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Comparative Efficacy of Family and Group Treatment for Adolescent Substance Abuse

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Due to the continuing prevalence of adolescent substance abuse, promising treatment models need to be developed and evaluated. Thus, the purpose of this study was to evaluate the efficacy of two promising models, Strengths Oriented Family Therapy (SOFT) and The Seven Challenges® (7C). Adolescents who qualified for outpatient treatment and agreed to participate in our study were randomly assigned to one of the two treatments and assessed at 3 and 6-months following baseline. Using a two-part, random-effects model, we examined the odds of achieving abstinence or full symptom remission between treatments and over time. For those not achieving full abstinence or full problem remission, we investigated whether frequency of use or symptom severity were reduced at follow-up. Participants in both SOFT and 7C demonstrated significant reductions in substance use and related problems, but treatments did not differ at 3 and 6 months following baseline. Overall, treatment services were delivered as planned. Both SOFT and 7C were efficacious with adolescents who abuse substances, as participants in both conditions were significantly more likely to be in symptom remission or abstinent at follow-up interviews versus at baseline. Replication studies are needed that address this study's limitations. (Am J Addict 2006;15:131–136)

As adolescent substance abuse continues to be a major societal problem with dire consequences, continued research is needed on the efficacy of promising drug treatment models.[1,2] Prior to the 1990's, only a few studies on drug treatment existed and these studies, for the most part, suffered from major design flaws, including poorly specified treatments, high treatment dropout in control conditions, poor documentation of service hours, nonstandard and insensitive outcome measures, and high follow-up attrition rates.[3] More recent studies have addressed these design flaws, but additional rigorous adolescent substance abuse outcome studies are needed.[4]

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BACKGROUND AND SIGNIFICANCE

Evaluating the efficacy of promising treatment approaches adds to our knowledge about adolescent substance abuse treatment by demonstrating their short-term impact. Based on initial results, researchers can decide if treatments are worthy of additional study and eventual dissemination.[5] If treatment models are found to be efficacious, they can be added to the arsenal of evidence-based treatments available to practitioners. Overall, the practice field has made it a priority to develop and implement evidence-based treatments. Additional studies are also needed on new and unique treatment models that differ in therapeutic orientation from existing models. This study addresses these needs by evaluating the efficacy of two new models for adolescent substance abuse, Strengths Oriented Family Therapy (SOFT) and The Seven Challenges® (7C).

Treatment Descriptions

Strengths Oriented Family Therapy (SOFT) Overview

Although some research has demonstrated positive outcomes for existing family therapy models, these models did not include components such as pre-treatment motivational sessions with parents, solution-focused language, or formal strengths assessments.[6,7] SOFT combines a pre-treatment motivational family session, solution-focused family therapy, multifamily skills training groups, and targeted case management to comprise a distinct family-based intervention.[8] Since SOFT has unique qualities, evaluating its efficacy could eventually

increase the number of evidence-based, replicable treatments. SOFT is thoroughly described elsewhere.[9]

Seven Challenges® (7C) Overview

7C treatment combines decision-making exercises, skills training, interactive journaling, and motivational interviewing concepts to treat adolescent substance abusers. The unique activities of this therapeutic approach include journaling and receiving feedback from clinicians on journal entries, careful therapist role definition, and use of peer-developed readings. This innovative approach shares components with other interventions such as the use of active listening and non-confrontational challenging, decisional balance activities, amplification of client ambivalence about change, and the use of the stages of change. Comprehensive descriptions of 7C exist elsewhere.[10,11]

Hypotheses

Clients in both treatments were expected to exhibit significant reductions in substance use and related problems. Based on previous literature, we did not expect that one condition would produce significantly better reductions in substance use frequency or related problems.[4,12]

METHOD

Setting

All procedures were approved by the University of Iowa's Institutional Review Board before any data were collected. The study was conducted in a catchment area that included both metropolitan and rural counties. Treatment services in this study were provided in collaboration with the Mid-Eastern Council on Chemical Abuse (MECCA), a private not-for-profit agency.

Intake/Follow-Up Procedures

Initially, adolescent participants were interviewed with the Global Appraisal of Individual Needs (GAIN-I) while the parent completed collateral measures (i.e., GAIN-CI). Then, a few days later, the youth and parent returned to discuss the results of the assessment.[13] At this feedback session, a therapist provided clinical recommendations and informed adolescents referred to outpatient treatment that they were eligible for our treatment study. A research assistant then met with eligible teens and their parents to invite them to participate. Active consents were obtained from both parent and teen. If the youth and parent chose not to participate, the family was referred directly to standard drug treatment at MECCA. Participants were then oriented to study procedures, signed consent documents, provided information used for follow up location, completed additional intake measures, and were randomized to condition. The youth returned for assessments at 3, 6, 9, and 12-months following baseline while parents were assessed only at 6 and 12 months following baseline. Enrollment into the randomized study began in June 2003 and ended in August 2005.

Participant Characteristics

Inclusion Criteria

These data are a subset of a larger longitudinal study comparing SOFT to 7C. Adolescents could be included in this study if they were: a) 12–18 years old, b) living in the catchment area or could commute, c) conversant in English, d) referred to adolescent outpatient treatment, and e) covered by either public or private insurance. For the current study, we selected cases that had completed both baseline and six-month assessments.

Out of 210 eligible adolescents, 103 (i.e., 49%) consented to participate. Five cases were excluded from analysis because it was determined after randomization that they did not meet study inclusion criteria. Of these, four had insurance difficulties, and one was randomized to SOFT but chose to enroll in 7C instead. We retained 92% and 92% of participants for 3 and 6-month follow-ups, respectively. The final analysis sample included 98 participants.

Demographic and Clinical Characteristics ($N = 98$)

The mean age of participants was 15.8 years. The sample was 29% female, 24% minority, 39% lived in a single-parent household, and 71% reported current juvenile justice system involvement. For the 90 days prior to intake, youth reported risky behaviors including, (a) using substances while driving, operating machinery, or playing sports (13%), (b) using substances at work, school, or while babysitting (31%), and (c) having unprotected sex (30%). Using data on past year symptoms, we diagnosed 1% with alcohol dependence, 12% with marijuana dependence, 12% with some AOD dependence, 22% with alcohol abuse, 37% with marijuana abuse, and 38% with some AOD abuse. Using lifetime data, we diagnosed 90% with substance abuse and 47% with substance dependence. Also using lifetime data, 68% of participants reported being physically, sexually, or emotionally abused, with 42% reporting past year abuse experiences. Over 80% of participants reported three or more past year substance-related, psychological, behavioral or legal problems.

Strengths-Oriented Family Treatment Procedures

The major activities of SOFT treatment included several sessions and tasks. Initially, the youth and parent participated in a pre-treatment motivational feedback session (SORT). After completing an Immediate Concerns Checklist, the therapist interviewed the youth and parent using a formal Strengths and Resources Assessment. Based on these strengths and concerns, the therapist and family developed a Solution Plan which identified the immediate and long-term goals for the family. Youth and parents attended several multifamily group sessions in which they received family communication skills training. Finally, therapists provided targeted case management to address ecological factors relevant to treatment (e.g.,

school, friends, etc.). Families also developed a relapse prevention plan together. Because SOFT is a solution-focused model, great emphasis is placed on adolescents and parents making concrete action plans for reducing substance use and improving family communication.

SOFT Dosage

During SOFT treatment, adolescents and their parents attended ten weekly multifamily groups and five conjoint family therapy sessions. Clinicians met with adolescents individually in limited situations, which is commonly allowed in family treatments to promote engagement. Multifamily group sessions lasted about two hours while conjoint family sessions were approximately two hours in duration. We planned that SOFT participants would receive approximately 30 hours of treatment. Typically all SOFT sessions were provided within the first three months following baseline.

Seven Challenges Procedures

Youth met with therapists for individual sessions and with other teens in peer groups. During 7C treatment, participants completed journaling exercises that examined barriers to being honest about their use, what they liked about drugs and alcohol, the impact of drugs and alcohol on their lives, their and others' responsibility for their problems (i.e., including victimization), goals and dreams in life, decisions about use, and steps needed to follow through on those decisions. The therapists wrote comments in the margins of the clients' journals empathizing, clarifying, or asking the client to expand on themes. Therapists also discussed journal content in individual sessions, which had a heavy emphasis on building rapport and maintaining a non-confrontational stance. During Seven Challenges therapy groups, adolescents completed a structured check-in activity, read a reading on one of the Seven Challenges followed by a brief lecture and discussion, and spent the remainder of the group doing journaling activities.

Seven Challenges Dosage

Youth attended 10 weekly group sessions and 5 bi-weekly individual sessions with their counselors occurring within the 3 months following baseline. As group sessions averaged about two hours and individual sessions lasted one hour, we planned that 7C® participants would receive about 25 hours of treatment.

Treatment Dosage Variations

Minor variations in service hours existed for both conditions, which depended on whether the adolescent was in need of intensive outpatient or regular outpatient, or lived in rural or urban locations. For extremely rural adolescents (8%), we could not provide group treatment as they could not always travel to our treatment location and the pool of available clients varied. Thus, we modified treatment models so that group content was presented in individual sessions.

Staff Training and Supervision

Both SOFT and 7C therapists were trained initially by the principal developers of each model. As part of these initial trainings, we reviewed the treatment manuals with the therapists, and provided intensive supervision of initial SOFT and Seven Challenges cases by tape reviews and weekly supervision. Manuals were referred to regularly throughout the study. Additionally, therapists recorded intervention dosage using a web-based management information system. We conducted spot checks on recorded dosage.

Study Therapists

Three master's level therapists provided SOFT—one male and two females. The male therapist had six years of experience, but the other two therapists had no adolescent substance abuse treatment experience. Four therapists provided the Seven Challenges intervention—two with master's degrees and two with bachelor's degrees, one male and three females, and an average of 2 years experience treating adolescent substance abusers. Therapists were originally nested within condition, but for a brief period SOFT therapists were crossed over to provide 7C after receiving appropriate training. We monitored the 7C cases of these therapists closely to prevent intervention bleeding.

Assessment Procedures

Global Appraisal of Individual Needs (GAIN)

We administered the GAIN, a widely used, reliable and valid, semi-structured interview, with each adolescent at baseline.[14–16] Trained interviewers were certified after 2–3 tapes were satisfactorily reviewed. Approximately 5% of all audio taped assessments were reviewed. For this study, two GAIN scales were used, the Substance Frequency Scale (SFS) and the Substance Problem Scale (SPS). The *Substance Frequency Scale* (SFS) is a reliable ($\alpha = .87$) and valid scale measuring the average percent of days reported of any AOD use, days of heavy AOD use, days of problems from AOD use, and days of alcohol, marijuana, crack/cocaine and heroin use. The *Substance Problem Scale* (SPS) is a reliable ($\alpha = .88$; test-retest $r = .73$) and valid scale measuring the presence of substance-related problems (i.e., DSM-IV criteria).

Treatment Dosage

We examined both simple counts of session types, as well as actual time spent on activities to yield measures of total non-session minutes (i.e., case management), total session minutes, and total treatment minutes (i.e., case management plus counseling). In Table 1 we converted minutes to hours for ease of presentation.

TABLE 1. Treatment dosage by condition

	7C (n = 40)	SOFT (n = 58)	Total (n = 98)
Mean Sessions (SD)			
Individual Counseling-Youth*	4.80 (3.98)	1.02 (2.31)	3.15
Individual Counseling-Collateral	0.08 (0.27)	0.24 (0.60)	0.17
Single Family Counseling*	0.55 (0.96)	5.36 (4.05)	3.40
Multifamily Group Counseling*	0.08 (0.27)	5.83 (4.45)	3.48
Group Counseling-Teen Only*	6.08 (5.81)	0.91 (1.22)	3.02
Group Counseling-Parents Only	0.05 (0.22)	0.02 (0.13)	0.03
Follow-Up Counseling Session	0.10 (0.30)	0.16 (0.41)	0.13
Mean Hours (SD)			
Total Counseling*	15.41 (12.34)	23.26 (15.34)	20.05
Case Management*	0.29 (0.58)	1.57 (2.06)	1.05
Total Treatment*	15.70 (12.63)	24.83 (16.32)	21.10
Treatment Completion (%)†			
None	7.5%	0.0%	3.1%
Partial	47.5%	43.1%	44.9%
Completed	45.0%	56.9%	52.0%

*Statistically significant, $p < 0.01$.

†Based on 0 minutes for none (i.e. received no treatment), percentage of clients receiving below 75% of expected dose (partial), and percentage of participants receiving equal to or above 75% of expected dose (Completed) calculated at 1125 minutes for 7 Challenges, and 1350 for SOFT.

Urinalysis Results

We investigated the validity of self-reported past month marijuana use using the rate of false negatives (i.e., positive urine test, negative self report) as the criterion for a subset of assessments ($n = 245$). We found that 15 participants out of 154 (9.7%) did not report using marijuana but tested positive for THC.

Data Analysis

A mixed-effects, two-part model was used that first estimated the logistic probability that a client achieved abstinence (i.e., SFS) or had full symptom remission (i.e., SPS). The model then predicted differences in the severity of non-zero outcomes using a log-normal regression. We used the SAS macro "MIXCORR," for the mixed-effects two-part model.[17,18] In all analyses, age, gender, race, days in controlled environments, weekly use in the home, and age of onset were included as covariates. We controlled for the last two variables because they were not distributed evenly across conditions at baseline.

RESULTS

Treatment Dosage

Data on number of sessions, total service hours, and percentages of clients completing treatment (i.e., achieving 75% of expected dose) are presented in Table 1. Overall, service patterns for both groups reflected adherence to expected dosage.

Changes over Time and Between Groups Analyses

Many clients reported abstinence (SFS) or full symptom remission (SPS), respectively. The percentages of abstinent participants in 7C and SOFT were 8% and 3% at baseline, 34% and 27% at 3 months, and 39% and 31% at 6 months, respectively. The percentages of symptom free adolescents in 7C and SOFT were 33% and 26% at baseline, 50% and 60% at month 3, and 61% and 60% at month 6, respectively. As shown in Table 2, clients in both treatments were significantly more likely to be abstainers or in full remission at the three and six month interviews than at baseline. For 7C participants, the odds of continued use (SFS) at month 3 and month 6 were reduced by 93% and 95% respectively, and the odds of continued substance-related problems (SPS) at month 3 and month 6 were reduced by 52% and 69%, respectively. Similarly, for SOFT participants, the odds of continued use (SFS) at month 3 and month 6 were reduced by 94% and 95% respectively, and the odds of continued substance-related problems (SPS) at month 3 and month 6 were reduced by 76% and 76%, respectively. No significant differences were found between the two conditions on SFS or SPS, indicating that neither treatment was superior at reducing the odds of continued use or continued symptoms.

When considering those that had not achieved full abstinence or full symptom remission, participants in both conditions significantly reduced their frequency of use at three months. Reductions in the severity of substance problems were also found for SOFT participants,

TABLE 2. Between group differences and changes over time for substance use frequency and substance-related problems

	SFS				SPS			
	Est.	S.E.	p	OR	Est.	S.E	p	OR
Part I: Logistic occurrence of abstinence (SFS) or symptom remission (SPS)[†]								
Baseline to 3 months: 7C	−2.74*	0.97	0.01	0.07	−0.73*	0.33	0.03	0.48
Baseline to 3 months: SOFT	−2.75*	1.04	0.01	0.06	−1.44*	0.28	<0.01	0.24
Baseline to 6 months: 7C	−2.97*	0.97	<0.01	0.05	−1.16*	0.33	<0.01	0.31
Baseline to 6 months: SOFT	−3.06*	1.03	<0.01	0.05	−1.44*	0.28	<0.01	0.24
SOFT vs. 7C: 3 months	−0.02	1.40	0.99	0.98	−0.71	0.44	0.11	0.49
SOFT vs. 7C: 6 months	−0.09	1.40	0.95	0.91	−0.28	0.44	0.52	0.75
Part II: Lognormal severity of frequency of use or abuse/dependence symptoms[‡]								
Baseline to 3 months: 7C	−0.77*	0.34	0.02	NA	−0.11	0.14	0.44	NA
Baseline to 3 months: SOFT	−0.70*	0.28	0.01	NA	−0.36*	0.12	<0.01	NA
Baseline to 6 months: 7C	−0.32	0.35	0.35	NA	0.03	0.15	0.86	NA
Baseline to 6 months: SOFT	−0.51	0.29	0.08	NA	−0.36*	0.12	<0.01	NA
SOFT vs. 7C: 3 months	0.07	0.30	0.80	NA	−0.26	0.18	0.17	NA
SOFT vs. 7C: 6 months	−0.19	0.45	0.68	NA	−0.28	0.44	0.52	NA

[†] Logistic occurrence of zero or non-zero values (i.e., abstinence or full symptom remission) on the Substance Frequency Scale (SFS) and Substance Problem Scale (SPS). Using the formula 1-OR (i.e., Odds Ratio) we calculated the reduction in odds of continued use or continued symptoms at follow-up assessments.

[‡] Prediction of lognormal values after zeros (i.e., participants in remission or participants reporting abstinence) were removed in the first part of the two part model. Odds ratios (OR) are not applicable for this portion of the model. Instead the coefficient (Est.; β) is presented. Negative estimates indicate reduced severity at follow-up. Standard errors (S.E.) of the estimates are also presented.

*Statistically significant at $p < .05$.

but not 7C participants, at both follow up points. Neither condition was found to be superior to the other in reducing frequency of use or substance problem severity at the follow up assessments.

DISCUSSION

These results support the efficacy of SOFT and 7C in clinical practice to reduce drug use frequency and related problems. Many participants in both conditions achieved full abstinence or symptom remission, and even for those that didn't there were still significant reductions in frequency of use at three months. Neither SOFT nor 7C demonstrated superior results when directly compared. Nevertheless, initial empirical support was found for these treatments.

Strengths and Limitations of Current Study

Although the sample size for this study ($n = 98$) did not allow adequate power to include other variables of interest, rigorous design features and strengths should be noted. First, treatment manuals and supervision procedures ensured treatment integrity. Second, dosage for treatment interventions was documented to address previous critiques. Third, standardized measures with quality assurance procedures (i.e., certified data collectors, tape reviews with feedback, support from coordinating center) were used to ensure standardized data collection. Fourth, follow-up attrition rates were low (i.e., less than 20%), which is very important because drop-out from follow-up assessments introduces bias into findings.[19] Fifth, this study controls for an important confound of longitudinal substance abuse outcomes, time spent by participants in a controlled environment during the follow-up period.[20] Sixth, the sample included adolescents from a wide range of ages. Taken together, this trial was methodologically rigorous.

Several limitations should also be noted. First, treatment manuals were finalized during the initial months of the study. Thus, although didactic trainings, supervision, and the production of manuals were all components of this study, the developmental nature of this study may have impacted results. Second, case flow issues dictated that we modified the intervention format for rural clients. Third, we used open groups, which meant that participants in this study attended groups with non-study participants. Finer grain analyses of how nesting adolescent participants within these groups affected outcomes were not possible due to a lack of data on non-study participants. Fourth, this study presents the 6 month results of an on-going study following adolescents through 12 months. Although findings demonstrate that SOFT and 7C reduce drug use frequency and substance-related problems at 6 months, little is known about the long-term intervention effects. Fifth, because we excluded participants without insurance, results may not generalize to underserved populations. Finally, it was difficult to adequately address therapist effects in this analysis model,

due to the low number of clients seen by therapists that were crossed over into 7C. Future studies should address these limitations.

CONCLUSION

Participants receiving both the Strengths Oriented Family Therapy (SOFT) and The Seven Challenges® treatments showed significant reductions in substance use frequency and substance-related problems. Future research should replicate these promising findings on the efficacy of SOFT and 7C while addressing this study's limitations.

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