

Seeking Safety Therapy for Adolescent Girls with PTSD and Substance Use Disorder: A Randomized Controlled Trial

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Abstract

This randomized, controlled trial evaluated a manualized psychotherapy, Seeking Safety (SS), for posttraumatic stress disorder (PTSD) and substance use disorder (SUD) in adolescent females. To our knowledge, no prior study has evaluated any psychotherapy designed for this population. SS was compared to treatment as usual (TAU) for 33 outpatients, at intake, end-of-treatment, and 3 months follow-up. SS evidenced significantly better outcomes than TAU in a variety of domains at posttreatment, including substance use and associated problems, some trauma-related symptoms, cognitions related to SUD and PTSD, and several areas of pathology not targeted in the treatment (e.g., anorexia, somatization). Effect sizes were generally in the moderate to high range. Some gains were sustained at follow-up. SS appears a promising treatment for this population, but needs further study and perhaps additional clinical modification.

Introduction

Adolescents are at risk for both substance use disorder (SUD) and posttraumatic stress disorder (PTSD), as well as their combination.¹ For example, rates of PTSD in adolescent SUD samples (community and clinical) are estimated at 11% to 47%.¹ Adolescent girls are at particular risk. They have higher rates of PTSD than boys;² and their rate of SUD has increased, becoming for the first time comparable to boys' in the past decade.³ Clinically, those with the dual diagnosis show worse psychosocial functioning than those with just one of the diagnoses, both in adolescent and adult samples.^{1,4}

There has been little research on adolescents with the dual diagnosis of PTSD–SUD, and thus far no treatment studies using a manual designed for this population.¹ In adult samples,

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psychotherapy trials have found positive results by using manualized treatments specific to the dual diagnosis (see reference numbers 5 and 6). A theme across these efforts is the notion that treating both disorders at the same time (integrated treatment) is likely to be more effective than traditional sequential treatment, in which SUD is treated first and PTSD treatment is delayed.

*Seeking Safety*⁷ (SS) was the first psychotherapy for the dual diagnosis with published outcome results.⁵ In adult samples, it has been applied to women and men, group and individual format, and a variety of settings (e.g., inpatient, residential). Positive outcomes have been reported in each of the adult studies where it has been implemented thus far, including women in prison,⁸ urban low-income women,⁹ outpatient women,⁵ men,¹⁰ women in a community mental dual diagnosis program,¹¹ women with PTSD,¹² and veterans.¹³ All of these were uncontrolled pilot studies except that of Hien et al.,⁹ which was a randomized controlled trial.

This article describes the results of a randomized controlled trial of SS in adolescent girls compared to treatment as usual. Adaptation to their developmental level is described below.

Methods

Participants

Thirty-three outpatient adolescent girls were randomized to either SS plus treatment as usual (TAU) ($n = 18$), or TAU alone ($n = 15$). The sample size was relatively small due to the exploratory nature of this project. All girls met the inclusion/exclusion criteria for the study and completed the intake assessment. Informed consent was obtained from the girls' legal guardians, with assent obtained from the girls. Patients were obtained through posted fliers (e.g., at local bus stops, laundromats, and bookstores), and active recruitment from local clinics, hospitals, schools, and clinicians. All met current DSM-IV criteria for both PTSD and SUD, with most ($n = 31$, 93.9%) having substance dependence, the most severe form of SUD. They also had to report active substance use within the past 60 days, a more stringent criterion than DSM-IV to ensure a sample that was actively using substances. Patients were excluded if they had a history of bipolar I disorder (mania), psychotic disorder, were mandated to treatment, or had characteristics that would interfere with treatment completion (mental retardation, homelessness, impending incarceration, or a life-threatening illness). Sample size for SS was determined from an outcome study of adult women,⁵ which had obtained positive outcomes with 17 women.

Treatment

Seeking safety

This coping skills therapy targets current PTSD and SUD. The treatment manual⁷ has 25 topics representing cognitive, behavioral, and interpersonal domains. Each topic offers a "safe coping skill" relevant to both disorders, such as Asking for Help, Compassion, Setting Boundaries in Relationships, and Honesty. The treatment has five principles: (1) safety as the priority; (2) integrated treatment of both disorders; (3) a focus on ideals; (4) four content areas: cognitive, behavioral, interpersonal, and case management; and (5) attention to therapist processes. SS was designed as a stand-alone intervention, but patients can be in external treatments. The treatment is described in a manual,⁷ book chapters (see reference number 14), website (www.seekingsafety.org), and videos (see reference number 15).

Adaptation of seeking safety for adolescents

The goal was to adhere closely to the original manual, while also modifying it for adolescents' developmental level. Modifications were as follows: (1) conveying the material verbally if a

patient resisted reading handouts; (2) talking “in the displacement” to evoke deeper feelings (e.g., “What if that happened to a friend?”); (3) discussing trauma details if the girl chose to (labeled “trauma discussion” below); (4) providing up to two unspecified sessions for topics outside the manual; (4) brief updates with parents, if the adolescent agreed to it.

Treatment as usual

All participants were allowed to attend any concurrent treatments they naturalistically sought (e.g., Alcoholics Anonymous, psychotropic medication, and other individual and group psychotherapies). This design is common in severe populations because restricting treatment would obtain a skewed sample (i.e., most patients are in multiple treatments). Thus, the question is the degree to which the experimental treatment provides greater benefit than TAU.

Protocol

Patients in SS were offered 25 sessions over 3 months, identical to its implementation in most prior studies. Parents were invited to attend one session (topic: Getting Others to Support Your Recovery). Patients received free treatment for completing assessments; they were not paid for session attendance. Sessions lasted for 50 min, in individual format. Both SS and TAU received nominal and identical payments for assessments. SS was conducted by the principal investigator (eight patients) or by one of two postdoctoral clinical fellows (female psychologists) under supervision from the PI based on didactic training, weekly reviews of session audiotapes, and adherence ratings. One had six patients, the other had four. Diagnostic assessments were conducted by the postdoctoral fellows under supervision from the PI based on audiotapes. Self-report measures were administered by bachelor-level research assistants. Randomization was at the case level. Assignment occurred immediately after intake completion, with staff blind to their assignment until informed by the PI. Urinalysis was obtained at the first session each week to promote honesty in self-report of substance use for both treatment and assessment. Urinalyses were not an outcome measure because of their nonrandom nature and inability to accurately detect the primary substances of the sample. Specifically, alcohol has low sensitivity (it is detectable only within a few hours), and marijuana has low specificity (it can appear positive up to a month later). Prior research shows patients with PTSD–SUD have very high correspondence between self-report and urinalysis.¹⁶

Measures

Major assessments were conducted at intake, end-of-treatment, and 3 months follow-up. Unless otherwise indicated, all measures were self-report, administered at major assessments, and scaled such that higher scores indicated greater impairment. Maximum sample sizes were as follows: at intake, 18 SS and 15 TAU; end-of-treatment, 14 SS and 12 TAU (79% of the original sample); and follow-up, 11 SS and 9 TAU (61% of the original sample). Sample sizes varied because of missing data on some measures or variables within measures. Missing data was attributable to either lack of attention or unwillingness of the respondent to answer all items or research assistant error (such as miscopying pages of a questionnaire). Such errors are typical in treatment outcome studies despite a high degree of effort to obtain complete data.

Participant characteristics

Several measures were obtained only at intake to describe the sample and evaluate the inclusion/exclusion criteria. Current PTSD diagnosis was from the Clinician Administered PTSD

Scale—Child and Adolescent Version (CAPS).¹⁷ Current SUD diagnosis was from the Adolescent Diagnostic Interview.¹⁸ Exclusionary diagnoses (lifetime manic or psychotic disorders) were from the Mini-International Neuropsychiatric Interview.¹⁹ A Timeline Interview²⁰ evaluated age of onset for PTSD and SUD. Lifetime trauma was assessed on the Trauma History Questionnaire (THQ).²¹

Attendance and outcome

Attendance at external treatments (service utilization) was assessed on the Teen Treatment Services Review interview (TTSR).²² It is scaled as number of days in the past 30 that each treatment type was used. Attendance at SS was tallied separately.

Outcome measures were selected for appropriateness in adolescents and psychometric characteristics. These were as follows. For substance abuse, the Personal Experiences Inventory (PEI)²³ was the primary measure. It has two sections: chemical involvement problem severity (153 items) and psychosocial problems (147 items), each with multiple subscales (see [Results](#)). Scaling varies based on the section, including frequencies and Likert ratings (e.g., “strongly agree”). Psychometric information is in the PEI manual. For cognition, three measures were used. Beliefs About Substance Use (BSU)²⁴ assesses SUD cognitions, scaled 1 to 7. Reasons for Using (RFU) is derived from a SUD expectancy questionnaire.²⁵ The questionnaire was modified to fewer items (16), the addition of trauma-related items, 0–4 scaling (“not at all” to “extremely”), and a stem/response format (e.g., “I use substances...to help me sleep”). The World Assumptions Scale (WAS)²⁶ assessed PTSD cognitions, which were scaled 1–6 (higher indicating positive cognitions). For psychopathology, two measures were used. The Adolescent Psychopathology Scale (APS)²⁷ has 346 items that provide 20 DSM-IV Axis I disorders, five DSM-IV Axis II disorders, eleven psychosocial problems, and three factor scores. Scaling varies, including true/false and frequencies (e.g., “almost never” to “nearly every day”). Psychometric information is in the APS manual. The Trauma Symptom Checklist for Children (TSCC)²⁸ addressed trauma-related symptoms. It has 54 questions (scaled 0–3, from “never” to “almost all of the time”) with six clinical subscales: anxiety, depression, anger, posttraumatic stress, dissociation, and sexual concerns. Psychometric information is in the TSCC manual.

Treatment satisfaction

The Client Satisfaction Questionnaire²⁹ was obtained at end-of-treatment and follow-up, scaled 1–4. The Helping Alliance Questionnaire, patient version (HAQ)³⁰ was obtained at session 3, end-of-treatment, and follow-up, scaled 0 to 4. For both, higher scores indicate greater satisfaction.

Adherence

The principal investigator (L.N.) evaluated the two other clinicians on the Seeking Safety Adherence Scale³¹ on a sample of 22 sessions, using full-session audiotapes. Higher scores indicate greater adherence.

Data analysis

Four topics were addressed: participant characteristics, attendance and outcome, treatment satisfaction, and adherence. Descriptive statistics were used for all. Also, two-tailed independent samples *t* tests and chi-square tests compared SS and TAU at intake. Univariate analyses of variance (ANOVA) evaluated differences between SS and TAU at each time point. To compare

the two across time, a full intent-to-treat (FITT) analysis was conducted by using random effects regression. FITT utilizes all data available at each time point, thereby increasing power. Both linear and curvilinear models were tested, and that with the highest log likelihood is reported. If any variable showed a significant difference at intake between the treatment and control conditions on the ANOVA (at 0.05 or below), the FITT analysis for that variable was conducted with covariance of that variable's intake levels (to conduct a more conservative test); only those still significant on the FITT after covariance are reported as positive outcome results. For all variables, effect size (Cohen's *d*) was also calculated. All measures were analyzed by using the scoring designed for them (e.g., totals and/or subscales). Results are reported at the conventional $P \leq 0.05$ as well as trends of $P \leq 0.10$. Trends are included because the small sample increases the likelihood of type II error. To address type I error, the total number of comparisons is reported so as to evaluate whether significant findings exceed chance levels. All outcomes indicate improvement unless otherwise noted. For intake description, if SS and TAU were not different, means are reported for the entire sample.

Results

Participant characteristics

Sociodemographics

Participants, whose average age was 16.06 years (SD = 1.22), consisted of 26 Caucasians (78.8%) and 7 of minority descent (21.2%). Breakdown by minority was 4 Asian/Pacific Islander (12.1%), 1 African American (3%), 1 Hispanic (3%), and 1 multiethnic (3%). No difference was found for age or minority status by study condition.

Substance use

Current substance dependence diagnoses per DSM-IV criteria at intake were cannabis 26 (78.8%), alcohol 22 (66.7%), hallucinogens 7 (21.2%), amphetamines 5 (15.2%), cocaine 3 (9.1%), opioids 3 (9.1%), inhalants 3 (9.1%), barbiturates 2 (6.1%), polysubstance 2 (6.1%), and PCP 1 (3.0%). Participants could have more than one diagnosis; thus, rates total more than 100%. Only two participants did not meet a dependence diagnosis; their substance abuse diagnoses were cannabis and alcohol. The two most prevalent diagnoses (cannabis and alcohol dependence) were not different for SS versus TAU.

Trauma/PTSD

From the THQ, the most common trauma category was sexual abuse ($n = 29$; 87.9%), followed by general disaster/accident ($n = 27$; 81.8%), physical abuse ($n = 24$; 72.7%), and crime ($n = 13$; 39.3%). On the Timeline Interview, the average age of first trauma was 8.75 (SD = 3.92) with PTSD onset at 11.91 years (SD = 3.85). PTSD arose first for 13 participants (39.4%), SUD first for 8 (24.2%), "can't say" or missing for 9 (27.3%), and both at the same time for 3 (9.1%). Most believed their PTSD and SUD were related ($n = 18$; 75%); six did not ($n = 6$; 25%), and 9 were "can't say" or missing. None of these variables differed by study condition.

Concurrent treatment

On the TTSR, there were no differences at any time point by study condition on service utilization. The categories were hospitalization, medication, any psychotherapy (group and/or individual), and self-help groups, all reported for number of days out of the past 30 that the patient

utilized such services. Means across the three time points ranged from 1.33 (SD = 3.60) to 2.63 (SD = 8.60) for hospitalization days; 15.09 (SD = 14.08) to 17.67 (SD = 17.29) for medication; 8.00 (SD = 13.89) to 18.25 (SD = 34.38) for any psychotherapy; and 0.33 (SD = 1.29) to 0.54 (SD = 1.47) for self-help. (The low use of self-help groups is notable).

Attendance and outcome

Attendance

The 18 SS patients averaged 11.78 sessions (SD = 6.25), of which most were Seeking Safety ($x = 9.67$, SD = 5.05) rather than trauma discussion ($x = 1.33$, SD = 2.09) or unspecified ($x = 0.78$, SD = 1.00). Some patients' inability to attend sessions (apparently due to problems relating to scheduling, transportation, hospitalization, or moving), lowered the mean below what might be expected in other treatment settings.

Outcome

Throughout this subsection, means are reported only for significant time points, with SS improving more than TAU unless noted otherwise.

Substance abuse

PEI was the main measure for this domain. Significant results are shown in Table 1. For part 1 (chemical involvement problem severity), seven of ten subscales showed significant outcomes, with SS better than TAU. Effect sizes ranged from 0.37 to 1.17. For subscales that were not significant, effect sizes were as follows: personal consequences of drug use, social-recreational drug use, and personal involvement with chemicals. For part 2 psychosocial section subscales were not significant on FITT (psychological disturbance, uncontrolled, peer chemical environment, absence of goals, family estrangement, sibling chemical use, spiritual isolation, rejecting convention, negative self-image; and family pathology). One psychosocial subscale, deviant behavior, was significant on the end-of-treatment ANOVA (but the FITT was not; 5.13 vs. 10.14, $F = 5.41$, $P < 0.05$, $d = 0.89$).

Cognition

SS evidenced more positive results than TAU on both a cognitive SUD measures (Reasons for Using), and a cognitive PTSD measure (the World Assumptions Scale subscale benevolence) (Table 1). Nonsignificant results occurred on the total score of the measure Beliefs about Substance Use, and two subscales of the World Assumption Scale (self-world and meaning).

Psychopathology

The APS assessed a broad array of Axis I and Axis II pathology. Significant outcome results are reported in Table 1, and indicate that SS outperformed TAU. On some subscales, ANOVA was significant at end-of-treatment, but the FITT was not. These occurred on the Axis II variable obsessive-compulsive (0.78 vs. 1.16, $F = 4.89$, $P = 0.04$; $d = 0.33$) and the factor score personality disorder (0.55 vs. 0.86, $F = 4.55$, $P = 0.05$, $d = 0.49$).

Nonsignificant APS subscales were as follows. For Axis I disorders: generalized anxiety disorder, bulimia, social phobia, panic disorder, oppositional defiant disorder, schizophrenia, conduct disorder, adjustment disorder, dysthymia, obsessive-compulsive disorder, attention

Table 1
Outcome results

| Domain/Scale | Intake | | | End of treatment | | | 3 months follow-up | | | Across time | | Effect size Cohen's <i>d</i> |
|--|-------------------|--------------|----------|-------------------|--------------|----------|--------------------|--------------|----------|----------------|------|---------------------------------|
| | Seeking Safety | TAU | <i>F</i> | Seeking Safety | TAU | <i>F</i> | Seeking Safety | TAU | <i>F</i> | FITT | | |
| Substance use | | | | | | | | | | | | |
| Personal Experiences Inventory ^a | 9.08 (6.36) | 13.92 (7.83) | 2.85 | 5.75 (5.57) | 14.29 (7.87) | 6.00* | 7.00 (8.73) | 14.29 (6.73) | 3.42 | 2.66** (2.38) | 1.12 | |
| Chemical involvement subscale | 6.33 (5.61) | 8.77 (5.75) | 1.15 | 4.25 (4.06) | 10.57 (7.91) | 3.98 | 3.90 (5.24) | 7.40 (5.86) | 1.70 | 2.58** (1.47) | 0.82 | |
| Effects from drug use | 7.83 (4.17) | 10.46 (5.77) | 1.68 | 4.50 (3.16) | 13.71 (7.74) | 9.60** | 5.30 (6.75) | 10.43 (6.29) | 2.51 | 2.13* (1.89) | 1.02 | |
| Polydrug use | 11.58 (5.96) | 14.54 (5.09) | 1.79 | 7.63 (6.65) | 17.86 (3.49) | 13.28** | 8.80 (7.35) | 12.43 (6.63) | 1.09 | 1.97* (1.99) | 0.98 | |
| Psychological benefits drug use | 15.00 (7.50) | 17.46 (5.59) | 0.88 | 7.75 (5.04) | 18.86 (7.13) | 12.41** | 9.60 (7.68) | 16.43 (7.25) | 3.40 | 1.88* (2.32) | 1.17 | |
| Transitional drug use | 7.00 (4.75) | 10.31 (4.11) | 3.48 | 5.00 (5.66) | 11.14 (4.18) | 5.57* | 5.90 (6.66) | 9.43 (2.51) | 1.76 | 2.68** (1.44) | .92 | |
| Preoccupation with drugs | 11.08 (6.08) | 15.62 (3.86) | 5.03* | 5.38 (3.54) | 17.00 (3.83) | 37.29** | 7.30 (6.83) | 14.00 (4.62) | 5.06* | 3.45** (1.71) | .37 | |
| Loss of control ^b | | | | | | | | | | | | |
| Cognition | | | | | | | | | | | | |
| Reasons for using | 1.19 (0.76) | 1.62 (0.64) | 2.75 | 0.64 (0.68) | 1.37 (0.38) | 6.70* | 0.84 (0.77) | 1.60 (0.82) | 4.03 | 2.07* (0.24) | 1.10 | |
| World Assumptions Scale—Benevolence | 3.45 (1.09) | 3.30 (0.84) | 0.16 | 4.36 (0.64) | 2.66 (0.77) | 24.44** | 3.85 (0.87) | 3.00 (1.06) | 3.18 | -2.07* (0.30) | 1.35 | |
| Psychopathology | | | | | | | | | | | | |
| Adolescent Psychopathology Scale | | | | | | | | | | | | |
| Axis I—Substance use disorder | 0.62 (0.43) | 0.84 (0.42) | 1.71 | 0.16 (0.23) | 0.69 (0.38) | 12.21** | 0.50 (0.24) | 0.52 (0.49) | 0.01 | 2.47** (0.12) | 0.94 | |
| Axis I—Anorexia ^b | 0.62 (0.60) | 1.07 (0.51) | 4.68* | 0.33 (0.42) | 1.24 (0.30) | 25.69** | 0.32 (0.47) | 1.21 (0.45) | 15.39** | 3.97** (0.16) | 2.02 | |
| Axis I—Somatization | 0.44 (0.44) | 0.65 (0.41) | 1.65 | 0.31 (0.54) | 0.92 (0.26) | 7.73** | 0.33 (0.35) | 0.77 (0.41) | 5.73* | 2.50** (0.14) | 1.27 | |
| Axis I—Major Depression | 0.76 (0.47) | 0.93 (0.38) | 1.07 | 0.65 (0.47) | 0.92 (0.33) | 1.41 | 0.90 (0.29) | 0.86 (0.30) | 0.06 | 14.72** (0.11) | 0.40 | |
| Trauma Symptom Checklist for Children ^a | | | | | | | | | | | | |
| Sexual concerns ^b | 5.25 (2.75) | 9.85 (7.26) | 5.49* | 2.22 (2.22) | 4.67 (3.67) | 2.62 | 2.67 (2.88) | 5.00 (4.73) | 1.07 | 5.31* (0.33) | 0.50 | |
| Sexual distress ^b | 1.63 (2.00) | 3.54 (2.26) | 5.86* | 0.56 (1.13) | 1.67 (1.50) | 3.29 | 1.08 (1.86) | 1.83 (1.94) | 0.47 | 5.08* (0.46) | 0.71 | |

Only significant FITT results are reported in this table; see text for results significant on ANOVA only and nonsignificant results. On all scales, higher scores indicate more pathology, except the World Assumptions Scale, on which a higher score signifies less pathology. For both subscales listed, months 1 and 2 were significant in *t* tests (see text). FITT: full intent to treat; TAU: treatment as usual.

Within parentheses are standard deviations, except for the FITT analysis, which is the standard error. **P* < 0.05; ***P* < 0.01.

^aThis measure was assessed at six-monthly time points, but only three are provided here to be consistent with the rest of the table.

^bThis variable remains significant in across-time analysis even when baseline levels were covaried.

deficit hyperactivity disorder, PTSD, depersonalization, sleep disorder, separation anxiety, and mania. For Axis II disorders: avoidant, paranoid, schizotypal, and borderline. For psychosocial problems: aggression, disorientation, introversion, suicide, anger, emotional lability, social adaptation, alienation–boredom, self-concept, substance use difficulties, and interpersonal problems. For factor scores: internalizing and externalizing.

The TSCC assessed psychopathology relevant to trauma-related symptoms, conducted monthly, i.e., six times from intake through follow-up. See Table 1 for the two subscales that had significant FITT results (sexual concerns and sexual distress). Also, each of these subscales showed significant differences at months 1 and 2: sexual concerns month 1 (2.67 vs. 7.17, $F = 4.72$, $P = 0.04$), and month 2 (2.55 vs. 8.44, $F = 13.20$, $P = 0.002$); sexual distress month 1 (0.56 vs. 2.67, $F = 5.52$, $P = 0.03$), month 2 (0.82 vs. 4.56, $F = 22.28$, $P < 0.000$). Nonsignificant subscales of the TSCC were anxiety, anger, sexual preoccupation, depression, PTSD, fantasy dissociation, overt dissociation, and dissociation.

Across the outcome measures, 76 variables were tested, of which 15 (20%) showed significance on the FITT. Thus, the number of positive results exceeds the number expected by chance (5% of 76, i.e., 3.75). Also, three additional variables were significant at end-of-treatment or follow-up but the FITT was not significant.

Treatment satisfaction

The mean on the Client Satisfaction Questionnaire was 2.76 (SD = 0.56) at end-of-treatment and 2.51 (SD = 0.56) at follow-up; these indicate moderate satisfaction on the 1–4 scale. On the HAQ, scaled 0–4, the mean was 2.42 at end-of-treatment (SD = 0.59), and 2.19 at follow-up (SD = 0.81), also in the moderate range. No significant differences were found on either of these two measures based on clinician assignment.

Adherence

Adherence was very strong, with means as follows on the 0–3 scale: on intervention items, 2.06 for adherence (SD = 0.41) and 1.60 for helpfulness (SD = 0.53); on process items, 2.14 (SD = 0.41).

Discussion

This is the first study to evaluate a manualized psychotherapy in adolescents with PTSD and SUD. SS therapy (individual format) was compared to treatment-as-usual in a randomized controlled trial. Positive outcomes favoring the SS condition were found in various domains including substance use and associated problems (on the Personal Experiences Scale and the Adolescent Psychopathology Scale), some trauma-related symptoms (on the Trauma Symptom Checklist for Children), cognitions related to SUD and PTSD (the Reasons for Using Scale and the World Assumptions Scale), and various psychopathology (on the Adolescent Psychopathology Scale). It is notable that on the latter scale, improvements were seen even on problems that were not targeted in the treatment (e.g., anorexia, somatization). Satisfaction and alliance by SS patients was in the moderate range. It is also notable that we found significant differences despite the relatively small sample size, and that all such differences favored SS over TAU. Attendance averaged close to 12 sessions, which is comparable to other therapy outcome trials,³² including some studies on SS with adult samples.⁹ Twelve sessions is also typical of many substance abuse treatment models.³³ The two conditions were not different on sociodemographics, amount of treatment received during the trial, primary SUD diagnoses, or trauma type, age, or onset, suggesting that gains achieved were likely due to the intervention.

Strengths of the study include its rigorous diagnoses at intake, adherence monitoring, use of measures designed for adolescents, recruitment of participants highly representative of the severe end of the spectrum for this dual diagnosis (e.g., young age of first trauma, most with substance dependence), an FITT statistical analysis, covariance of intake differences for variables where such occurred, and calculation of effect size in addition to statistical significance. The number and breadth of significant findings, in particular, given the small sample size, is notable. Also, effect sizes were largely in the moderate to high range, using Cohen's criteria of 0.20 for small, 0.50 for medium, and 0.80 for high.³⁴

Limitations

The study had several weaknesses, however, including small sample sizes (particularly at end-of-treatment and follow-up), the greater level of psychopathology in TAU at intake on some variables (despite randomization), the female-only sample, the restriction to outpatients; missing data on some patients and/or measures; and the multiple statistical testing. The TAU control also represents only an initial comparison, with the need for later studies to compare SS to other manualized treatments.

Implications for Behavioral Health

SS therapy has previously evidenced positive outcomes in adult samples and, in this first study in adolescent girls, appears to show initial promise. This is encouraging despite the preliminary nature of this study because it suggests that this highly prevalent dual diagnosis may be amenable to change early. The typical trajectory of the dual diagnosis is persistence into adulthood.⁴ Many authors have commented on the public health need to provide greater access to PTSD treatment, particularly as the diagnosis remains highly underdiagnosed across a variety of settings.^{35,36} The cooccurrence of SUD is known to create even more clinical challenge. A manualized treatment may aid clinicians by providing readymade handouts and guidelines, particularly when access to treatment is brief. Most adolescents in this study believed their PTSD and SUD were related, suggesting that even at this stage, they perceive the connection between the disorders. One said, for example, "The drinking helps me feel better so I don't think about the rape." It appears helpful to use these connections to motivate them to stop abusing substances, especially as their awareness of substance abuse problems may be limited during adolescence. As one girl said, "I just want to get high. My friends do it. If adults tell me it's bad, I don't believe them." The primacy of sexual and physical abuse in the sample is consistent with the literature on females with this dual diagnosis,^{1,37} and suggests a need for greater public health prevention efforts to protect against future incidents.

In this study, SS was largely conducted as it had been in adult samples, with some modification for adolescents' developmental level. Further adaptation may be needed for other settings (e.g., residential, day treatment) or with boys. The lack of maintenance of gains on many variables at follow-up suggests that SS may need to be longer and/or more intensive. SS patients may have experienced distress at having to terminate the treatment, an observation found in other studies of SS.^{5,38} This may be buttressed by the fact that, based on inspection of means, TAU patients do not appear to show this same lack of maintenance of gains on some variables (e.g., substance use) from end-of-treatment to follow-up. However, it is also possible that the sample size may simply have been too low to detect effects. It is notable that adolescents showed little interest in one modification: discussion of their trauma (which averaged 1.3 sessions). This converges with prior research in suggesting that some patients with the dual diagnosis may prefer a present-focused coping approach rather than a past-focused trauma discussion approach.¹⁰ Coffey et al.,³⁹ who have studied PTSD exposure therapy for this dual diagnosis, suggest that poor treatment candidates include those with

repetitive childhood abuse, marked dissociation, and/or inability to tolerate distress. No studies, however, have evaluated exposure therapy in an adolescent PTSD–SUD sample.

Further research is needed, both to expand on the results of this preliminary study, and to further evaluate the descriptive characteristics of this population. Greater understanding of the attendance rate (about half of available sessions) and satisfaction level (moderate) would also be useful. For example, it is unclear if their 12 session attendance rate represents an optimal amount of treatment (given the substantial effect sizes found and the superiority of outcome results for SS compared to TAU), or if some modification of the treatment would be needed to create higher attendance. The satisfaction level was lower than that found in adult samples in SS studies, and may reflect a need for more adaptation of the model for adolescents, or possibly a tendency for adolescents to generally rate treatment more negatively. Additional issues for future research include mechanisms of treatment (what aspects of SS are helpful, neutral, and unhelpful?), and differences in outcome based on clinician differences. Studying the effectiveness of methods for training clinicians in the model would also be a later stage of work.

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