



Effectiveness of cognitive–behavioral trauma treatment for incarcerated women with mental illnesses and substance abuse disorders

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ABSTRACT

An open trial design was used to examine the implementation and effectiveness of a cognitive–behavioral intervention (Seeking Safety) for comorbid post-traumatic stress disorder (PTSD) and substance use disorder (SUD) for incarcerated women with Axis I mental disorders who self-referred for specialty trauma treatment. The study sample was female inmates aged 18 and old who were primarily minority, had experienced childhood-based trauma, committed violent crimes, had a serious mental illness, and resided in maximum, medium, and minimum compounds of a women's prison. A total of 74 women completed the group intervention, with the average attending 23 of the 28 sessions (82%). Implementation feasibility was demonstrated by the ability to recruit, screen, assign, and retain participation. Effectiveness was supported by changes pre–post intervention on the PTSD Checklist (ES = 0.56) and Global Severity Index (ES = 0.47). Of the 19 completers with PCL scores of 50 or higher pre-intervention, 16 (84%) had scores below 50, the “cut score” consistent with or supportive of a PTSD diagnosis. Three-quarters or more of participants reported that Seeking Safety was helpful in each of the following areas: overall, for traumatic stress symptoms, for substance use, to focus on safety, and to learn safe coping skills. Future directions include the need for larger scale randomized controlled trials in medium or maximum security prisons and fidelity evaluations of non-research dissemination efforts.

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1. Introduction

Incarcerated women report high rates of physical, sexual, or emotional abuse during their formative years and often into adulthood (Wolff, Shi, & Siegel, 2009), mental illnesses (Covington, 2003; Wolff, 2008), and addiction problems (Bloom, Owen, & Covington, 2003). Overall, half or more of incarcerated women reported experiencing at least one traumatic event in their lifetime (Sacks, 2004). Rates of trauma are highest among incarcerated women with mental disorders. An estimated 74.3% of incarcerated women with a mental disorder experienced a traumatic event prior to age 18, with 60.5% also reporting a traumatic event after age 17. The comparable rates for incarcerated women without a mental disorder were 48.2 and 41.9%, respectively (Wolff & Shi, 2009). Prevalence rates for physical and sexual victimization among female inmates were also found to be significantly higher for inmates with a mental disorder than those without a mental disorder, and these rates were higher than those reported for community samples (Blitz, Wolff, & Shi, 2008; Wolff, Blitz, & Shi, 2007).

Not surprisingly, the prevalence of post-traumatic stress disorder (PTSD) among incarcerated women is also elevated. Teplin, Abram, & McClelland (1996) estimated rates for current PTSD among female jail detainees at 23.3% the second most common behavioral health disorder (with the first being substance use disorder (SUD)). PTSD and SUD often co-occur in incarcerated (Wolff et al., 2011; Zlotnick, 1997) and community samples (Helzer, Robins, & McEvoy, 1987; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kulka et al., 1990). Based on a sample of 209 incarcerated women who self-referred for trauma treatment, 79% were found to have comorbid PTSD and SUD (Wolff et al., 2011). In community samples, women with current PTSD were 1.4–5.5 times more likely to have a co-occurring SUD than their counterparts without PTSD (Helzer et al., 1987; Kessler et al., 1995; Kulka et al., 1990). A recent epidemiologic study of a sample of female inmates seeking trauma treatment found that two-thirds of these females had a serious mental illness (67%); 88% had PTSD (full or sub-threshold) and significant and complex histories of traumatic event exposure and 87% had a SUD (Wolff et al., 2011).

The epidemiologic evidence indicates a clear need among incarcerated women for trauma-informed behavioral health interventions. In response, guidelines published by the National Institute of Corrections called for integrated interventions that

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target the co-occurrence of trauma, PTSD, and SUD among incarcerated women (Hills, Siegfried, & Ickowitz, 2004). Several cognitive-behavioral interventions have been developed to treat comorbid PTSD and SUD among women (Hien, Cohen, Miele, Litt, & Capstick, 2004). Seeking Safety (SS), a present-focused cognitive-behavioral therapy designed to target trauma/PTSD and SUD (Najavits, 2007), is the only effective treatment intervention for co-occurring PTSD and SUD identified by the *International Society for Traumatic Stress Studies Practice Guidelines* (2009). This manualized intervention covers 25 topics addressing the cognitive, behavioral, interpersonal, and case management needs of persons with both trauma/PTSD and SUD, and focuses on deficits found in the incarcerated population, including impulsiveness, social maladjustment, and emotional dysregulation.

Research evidence on SS is not straightforward on primary outcomes related to trauma symptoms and substance use. In non-correctional samples, SS has been found effective in reducing PTSD symptoms in pre-post intervention comparisons but these pre-post changes were only significantly superior to non-specific, standard treatment comparison groups (Gatz et al., 2007; Hien et al., 2004). In comparisons with manualized relapse prevention or health education programs, no statistically significant differences were found for PTSD outcomes between SS and these comparison groups (Hien, Cohen, & Campbell, 2009; Hien et al., 2004). For women with more severe PTSD and substance abuse problems at baseline, SS was found to be more effective in reducing PTSD symptoms than a manualized health education program when both SS and health education programs were coupled with standard substance abuse treatment (Hien, Campbell, Ruglass, Hu, & Killeen, 2010). The performance of SS on substance use outcomes has been mixed. Substance abuse outcomes in studies of SS have been found to worsen over time (Desai, Harpaz-Rotem, Najavits, & Rosenheck, 2008); improve over time but not relative to non-standardized controls (Gatz et al., 2007); improve over time and relative non-standardized controls (Hien et al., 2004); improve over time but not relative to manualized controls (Hien et al., 2004); and not change over time or between conditions (Hien et al., 2009).

In terms of secondary outcomes, SS in pre-post intervention comparisons has been found to improve coping skills (Gatz et al., 2007); self-esteem, the medical measure of the 12-item Short-Form survey, hypervigilant behavior, and days homeless (Desai, Harpaz-Rotem, Najavits, & Rosenheck, 2009); social support (Desai et al., 2008, 2009); suicide risk, suicidal thoughts, social adjustment, family functioning, problem solving, depression (Najavits, Weiss, Shaw, & Muenz, 1998); and HIV risk (Hien et al., 2010). When compared to alternative interventions, Seeking Safety had superior secondary outcomes in the following domains: HIV risk (Hien et al., 2010); avoidant behavior and social support (Desai et al., 2009); coping skills (Gatz et al., 2007); and social support (Desai et al., 2008, 2009).

What works for samples of women with co-morbid PTSD and SUD in non-correctional settings does not necessarily transfer to women in correctional settings (Lewis, 2006). Setting differences as well as psychopathology and behavioral differences between incarcerated and non-incarcerated samples may marginally impact the effectiveness of SS. For this reason, several studies have explored the effectiveness of SS in correctional settings. In a small feasibility study ($n = 17$) of SS, significant improvements were found in PTSD symptoms post-intervention and legal and substance use six-weeks post-release from prison (Zlotnick, Najavits, Rohsenow, & Johnson, 2003). Another study, comparing 59 incarcerated women with comorbid PTSD and substance use to a wait-listed group ($n = 55$), found significant improvements in PTSD and depression symptoms for the SS participants compared to the wait-listed group (Lynch, Heath, Mathews, & Cepeda, 2012). The RCT study ($n = 49$) compared SS to a non-trauma-oriented substance abuse treatment program. No significant differences were found between conditions

on measures of PTSD symptoms, substance use, or psychopathology, although for both programs significant pre-post intervention improvements were found for each of the measures (Zlotnick, Johnson, & Najavits, 2009). None of the studies of SS has focused exclusively on incarcerated women with serious mental illnesses, nor with women who were in maximum security housing units.

This study was designed to test the implementation and the effectiveness of SS for women who self-referred for trauma treatment; screened positive for an Axis I disorder, PTSD (full or sub-threshold), and SUD; and were residing in maximum, medium, or minimum security compounds of a prison for women. The feasibility part of the study tests the ability to implement a group therapy intervention focusing on trauma and SUD in a prison setting. Incarcerated women may be reluctant to fully participate in group therapy about trauma if they feel safety and confidentiality cannot be assured. It also may be difficult to secure and maintain recruitment when other treatment, social services, and academic programming is available and where the dynamics within the prison setting can result in unpredictable movements to other units or settings. Feasibility in this study focused on recruiting, screening for, and retaining participation in SS without any compensation for participation (either in terms of good time credits or interview payments). Effectiveness was measured pre-post intervention using treatment outcomes. This is the first study using a sample of incarcerated women with Axis I mental disorders (in addition to PTSD) and primarily violent offenses, located in the general population units of a prison, including maximum, medium, and minimum security compounds, and with a sample size over 60 assigned to SS.

2. Method

2.1. Study overview

The purpose of this open clinical trial was to provide implementation and effectiveness data on a group therapy modality of SS provided to incarcerated women with mental illnesses in addition to PTSD and SUD housed in general (non-therapeutic) population.

2.2. Participants

The study population was English-speaking females, age 18 years or older, with trauma histories who resided at an adult women's correctional facility (population ~850) located in a north-eastern state and had at least 30 weeks left to serve at the adult prison as of August 1, 2009. The study was announced in monthly inmate newsletters and at presentations given in housing units by the investigators. Interested subjects could self-refer for participation in their housing units, during the orientation presentation, or by sending a note to the study mailbox at the prison. Subjects volunteered to participate in treatment and did not receive compensation or prison credits (i.e., "good time" credits) for participation. They did receive three note cards for each assessment interview. Written informed consent was required prior to study participation. The appropriate university Institutional Review Board and the agency research review committee approved the protocol, recruitment and consent procedures, and consent form.

A total of 209 females (mean age = 34.0, $SD = 9.4$) aged 18 or older participated in the screening: 105 (50.2%) were African American, 65 (31.1%) non-Hispanic White, 33 (15.8%) Hispanic, and 6 (2.9%) were other race or ethnicity. Volunteers were screened over a 10-month period and were assigned to SS within three months of being determined eligible for the study. Of the 154 who screened positive for all three eligibility criteria and also met time and English language requirements, 147 initially agreed to participate in the

study and 76% ($n = 111$) of the eligible participants were assigned to Seeking Safety. There was no significant difference in the age, race, violent crime, serious mental illness, or education level characteristics between the eligible group ($n = 147$) and the assigned group ($n = 111$). Of the 111 assigned to Seeking Safety, 74 (67%) completed the program, i.e., they were enrolled at the beginning and end of the intervention. People “completed” the program if they had no more than two unexcused absences (absences were excused for medical, legal, or personal visits, or institutional irregularities that prevented movement) and did not voluntarily drop out of the program.

2.3. Clinical assessment procedures and instruments

Clinical interviews were administered by masters-level, clinically trained social workers or psychologists and were conducted in private rooms. The interviewers were trained and supervised by Ph.D.-level researchers with experience administering these instruments in clinical and research settings related to PTSD and serious mental illnesses (Frueh et al., 2005). Assessments took approximately 2 h to administer. Assessments were conducted from July 2009 through April 2010.

The initial diagnostic clinical interviews included the following instruments: the Clinician–Administered PTSD Scale (CAPS), to diagnosis lifetime and current full or sub-threshold PTSD; the Structured Clinical Interview for DSM-IV-Non-Patient Version (SCID-NP), to assess other Axis I disorders, including alcohol and substance abuse or dependence disorder; and the Trauma History Questionnaire and the Life Stressor Checklist-Revised (LSC-R), to assess trauma history. All clinical measures are commonly used to assess traumatized populations (Elhai, Gray, Kashdan, & Franklin, 2005) and were scored in standard fashion.

Diagnostically, full PTSD was defined as having a qualifying traumatic event, one re-experiencing symptom, three avoidance symptoms, and two arousal symptoms with the presence of co-occurring significant distress and impairment. Sub-threshold PTSD classification required a qualifying traumatic event, one re-experiencing symptom and either three avoidance or two arousal symptoms with the presence of co-occurring significant distress and impairment (Desai et al., 2008).

2.4. Intervention

Seeking Safety (SS), a manualized program, was developed to promote trauma recovery and to treat SUD in people with co-occurring mental illness (including serious mental illness) (Najavits, 2002). SS, while designed for individual or group therapy formats, was implemented in a group therapy format. Two clinicians led the 19 SS groups held from August 2009 to November 2010. One clinician, hired by the research team, was a LCSW therapist with 10 years of clinical practice. The other clinician had a MA degree in psychological counseling with approximately three years of clinical experience. Both clinicians completed the DVD SS training modules, were observed by an associate of Dr. Lisa Najavits, founder of SS, and supervised by a Ph.D. level researcher with over 20 years of experience in trauma counseling and research. The subjects were provided with 23 of the 25 handouts within the SS manual, excluding handouts on Community Resources and the Life Choices Game. The 23 handouts were covered over 28 sessions, with several handouts covered over two sessions. The handouts were organized in a binder. Groups of 6–12 participants met with the clinician for 90-min, twice a week for 14 weeks (a 42-h intervention). Participants agreed to attend each scheduled session and were dropped from the group if they had more than two unexcused absences. The attendance requirement was modeled on the institution’s policy regarding program participation whereby attendance is either mandatory or voluntary with

termination after two unexcused absences. We opted for the later. Of the 74 participants completing the study, 81% attended at least 22 or more of the scheduled sessions. In seven cases, participants were re-classified from medium to minimum security and were re-assigned to the concurrent SS group (matched by clinician) offered on the minimum security compound.

2.5. Feasibility and effectiveness assessment

Feasibility of implementation was assessed by recruitment and retention rates, as well as through exit interviews with those who dropped out of treatment and focus groups with those who completed. Effectiveness was measured pre- and post-intervention using the Brief Symptom Inventory (BSI), an established self-report measure of psychological symptoms, and the PTSD Checklist (PCL), a 17-item self-report measure of PTSD symptoms based on DSM-IV criteria. Focus groups were conducted with participants who completed the intervention to elicit their opinions about the program. Prior to the focus groups, participants were asked to complete the Client Satisfaction Questionnaire (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) and the End-of-Treatment Questionnaire (Najavits, 1994). Focus groups were conducted with two to eight subjects, lasted approximately 45–60 min, and were conducted within two weeks of completing the program. All assessments were conducted by trained research assistants.

2.6. Analysis

The primary outcome variables were pre–post intervention change in the total score for the PCL and Global Severity Index (GSI)—mean of all 53 items of BSI. The pre- and post-PCL and GSI scores were used in the effect size analysis. Participants were classified into mental disorder, race, education, offense, and facility groups for subgroup analyses. Mental disorder was classified as serious mental illness (inclusive of psychotic disorders, bipolar, and major depression) and other Axis I disorders (inclusive of anxiety disorder, dysthymic disorder, depressive disorder, other mood disorder and adjustment disorder). The significance level used to assess the validity of the null hypotheses was $p < 0.05$ and $p < 0.01$. Proc means, freq, ttest and corr of SAS 9.2 were used to construct all statistics.

3. Results

The study sample of 74 incarcerated women who self-referred to trauma treatment and completed the SS intervention were, on average, 36 years old, African American, serving time for a violent crime, had a serious mental illness (SMI), full PTSD, and a substance use disorder (see Table 1). Of the 61 participants with a SMI, 46 (75%) had major depression and 15 (25%) bipolar disorder. The majority of participants with bipolar disorder ($n = 10$, 67%) and major depression ($n = 26$, 57%) had a co-occurring anxiety disorder. Those with a non-SMI Axis I disorder ($n = 13$) had depression only ($n = 2$); depression and anxiety disorders ($n = 5$); anxiety only ($n = 5$); and adjustment disorder ($n = 1$). The trauma experiences of these women were severe and first occurred before age 18 and continued into adulthood. Approximately three-quarters of the women reported trauma that was life threatening or resulted in serious injury. Comparatively, sexual victimization was more likely to occur in childhood, while physical victimization was more prevalent in adulthood. Although no significant differences were found in trauma characteristics by type of mental disorder (serious or other), women with serious mental disorders reported more physical, sexual, and both types of trauma, and trauma events that resulted in serious injury (not shown).

Table 1
Demographic, behavioral, and trauma characteristics of study sample.

Characteristics	Total (n = 74)
Age (mean ± SD)	36.0 ± 10.0
Race: (%)	
White	36.5
African American	43.2
Hispanic	16.2
Other	4.1
Violent crime (%)	63.5
Serious mental illness ^a (%)	82.4
Substance use disorder (%)	100
PTSD, full (%)	87.8
PTSD, sub threshold (%)	12.2
Trauma age of onset (mean ± SD)	16.9 ± 9.4
Trauma event type (%)	
Physical	64.9
Sexual	66.2
Both physical and sexual	32.4
Level of harm (%)	
Life threatening	73.0
Serious injury	77.0
Threat to physical integrity	82.4
Childhood trauma/violence (%)	
Physical	39.2
Sexual	64.9
Adulthood trauma/violence (%)	
Physical	78.4
Sexual	40.5
Overall LSC ^b score (mean ± SD)	15.2 ± 3.7

^a Includes anyone with diagnosis a psychotic disorder, bipolar disorder, or major depression.

^b Life Stressor Checklist.

3.1. Feasibility of implementing group intervention

The first aim of this study was to determine whether it was feasible to implement group therapy focusing on trauma in non-therapeutic units of a prison. Feasibility was measured by recruitment, retention, and group cohesion. In terms of recruitment, less than 5% ($n = 7$) of the self-referred sample who met the screening criteria declined participation in the trauma intervention. Of those who declined, three were relocated to a halfway house and were no longer eligible and four declined for personal reasons, particularly “not being ready to deal with issues.” A total of 147 eligible participants agreed to participate and 111 were assigned (subjects were screened over a 10-month period and were assigned within 3 months of being screened positive). A total of 36 eligible participants were not assigned to treatment: 10 relocated to the halfway house; 8 went to lock for institutional violations; and 18 either declined treatment or dropped out of the study prior to being assigned.

In terms of retention, of the 111 participants assigned to SS, 74 completed the intervention. The reasons for not completing the intervention were: relocated to the halfway house ($n = 5$); went to lock for violation ($n = 15$); and dropped from program because missed more than two sessions ($n = 2$) or dropped out because of

Table 2
Mean (SD) comparisons of primary outcomes at baseline and end of intervention by mental disorder.

Mean raw score (SD)	Baseline N = 74			End of intervention N = 74		
	Combined group N = 74	Serious mental disorder ^a N = 61	Other Axis I disorder N = 13	Combined group N = 74	Serious mental disorder ^a N = 61	Other Axis I disorder N = 13
GSI	0.74** (0.59)	0.79** (0.62)	0.51 (0.30)	0.50 (0.48)	0.53 (0.52)	0.36 (0.25)
PCL	38.4** (15.8)	39.4** (16.4)	33.5 (12.1)	29.9 (11.6)	30.2 (11.8)	28.2 (11.2)

** p value < 0.01; * p < 0.05 using paired t -test.

^a Includes anyone with diagnosis a psychotic disorder, bipolar disorder, or major depression.

disinterest ($n = 9$) or other personal issues ($n = 6$). Exit interviews were conducted with non-completers. Of those who voluntarily dropped out ($n = 15$), the reasons provided were: did not wish to continue the work ($n = 9$); had scheduling conflicts ($n = 3$); had conflicts with group members ($n = 2$); and had conflict with therapist ($n = 1$).

The completers, on average, attended 82% of the 28 sessions (range = 13–27 and mean = 23). Variation in number of sessions existed across the groups due to prison movement limitations. Excused individual absences included unit lock down, medical or court visits, movement disruptions, other unavoidable movement restrictions. The vast majority of participants reported feeling safe in the Seeking Safety groups, with 82.4% reporting feeling safe “a whole lot” and 10% reported feeling safe “quite a bit.” Three participants reported feeling “not at all” or “a little bit” safe in the groups.

Group cohesion was explored in the focus groups. Participants reported “being comfortable enough in the environment to share, open up, and get positive feedback,” “feeling safe enough to express my feelings with someone who doesn’t judge and always listens,” “[felt she] could share in the group,” “that [she] was able to open up and talk about some of the things that [she] never felt comfortable talking about,” and “[felt] comfortable to say a whole lot about [her] own personal issues.” Participants “loved” their groups and felt very safe and supported by other group members and the therapist. When asked what they liked most of about SS, participants said “the group!” “the small therapy groups” and “the group and how open [and] safe I could be.” They liked the groups because “we are alike and we give each other that love, understanding, caring, trust and we all had a bond with each other and our leader.” This was a repeated theme among focus groups. The women had bonded together in their recovery and learned that “I wasn’t alone,” felt willing and able to “express the real me,” because in the setting they could “talk without fear of being judged.” The participants felt they could be honest and open because they were confident that “what I say stays in group.” One participant reported that “we could openly discuss our traumas with confidentiality and confidence and to know that we were not alone.”

3.2. Effectiveness for completers

A pre-post design was used to identify treatment effects associated with SS. For the full sample, the average change in the PCL symptom score was 8.5 ($p < 0.0001$). The average change in the PCL doubled (22.8, $p < 0.0001$) for the group with PCL > 49 at baseline ($n = 19$). Of the 19 participants with PCL scores above 49 at baseline, 16 (85%) had scores below 50, the “cut score” consistent with or supportive of a PTSD diagnosis. For a single group pre-post study design, an effect size around the medium (0.5) range was calculated for the GSI (ES = 0.47) and PCL (ES = 0.56). Using paired t -tests, a significant decrease was found in PTSD symptoms (measured by the PCL) and mental health symptoms (measured by the GSI) from pre- to post-intervention (see Table 2). Significant decreases

Table 3
Mean comparisons of primary outcomes at baseline and end of intervention by race.

Mean raw score (SD) ^a	GSI				
	Combined group N = 74	White N = 27	African American N = 32	Hispanic N = 12	Other N = 3
Baseline	0.74** (0.59)	0.73** (0.50)	0.64 (0.55)	1.10* (0.79)	0.46 (0.57)
End of intervention	0.50 (0.48)	0.39 (0.27)	0.51 (0.58)	0.75 (0.55)	0.48 (0.32)
Mean raw score (SD) ^a	PCL				
	Combined group N = 74	White N = 27	African American N = 32	Hispanic N = 12	Other N = 3
Baseline	38.4** (15.8)	37.4** (12.9)	38.7** (18.1)	41.3 (15.7)	32.0 (21.0)
End of intervention	29.9 (11.6)	27.6 (8.9)	30.4 (13.9)	32.5 (10.6)	34.7 (11.4)

**p value < 0.01; *p < 0.05 using paired t-test.

^a Standard deviation.

Table 4
Mean comparisons of primary outcomes at baseline and end of intervention by education.

Mean raw score (SD)	Baseline N = 74			End of intervention N = 74		
	Combined group N = 74	GED/HS or higher N = 49	Less than HS N = 25	Combined group N = 74	GED/HS or higher N = 49	Less than HS N = 25
GSI	0.74** (0.59)	0.71** (0.53)	0.79 (0.69)	0.50 (0.48)	0.46 (0.35)	0.59 (0.67)
PCL	38.4** (15.8)	35.5** (12.9)	44.0** (19.5)	29.9 (11.6)	28.6 (9.5)	32.3 (14.9)

**p value < 0.01; *p < 0.05 using paired t-test.

were also found in PTSD symptoms from pre- to post- intervention for serious mental disorder group (Table 2), Whites and African Americans (Table 3), all education subgroups (Table 4), violent and non-violent offense types (Table 5), and maximum and minimum security compounds (Table 6). GSI scores significantly improved for serious mental disorder group (Table 2), Whites and Hispanics (Table 3), the GED or higher education subgroup (Table 4), violent offense type (Table 5), and maximum and minimum security compounds (Table 6). While change scores for the primary outcomes were not correlated with the number of group sessions attended

(PCL: $r = -0.09089$, $p = 0.4412$; BSI: $r = 0.00277$, $p = 0.9813$), changes scores for the PCL and BSI pre-post intervention were positively correlated ($r = 0.59384$, $p = <0.0001$).

3.3. Satisfaction with Seeking Safety

At the end of the intervention, participants completed an End-of-Treatment Questionnaire, which consisted of questions about what their experience with Seeking Safety (SS) and their overall assessment of the handouts, group leader, and discussion

Table 5
Mean comparisons of primary outcomes at baseline and end of intervention by offense type.

Mean raw score (SD)	Baseline N = 74			End of intervention N = 74		
	Combined group N = 74	Violent offenders N = 47	Non-violent offenders N = 27	Combined group N = 74	Violent offenders N = 47	Non-violent offenders N = 27
GSI	0.74** (0.59)	0.76** (0.61)	0.70 (0.55)	0.50 (0.48)	0.49 (0.52)	0.52 (0.42)
PCL	38.4** (15.8)	38.1** (15.6)	38.9* (16.5)	29.9 (11.6)	29.2 (12.0)	31.0 (11.1)

**p value < 0.01; *p < 0.05 using paired t-test.

Table 6
Mean comparisons of primary outcomes at baseline and end of intervention by facility.

Mean raw score (SD)	Baseline N = 74			End of intervention N = 74		
	Combined group N = 74	Max N = 49	Ground N = 25	Combined group N = 74	Max N = 49	Ground N = 25
GSI	0.74** (0.59)	0.78** (0.61)	0.65* (0.53)	0.50 (0.48)	0.56 (0.54)	0.39 (0.33)
PCL	38.4** (15.8)	40.4** (15.9)	34.3* (15.1)	29.9 (11.6)	30.5 (12.0)	28.6 (11.0)

**p value < 0.01; *p < 0.05 using paired t-test.

groups. The questionnaire ratings ranged from 1 (not at all) to 5 (a whole lot). Three-quarters or more of participants reported that SS was helpful overall (mean=4.7, SD=0.54), for trauma (mean=4.4, SD=0.78), for substance use (mean=4.2, SD=0.94), to focus on safety (mean=4.5, SD=0.69), and to learn safe coping skills (mean=4.7, SD=0.53). The mean score (based on a 4-point Likert scale with 1 = poor and 4 = excellent) for the Client Satisfaction Questionnaire was 3.4 (SD=0.58) for the extent to which “SS met your needs;” 3.8 (SD=0.43) for “SS helped you to deal more effectively with your problem;” 3.7 (SD=0.58) for “satisfaction with SS;” and 3.9 (SD=0.46) for “would you recommend the program to a friend.”

4. Discussion

4.1. Feasibility of treatment implementation

The results obtained from this open trial support the feasibility and acceptability of implementing cognitive-behavioral therapy, particularly Seeking Safety for female prison inmates with PTSD, SUD, and other serious mental illnesses. Among the females in this self-referred sample, 74% (154/209) met screening criteria, of those 95% (147/154) initially agreed to participate in treatment, of those 76% (111/147) were assigned to treatment, and of those 67% (74/111) completed treatment. This means that 48% (74/154) of those who met screening criteria were treatment completers. Of those who agreed to participate but either did not start or did not complete treatment ($n=73$), a substantial number ($n=15$) were unable to complete the intervention because of factors outside of their control, such as being relocated to a halfway house, while another group ($n=23$) were locked down for institutional violations. Qualitative results from focus groups with treatment completers indicated that participants had extremely favorable perceptions about the group dynamics; they reported feeling safe enough with others in the group to talk about their trauma and to be honest and open.

4.2. Effectiveness

Clinical results of this open trial offer support for the effective treatment of PTSD among female inmates with PTSD, SUD, and other serious mental illnesses. Treatment completers showed significant improvements from pre- to post-treatment on overall PTSD symptoms and global severity of illness, with medium effect sizes for both domains. On average, for the full sample of completers, PCL scores decreased by 8.5 points, a 22% reduction from the baseline average. Of the 19 completers with PCL scores greater than 49 at baseline, 16 (84%) had scores post-treatment that were below 50, with an average change score of 22.8 points. For the group with PCL scores below 50 at baseline ($n=55$), the average change in the PCL score was 3.5 points (paired t -test, $p=0.0093$). PTSD symptoms declined significantly across all education, offense, and security level subgroups. Results clearly show that participants who remained in the treatment tended to benefit from it and were satisfied with the treatment they received. Furthermore, there were no adverse events associated with any aspect of the intervention and no participants' clinical status deteriorated significantly during the course of the study. Thus, clinical outcome efficacy for PTSD in this underserved and difficult to treat population is extremely promising.

4.3. Study strengths and limitations

There are several important and novel aspects to this study. First, the study shows that it is feasible to implement Seeking Safety in housing units classified for inmates with maximum,

medium, and minimum security risks. We were able to recruit participants from these three housing units, fully engage their participation in group therapy, and retain their participation without incentives, as well as hold groups on these compounds without movement or custody problems. Second, the results show highly positive clinical outcomes in a sample of adult females with early and complex trauma histories, substance abuse, high levels of psychiatric comorbidity, impaired functioning, and criminal justice involvement for violent offenses. The strength of the clinical effect may partially reflect several implementation features: closed group enrollment and a strict attendance policy, which standardized the “dosage” of the intervention. Previous studies in correctional and community samples allowed for open group enrollment and/or lenient attendance, adding imprecision to the dosage and affecting group cohesion (Hien, Cohen, & Campbell, 2009; Hien et al., 2004; Hien, Wells, et al., 2009; Lynch et al., 2012; Zlotnick et al., 2009, 2003). To more accurately measure “dose” and to model implementation practices in correctional settings (i.e., mandatory attendance), we implemented a more structured design. Strict attendance policies may be particularly beneficial for groups with histories of adherence and compliance problems. The sample in this study is difficult to treat because of their disorders' severity and complexity, criminal histories, and incarceration status. They have been almost completely excluded from clinical research with PTSD, and represent an underserved and understudied population. Third, the sample is heavily minority based (43% African-American, 16% Hispanic), and results support the clinical effectiveness and acceptability of the intervention among these participants.

Despite its merits, this study also has important methodological limitations. This is an open-trial, allowing for potential Type I error and limiting conclusions related to causality of the intervention. In addition to all the usual methodological limitations of cross-sectional and self-report research, this study has several additional limitations. First, we did not measure substance abuse outcomes or risk factors to substance use (e.g., motivation to change, addiction-related beliefs). Because researchers have a duty to report substance abuse among incarcerated persons, we did not ask participants to report substance use. Future research with this population, however, could explore changes in addiction-related thinking and readiness for change as an intermediate outcome measure. Second, our primary trauma outcome measured PTSD symptoms and changes in symptoms, which were not confirmed through a clinically administered instrument, such as the SCID or CAPS. Prior research, however, has found the PCL to be highly correlated with the CAPS (Blake, Weathers, Nagy, Kaloupek, & Klauminzer, 1990), have good diagnostic efficiency, and robust psychometric properties (Andrykowski, Cordova, Studts, & Miller, 1998). Relatedly, without follow-up interviews at three, six, or 12 months, it is not clear whether the measured changes in outcomes endured post-intervention. Third, two of the 19 groups were facilitated by one clinician and, as such, the change measured in symptoms could be fully or partially attributed to the style of the facilitator, not the SS intervention itself. Fourth, the drop-out rate for our study was higher than average (33%) for effectiveness trials, although similar to the 34% and 38% rate reported, respectively, by Gatz et al. (2007) and Lynch et al. (2012). This drop-out rate is a reflection of the impaired role-functioning and chaos that characterizes the life of these adults, which contributes to their security status and institutional misconduct. Participants in more secure units can be expected to engage in misconduct that results in their movement to disciplinary units. Examination of completers and non-completers in this study suggests that the two groups were not significantly different from each other at baseline on demographic, comorbidity, or psychological symptoms, with the notable exception of age (non-completers: $N=37$, mean age 32; completers:

$N = 74$, mean age 36). Given the correlation between younger age and criminal behavior and misconduct, it is not surprising that older participants, compared to their younger counterparts, were more likely to complete the intervention, primarily by not getting institutional charges that resulted in being removed from general population.

4.4. Future directions

The findings regarding implementation feasibility and treatment effectiveness are quite encouraging and warrant further research. Randomized controlled longitudinal trial designs are needed to test effectiveness over time and ascertain causality of treatment effects (disentangling them from clinician effects) in this population. Comparison strategies might include “treatment as usual” or other variations of multi-component cognitive-behavioral interventions, such as those developed for veterans or severely mentally ill adults with PTSD (Beidel, Frueh, Uhde, Wong, & Mentrikoski, 2011; Frueh et al., 2009). These clinical studies should examine outcomes on a broad array of relevant variables, including PTSD, depression, anxiety, and substance abuse domains—as well as costs and association with institutional violations and reentry outcomes. For example, does reducing PTSD severity reduce other psychiatric symptoms or criminogenic risks? Does it improve role functioning or facilitate community reentry in measurable ways? In addition, research should examine effectiveness of interventions for male inmates who also have high rates of trauma and PTSD (Crisanti & Frueh, 2011; Epperson et al., 2011) and make up the vast majority of prisoners in the U.S. Efforts to simplify or shorten the 42-h intervention might also be important to improve feasibility, as this is a high number of sessions relative to most cognitive-behavioral interventions and no correlation was found between number of sessions completed and primary outcomes. Briefer group therapies (e.g., Bradley & Follingstad, 2003; Cole, Sarlund-Heinrich, & Brown, 2007) have found similar effects with incarcerated women. In previous studies, the Seeking Safety group modality intervention has ranged from 48 h (Lynch et al., 2012) to 24 h (Hien, Cohen, & Campbell, 2009; Hien et al., 2004; Hien, Wells, et al., 2009) of group therapy, with shorter interventions often used when Seeking Safety is coupled with a substance abuse treatment program (Hien, Cohen, & Campbell, 2009; Hien et al., 2004; Hien, Wells, et al., 2009). Deconstructing interventions may help with this by identifying treatment components (e.g., social skills training, anger management, trust exercises) that are most clinically relevant and beneficial. We also need further study of strategies to reduce drop-out and improve session attendance (Lefforge, Donohue, & Strada, 2007). Eventually, research efforts will be needed to disseminate efficacious treatments for PTSD in this population (Cahill, Foa, Hembree, Marshall, & Nacash, 2006; Frueh, Grubaugh, Cusack, & Elhai, 2009), integrating it with existing interventions and criminal justice programs for inmates and parolees in order to improve behavioral healthcare for this underserved group (Epperson et al., 2011).

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