically toward helping the veterans meet their goals. Follow-up data were unavailable, precluding the opportunity to evaluate the maintenance of treatment gains.

The limitations of the study provide opportunities for future research, such as use of a more representative sample of veterans and examination of occupational performance and satisfaction in daily living, not just in a residential hospital environment. Such studies would provide valuable information about the occupational needs and psychological functioning of returning veterans. More detailed knowledge about the influence of the intervention context (e.g., home, community) would be valuable to help facilitate the initial transition from active duty to civilian roles and the transition home from a residential program or institutional facility. Finally, research is also needed to explore effectiveness of individualized interventions targeting specific symptom reduction and function in reported problem areas such as health management, socialization, and relaxation.

Implications for Occupational Therapy Practice

The results of this study have the following implications for occupational therapy practice:

- Supported engagement in meaningful yet problematic occupational areas, such as health management, relaxation, and social participation, promotes performance and satisfaction in these areas.
- Change in self-reported depression symptom severity is associated with increases in occupational performance and satisfaction.
- Change in self-reported PTSD symptom severity is associated with improvement in occupational satisfaction.
- Occupational therapy practitioners should consider symptoms associated with MDD, PTSD, and history of TBI when assessing, planning intervention, providing care, and making recommendations or referrals for veterans with these conditions.
- Findings provide additional support for use of the COPM to assess veterans' self-identified occupational problem areas, create individualized occupational goals,

plan treatment, develop programming, and measure progress. ▲

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