Community Mental Health Journal, Vol. 43, No. 3, June 2007 (© 2007)
DOI: 10.1007/s10597-006-9075-2

The Trauma Recovery Group: A Cognitive-Behavioral Program for Post-Traumatic Stress Disorder in Persons with Severe Mental Illness

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ABSTRACT: To address the problem of post-traumatic stress disorder (PTSD) in severe mental illness, the Trauma Recovery Group, a mixed gender cognitive-behavioral program, was developed and piloted at a community mental health center. The 21-week program includes breathing retraining, education about PTSD, cognitive restructuring, coping with symptoms, and making a recovery plan. Eighty clients were assessed at baseline and 41 provided follow-up data. Retention in the group was good: 59%. Treatment completers improved significantly in PTSD symptoms and diagnosis, depression, and post-traumatic cognitions, but dropouts did not. The results support the feasibility of the program and suggest it produces clinical benefits.

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KEY WORDS: cognitive-behavior therapy; post-traumatic stress disorder; severe mental illness; trauma; cognitive restructuring.

INTRODUCTION

There is emerging evidence that persons with severe mental illnesses (SMI), such as schizophrenia, bipolar disorder, and treatment refractory major depression, are more likely to experience traumatic events both before and after the onset of their mental illness (Goodman, Rosenberg, Mueser, & Drake, 1997; Honkonen, Henriksson, Koivisto, Stengård, & Salokangas, 2004; Read & Argyle, 1999). Increased trauma exposure has been associated with a wide range of negative outcomes in persons with SMI, such as more severe symptoms (Carmen, Rieker, & Mills, 1984; Muenzenmaier, Meyer, Struening, & Ferber, 1993; Schenkel, Spaulding, DiLillo, & Silverstein, 2005), frequent hospitalizations (Briere, Woo, McRae, Foltz, & Sitzman, 1997; Carmen et al., 1984), and substance use problems (Goodman et al., 2001; Read, Brown, & Kahler, 2004). One consequence of trauma exposure in persons with SMI that has received increased attention recently has been post-traumatic stress disorder (PTSD), with most studies reporting rates of *current* PTSD between 28% and 43% (Cascardi, Mueser, DeGiralomo, & Murrin, 1996; Craine, Henson, Colliver, & MacLean, 1988; Howgego et al., 2005; McFarlane, Bookless, & Air, 2001; Mueser et al., 1998, 2004c; Switzer et al., 1999). These rates of PTSD are substantially higher than the estimated point prevalence of PTSD in the general population of 2% (Stein, Walker, Hazen, & Forde, 1997) or the lifetime prevalence of 8–12% (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993).

The high rate of PTSD in persons with SMI has important clinical implications for two reasons. First, PTSD has been hypothesized to worsen the course of SMI through both direct and indirect effects (Mueser, Rosenberg, Goodman, & Trumbetta, 2002). An example of a *direct effect* would be PTSD symptoms acting as stressors on SMI vulnerability, leading to more severe SMI symptoms and more frequent relapse. One example of an *indirect effect* would be the use of alcohol or drugs to cope with PTSD symptoms, resulting in symptom relapses and hospitalizations. Another example of an indirect effect of PTSD on functioning would be interpersonal problems related to PTSD, such as

pervasive distrust of other people, leading to clients receiving fewer preventive health and mental health services. Consistent with this model, there is evidence that individuals with SMI and PTSD have worse physical and mental health functioning than clients without PTSD (Howgego et al., 2005; Mueser, Essock, Haines, Wolfe, & Xie, 2004a; Mueser et al., 2004c; Resnick, Bond, & Mueser, 2003). These associations suggest that effective treatment for PTSD in persons with SMI could reduce PTSD symptoms and more broadly improve both physical and mental health functioning.

Second, although effective interventions have been developed to treat PTSD in the general population (Foa, Keane, & Friedman, 2000), similar programs for clients with co-occurring SMIs remain to be demonstrated. It is important to develop and evaluate interventions for PTSD that can address the unique needs of clients with SMI. Some of these needs include the management of severe symptoms other than PTSD (e.g., depression, psychosis, mania or hypomania), cognitive impairments, substance abuse, high sensitivity to stress, daily living problems such as housing instability, poor self-care and health maintenance skills, and lack of social support.

To address the need for a PTSD treatment program for persons with SMI, we developed a 21-week group-based cognitive-behavioral intervention called the *Trauma Recovery Group*. This program is aimed at addressing PTSD in a broad range of persons with a SMI, including women and men. As many individuals with SMI have multiple treatment needs, such as medication and case management, the Trauma Recovery Group was designed to be provided at a local community mental health center, where comprehensive services for psychiatric disorders are available. The program is divided into seven components, including an introduction and orientation, breathing retraining, education about PTSD, cognitive restructuring, coping with persistent PTSD symptoms, developing a personal recovery plan, and termination. The primary focus of the program is on cognitive restructuring, which accounts for 12 of the 21 sessions. In the next section we provide a brief description of the theoretical framework and practical considerations that informed the development of the program.

Development and Rationale for the Trauma Recovery Group

PTSD has been conceptualized as a disorder involving multidimensional stress responses including affective components; disruption of coping; and alterations in memory and cognition stemming from the

experience and interpretation of traumatic events. Although multiple formulations and treatment models have been put forth in regards to post-traumatic stress syndromes, including Freud's early formulations (Freud, 1917, 1920; Freud & Brewer, 1895), cognitive models have been at the forefront of theories of PTSD since publication of Foa and Kozak's (1986) information processing model (Brewin, 2001; Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1988; Dalgleish, 2004; Ehlers & Clark, 2000; Halligan, Michael, Clark, & Ehlers, 2003; Laposa & Alden, 2003). Indeed, prevailing formulations of PTSD all recognize the central role of cognitive processes in defining, mediating, and maintaining post-traumatic symptomatology, including psychophysiologic symptoms such as overarousal.

The essence of modern cognitive theories is that negative appraisals about traumatic events and how they are responded to can have major effects on individuals' beliefs or underlying cognitive schemas about themselves (e.g., "I'm an ineffectual person"), other people (e.g., "you can't trust men"), or the world in general (e.g., "the world is a cold, hostile place"). While some negative beliefs may have been accurate in the past, people may cling to them long after their environment and circumstances have changed and the beliefs are no longer accurate or helpful (e.g., a person reared in a physically abusive home who continues to believe "people will hurt you if they have a chance" long after leaving home). Other inaccurate beliefs may develop that are simply inflated perceptions of the inherent risks involved in everyday activities (e.g., the likelihood of being assaulted again) or may emerge in the aftermath of traumatic events as people struggle to find meaning in their experiences and their reactions (e.g., "I'm a bad person because I allowed my abuse to continue past the point where I could have stopped it"). As these thoughts are associated with negative feelings (e.g., anxiety, guilt, depression), people attempt to avoid or suppress them, as well as trauma-related stimuli that can provoke them. When efforts to avoid trauma-related thoughts and feelings fail, PTSD symptoms emerge or worsen, including re-experiencing, avoidance, and overarousal. The primary goal of treatment, therefore, is to identify and correct these core trauma-related schemas that are the root cause of PTSD.

Research on the psychological treatment of PTSD indicates that cognitive-behavioral interventions have the strongest empirical basis (Bisson & Andrew, 2005; Bradley, Greene, Russ, Dutra, & Westen, 2005; Foa et al., 2000). Cognitive-behavioral approaches have the

added advantage of being applicable to a wide range of different cultural and racial groups (Comas-Diaz, 1981; Hinton et al., 2004; Organista, Muñoz, & González, 1994; Otto et al., 2003) and ages (Cohen, Mannarino, & Deblinger, 2003; Dick & Gallagher-Thompson, 1996; Granholm et al., 2005). Research on the treatment of PTSD has shown strong empirical support for two cognitive-behavioral methods, both of which may change inaccurate trauma-related beliefs: *cognitive restructuring* (i.e., identifying and correcting inaccurate thoughts that lead to negative feelings) and *exposure therapy* (i.e., facilitating exposure to feared but safe trauma-related memories and situations, leading to habituation of anxiety). Studies comparing these methods have failed to find significant differences between the approaches (Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Tarrier et al., 1999; Tarrier & Sommerfield, 2004), and their combination is no more effective than either one alone (Bryant, Moulds, Guthrie, Dang, & Nixon, 2003; Marks et al., 1998; Paunovic & Öst, 2001). Therefore, from an empirical perspective, there is no compelling reason to select one strategy over the other, and the rule of parsimony would argue against using both methods when either one alone is sufficient. Several considerations were involved in our decision to use cognitive restructuring rather than exposure therapy as the primary therapeutic strategy for reducing PTSD symptoms in the Trauma Recovery Group.

First, clients with SMI are highly sensitive to the effects of stress, and it is crucial that treatment for PTSD in this population minimize unnecessary exposure to stress. Since exposure therapy has often been reported to be stressful for persons with PTSD (Tarrier et al., 1999), we opted to to use cognitive restructuring instead. In addition, because avoidance of trauma-related stimuli is a symptom of PTSD that clients must be willing to confront in order to participate in exposure therapy, but not cognitive restructuring, we suspected that a program based on the latter would have higher acceptability to clients with SMI.

Second, there is extensive experience in the psychiatric rehabilitation field with the use of cognitive restructuring for the treatment of a variety of different SMIs, including schizophrenia (Fowler, Garety, & Kuipers, 1995; Kingdon & Turkington, 2004; Morrison, Renton, Dunn, Williams, & Bentall, 2004), bipolar disorder (Lam, Jones, Hayward, & Bright, 1999; Newman, Leahy, Beck, Reilly-Harrington, & Gyulai, 2002), major depression (Beck, Rush, Shaw, & Emery, 1979), and borderline personality disorder (Linehan, 1993a). In contrast, clinical

experience with exposure therapy approaches in the SMI population is limited mainly to single case studies (Mueser & Taylor, 1997; Nishith, Hearst, Mueser, & Foa, 1995). Thus, the feasibility of teaching cognitive restructuring to clients with SMI is well established, but not the feasibility of using exposure techniques.

Third, cognitive restructuring is useful for reducing distress due to wide range of symptoms aside from anxiety, such as depression and psychosis. These symptoms are common in clients with SMI, especially those who also have PTSD (Mueser et al., 2004a; Resnick et al., 2003). The impact of exposure techniques, on the other hand, is limited mainly to anxiety, with other potential effects secondary to improvements in anxiety. In addition, there is some evidence that exposure therapy is less effective in treating primary PTSD when the dominant emotions are guilt and shame rather than anxiety (Smucker, Grunert, & Weis, 2003). Thus, cognitive restructuring appears to have broader applicability than exposure therapy for treating persons SMI, suggesting it may also be more suitable for the treatment of comorbid PTSD in this population.

While the focus of the Trauma Recovery Group is on teaching cognitive restructuring to change inaccurate trauma-related beliefs, the program also incorporates several other features to help trauma survivors cope with their experiences and move forward in their lives. Similar to other cognitive-behavioral treatment programs for PTSD (Foa & Rothbaum, 1998; Resick & Schnicke, 1993), *education* is provided about the nature of trauma and PTSD in order to normalize clients' psychological responses to traumatic events, and to build motivation for participation in treatment. Also similar to other programs (Cloitre, Cohen, & Koenen, 2006; Foa & Rothbaum, 1998), *breathing retraining* is taught early in the program to help clients manage intense feelings of distress that were expected to improve over the long-term with cognitive restructuring.

Although cognitive-behavioral therapy is effective at reducing the severity of PTSD symptoms, often leading to remission of the disorder, some persistence of PTSD symptoms is common (Bisson & Andrew, 2005). Considering the other symptoms of mental illness experienced by clients with SMI and PTSD, we expected significant numbers of clients would continue to have persistent PTSD symptoms (albeit them less severe) following completion of the cognitive restructuring component of the program. To address this problem, we included several sessions devoted to teaching coping skills for persistent PTSD symptoms

such as re-experiencing the trauma, avoidance of trauma-related stimuli, and overarousal. Coping strategies were taught following the basic principles of coping skills enhancement for persistent symptoms (Gingerich & Mueser, 2005; Schaub, 1998; Tarrier, 1992), including the discussion, selection, and practice of coping strategies.

Finally, we chose to end the group by shifting the focus from the past to the future. The basic pretext of these sessions was the emerging new definition of *recovery* from mental illness as not being defined by symptoms and impairments, but rather in terms of new meaning in life (Anthony, 1993; Deegan, 1988; Fisher, 1992), and improved functioning and adaptation (President's New Freedom Commission on Mental Health, 2003). To foster this process, clients formulated their own personal recovery plans based on the challenges they expected to face and the goals they were striving to achieve.

The Trauma Recovery Group was designed to teach specific skills for managing and overcoming the effects of PTSD in clients with a diverse range of other psychiatric disorders, including mood disorders, schizophrenia-spectrum disorders, and personality disorders. The focus of the group on PTSD and associated problems, and experience in the field on applying a broad range of cognitive-behavioral approaches to persons with SMI, suggested to the program developers that the different symptoms of these disorders could be managed successfully in a group context. Furthermore, experience implementing a similar individual-based cognitive-behavioral model for PTSD in clients with SMI (Mueser, Rosenberg, Jankowski, Hamblen, & Descamps, 2004b; Rosenberg, Mueser, Jankowski, Salyers, & Acker, 2004) instilled confidence that the approach was sufficiently flexible to accommodate the needs of clients with different diagnoses and levels of functioning.

The rationale for two logistical aspects of the program also requires explanation, including the group format and the co-educational composition of the groups. A group format was selected over an individual one for several reasons. First, group psychotherapy may be more cost-effective to deliver than individual therapy because multiple clients can be engaged and treated simultaneously, thus conserving limited mental health services resources. Second, group interventions offer opportunities for peer support because clients are able to share their experiences with others in a mutually supportive setting, engendering feelings of acceptance and hope (Herman, 1992; Yalom, 1985). Third, the group format provides clients with multiple role models in a context that encourages social interaction and support for learning new skills

(Bellack, Mueser, Gingerich, & Agresta, 2004; Heimberg & Becker, 2002; Linehan, 1993b). Finally, group intervention for trauma survivors has been a widely implemented treatment modality, supporting the feasibility of the modality (Harris, 1998; Klein & Schermer, 2000; Najavits, 2002; Schnurr et al., 2003).

The developers of the Trauma Recovery Group decided to make the group co-educational rather than gender specific for several reasons. First, although women have a higher prevalence of PTSD than men in the general population (Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Kessler et al., 1995), most studies of the SMI population fail to report such gender differences (Cascardi et al., 1996; Mueser et al., 1998, 2004c; Switzer et al., 1999). Thus, PTSD is a significant clinical problem that requires treatment for men and women with SMI. Second, the primary therapeutic technique utilized in the program was cognitive restructuring, not exposure therapy, thereby minimizing concerns that discussion of trauma-related experiences in a co-educational group would trigger PTSD symptoms in some clients. Third, treating PTSD in a setting with both women and men could provide valuable opportunities for some clients to challenge gender-based assumptions about their traumatic experiences (e.g., "only women are sexually abused in childhood") and generalized negative beliefs about members of the opposite sex (e.g., "no man can be trusted"). Last, providing gender-specific groups is less practical for many mental health centers, especially smaller ones, because longer periods of time must pass in order to accumulate sufficient numbers of clients to begin a group.

The Present Study

In this report we describe preliminary results from 11 completed Trauma Recovery Groups. Our analyses were guided by two questions concerning the feasibility of the program and observed changes in PTSD and related symptoms: (1) can clients with SMI be successfully engaged and retained in the group? (2) is participation in the group associated with improvements in PTSD, depression, and trauma-related beliefs?

METHODS

The Trauma Recovery Group was developed and implemented at the Mental Health Center of Greater Manchester. Eligibility criteria for the group were broadly defined in

order to ensure the greatest possible access to the program, and included: (1) SMI as defined by the State of New Hampshire (DSM-IV Axis I or II disorder and functional impairment with respect to ability to work or care for oneself), (2) diagnosis of PTSD, (3) no psychiatric hospitalization within the past month, (4) not presenting a significant danger to self or others, (5) not floridly psychotic or disorganized so as to interfere with ability to comprehend material. Most or all of the participants were taking prescription medications for their psychiatric disorders; no restrictions on medications were imposed on the study participants, nor were attempts made to record the medications prescribed to clients. In order to participate in the research assessments conducted at baseline, post-treatment, and 3-month follow-up, clients also provided informed consent. Clients who met eligibility criteria for the group but who did not want to complete the research assessments were allowed to participate in the group without providing research data. This study reports data on clients who provided signed informed consent.

Participants

The full study sample included 80 clients who completed the baseline assessment. Of these clients, 79 (99%) were non-Hispanic white, 63 (79%) were women, 28 (35%) had never married, 55/77 (70%) had graduated from high school, 28 (35%) had primary diagnoses of personality disorder, 16 (20%) had major depression, 7 (9%) had bipolar disorder, 10 (12%) had schizophrenia or schizoaffective disorder, 19 (24%) had other psychiatric diagnoses, and 47 (59%) also had a current or past history of substance use disorder. The average age of the participants was 42.87 (*SD* = 7.93) years old. The average age of the participants at their first hospitalization was 31.56 (*SD* = 10.57) and their mean Global Assessment Scale score (GAS) (American Psychiatric Association, 1994) was 46.63 (*SD* = 10.19).

Trauma Recovery Group

Logistics. Groups were led by two co-therapists (one male, one female), and began with 6–8 clients. A total of five different therapists led the 11 groups that the present report is based on. As the material taught in the group was cumulative, it was a closed group with no new clients joining after the first session. Homework assignments were developed at the end of each session for clients to review information or practice skills taught in the sessions, which were then discussed at the beginning of the next session. Clinicians throughout the mental health center were informed about the nature of the group and its purpose. In addition, monthly meetings were held between the group leaders and the case managers of clients in the group. At these meetings, clients' progress in the group was reviewed, problems related to PTSD were identified, and case managers were taught the rudiments of cognitive restructuring so that they could support their clients in learning and using this skill to deal with negative emotions, including trauma-related emotions.

Content. The general outline for the Trauma Recovery Group is summarized in Table 1. The group begins with an *orientation,* including a brief description of when and for how long the group will meet and the different topics covered in it. As part of the orientation, group members are provided with a definition of "trauma," which is followed by discussing the possibility that anxiety or other PTSD symptoms could temporarily increase over the next few weeks as clients learn more about PTSD and begin to face their traumatic experiences. The first session concludes with teaching *breathing retraining*, a technique for coping with anxiety and reducing overall arousal

levels (Foa & Rothbaum, 1998; Rygh & Sanderson, 2004). The second session focuses on *education* about the nature of trauma and the symptoms of PTSD, while the third session addresses common symptoms or problems associated with PTSD, including depression, anxiety, guilt, substance use problems, and interpersonal difficulties (e.g., difficulties with sexual relationships). These educational sessions are taught in a lively, interactive style with clients encouraged to talk about their own symptoms and the effects on their lives.

The fourth session begins the teaching of *cognitive restructuring skills*. Clients are introduced to this through a discussion about the relationship between thoughts and emotions, and the concept that all emotional reactions to situations are determined by implicit thoughts or beliefs about those (and related) situations (Beck, 1995). These thoughts and beliefs can be influenced by an individual's personal history (e.g., traumatic experiences), and they may or may not accurately reflect the truth about the situation at hand. Thus, while it is "normal" and understandable why people who suffered a great deal of physical and sexual abuse while growing up might experience pervasive anxiety as adults due to concerns of personal safety, not all of these worries are objectively supported in every situation (e.g., people are not especially vulnerable to victimization when they are shopping for groceries in the middle of the day). Examples are used to illustrate how different types of thoughts in a given situation can lead to different feelings, and to emphasize that some thoughts are more accurate than others. Following this explanation, group members are introduced to the *common styles of thinking*, which are common cognitive distortions that contribute to negative feelings, based on the styles described by Burns (1980) (e.g., overgeneralization, catastrophizing). During this session and the next two sessions different common styles of thinking are discussed, clients are encouraged to identify situations in which they have engaged in one of the styles, and homework assignments are given to practice identifying common styles related to unpleasant feelings.

In session 7, after clients are familiar with the common styles of thinking, they are introduced to the *five steps of cognitive restructuring* (Mueser et al., 2004b), which include: (1) describe the situation; (2) identify the strongest negative feeling in that situation; (3) identify the thought underlying that feeling; (4) challenge the thought (i.e., generate evidence supporting the thought and evidence against it); and (5) take action! (i.e., if the thought is not supported by the evidence, change it to a more accurate one; if the thought is supported by the evidence, develop a plan for coping with the situation).

TABLE 1

Outline of Trauma Recovery Group

Session #	*Topic*
1	Orientation
1	Breathing retraining
2–3	Education
4–15	Cognitive restructuring
16–18	Coping skills
19–20	Developing a recovery plan
21	Graduation and termination

Group leaders familiarize participants with the five steps of cognitive restructuring by first working on less intense, day-to-day negative emotions. Then, gradually over time, clients work towards addressing more intense emotions related to trauma-related thoughts, with a particular focus on widely endorsed beliefs from the Post-traumatic Cognitions Inventory (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). The group context gives participants an opportunity to validate each others' experiences and to normalize their reactions to trauma, while also providing feedback to help people modify their inaccurate thoughts (e.g., someone who believes she is responsible for having been sexually abused as a child, someone who thinks he is a weak person because he has trouble coping with memories of physical abuse suffered as a child). Using the steps of cognitive restructuring, clients explore their feelings associated with these thoughts, challenge the thoughts by evaluating the evidence for and against them, and develop alternative and more accurate thoughts to replace them. For situations in which an objective evaluation of the evidence indicates that a particular thought *is* supported by the available evidence (e.g., a client in a new relationship worries that a verbally abusive boyfriend may become physically abusive), attention turns to developing a plan for dealing with the situation (e.g., setting clear limits with the boyfriend regarding verbal aggression, terminating the relationship).

When teaching cognitive restructuring is completed, the next three sessions focus on enhancing *coping with symptoms*. One session is held for each PTSD symptom cluster: re-experiencing, avoidance, and overarousal. Each session follows the same format. The nature of the symptom cluster is briefly discussed and clients' experiences with persisting symptoms are explored. Next, different coping strategies for managing problematic symptoms are generated and written on a flip chart. Then, clients evaluate the advantages and disadvantages of the different coping strategies, and develop a plan for implementing one or two of the selected strategies.

After the meetings on coping with PTSD symptoms, two sessions are conducted in which clients develop *personal recovery plans*. This involves identifying personal goals, strengths, vulnerabilities, and resources. Then a recovery plan is developed to achieve these goals, with problem-solving used to deal with possible obstacles to success. At the end of these sessions, group members share their personal recovery plans with other members, and are encouraged to share them with their primary case manager/clinician. The final session includes a *graduation*, in which clients are given a certificate of completion of the Trauma Recovery Group, and discuss the progress they have made in the group.

Measures

Clients provided information regarding trauma exposure, PTSD symptoms, knowledge of PTSD, trauma-related cognitions, and depression. *Trauma exposure* was measured with the Trauma History Questionnaire (THQ) (Green, 1996), modified for persons with SMI (Mueser et al., 1998). *PTSD* was assessed with the PTSD Checklist (PCL) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), which was administered at baseline to the client by a clinician, and subsequently by self-report. The THQ and PCL have been shown to be reliable and valid in persons with SMI (Mueser et al., 2001), with diagnosis of PTSD based on the PCL significantly correlated with diagnosis based on the Clinician Administered PTSD Scale (Blake et al., 1995).

Understanding of PTSD was assessed with the Knowledge of PTSD Test, which is a self-report measure containing 15 true/false or multiple choice items. This test was developed by our research group in order to measure understanding of PTSD (e.g., characteristic symptoms) and it has been shown to be sensitive to change following a brief psychoeducational intervention for PTSD (Pratt et al., 2005). *Trauma-related*

cognitions were assessed using an early version of the Post-traumatic Cognitions Inventory (PTCI) (Foa et al., 1999) containing 90 items. This self-report measure requires respondents to indicate their agreement with trauma-related beliefs on a 7-point Likert scale, with high numbers corresponding to endorsement of more negative thoughts and beliefs. For the analyses reported here, the sum of the 36-items on the later version of the PTCI was employed (Foa et al., 1999).

Depression was assessed with the Beck Depression Inventory (BDI) (Beck, Steer, & Garbin, 1988), which is a self-report measure that has been widely used in a range of clinical populations.

Procedure

Clients throughout the mental health center were provided a description of the Trauma Recovery Group by their clinician. Interested clients were then referred to an informational session, based on the research introduction group approach described by Drake, Becker, and Anthony (1994). These sessions were conducted weekly or biweekly by one or two of the group leaders prior to the start of each group. At this session clients were given an explanation of the purposes of the group, a description of the topics covered in it, eligibility criteria, and the nature of the research assessments. Clients who were interested in participating were invited to stay after the group to meet with one of the leaders (or an appointment was set). At this individual meeting the client could ask further questions if needed, sign informed consent, and complete the eligibility assessments, including the THQ and PCL. Clients who met eligibility criteria were scheduled to complete the remaining measures at a second meeting (PTSD Knowledge Test, PTCI, and BDI). The PTSD-related measures (PTSD Knowledge Test, PCL, and PTCI) and the BDI were administered again at post-treatment and the 3-month follow-up to all clients who were willing to complete them, regardless of their degree of participation in the group. In addition, the PTSD-related measures were given after the completion of the educational component of the program (Session #3), and the PCL was also administered at the end of the cognitive restructuring component of the program (Session #15).

Clients were not paid for completing the assessments because there were no research funds to support the evaluation of the program. Each client was assigned a study number for data collection in order to assure confidentiality of the participants. The study was approved by the Institutional Review Boards of Dartmouth College and the State of New Hampshire.

Statistical Analyses

We evaluated the outcomes of group participants using both intent-to-treat analyses with the whole sample of clients who attended at least one group session, and separately for the treatment completers and dropouts. We defined treatment "completers" as clients who participated in more than half the group sessions (11 or more sessions) and dropouts" as clients who participated in 1–10 sessions. Data were missing at some time points for clients who could not be contacted or refused to participate in the follow-up assessments.

We first summarized the rates of trauma exposure in the overall study sample and severity of PTSD symptoms on the PCL. Next, we compared clients who completed the baseline assessment but no follow-up assessments with clients who completed the baseline and at least one follow-up assessment on the demographic characteristics and baseline measures using t-tests (for continuous variables) and (χ^2 tests (for categorical variables). We then conducted similar analyses for the group of clients with baseline

and follow-up assessment data, comparing the treatment completers to the dropouts. Because of the small sample size, limited power, and missing data at the post-treatment and follow-up assessments, we conducted statistical analyses (within group *t*-tests for continuous variables, McNemar tests for change in PTSD diagnosis) on change from baseline to post-treatment, follow-up, and last observation separately within the full intent-to-treat sample, within the treatment exposed clients, and within the group of clients who dropped out. Probability levels for rejecting the null hypothesis were set at $p < .05$ for all tests.

RESULTS

Table 2 provides a summary of the traumatic events identified on the THQ for the full study sample. The average total PCL score for the full study sample at the baseline assessment was 64.10 (SD = 9.03). The mean of the B (re-experiencing) symptoms was 18.60 (SD = 3.75), the mean of the C (avoidance) symptoms was 26.18 (SD = 4.13), and the mean of the D (overarousal) symptoms was 19.40 (SD = 3.50), which corresponds to between the anchors of bothered "moderately" and "quite a bit."

There were no differences in age, age at first hospitalization, gender, substance abuse, marital status, living situation, or education between those participants who only completed the pre-assessment (N = 39) and those who completed a pre and post-assessment (N = 41). There were also no differences between these two groups on baseline measures of depression, knowledge, PCL, or PTCI. However, there was a difference on GAS (42.66 vs. 49.76; $t = -2.94$, $df = 64$, $p < .01$), such that individuals with higher GAS scores were more likely to have completed both pre- and post-assessment measures. There were also differences in work status in that people who were working were more likely to have completed a pre- and post-assessment (6/35 vs. 17/37; ($\chi^2 = 6.86$, $p < .01$). The average number of sessions attended by the clients who attended at least one group but only provided pre-assessment data was 7 sessions (SD = 5).

In the total sample of 80 clients, 12 attended no group sessions (11 clients who provided pre-treatment assessments only, 1 client who provide pre- and post-assessment). For the other 68 clients, 40 (59%) completed 11 or more groups and were designated "treatment completers," and 28 (41%) completed 1–10 sessions and were designated "dropouts." Among the 41 clients for whom we had pre- and post-data, one (2%) did not attend any sessions, 31 (76%) were treatment completers (mean sessions attended = 16), and 9 (22%) were dropouts (mean

TABLE 2

Prevalence of Trauma Exposure

	Men			*Women*			*Total*		
Trauma	*Frequency*	*%*	*n*	*Frequency*	*%*	*n*	*Frequency*	*%*	*n*
Military service: war zone or combat	0	0.0	13	0	0.0	53	0	0.0	66
Ever been in a serious accident	7	53.8	13	27	50.9	53	34	51.5	66
Ever been in a natural disaster	3	23.1	13	14	26.4	53	17	25.8	66
Childhood sexual abuse	5	38.5	13	37	69.8	53	42	63.6	66
Adult sexual assault	0	0.0	13	41	78.8	52	41	63.1	65
Attacked by anyone with a weapon	7	53.8	13	34	64.2	53	41	62.1	66
Ever been attacked with intent to kill	11	84.6	13	38	71.7	53	49	74.2	66
In other situation where you were injured	5	38.5	13	28	52.8	53	33	50.0	66
Any other situation where feared you'd be killed	6	46.2	13	29	54.7	53	35	53.0	66
Witnessed someone seriously injured or killed	11	84.6	13	30	56.6	53	41	62.1	66
Close friend or family member deliberately killed	2	18.2	11	12	23.5	51	14	22.6	62

sessions attended = 5). There were no differences between the treatment completers and dropouts on any of the demographic or diagnostic characteristics, or on any of the outcome variables measured at baseline.

Changes over treatment and at follow-up for the treatment completers, the dropouts, and the full sample for the primary continuous outcome variables (BDI, Knowledge Test, PTCI, and PCL) are summarized in Table 3. There were significant differences on the BDI for the full group between baseline and post-treatment, baseline and follow-up, and baseline and the last data point carried forward ($t = 2.48$, $df = 28$, $p < .05$; $t = 3.28$, $df = 28$, $p < .01$; $t = 2.93$, $df = 36$, $p < .01$, respectively). Similar differences were found for the treatment completers ($t = 3.52$, $df = 25$, $p < .01$; $t = 3.23$, $df = 20$, $p < .01$; $t = 2.96$, $df = 27$, $p < .01$, respectively). There was a significant difference between baseline and post-treatment for the dropouts ($t = 5.43$, $df = 2$, $p < .05$), but not between baseline and follow-up or last data point carried forward. In each analysis on the full group and the treatment completers the scores decreased after the baseline assessment. In contrast, the dropouts scored higher on the BDI at post-treatment.

All of the scores on the PTSD Knowledge Test at baseline were close to the maximum score of 15, resulting in a ceiling effect for this measure. There were significant differences on the PTSD Knowledge Test for the full group and for the treatment completers between baseline and post-treatment ($t = 2.38$, $df = 25$, $p < .05$; $t = 2.60$, $df = 22$, $p < .05$, respectively). In the analysis on the full group and the treatment completers the scores on the Knowledge Test significantly increased at post-test, but these gains were not maintained over time.

There were significant differences on the PTCI for the full group between the baseline and post-education, baseline and post-treatment, baseline and follow-up, and baseline and the last data point carried forward ($t = 2.78$, $df = 18$, $p < .01$; $t = 4.57$, $df = 32$, $p < .001$; $t = 3.69$, $df = 27$, $p < .001$; $t = 4.45$, $df = 39$, $p < .001$, respectively). Similar differences were found for the treatment completers ($t = 5.61$, $df = 29$, $p < .001$; $t = 3.96$, $df = 19$, $p < 001$; $t = 4.86$, $df = 30$, $p < .001$; $t = 2.79$, $df = 18$, $p < .01$, respectively). There was a significant difference between baseline and post-treatment for the dropouts ($t = 4.77$, $df = 2$, $p < .05$). In each analysis on the full group and the treatment completers the scores declined over time. In contrast, the dropouts scored higher on the PTCI at post-treatment.

There were significant differences on the PCL for the full group between baseline and post-cognitive restructuring, baseline and

TABLE 3

Means and Standard Deviations for Each Outcome Measure

	Full		*Tx. Completers*		*Dropouts*	
Measures	*M*	*SD*	*M*	*SD*	*M*	*SD*
BDI						
Baseline	31.07	10.97	29.97	11.09	34.74	10.29
Post-ed	–	–	–	–	–	–
Post-CR	–	–	–	–	–	–
Post-treatment	23.30*	13.49	21.55**	12.79	39.00*	10.15
Follow-up	23.94**	16.30	21.60**	16.54	30.38	14.71
Last forward	24.16**	15.31	21.86**	15.13	31.56	14.20
Knowledge Test						
Baseline	13.77	2.08	13.60	2.21	14.44	1.31
Post-ed	14.17	1.51	14.13	1.57	14.49	1.21
Post-CR	–	–	–	–	–	–
Post-treatment	14.46*	1.36	14.47*	1.43	14.37	.88
Follow-up	14.14	1.65	14.21	1.56	13.91	2.04
Last forward	14.20	1.59	14.29	1.54	13.92	1.83
PTCI						
Baseline	158.65	27.51	156.84	27.64	164.89	27.73
Post-ed	134.64**	35.54	134.64***	35.54	–	–
Post-CR	–	–	–	–	–	–
Post-treatment	127.94***	38.66	122.60***	35.31	181.33*	33.50
Follow-up	127.46***	44.12	116.00***	43.06	156.16	34.06
Last forward	131.48***	42.54	122.42**	40.03	162.67	37.42
PCL Total						
Baseline	64.37	9.15	63.81	9.50	66.33	8.02
Post-ed	64.17	9.21	64.55	9.27	61.50	9.61
Post-CR	55.70**	13.12	55.70**	13.12	–	–
Post-treatment	51.55***	14.61	50.10***	14.53	66.00	3.00
Follow-up	51.80***	15.87	48.50***	15.79	60.88	12.93
Last forward	52.83***	14.95	50.32***	14.90	61.44	12.22

Note. *$p < .05$, **$p < .01$, ***$p < .001$. BDI, Beck Depression Inventory; PCL, PTSD Checklist; PTCI, Posttraumatic Cognitions Inventory.

For the entire group the Ns ranged from 18 to 40, for the treatment completers Ns ranged from 18 to 31, and for the dropouts the Ns ranged from 0 to 9. The BDI was administered at only at baseline, post-treatment, and follow-up. The Knowledge Test and the PTCI were administered at baseline, post-education, post-treatment, and follow-up. For the PTCI, higher ratings indicate greater endorsement of negative cognitions. The PCL was administered at baseline, post-education, post-cognitive restructuring, post-treatment, and follow-up.

post-treatment, baseline and follow-up, and baseline and the last data point carried forward ($t = 2.87$, $df = 17$, $p < .01$; $t = 5.06$, $df = 32$, $p < .001$; $t = 5.21$, $df = 29$, $p < .001$; $t = 5.27$, $df = 39$, $p < .001$, respectively). Similar differences on the PCL were found for the treatment completers ($t = 2.87$, $df = 17$, $p < .01$; $t = 5.53$, $df = 29$, $p < .001$; $t = 5.27$, $df = 21$, $p < .001$; $t = 5.22$, $df = 30$, $p < .001$, respectively), but not the dropouts. In each analysis on the full group and the treatment completers the scores dropped over time.

There were significant differences in PTSD diagnosis for the full group between baseline and post-education, baseline and post-cognitive restructuring, baseline and post-treatment, baseline and follow-up, and baseline and the last data point carried forward ($\chi^2 = 21.13$, $df = 1$, $p < .001$; $\chi^2 = 5.56$, $df = 1$, $p < .05$; $\chi^2 = 8.76$, $df = 1$, $p < .01$; $\chi^2 = 8.53$, $df = 1$, $p < .01$; $\chi^2 = 14.40$, $df = 1$, $p < .001$, respectively). Similar differences in PTSD diagnosis were found for the treatment completers ($\chi^2 = 17.29$, $df = 1$, $p < .001$; $\chi^2 = 5.56$, $df = 1$, $p < .05$; $\chi^2 = 6.53$, $df = 1$, $p < .01$; $\chi^2 = 4.55$, $df = 1$, $p < .05$; $\chi^2 = 9.32$, $df = 1$, $p < .01$, respectively). There was a significant difference between baseline and follow-up and baseline and last point carried forward for the dropouts ($\chi^2 = 4.50$, $df = 1$, $p < .05$; $\chi^2 = 5.44$, $df = 1$, $p < .05$, respectively). In each analysis the number of people meeting criteria for PTSD decreased over time. These results are summarized in Table 4.

TABLE 4

Percentage of Individuals Meeting Post-traumatic Stress Disorder (PTSD) Diagnosis

	Full Meeting Criteria (%)	*Treatment Completers Meeting Criteria (%)*	*Dropouts Meeting Criteria (%)*
Baseline	100	100	100
Post-ed	91***	89***	100
Post-CR	78*	78*	–
Post-treatment	76**	73**	100
Follow-up	77**	73*	88*
Last forward	80***	77**	89*

Note. *$p < .05$, **$p < .01$, ***$p < .001$. PTSD diagnosis was assessed at baseline, post-education, post-cognitive restructuring, post-treatment, and follow-up.

DISCUSSION

The results of this pilot study support the feasibility of providing cognitive-behavioral treatment for PTSD for persons with SMI in a group format. Retention in the Trauma Recovery Group was moderately high, with 59% of clients who attended at least one session completing the program. This rate of retention is comparable to other group-based interventions for PTSD in special populations. For example, two studies of Seeking Safety (Najavits, 2002), a group intervention for persons with PTSD and co-occurring substance use disorders, have reported treatment retention rates of 63% (Najavits, Weiss, Shaw, & Muenz, 1998) and 61% (Hein, Cohen, Miele, Litt, & Capstick, 2004).

Further evidence that the program was tolerable to the clients was found in the fact that treatment completers did not differ from dropouts on any demographic, diagnostic, or symptom severity measures at baseline, although power to detect any differences was low. Thus, more symptomatic clients were not more likely to dropout of the group. Although treatment dropouts did not differ from treatment completers, clients with higher functioning on the GAS were more likely to provide post-treatment and follow-up data. This finding could be related to the format used for the assessments conducted in the study. All of the primary outcome measures were administered using self-report scales, which may have been more difficult for lower functioning clients to complete.

In addition to establishing the feasibility of the program, the results suggest that participation in the Trauma Recovery Group was associated with improvements in PTSD and related problems. Treatment completers demonstrated significant improvements from the baseline assessment to post-treatment and follow-up in PTSD symptoms and diagnosis, as well as depression and trauma-related cognitions. In contrast, clients who dropped out of the group generally showed modest increases in symptoms from baseline to post-treatment, and then a return to their baseline level of symptoms at the three-month follow-up assessment. These findings suggest that participation in the group contributed to clinical improvement in PTSD and other symptoms, although controlled research is needed to more definitively address this question. The results also raise the question of whether some participation in the program, followed by dropping out, may have "stirred up memories," leading to a temporary increase in PTSD symptoms and depression. Alternatively, it is possible exacerbations in other symp-

toms could have contributed to some clients dropping out of the group and continuing to report distressing symptoms. Additional clinical efforts to maximize retention in the Trauma Recovery Group may be critical to avoid any untoward effects of premature dropout.

Interestingly, treatment completers demonstrated significant improvements in trauma-related cognitions from the baseline to after the introductory parts of the intervention (orientation, crisis planning, breathing retraining, and education: sessions 1–3), and showed further improvements after cognitive restructuring (sessions 4–15), at the end of treatment, and at the three-month follow-up (Table 3). In contrast, improvements in PTSD symptoms tended to lag behind changes in post-traumatic cognitions, with significant effects emerging only after completing the cognitive restructuring component. These findings suggest that changes in trauma-related cognitions may mediate changes in PTSD symptoms, as hypothesized by Ehlers and Clark (2000).

Several limitations of this study deserve mention. First, the study was not a randomized controlled trial, and therefore improvements observed among the treatment completers could have been due to factors other than participation in the group. Second, the composition of the study sample lacked racial/ethnic diversity, although it was representative of the general population of persons served in the Manchester, New Hampshire area. Third, the sample size was relatively small and only one-third of the participants were men, limiting the ability to explore potential gender differences in response to the intervention. Fourth, the study sample included clients with a diverse range of different psychiatric disorders, most of whom were taking a variety of medications, making it impossible to explore interactions between psychiatric diagnosis and treatment response, or to remove the possibly confounding effects of medication. However, it should also be noted that the diagnostic heterogeneity of the study sample, and the inclusion of clients regardless of medication regimen, are also strengths of this study because the findings are more generalizable to typical mental health service settings where persons with SMI receive treatment. This is in sharp contrast to the preponderance of research on psychotherapeutic interventions for PTSD, which have routinely ruled out clients with comorbid psychiatric disorders and health conditions, as well as individuals taking prescription medications (Spinazzola, Blaustein, & van der Kolk, 2005).

In summary, the results of this pilot study support the feasibility of conducting cognitive-behavioral treatment for PTSD in mixed gender

groups of clients with SMI in a typical community mental health center setting. The Trauma Recovery Group had acceptable levels of treatment retention, and was associated with significant improvements at the end of treatment and at the three-month follow-up in PTSD diagnosis and symptom severity, trauma-related cognitions, and depression. The apparent impact of the program on PTSD symptoms and depression raises the question of whether it might also be effective for clients with trauma-related symptoms but who do not meet full diagnostic criteria for PTSD. These encouraging results suggest that a more rigorous evaluation of the Trauma Recovery Group is warranted.

ACKNOWLEDGMENTS

The authors appreciate the contributions of Margaret Almeida, Monica Descamps, Jessica Hamblen, Barbara Helmstetter, M. Kay Jankowski, Stanley D. Rosenberg, and Rosemarie Wolfe to the development of the Trauma Recovery Group and conducting this pilot study.

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