

Examining changes in substance use and conduct problems among treatment-seeking adolescents

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Background: Outdoor behavioral healthcare (OBH) treatment offers an alternative to parents of youth who are treatment-resistant or avoidant. **Method:** The current study evaluated OBH therapeutic outcomes. The sample was 190 adolescents ($M_{age} = 15.69$) presenting for treatment between 2006 and 2008. To be eligible, participants had to be between the ages of 13 and 17 years and be admitted to one of the three OBH programs for mental health intervention. Primary study hypotheses were that OBH treatment would be associated with a reduction in psychiatric symptomatology from baseline to post-treatment and second, that the OBH intervention would be associated with the maintenance of the hypothesized treatment gains. **Results and Conclusions:** Findings were consistent with hypotheses, suggesting that youth demonstrated significant symptomatic reductions and maintained these improvements over a 12-month follow-up period.

Key Practitioner Message

- Outdoor behavioral healthcare (OBH) treatment is associated with symptom remission
- OBH treatment is useful for resistant youth
- OBH is associated with improved substance abuse and oppositionality

Keywords: Adolescence; treatment resistance; therapeutic outcomes; substance abuse and dependence; behavioral dyscontrol

Introduction

There is a large body of literature documenting the magnitude of child and adolescent mental health problems. Worldwide epidemiological data suggest that 23% of adolescents meet diagnostic criteria for a mental health disorder (Belfer, 2008), suicide is the third leading cause of death in adolescents (Arias, MacDorman, Strobino & Guyer, 2003), and approximately 50% of adult psychiatric disorders have their onset in adolescence (Kessler, 2007). However, recent estimates suggest that the majority of youth are not receiving needed mental health interventions (Alexandre, Dowling, Stephens, Laris & Rely, 2008). It has been suggested that these findings may be due, in part, to the fact that adolescents are a difficult population to treat (Gulliver, Griffiths & Christensen, 2010). The developmental demands of this period are characterized by increased vulnerability and sensitivity which may amplify resistance to intervention (e.g., Rickwood, Deane & Wilson, 2007).

Given these issues in concert, understanding the various treatment options available to resistant or non-responsive youth is of critical import. Outdoor Behavioral Healthcare (OBH) offers parents and families an option for youth who refuse, resist, or prematurely terminate traditional forms of mental health interventions. OBH is a residentially based, therapeutic approach, which has evolved considerably since its inception. Currently, while programs are heterogeneous,

they contain select core components (Russell, 2001, 2006b). Group process, experiential learning, peak experiences, unfamiliar environments, and natural consequences are postulated as possible mechanisms of action (e.g., Bandoroff & Scherer, 1994; Newes & Bandoroff, 2004; Russell, 2001).

Despite the proliferation of OBH programs and the corresponding need to examine treatment outcomes, as well as the ethical difficulties associated with these types of interventions (i.e., Becker, 2010; Scott & Duerson, 2010), the empirical study of therapeutic outcomes remains limited. Prior studies have reported improvements in (a) recidivism for adjudicated youth (Castellano & Soderstrom, 1992) and sexual offenders (Lambie et al., 2000), (b) family functioning (Harper & Russell, 2008), (c) oppositional and defiant behavior among adolescents (Brand, 2001), and d) interpersonal functioning (Clark, Marmol, Cooley & Gathercoal, 2004).

Building on this initial work, recent large-scale studies have utilized prospective designs to examine OBH treatment outcomes. The Outdoor Behavioral Healthcare Research Cooperative (OBHRC; Russell, 2003, 2005, 2006a) sampled 858 parents and their adolescents enrolled in eight different OBH therapy programs. Adolescents demonstrated significant symptom remission at the completion of OBH treatment, as measured by both self- and parent-report on the Youth Outcome Questionnaire (Y-OQ; Wells, Burlingame, Lambert, Hoag & Hope, 1996). Furthermore, adolescents and parents

providing data at the 12-month follow-up assessment ($n = 99$) continued to maintain therapeutic gains (Russell, 2003). A second study sampled 774 adolescents across five OBH programs in an effort to understand factors that may influence treatment response (Russell, 2006a, 2007). Compared to baseline scores, participants reported greater therapeutic engagement and readiness for change upon treatment completion. In addition, adolescents reported improvements in feelings of stress, anxiety, depression, as well as frequency of substance abuse and overall satisfaction with the therapeutic process. At the 6-month follow-up evaluation, therapeutic improvements were maintained in the 31% of the sample which participated ($n = 243$).

These preliminary results regarding the effectiveness of OBH programs are promising. Importantly, however, there are several key limitations to extant studies that constrain the conclusions that can be drawn. Study retention rates ranging from 11% to 31% (Russell, 2003, 2005, 2006a) render conclusions about treatment gains tentative because of the bias potentially introduced by systematic attrition related to treatment response. Moreover, prior studies relied on the Youth Outcome Questionnaire (Y-OQ, Burlingame et al., 1996; Wells et al., 1996) to index treatment outcomes. The Y-OQ is reported to have similar psychometric properties (Wells et al., 1996) as the Outcome Questionnaire (OQ; Lambert et al., 1996), from which it was derived. However, construct validation research failed to support the multifactor structure of the OQ, suggesting that the factors, which comprise the instrument may be unstable (Mueller, Lambert & Burlingame, 1998).

The objective of the current investigation was to extend prior studies methodologically and conceptually. The foci were on the maintenance of therapeutic gains by improving upon assessment and retention approaches. Primary study hypotheses were that OBH treatment would be associated with a reduction in psychiatric symptomatology from baseline to post-treatment. Second, in an effort to uniquely extend prior work in the area, the maintenance of therapeutic gains was examined over a 12-month follow-up period. It was hypothesized that the OBH intervention would be associated with the maintenance of the hypothesized treatment gains. In an effort to reduce participant attrition relative to prior investigations, thereby decreasing the likelihood that associations between participation in OBH programs and symptom alleviation were due to systematic participant attrition, a relatively smaller sample was enrolled and resources were allocated to participant retention efforts.

Method

Participants

Participants were 190 treatment-seeking adolescents aged 13–17 years ($M_{\text{age}} = 15.69$; $SD = 1.03$). Adolescents' parents sought admission for mental health and substance-related treatment at one of three OBH programs, located in North Carolina ($n = 103$; 54.2%), New York ($n = 29$; 15.3%), and Idaho ($n = 58$; 30.5%). This sample was obtained using a continuous enrollment protocol, from a group of 230 adolescents presenting for treatment between the dates of 2006 and 2008. To be eligible, participants had to: (a) be between the ages of 13 and 17 years-old, and (b) be admitted to one of the three OBH programs for mental health intervention. Two hundred and thirty adolescents were matriculated into the study without regard to

gender, race, or ethnicity. Of this sample, 18% ($n = 40$) withdrew during part I of the study (i.e., prior to treatment completion), yielding a final sample of 190 adolescents. Youth who withdrew from the study during Part I provided numerous reasons, such as disinterest in continuing, desire to focus on treatment, and upset associated with treatment admission.

Of the final sample of participants, 66% were male ($n = 125$) and 87% were Caucasian ($n = 166$), with 4% self-identifying as Hispanic, 1% as African American ($n = 2$), 1% as Asian American ($n = 2$), and 0.5% ($n = 1$) as American Indian/Alaska native. Twenty-five percent endorsed one or more psychotropic medication prescriptions at the time of their admission. Twenty-five percent of the sample reported experiencing one or more psychiatric hospitalizations and 75% of the sample reported working with at least one therapist prior to their admission to the OBH program.

Procedures

Recruitment. Potential participants were identified by program staff. The parents of potential participants were approached by trained personnel at the select OBH programs. Verbal and written informed parental consent for child participation as well as written adolescent assent were obtained prior to enrolling participants. Participants were informed of study procedures, the risks and benefits of taking part in the study, that their participation was voluntary, and that they could withdraw at any time without penalty or prejudice.

Study design and data collection. A repeated measures design, with a naturalistic follow up was employed. The primary outcome instrument was completed at all assessment sessions. The assessment protocol for Part I included Baseline, Day 7, and Graduation assessments; Part II included a 3 months and a 12 months post-treatment evaluation. During Part I, self-report indices were completed by participants in a quiet, private space with a trained researcher on hand to answer any questions. During Part II, trained research personnel administered the assessment battery over the telephone. Participants were compensated in accordance with a weighted compensation schedule; they received \$10 in gift certificates for completing the baseline assessment, \$10 (cash) for the 3-month assessment, and \$25 (cash) for the 12-month assessment. In addition, participant names were entered into a lottery each time they completed an assessment; 10 participants were then randomly selected to receive \$150. Participants were fully debriefed upon study completion.

The principal investigator provided training to all staff involved in the study at the three treatment sites. Systematic training included direct instruction on administering the study assessment battery, including observations of data collection administration, annual site visits to monitor for assessor drift, and training in procedures for maintaining participant involvement. Research personnel involved in telephone interviews for Part II of the study were trained to mastery on administration of the assessment battery, procedures for managing suicidal or homicidal ideation, subject debriefing, and administrative tasks such as participant tracking and compensation. The principal investigator trained senior graduate students, which involved conducting joint telephone assessments initially, followed by gradual withdrawal of direct supervision as research assistants demonstrated mastery. As no diagnostic decision-making was involved, no inter-rater reliability checks were conducted. All training and ongoing oversight was provided by the principal investigator.

OBH therapeutic intervention. The OBH therapeutic modality has been presented extensively elsewhere (cf., News & Bandoroff, 2004; Russell, 2001) and an exhaustive review is beyond the scope of this article; thus, only the essentials will be provided. The three OBH treatment programs are based on the model that a contextual shift away from the home environment, where problems are being maintained, provides an important backdrop for individuals to change behavior. Specifically, the new context allows youth to develop skills that can then be employed upon returning home, rather than trying to develop such skill repertoires under the contextual control of

the home environment. Moreover, it is posited that by administering treatment while youth are not living in their home environments, they are better able to engage in treatment, experience the natural consequences of their behavior, and participate in a therapeutic milieu with peers who are developmentally similar. The therapeutic group also serves a critical function within the treatment model, providing a context in which youth must learn to cooperate, communicate, and cohabitate for the duration of treatment.

The average length of treatment was 57.48 days ($SD = 13.22$), across the three sites. Upon admission, youth were cleared for the field via a medical examination. At each site, clients were placed in groups of 8–10 same-gender peers with similar presenting problems and clinical needs. Program curricula, designed to prepare clients for outdoor activities, assess and conceptualize their clinical needs, develop individualized treatment plans, and provide weekly group and individual therapy was provided by a clinical team. The team is led by a masters-level therapist and includes bachelors-level residential staff. Toward this end, clients participate in weekly individual therapy, as well as psychoeducational training modules and group process meetings.

Multiple behavior management strategies are employed to teach, reward, and elicit adaptive behavior. Contingency management is used to reinforce target behaviors. Toward this end, clients progress through a series of levels which are cumulative and build upon demonstrated progress at the prior stage. Each level includes behaviorally defined objectives, which are comprised of developmental tasks such as skill acquisition, social-cognitive growth, community involvement, generalizing learned skills to the natural environment, and expanding adaptive coping. Additional behavioral techniques include the use of metaphor, vicarious and instrumental conditioning, goal setting, the experience of naturally occurring consequences, and relapse prevention and planning.

Measures

The Youth Version of the Treatment Outcome Package (TOP; Kraus, Seligman & Jordan, 2005) was used as the primary index of treatment outcomes. The TOP has a number of advantages over other treatment outcome measures. The TOP was developed by administering approximately 20,000 longer versions to the full continuum of patient populations and levels of care. Consequently, the TOP has demonstrated excellent construct, external, convergent, and divergent validity as well as reliability (Kraus & Castonguay, 2010; Kraus, Wolfe & Castonguay, 2006; Kraus et al., 2005). Furthermore, the TOP has stable factor structures, which is a limitation of a number of other outcome assessment methods (e.g., Mueller et al., 1998). Second, the TOP has no ceiling or floor effects; thus, it measures clinically severe extremes, as well as normative and healthy behaviors. Finally, the TOP has been demonstrated to be highly sensitive to change across short spans of time.

The TOP measures subjective distress, symptomatic states, and overall functioning; these psychological domains are rec-

ommended as critical indicators of therapeutic effectiveness by the Core Battery Conference, organized by the Society for Psychotherapy Research (Horowitz, Lambert & Strupp, 1997). For each of 58 phrases in the youth version (e.g., "had trouble concentrating or making decisions"), participants are asked to rate the frequency of the described experience on a 1 (*all the time*) to 6 (*none of the time*) scale, which yields scores on 11 subscales. The following 9 factors were examined in the current evaluation (a) *ADHD*, (b) *Conduct*, (c) *Depression/anxiety*, (d) *Substance Abuse*, (e) *Academic Functioning*, (f) *Violence*, (g) *Suicidality*, (h) *Sleep Disruption*, and (i) *Social Conflict*. The TOP was administered at every assessment. Raw scores are converted into standardized z-scores, with a mean of zero, which is the general population average and a standard deviation of 1. For the current study, a conservative definition of clinical symptom levels was adopted (i.e., +2 standard deviations above the mean). Higher scores represent more severe symptoms or poorer functioning while negative scores indicate fewer symptoms or healthier functioning.

Results

Descriptive data

As described above, the TOP yields several clinical subscales. Examination of baseline levels of symptoms indicated that participants were characterized by particularly elevated levels of conduct and substance use problems ($m = 4.80$ and 5.05 , respectively). No other subscales were comparably elevated. Means for the ADHD, social conflict, sleep problem, suicidality, and violence subscales, while clinically elevated, only ranged between 1.2 and 1.8, with all other subscales evidencing a mean of less than 1. These data suggest participants' primary clinical problems included conduct-related impairment (i.e., behavioral dyscontrol such as delinquent behavior, truancy, defiance, argumentativeness, etc.) and substance use. Accordingly, these outcomes are focused on here.

Participant retention

Of the initial sample of 190 participants, 166 (86.9%) completed the post-treatment assessment, 138 (72.2%) completed the 3-month follow-up assessment, and 120 (62.8%) completed the 12-month follow-up assessment. Comparisons between youth completing the OBH program and those dropping out prior to program completion suggested no significant differences in regards to gender ($\chi^2 = 0.13$, $p = .71$), age [$t(179) = 0.00$, $p = .95$], pre-treatment levels of conduct problems [$t(189) = 1.15$, $p = .28$] or substance use problems [$t(189) = 0.31$, $p = .57$].

Table 1. Means and standard deviations for, and zero-order correlations among primary outcome measures

	Mean (SD)	1	2	3	4	5	6	7	8
1. Pre-treatment TOP conduct	4.80 (5.67)	–	.26**	.38**	.33**	.11	.12	.10	.05
2. Pre-treatment TOP SA	5.05 (4.89)	–	–	.13	.47**	.02	.20*	–.05	.19*
3. Post-treatment TOP conduct	1.87 (4.40)	–	–	–	.46**	.12	.11	.29**	.10
4. Post-treatment TOP SA	2.32 (3.87)	–	–	–	–	.07	.31**	.03	.23*
5. 3-month TOP conduct	0.41 (1.93)	–	–	–	–	–	.41**	.32**	.15
6. 3-month TOP SA	1.44 (2.68)	–	–	–	–	–	–	.14	.41**
7. 12-month TOP conduct	0.52 (2.29)	–	–	–	–	–	–	–	.46**
8. 12-month TOP SA	1.28 (2.59)	–	–	–	–	–	–	–	–

Note: TOP: Treatment Outcome Package (Kraus et al., 2005); Conduct: symptoms of behavioral disorders, such as conduct disorder, oppositional defiant disorder, and disruptive behavior, NOS (subscale on the TOP); SA: symptoms of substance abuse and dependence (subscale on the TOP).

n varies from 190 to 105 due to attrition (from 190 at pre-treatment to 120 at the 12-month follow-up) as well as missing data.

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

Symptom patterns during and after treatment

Pre- to post-treatment. Table 1 includes means and standard deviations for the primary outcome measures examined as well as the zero-order correlations among these factors. Paired samples *t*-tests were conducted to compare pre- and immediately post-treatment levels of conduct and substance use problems. Results suggested that pre-treatment levels of conduct problems ($m = 4.57, SD = 5.62$) were significantly [$t(165) = 6.15, p < .001$] lower at the post-treatment assessment ($m = 1.87, SD = 4.40$). Similarly, levels of substance use problems were significantly [$t(165) = 7.51, p < .001$] lower at the post-treatment assessment ($m = 2.32, SD = 3.87$) compared to the pre-treatment assessment ($m = 4.96, SD = 2.32$). Of the 166 participants completing the post-treatment assessment, 111 (66%) reported lower levels of substance use problems at the post-, compared to pre-treatment assessment; 90 (54%) reported lower levels of conduct problems.

Post-treatment through the 12-month follow-up. Individual growth curve modeling estimated in Proc Mixed in SAS (Littell, Milliken, Stroup & Wolfinger, 1996) was employed to examine change in symptom levels during the follow-up period. This approach was adopted because evidence suggests that longitudinal modeling approaches are more powerful than repeated measures ANOVAs (Muthén & Curran, 1997). Two parameters are estimated when modeling individual change trajectories using this modeling approach: a starting point (post-treatment symptom levels in the current study) and time (or slope of the change trajectory across the follow-up period in the current study), referred to as post-treatment symptom levels and time hereafter. This analytic approach allowed for testing the current hypotheses pertaining to the maintenance of treatment gains during the follow-up period by allowing for examining change trajectories in symptom levels during the follow-up period, and how such change trajectories related to post-treatment symptom levels as well as receipt of post-OBH program follow-up treatment.

The number of predictors entered into the models was restricted to four due to the limited number of repeated measurement points examined. Post-treatment symptom levels and time were first entered into the models as random effects. Also considered was the fact that a subsample of participants (70%) received additional residen-

tial treatment following completion of OBH. In an effort to examine the effects of this post-OBH treatment on treatment maintenance, coded variables, indexing receipt of post-OBH program follow-up treatment and the post-OBH program follow-up treatment \times time interaction term were entered into the models (Table 2).

Conduct. First, in terms of conduct problems, there was statistically significant variability in both post-treatment symptom levels ($z = 5.29, p < .0001$) and change trajectories ($z = 2.70, p < .0001$). Post-treatment symptom levels also were significantly, negatively, correlated with change trajectories ($z = -4.13, p < .01$). Results also suggested that on average participants concluded OBH treatment with a conduct problems *z* score on the TOP of 2.46 and it significantly decreased across the follow-up period by approximately 0.92 per assessment point ($t = -2.95, p < .01$). Pre-treatment, 52.6% of participants ($n = 100$ of 190) exceeded the clinical cutoff for conduct problems compared to 22.3% ($n = 37$ of 166) post-treatment, 8.7% ($n = 12$ of 138) at the 3-month follow up, and 7.5% ($n = 9$ of 120) at the 12-month follow up. While post-OBH treatment was significantly, negatively, related to post-treatment conduct problem scores ($t = -2.32, p < .05$), such post-OBH treatment did not significantly relate to change trajectories ($t = 1.02, p = .31$).

Substance use. With respect to substance use, there was again statistically significant variability in both post-treatment symptom levels ($z = 5.60, p < .0001$) and change trajectories ($z = 2.74, p < .01$). Post-treatment symptom levels also were significantly, negatively, correlated with change trajectories ($z = -3.83, p < .0001$). Furthermore, results suggested that participants completed OBH treatment with an average *z* score of 2.74 on the TOP substance use factor and it significantly decreased across the follow-up period by approximately 0.68 per assessment point ($t = -2.35, p < .05$). At the pre-treatment assessment, 61.6% of participants ($n = 117$ of 190) exceeded the clinical cutoff for substance abuse problems compared to 37.3% ($n = 62$ of 166) post-treatment, 25.4% ($n = 35$ of 138) at the 3-month follow up, and 23.3% ($n = 28$ of 120) at the 12-month follow up. Receiving post-OBH program treatment was not significantly related to either post-OBH TOP substance use scores ($t = -1.35, p = .17$) or follow-up change trajectories ($t = 0.72, p = .47$).

Table 2. Main and interactive contributions of post-treatment symptom levels, change trajectories, and receipt of post-outdoor behavioral health treatment in predicting conduct and substance use problems across the 12-month follow-up period

	β	<i>df</i>	<i>t</i>	<i>p</i>
Dependent variable: conduct problems				
Post-treatment symptom levels	2.46	167	5.18	<.0001
Time	-0.92	240	-2.95	<.01
Receipt of post-OBH treatment	-1.42	167	-2.32	<.05
Time \times post-OBH treatment	0.41	240	1.02	ns
Dependent variable: substance use problems				
Post-treatment symptom levels	2.74	167	5.97	<.0001
Time	-0.68	240	-2.35	<.05
Receipt of post-OBH treatment	-0.80	167	-1.35	ns
Time \times post-OBH treatment	0.26	240	0.72	ns

Note: $n = 172$. β = unstandardized beta weight.

Discussion

Previous research has provided preliminary support for OBH programs in alleviating psychiatric symptoms in adolescents (e.g., Russell, 2003, 2005, 2006a). Available work, however, is characterized by significant participant attrition. Furthermore, it is critical to determine whether adolescents' initial symptom reductions translate to lasting improvements. Therefore, the overarching objective of the current study was to build upon and uniquely extend previous studies by employing a scientifically rigorous and methodologically sound approach to the hypothesized questions.

The primary presenting problems of the current sample were externalizing, as indexed by the TOP factors of substance abuse and conduct disorder-type symptoms. These two scales yielded scores that were almost 5

standard deviations above the mean at the baseline assessment. This is consistent with prior work which found that youth participating in OBH treatment were most often diagnosed with Oppositional Defiant disorder or substance abuse or dependence (i.e., Russell, 2003). While symptoms of internalizing problems were evident as demonstrated by mild elevations on the TOP suicide scale, the severity of these symptoms was markedly less.

As expected and consistent with prior work (i.e., Russell, 2003, 2005, 2006a), participants reported significantly less substance-related dysfunction and disruptive behavior disorder symptoms at the post-treatment assessment, as compared to baseline assessment. These findings suggest that OBH treatment, as practiced by the three sites in the current study, is associated with improvements in externalizing symptoms of substance abuse and disruptive behavior disorders.

The use of individual growth curve modeling allowed for the examination of the slope and nature of symptom changes across the course of treatment. As hypothesized, participants reported significant decreases in symptoms of disruptive behavior disorders and substance abuse across the follow-up assessment period. As compared to their post-treatment scores, youth demonstrated persistent and significant improvements at both the 3- and 12-month follow-up assessment. This finding indicates that participants not only maintained the therapeutic gains associated with treatment but they continued to improve for a full year after completion of OBH interventions.

It is critical to examine the role of post-treatment intervention on the maintenance of therapeutic gains to determine whether subsequent treatment (post-OBH) contributed to therapeutic maintenance or improvements. Seventy percent of participants utilized continuing care residential programs following graduation from OBH interventions. These residential treatment programs, selected by participants in the current study represented a continuum of services, including residential treatment centers, therapeutic boarding schools, and emotional growth schools. However, approximately 30% of the sample returned home to live following completion of OBH treatment, utilizing various therapeutic options ranging from no treatment to community-based outpatient services.

Positive associations were found between greater conduct disorder-like symptoms at the post-treatment assessment and the use of a continuing care residential placement. Participants with more severe disruptive behavior scores at graduation were more likely to utilize residential services suggesting that the selection of additional residential intervention is appropriately informed by the clinical needs of youth at program completion. Importantly, the use of residential intervention did not appear to significantly impact the trajectory of conduct problems during the follow-up period. Thus, it appears that youth who participated in OBH programs reported improvements in symptoms of disruptive behavior disorders and that these therapeutic gains were maintained regardless of whether the youth selected a continuing care residential intervention or returned home to live.

A similar pattern emerged for symptoms of substance abuse. Participants experienced continued improvements over the follow-up assessment period, regardless of whether they enrolled in an additional residential

program or returned home to live. Therefore, based on the current data, it appears that youth participating in OBH programs reported less substance-related dysfunction and that therapeutic gains were maintained independent from any additional therapeutic services provided to the youth. Notably, no relation was found between the use of aftercare services and the severity of substance abuse scores post-treatment. In other words, participants transitioned to continuing care residential programs regardless of how severe their substance abuse symptoms were post-treatment. This finding likely is influenced by the high rates of relapse in substance dependent populations (Williams & Chang, 2000), which encourages parents to maintain youth in environments without access to substances. Notably, participants returning home following OBH treatment did not report fading therapeutic effects (associated with substance abuse and dependency), suggesting that improvements are not solely associated with restricted access to drugs and alcohol.

A primary limitation of the current research is the lack of random assignment to treatment conditions and the absence of a comparison group. Without these components, firm conclusions about causality can not be made. Furthermore, pre-post-research designs can result in a number of erroneous conclusions about therapeutic effectiveness (Type I error for example). The current methodological approach is comparable to the standard established by the literature in the area (e.g., Russell, 2003, 2005, 2006a); however, inclusion of a comparison group should be a main focus of future work. Importantly, quasi-experimental or experimental research designs, including a comparison or wait-list control group will be necessary to establish effectiveness of OBH interventions. Additional study limitations are the possibility of selection bias and the use of self-report data primarily. Selection bias can result in the sample participants being unrepresentative of the population of interest since they were not randomly selected from the general population. Adolescent self-report of their private experience is a widely used strategy in the youth literature (e.g., Achenbach, McConaughy & Howell, 1987), although it would be ideal to triangulate self-report data with that from other respondents such as therapists. The data collection approach was deemed appropriate in the current study given the relatively under-developed state of the literature. Moreover, these data were not gleaned from or included in participants' medical records, thus youth were not likely motivated to appear less symptomatic to influence treatment duration. Finally, there likely is slight variability across the three program sites due to lack of manualization of service delivery. However, programs were selected because they adhere to an internally consistent model of OBH treatment (see Newes & Bandoroff, 2004; Russell, 2001 for a review).

These limitations notwithstanding, the current study represents an important contribution to the extant literature. It replicates prior findings and demonstrates that symptomatic improvements at post treatment do not fade across time but rather persist for the follow-up assessment period of 12 months and are not associated with the use of additional residential treatment following OBH program completion. These particular findings are unique and provide insight into the pattern of symptom

remission associated with select OBH programs. Further, current data suggest that OBH interventions may represent an alternative treatment modality for treatment resistant or nonresponsive youth.

Acknowledgements

Funding for this study was provided by Aspen Education Group (AEG) and its parent Company, CRC. Neither CRC nor AEG had a subsequent role in the study design, data collection, data entry or management, data analyses or interpretation, writing the manuscript, or submitting the paper for publication.

The author acknowledges financial support from AEG and CRC for the current work; remuneration was given to support study-related activities (e.g., study design, data collection, statistical analyses and interpretation, and manuscript preparation), for which the author is solely responsible. The author has declared that she has no other competing or potential of conflicts of interest arising from the publication of this work.

The author thanks the study participants, Sue Crowell, CRC, Aspen Education Group, Phil Herschman, and several key research collaborators and personnel, including Dr. Sheneen Daniels, Laura Dixon, Carolina Barreto, Hillary Farrell, Sara Goodrum, Taylor Sorrows, Ilene Thompson, Graham Shannonhouse, Kathy Rex, and Susan Hardy without whom this study could not have been completed.

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Accepted for publication: 16 January 2012