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Longitudinal Assessment of Treatment Outcomes in Outdoor Behavioral Healthcare

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EXECUTIVE SUMMARY

This publication reports the results of a follow-up assessment of treatment outcomes for adolescent clients who received treatment in seven participating Outdoor Behavioral Healthcare (OBH) programs from May 1, 2000 to December 1, 2000. Of the 858 clients who agreed to participate in the study, 840 completed treatment, a 97% completion rate. Clients and their parents were contacted at 3-, 6-, and 12-month follow-up periods to evaluate their well-being utilizing the Youth Outcome Questionnaire (Y-OQ) (Burlingame, Wells, & Lambert, 1995). The initial assessment of treatment outcomes reported in Technical Report 27 (Russell, 2001) showed that clients made significant improvement from treatment to discharge as measured by the Y-OQ. These findings suggested that OBH was effective at helping reduce clients' behavioral, emotional, and psychological symptoms as a result of OBH treatment. An important question asked in the conclusion of this report was: **To what degree will clients maintain outcomes realized from OBH treatment at follow-up periods?** This question was especially important given the lack of longitudinal outcome studies found in the literature and uncertainty whether clients apply skills and lessons learned in OBH treatment to their daily lives (Russell, 2001). The current study reports results from assessment of client well-being at 3-, 6-, and 12-month follow-up periods.

The results indicated that at the 3- and 6-month follow-up periods, outcomes were maintained as indicated by client self-report scores that did not significantly differ from previous assessments; parent assessments indicated higher Y-OQ scores at 3-month (4 points) and 6-month (8-points) follow-up periods when compared to discharge scores, (score differences were not statistically significant). It was assumed based on supporting literature and statistically significant score differences between full data sets and incomplete data sets that these samples could be biased in the direction of more favorable outcomes. This led to a random sample of clients being conducted at the 12-month follow-up period to gain a more representative and unbiased sample.

Client self-report and parent assessments suggest that clients maintained outcomes from treatment and were doing well emotionally and behaviorally at the 12-month follow-up period. For the randomly sampled data set at 12-months (scores at admission, discharge, and 12-months), clients self reported outcomes that averaged 8 points under the cut-score of 46 (38.61) that indicates a normal range of scores (Burlingame et al., 1996). This demonstrated that those clients had maintained outcomes from treatment, and had actually continued to improve up to one-year after completion of treatment. Parent scores were almost 10 points higher than client self-reports at 48.67, but were also not significantly different from the cut-score of 46.

No statistical differences were found in average scores at admission, discharge, and 12-month follow-up when comparing clients who utilized aftercare services with those who returned home. However, client self-report data show that clients who utilized aftercare services had higher scores at admission and discharge than those clients who returned home. At the 12-month follow-up period, scores remained higher by more than 6 points. Though no statistical differences were found in scores, the data suggest that clients who utilized aftercare services remained above the normal cut score of 46 at discharge and programs and parents may have believed they were still at-risk of resorting to past behaviors.

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INTRODUCTION

This publication reports the results of a follow-up assessment of treatment outcomes for adolescent clients who received treatment in one of seven participating Outdoor Behavioral Healthcare (OBH) programs from May 1, 2000 to December 1, 2000. Clients and their parents were contacted at 3-, 6-, and 12-month follow-up periods to evaluate their well-being utilizing the Youth Outcome Questionnaire (Y-OQ) (Burlingame, Wells, & Lambert, 1995). The initial assessment of treatment outcomes reported in Technical Report 27 (Russell, 2001) showed that clients had made significant improvement from treatment to discharge as measured by the Y-OQ. Client self-report mean Y-OQ scores were 70.67 at admission and 47.55 at discharge, indicating an average score reduction of more than 20 points. Parent assessment Y-OQ mean scores were 101.19 at admission and 48.55 at discharge, indicating an average reduction of 52.64. Thus, parents rated the clients presenting symptoms as more severe than did the clients themselves, but they perceived symptoms at discharge that were very similar. Discharge scores for both client self report and parent assessment are close to the normal range of symptoms (46 or below) as established by Burlingame et al. (1995b) in their sample tests of normal populations. Results of this study indicated that participation in OBH programs led to a statistically significant reduction in the severity of behavioral and emotional symptoms, as perceived by the clients, and even more so by their parents, as measured by the Y-OQ questionnaire. These findings suggest that OBH programs are effective at helping reduce the behavioral, emotional, and psychological symptoms with which clients presented. An important question asked in the conclusion of this report was: **To what degree will clients maintain outcomes realized from OBH treatment at follow-up periods?** This question is especially important given the lack of longitudinal outcome studies found in the literature and the uncertainty surrounding the degree to which clients can apply the skills and lessons learned in OBH treatment to their daily lives (Russell, 2001).

These positive findings were consistent with several meta-analyses that suggest that OBH and related wilderness programs for troubled adolescents enhance self concept (Hattie, Marsh, Neill, & Richards, 1997), strengthen locus of control (Hans, 2000), and help reduce recidivism rates of young offenders (Winterdyk & Griffiths, 1984). However, most participant assessments are done immediately following the experience and could possibly be affected by the “post-group euphoria,” a feeling of euphoria often experienced by the participant following an intense and unique group experience (Ewert & Heywood, 1991; Marsh, Richards, & Barnes, 1986). Follow-up assessments of treatment outcomes can address this concern and are especially important in OBH because of the primary goal of treatment: helping adolescent clients understand what issues in their lives may be driving their problem behaviors, and creating a desire to want to change these behaviors (see Russell & Hendee, 2000, for overview of OBH treatment). Moreover, the degree to which clients can apply skills and lessons learned in wilderness environments to their everyday lives has not been well documented in the literature (Hattie et al., 1997; Winterdyk & Griffiths, 1984). Finally, very few long term assessments of client outcomes in OBH related programs have been conducted.

*An important question asked in the conclusion was: **To what degree will clients maintain outcomes realized from outdoor behavioral healthcare treatment at follow-up periods?***

The few longitudinal studies found in the literature have typically examined recidivism rates for delinquent and substance abusing youth. Hattie et al. (1997) found in a meta-analysis of different participants in OBH related programs that “the effect sizes for the delinquents in the follow-up studies were greater than for the other identified groups” (p. 59). This meta-analysis included some of the seminal studies on Outward Bound (Kelly & Baer, 1968, 1969; Kelly, 1974) and highlighted the potential of wilderness expeditions to help rehabilitate young offenders not being reached by traditional corrections programs. Castellano and Sodersrom (1992) continued this line of research, and found that after taking 30 adolescents on a 30-day wilderness expedition, successful completion of the course resulted in arrest reductions which began immediately after the program was complete and lasted for about one year. Another study found that a 3-day therapeutic camping program for young people as part of a substance abuse treatment program had a positive impact on relapse rates for participants when compared to controls at a 10-month follow-up period (Bennet, Cardone, & Jarczyk, 1998). Despite these positive results, the question still remains: Do OBH programs do a better job of reducing recidivism for adolescents in these programs than traditional treatment and rehabilitation programs?

For example, several longitudinal studies have failed to conclude significant differences in recidivism rates between OBH programs and other methods of rehabilitation. Deschenes and Greenwood (1998) evaluated the Nokimus Challenge Program for delinquents, which utilizes a wilderness expedition as a component of rehabilitation, and found few differences in outcomes of recidivism and social adjustment measures between treatment and control groups at follow-up periods. The authors suggest that to derive benefit from short-term placements, the aftercare component must be strengthened to help youth avoid relapse. These findings are echoed by Eggleston (1998), who examined adjudicated youth aged 13-18, who participated in an OBH program in New Zealand. She interviewed participants 18-months after the program to examine which program elements were still important in their lives. She concluded that program benefits were difficult for participants to apply in their everyday lives, and that follow-up care was inadequate. Each of these studies report either no differences between OBH treatment and control groups, or diminished effects of treatment due to lack of follow-up by programs and point to the need for aftercare services as essential for participants to maintain outcomes. These findings are supported by the extensive literature on the effectiveness of substance abuse treatment programs for adolescents that demonstrates the importance of aftercare and relapse prevention in maintaining outcomes (Winters, 1999).

Longitudinal outcome studies have identified diminished effects over time, highlighting the importance of aftercare services to help clients maintain outcomes after treatment.

In summary, any examination of OBH outcomes at follow-up periods must take into account how aftercare services are utilized because of the important role they play in maintaining treatment outcomes. As Hattie et al. (1997) state “recidivism may be, at least in part, a function of inadequacy of postprogram support” (p. 59). This is supported by OBH program staff who believe that short-term (3-8 weeks) OBH programs are designed to help prepare and develop an internal motivation for clients to engage in long term care when appropriate (Russell, 1999). Second, those studies that have assessed outcomes at follow-up periods have found mixed results. One reason that has been suggested, and that is consistent with similar literature on the treatment of at-risk adolescents in other modalities, is the presence of aftercare and follow-up procedures to help explain these mixed results. Reflecting this critical need to assess outcomes at follow-up periods and examine how aftercare services are utilized, this study will report results from 3-, 6-, and 12-month assessments of OBH clients that either returned home, or went on to an aftercare program at the termination of treatment.

RESEARCH METHODS

Research Design

A time series research design was used in this study (Graziano & Raulin, 1997). A census of 858 clients at seven participating programs (see Table 1) were surveyed during the time period of May 1, 2000 to December 1, 2000. The seven participating programs are all members of the Outdoor Behavioral Healthcare Industry Council (OBHIC) but do not represent the entire OBH industry. Therefore, study findings cannot be generalized beyond these seven programs; findings represent possible outcomes under the parameters of treatment in these programs.

Research Questions

The following research questions were addressed in this study:

Research Question 1. What outcomes that resulted from OBH treatment as measured by Y-OQ score differences between admission and discharge were still present at 3-, 6-, and 12-month follow-up periods?

Research Question 2. How did former OBH clients’ emotional and behavioral functioning at follow-up periods vary according to client attributes, such as age and gender?

Research Question 3. How did former OBH clients’ emotional and behavioral functioning at follow-up periods vary according to the utilization of aftercare services?

Research Question 4. How did former OBH clients’ emotional and behavioral functioning at follow-up periods vary across the six content areas of the Y-OQ?

Table 1. Participant programs, program type, model and length and program time spent on wilderness expedition (Russell & Hendee 2000).

Organization	Type	Model	Length	Time Spent on Wilderness Expedition
Anasazi 1424 S. Stapley Mesa, Arizona 85204	Private Placement	Continuous Flow Expedition	56 days	56 days
Ascent PO Box 230 Ruby Creek Road Naples, Idaho 83847	Private Placement	Base Camp Expedition	42 days	14 days
Aspen Achievement Academy PO Box 369 Loa, Utah 84747	Private Placement	Continuous Flow Expedition	52 days	52 days
Catherine Freer PO Box 1064 Albany, Oregon 97321	Private Placement	Contained Expedition	21 days	21 days
Red Cliff Ascent 757 S. Main Street Springvale, Utah 84663	Private Placement	Continuous Flow Expedition	56 days	56 days
SunHawk Academy 948 N 1300 W St. George, Utah 84770	Private Placement	Residential Expedition	56 days	28 days
SUWS 911 Preacher Creek Road Shoshone, Idaho 83352	Private Placement	Contained Expedition	21 days	21 days
			Ave. 45 days	Ave. 34.5 days

Youth Outcome Questionnaire (Y-OQ)

The Outcome Questionnaire (OQ) was developed to assess outcomes in behavioral healthcare and has been deemed a valid and reliable psychometric tool (Lambert, Huefner, & Reisenger, 1996). The Youth Outcome Questionnaire (Y-OQ™) and Self-Report-Youth Outcome Questionnaire (SR Y-OQ™) evolved from the OQ, (herein referred to simply as the Y-OQ except where distinction is important), and offers parent assessment and adolescent self-reports of an adolescents' well-being and is designed for repeated measurement of client symptoms (i.e. admission, during therapy, at termination, and at follow-up intervals) (Burlingame et al., 1995b; Burlingame et al., 1996; Lambert & Cattani-Thompson, 1996; Lambert et al., 1992; Lambert et al., 1996; Wells, Burlingame, Lambert, Hoag, & Hope, 1996; Wells, 1990).

A total of 64 questions are included in the Y-OQ to assess change in the six content areas described in Figure 1.

Figure 1. Six content areas of the Youth Outcome Questionnaire (Y-OQ).

Content Area	Assesses
Intrapersonal Distress (ID)	Assesses change in emotional distress including anxiety, depression, fearfulness, hopelessness, and self harm.
Somatic (S)	Assesses change in somatic distress typical in psychiatric presentation, including headaches, dizziness, stomachaches, nausea, and pain or weakness in joints.
Interpersonal Relations (IR)	Assesses change in the child's relationship with parents, other adults, and peers as well as the attitude towards others, interaction with friends, aggressiveness, arguing, and defiance.
Critical Items (CI)	Assesses inpatient services where short term stabilization is the primary change sought: changes in paranoia, obsessive-compulsive behavior, hallucination, delusions, suicide, mania, and eating disorder issues.
Social Problems (SP)	Assesses changes in problematic behaviors that are socially related, including truancy, sexual problems, running away from home, destruction of property and substance abuse.
Behavioral Dysfunction (BD)	Assesses change in a child's ability to organize tasks, complete assignments, concentrate, handle frustration, including items on inattention, hyperactivity, and impulsivity.

The Y-OQ parent assessment is designed to measure parent perceptions of a wide range of behaviors, situations, and moods which commonly apply to troubled teenagers. The Y-OQ self-report is designed to measure client self assessments of the same behaviors. When the client is admitted to treatment, the Y-OQ is completed by parents and the client to establish baseline scores against which to compare future scores. Follow-up periods in this longitudinal study were at 3-, 6-, and 12-months. The 64 items contained in the Y-OQ are summed across the six content areas to produce a total score.

Criteria to Assess the Y-OQ and SR Y-OQ

The Y-OQ assesses the psychological, symptomatic and social functioning of adolescents, which reflect the goals of OBH treatment. It is also a well-normed and easily administered outcome measure with good internal consistency and test-re-test reliability. As a general rule, validity and reliability coefficients should be at or above .80 (Jacobsen & Truax, 1991). Estimates of the Y-OQ internal consistency range from .74 to .93 with a total scale estimate of .96. Test-re-test reliability scores are above .70, indicating moderately high temporal stability (see Burlingame et al., 1996 for detailed review of these estimates). High correlations also exist between the Y-OQ and subscale scores, and other frequently used assessment instruments (Wells et al., 1996). For example, scales on the Child Behavior Checklist (Achenbach, 1991) correlate highly with parallel scales on the Y-OQ. The Y-OQ instrument can be easily administered by staff at each OBH program and only takes ten minutes for the parents and client to complete. The device has not proven too complicated or detailed for respondents, which is an important consideration when working with adolescents (Burlingame et al., 1996).

A key distinction in delineating treatment effects is to identify symptomatic improvement that often precedes behavioral improvement (Burlingame et al., 1995a). Functional improvements for an adolescent, such as improvements in school performance and family relationships, often occur later in treatment than do symptomatic improvements. Because the content areas contained in the Y-OQ assess various elements of therapeutic change in response to therapy, it is thought to be sensitive to symptomatic and functional improvements the client is making. While the Y-OQ stands up well to these criteria, one must always be aware that questionnaires do not directly measure behavior, situations and moods; they measure the reporters' perceptions of those attributes based on responses to questions.

Clinically Meaningful Change

The validity of the Y-OQ rests upon its ability to detect change from the previous assessment. This is especially critical because other popular child assessment measures such as the Conners' Parent Rating Scale, the Revised Behavior Problem Checklist, and the Child Behavior Checklist have not proven adequately sensitive to measuring changes (Mosier, 1998). Using guidelines established by Jacobsen and Truax (1991), Y-OQ score intervals have been developed that indicates normative functioning by the adolescent. When certain cutoff scores are reached, the client is said to have clinically improved or reached a normal distribution of symptoms (Wells et al., 1996).

Burlingame et al. (1996) evaluated other inpatient, residential, and outpatient therapies, and have suggested criteria for assessing whether a client can be labeled "recovered" or "improved." Adolescents who have follow-up Y-OQ scores of 46 indicate normal functioning. Therefore, a score of 46 or below is considered normal, and the client is labeled "recovered." A client that has moved thirteen or more points but does not reach the range of normal functioning indicated by a score of 46, can be labeled "improved." These two criteria are used to relate the change in parent assessment and adolescent self-report scores from admission to discharge.

For example, at admission into treatment, the parent and client are each administered their respective Y-OQs. The scores generated from these assessments serve as pretreatment baseline measures of the child's symptom's or conditions in the attributes addressed. At the conclusion of treatment, the parent and client complete questionnaires which assess the same attributes, generating "discharge" posttreatment scores. The change in scores quantify the client's therapeutic progress. For example, a client may enter treatment with a Y-OQ and SR Y-OQ score of 95 and 100 respectively, and at the termination of the OBH program, his/her Y-OQ and SR Y-OQ scores may have dropped to 47 and 53 respectively. Relating these scores to the above discussion of clinical improvement and recovery, a 47 and 53 would be considered clinically "improved" (a movement of 13 or more points) but not "recovered" because the score is not 46 or lower.

The Y-OQ has been shown to be sensitive to symptomatic and functional improvements the client is making.

Data Collection and Entry

The parents or legal guardians of clients enrolling at each participating program between May 1 and December 1, 2000 were asked to sign a research consent form during the admission process. Of the 1,035 participants in the programs, 858 agreed to participate in the study (83%). Consent forms were administered and maintained at each respective program. Care was taken by the Y-OQ administrators at each program to explain the importance of the research in helping improve OBH treatment. The confidentiality of parents, legal guardians and clients was maintained through the assignment of a code by each program administrator, which was used throughout the data collection, analysis and reporting process.

Clients participating in the study and their parent/legal guardian were asked to complete the Y-OQ admission questionnaire at admission. For divorced or separated parents, the primary care parent or legal guardian was asked to complete the questionnaire. For families with both parents residing in the household, either parent was asked to complete the questionnaire. If parents or legal guardians were unavailable, the program administrator mailed them the questionnaire, along with a return envelope addressed to the University of Idaho-Wilderness Research Center (UI-WRC) and cover letter outlining the purposes of the study. An initial phone call was made by each program to ensure that the parent or guardian received the information, and to answer any questions regarding their participation in the study.

After each adolescent completed OBH treatment, the parent/legal guardian was asked to complete a Y-OQ discharge questionnaire. Assessment at discharge was based on parents' communication and contact with their child while he/she was in treatment, communication with the therapist responsible for his/her care, and contact with their child at graduation ceremonies. The completed discharge questionnaire was then mailed by the respondent directly to the UI-WRC.

Clients were also asked to complete a self-report Y-OQ at discharge. This was done before the client was released from the program to ensure a higher response rate. These questionnaires were then collected by program administrators at each site and mailed directly to the UI-WRC. Upon receipt of the completed Y-OQ questionnaires from each program, a database was constructed and a coded file established at the UI-WRC for each client. Questionnaires were filed according to client identification numbers and program codes and were accessible only by the principal investigator and a research assistant.

After each client had completed treatment, the study administrator at each program mailed the follow-up Y-OQ and SR Y-OQ to each participating client and their parents or legal guardians at 3-, 6-, and 12-month intervals. A cover letter accompanied the questionnaire reminding study participants of the importance of the research and their continued support of the effort. If the client entered an aftercare program such as an emotional growth boarding school or residential drug and alcohol treatment center, permission was granted to contact

primary care provider at that institution who was asked to encourage the client to complete the Y-OQ. Aftercare environments included any of the following types: 1) return to family or primary care giver, 2) transition home, 3) therapeutic boarding school, 4) long term residential drug and alcohol treatment center, and 5) inpatient hospital.

A UI-WRC addressed envelope accompanied the questionnaire, and the respondents were asked to mail the questionnaire to the UI-WRC when completed. It is well documented that the percentage of respondents drops considerably at the follow-up time periods (Stinchfield et al.,1994). Because of this, follow-up phone calls were required to remind participants to complete their questionnaires.

Study Retention

Retention of participants at follow-up periods was a limitation in this study. Study retention was not influenced by treatment completion, as 840 clients of the total of 858 completed treatment, a 97% completion rate. Of the 858 clients who originally agreed to participate in the study, complete assessments containing an admission and discharge questionnaire were available for 481 (56%) client self-reports and 338 (40%) parent assessments.

Of the 858 clients and parents who agreed to participate in the study, there is at least one assessment out of a total of five for 737 clients and 594 parents (at admission, discharge, 3-, 6-, and 12-months). There are several reasons study participants did not complete questionnaires at various assessment periods. First, many clients and their parents agreed to participate in the study and simply did not return questionnaires for reasons unknown. Second, necessary mail-back procedures were a disadvantage, but were necessary because study participants came from all regions of the United States. This is despite the fact that phone calls and follow-up letters were also mailed. Third, clients in after-care facilities were contacted and sent questionnaires, but did not return them for unknown reasons. Finally, some clients and their parents had relocated and could not be found.

Of the 1,035 clients and their parents asked to participate in the study, 858 agreed (83%).

12-Month Follow-up Assessment Procedures

Past research on treatment outcomes has shown that non-respondent study participants at follow-up time periods may have poorer outcome than respondents (Stinchfield 1994). Researchers have concluded that adolescent outcome reports that contain a significant number of non-contacted cases may represent overestimates of outcome if generalized to the entire study population. In this study, it was noted that the number of questionnaires returned to the UI-WRC at the 3- and 6-month follow-up periods indicated a low response rate, leading to the potential bias reported above. Therefore, it was determined that the most accurate way to ensure a more representative sample at the 12-month time period was to contact a random sample of clients that had at least completed one assessment at admission or discharge. In doing so, the non-contact bias could be reduced and a more accurate assessment of client well-being at 12 months after OBH treatment could be determined.

To accomplish this, a random sample of parents that had completed at least one assessment at admission or discharge were called at the 12-month time period and asked to complete a Y-OQ questionnaire over the phone, or by mail. Parents were selected for contacting because they would also serve as a resource to locate the adolescent if he or she was not living at home or in an aftercare facility. A total of 594 parents of the original 858 who agreed to participate in the study completed at least one questionnaire at admission or discharge (70%). To accurately test for differences in mean treatment scores at discharge and 12-months using a pairwise t-test, sample sizes of 138 parents and 78 clients were calculated using a power equation that would yield a power of .80 at a $\alpha=.05$ significance level (Cohen, 1988). The sample size was computed using the standard deviation of the mean scores at discharge, which was then divided by 13 points, which is the difference in scores that reflects clinical improvement, yielding an effect size of .36 for parents and .42 for clients. The list of client coded numbers were randomly ordered and the first 300 names were selected for contact. (More names were selected for contact because it was assumed some would be difficult to locate and that many of these parents would not have completed Y-OQ sets at both admission and discharge). Parents who completed a 12-month assessment but did not have completed Y-OQs at admission and discharge served as a “check” against those that had completed both admission and discharge questionnaires.

A total of 29 parents could not be reached. After phone calls were conducted, a total of 271 parents completed Y-OQs. Additionally, 139 adolescent clients also completed Y-OQs after attempted contact based on parent referrals. Table 2 summarizes the results from sampling, contacting, and completed Y-OQs at the 12-month follow-up period for parents and clients.

Table 2. Total study participants, number who completed at least one Y-OQ during study period, sample size required to estimate the average at 12-months, total number of study participants contacted and total number of 12-month follow-up contact calls.

	Total Study Participants	Number With At Least One Y-OQ	Admission and Discharge Completed	Sample Size Required	Number Contacted	Completed Y-OQs at 12-Month
Parent Y-OQs	858	594	338	138	300	271
Client Y-OQs	858	737	489	78	178	139

A random sample of parents that had completed at least one assessment at admission or discharge were called at the 12-month time period and were asked to complete a Y-OQ questionnaire over the phone, or by mail.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS™). There were several ways that the data could be analyzed. The first step was to test for normality and to compute averages for scores at each assessment period for both parent and client scores. Confidence intervals ($\alpha = .05$) were computed to better understand the range of scores and to determine if any outliers were present. These data are referred to as the incomplete data set (see Table 3). Table 3 also shows data from the admission and discharge assessments that were reported in Technical Report 27, *An Assessment of Treatment Outcomes in Outdoor Behavioral Healthcare* (Russell, 2001).

Because client study participation dropped at follow-up periods, data sets were calculated for each follow-up time period that also included an admission and discharge score. These data sets are referred to as complete data sets for each time period and evaluated individual clients at admission, discharge and the respective follow-up period. For example, a data set was constructed that included those study participants for whom data were available at admission, discharge and 3-months. This data set is referred to as the 3-month data set. The first step was to conduct tests of normality for these data sets at 3-, 6-, and 12-month time periods. Each data set was found to be normal. Averages and confidence intervals were also computed for each data set. Paired t-tests were run between discharge scores and the follow-up time period to examine differences in mean scores. Finally, data were analyzed to look for differences in average scores at these assessment points based on client attributes, including gender, age, and aftercare services utilized.

Non-Response Analysis

To examine the nonresponse bias at all assessment periods, a series of t-tests were run to examine differences between complete data sets and all questionnaires received at that particular time period (incomplete sets) (see Table 3 for results). Where statistical differences were found, it was assumed that the data set was not representative of the full data set that was received, and could thus be considered biased in the direction of the identified difference.

Two assessments were found to be statistically different: 1) client scores at admission for the 6-month data set were lower than those for the incomplete set. This finding suggests that this set of clients may have exhibited fewer symptoms at admission, and thus would be predisposed to lower scores at discharge and follow-up periods; and 2) parent scores at discharge for the 6-month data set were also lower than the incomplete set, suggesting that parents who continued to complete questionnaires for these clients may have indicated lower scores at the 6-month follow-up period. Each of these nonresponsive bias analyses at 6-months is consistent with the literature that suggests that those study participants that provide data at follow-up periods may exhibit better outcomes than those clients that do not provide data (see Stinchfield et al. 1994). Three-month data sets were not found to be statistically different than the incomplete set, and may be more representative of the sample of clients. This may be due to the shorter duration of the follow-up contact period. These analyses and low response rates necessitated the need for the random sample of clients at the 12-month period.

Table 3. Parent and client Y-OQ scores at admission, discharge, 3-, 6-, and 12-months arranged by total assessment for that time period, and in 3-month, 6-month and 12-month data sets.

	Admission (n) Ave.	Discharge (n) Ave.	3-Month (n) Ave.	6-Month (n) Ave.	12-Month* (n) Ave.
Parent (Incomplete set)	(n=594) 98.72	(n=410) 51.53 ²	(n=244) 52.68	(n=247) 50.87	(n=221) 46.64*
Client (Incomplete set)	(n=720) 71.32 ¹	(n=591) 50.02	(n=155) 47.35	(n=147) 40.48	(n=139) 38.35*
Parent (Complete discharge set)	(n=338) 100.19	(n=338) 48.55			
Client (Complete discharge set)	(n=481) 70.67	(n=481) 47.55			
Parent (Complete 3-Month Set)	(n=158) 98.99	(n=158) 47.36	(n=158) 51.01		
Client (Complete 3-Month Set)	(n=114) 68.69	(n=114) 51.51	(n=114) 46.20		
Parent (Complete 6-Month Set)	(n=135) 97.99	(n=135) 42.35 ²		(n=135) 50.20	
Client (Full 6-Month Set)	(n=103) 63.48 ¹	(n=103) 46.68		(n=103) 41.07	
Parent (Complete 12-Month Set)	(n=144) 97.46	(n=144) 44.94			(n=144) 48.67*
Client (Complete 12-Month Set)	(n=99) 68.30	(n=99) 47.25			(n=99) 38.61*

* Indicates a random sample of study participants was conducted for follow-up period.

1. Averages for this time period were found to be statistically different from the incomplete set $t(719) = -2.579, p < .01$.
2. Averages for this time period were found to be statistically different from the incomplete set $t(409) = -3.371, p < .001$.

Limitations to the Study

There are other potential sources of error or bias in this study not addressed in the previous section on non-response bias data analysis. The first limitation to note is that no control group was utilized and there was no random assignment of treatment. This is due to the ethical dilemma and cost of establishing control groups in private placement programs. The mean participation rate among clients in all programs was 83% (858 of the 1053 clients entering treatment). Participation rates among programs ranged from 61% to 90% (see Table 4).

Table 4. Total number of clients participating in OBH treatment and participating in the study from May 1, 2000 to December 1, 2000 in the seven participating programs.

Program	Total Number of Clients in OBH Treatment	Total Number of Clients in Study	Percent of Clients in Study
Ascent	217	185	85%
Freer	178	150	84%
SUWS	149	133	90%
Redcliff	140	120	86%
Aspen	172	105	61%
Anasazi	109	86	79%
Sunhawk	70	52	75%
Total Number of Clients	1035	858	80% Ave.

Interpreting Follow-up Results

It is important to note that several factors affect clients once they are discharged from an OBH program. These factors will obviously affect their well-being, as they try to integrate skills and lessons learned in OBH to posttreatment environments, i.e. aftercare, home, school, and/or peer. It is difficult to determine the specific factors that are affecting their well-being in these posttreatment environments. With this said, future research could help to identify which factors play primary roles in helping clients maintain identified therapeutic progress. It was simply beyond the scope of this study to do so.

Summary of Limitations

The study findings are based on follow-up data sets from parents and clients, which represent a percentage of all OBH clients entering treatment in the seven OBH programs from May 1, 2000 to December 1, 2000. While this study results represent only those clients agreeing to participate and providing data sets at respective time periods, it appears as though only the data sets at 6-months may be biased toward clients who exhibited fewer symptoms upon admission, or were assessed as doing well at discharge by their parents. The data at discharge, 3-month, and 12-months appears to accurately reflect client well-being after completion of OBH treatment at these periods.

RESULTS
Client Characteristics

Gender and Age

Approximately 70% of clients were male, and 30% female. Clients ranged in age from 11-19 years, with 75% of clients between the ages of 16-18 years. Tables 5 and 6 show the study participants' gender and age.

Table 5. Gender of study participants.

Gender	Number of Clients	Percent
Male	589	68.6
Female	269	31.4
Total	858	100.0

The majority of clients in the study were males between the ages of 16 and 17.

Table 6. Ages of study participants.

Age	Total Number of Clients	Percent
11	1	.1
12	2	.2
13	20	2.3
14	79	9.2
15	159	18.5
16	256	29.8
17	227	26.5
18	81	9.4
19	5	.6
Total	830	96.7
Age Data Available	28	3.3
Total Number of Clients	858	100.0

Primary Diagnoses

Table 7 shows the types of disorders with which clients were primarily diagnosed (according to the DSM-IV manual) and their frequency (some clients may have been diagnosed with more than one disorder; primary diagnoses only are reported here). Specific diagnoses were made for 481 of the 858 study participants (56%) (see Table 7). It is important to note, that due to limitations in the study, it was not possible to distinguish which clients out of the 377 for whom no diagnoses were reported did not warrant a diagnosis. It is possible that a proportion of these clients simply did not warrant a primary diagnosis after initial assessments by staff at each program. Almost 10% of the diagnoses were too varied to report here.

Oppositional Defiant Disorder (29%) was the most frequent diagnosis reported, followed by 25.8% with diagnoses associated with some kind of substance abuse or dependence (cannabis dependence (10%), cannabis abuse (5%), alcohol dependence (.7%), alcohol abuse (2.3%), and amphetamine dependence (1.1%)). Depression Disorder (10%), Dysthymic Disorder (5%) (a form of depression), and Bi-Polar Disorder accounted for 22.4% of the diagnoses. Other primary diagnosed disorders of noted frequency included Adjustment Disorders (4%) and Bipolar Disorder (3%).

Table 7. Average percentage of primary diagnoses of study participants.

Disorder	Number of Clients	Percent
Behavioral Disorders ¹	182	37.8
Substance Disorders ²	145	30.1
Mood Disorders ³	108	22.4
Other ⁴	45	9.7
Total	481	100
Diagnoses Available	481	56.1
No Diagnoses Data Available	377	43.9

1. Includes Oppositional Defiant, Attention Deficit, and Conduct Disorders.
2. Includes disorders associated with substance abuse or dependence.
3. Includes Depression, Dysthymia and Bipolar Disorders.
4. Includes Anxiety and Adjustment Disorders.

Prior Treatment

Previous outpatient services were received by more than half of all OBH clients (57%). Study participants had also previously received inpatient treatment services before enrolling in OBH (17.4%). Thirteen percent of all clients received both inpatient and outpatient services; this group represents perhaps the most seriously affected clients in the study. Inpatient services consists of those services where the client was in protective care of therapeutic facility, while outpatient services, which consisted of periodic individual or group counseling sessions, are those services where the child remained in the protective custody of the parent.

Table 8. Frequency and percentage of clients who received inpatient and outpatient treatment services prior to enrolling in OBH treatment.

Prior Inpatient Services		Number of Clients	Percent
	Yes	149	17.4
	No	709	82.6
Total		858	100
Prior Outpatient Services			
	Yes	491	57.2
	No	367	42.8
Total		858	100
Prior Inpatient and Outpatient Services			
	Yes	115	13.4
	No	743	86.6
Total		858	100

Table 8 shows that 57% of clients had received outpatient counseling prior to OBH treatment.

Summary of OBH Client Characteristics

Clients who participated in the study demonstrated the following characteristics: 1) the majority of the 858 clients were male (69%) and were between the ages of 16-18 years old (75%) (see Tables 5 and 6); 2) client diagnoses included Behavioral Disorders (38%), substance disorders (30%), and depressive disorders (22%) (Table 7); and 3) over half of the OBH clients (57%) had received outpatient services prior to enrolling in an OBH program, 17% had received inpatient treatment, and 13% had utilized both outpatient and inpatient prior to OBH treatment (Table 8).

TREATMENT OUTCOME

Research Question 1. What OBH treatment outcomes were still present at 3-, 6-, and 12-month follow-up periods?

Overall, the results indicated that the OBH clients participating in the study had reduced behavioral symptoms at discharge as measured by both client self-reported and parent assessments (Table 9). For client self-reports, group means decreased 23.12 points from 70.67 to 47.55 between admission and discharge. Parent assessments decreased 51.64 points from 100.19 at admission to 48.55 at discharge, more than twice the improvement reported by clients. These results suggest that the average OBH adolescent client reported clinically significant improvement after OBH treatment, and had outcome scores at discharge that were within two points of a normal range of functioning (score of 46 or below), similar to a normed sample of adolescents their age (Burlingame et al., 1996).

Table 9. Admission and discharge average SR Y-OQ and Y-OQ scores, including mean differences in scores from admission to discharge.

	N	Period	Average Mean Score (sd*)	Mean Difference
Client Self Report SR Y-OQ	481	Admission	70.67 (32.86)	23.12
	481	Discharge	47.55 (31.23)	
Parent Assessment Y-OQ	338	Admission	100.19 (28.52)	51.64
	338	Discharge	48.55 (37.48)	

Average differences in client self-report scores from admission to discharge showed a more than 20 point difference, suggesting clinically significant improvement from treatment.

* Indicates standard deviation of scores. Other assessments using the Y-OQ report similar standard deviations. For example, Mosier et al. (2001) report standard deviations from 36.68 to 40.521 at various assessment periods.



Outcomes at 3-Month Follow-up Period

Outcome data available at the 3-month follow-up period indicate that clients maintained progress resulting from OBH treatment. Client self-report scores show a discharge score of 51.51 and a 3-month score of 46.20 ($n=114$) (see Table 10). The incomplete client self-report data set shows a discharge score of 49.10 and a slightly higher score at 3-months of 50.54, suggesting that for this smaller sample of clients, outcomes were also maintained. Parent assessments show a slightly higher score at 3-months of 51.01, increasing 4-points from 47.36 at discharge ($n=158$). For both client self-reports and parent assessments, scores were higher at the 3-month follow-up period for the incomplete data set, suggesting that clients for whom a complete data set was available at admission, discharge and 3-months had better outcomes than those that did not report scores. Paired t-tests showed no significant differences between scores at discharge and three-months for both the incomplete and the 3-month data sets.

The 95% Confidence Interval for client scores for the complete 3-month data set ranged from 38.62 to 50.66 for client self-reports and 39.53 to 53.20 for parent assessments ($\alpha = .05$). These confidence intervals suggest that clients maintained outcomes from treatment at the 3-month follow-up period, with 95% of the scores falling within 4-7 points of the normal cut-score score of 46 established by Burlingame et al. (1996).

Table 10. Average SR Y-OQ and Y-OQ scores and frequency for the incomplete data set and the 3-month data set.

	Average Admission (<i>n</i>) Ave. (<i>sd</i>)	(<i>n</i>) Ave. (<i>sd</i>)	(<i>n</i>) Ave. (<i>sd</i>)
Client Self Report			
Incomplete Set	(<i>n</i> = 606) 71.87 (31.85)	(<i>n</i> = 477) 49.10 (32.56)	(<i>n</i> = 41) 50.54 (30.67)
Three-Month Set	(<i>n</i> = 114) 68.69 (32.72)	(<i>n</i> = 114) 51.51 (33.12)	(<i>n</i> = 114) 46.20 (31.05)
Parent Assessment			
Incomplete Set	(<i>n</i> = 546) 99.04 (27.61)	(<i>n</i> = 252) 52.80 (35.21)	(<i>n</i> = 86) 55.70 (36.47)
Three-Month Set	(<i>n</i> = 158) 98.99 (28.81)	(<i>n</i> = 158) 47.36 (36.92)	(<i>n</i> = 158) 51.01 (38.25)

Outcomes at 6-Month Follow-up Period

At 6-months, client self-report scores had dropped from 46.68 at discharge to 41.07 at 6-months ($n=103$ clients). This finding indicates that these clients viewed themselves as continuing to make progress after termination of the OBH treatment programs. Parents assessed clients at this period with a score of 42.35 at discharge and 50.20 at 6-months ($n=135$). Though this suggests an deterioration of outcomes, scores were not significantly different than the cut-score of 46. The differences in parent scores at discharge and 6-months were not statistically significant ($p > .20$).

The 95% Confidence Interval for client scores for the complete 6-month data set ranged from 34.77 to 47.37 for client self-reports and 44.24 to 56.16 for parent assessments ($\alpha = .05$). These confidence intervals also suggest that clients maintained outcomes from treatment at the 6-month follow-up period, with 95% of the scores falling within 4-10 points of the normal cut-score score of 46 established by Burlingame et al. (1996).

Differences between the 6-month data set for clients and parents were found when compared to the incomplete data set, suggesting that clients for whom complete data were available may have had fewer symptoms than those clients in the incomplete set. Parent assessments for the 6-month data set show discharge scores that were statistically different from the incomplete set ($t(409) = -3.371, p < .001$); this suggests that these clients may have responded more favorably to treatment.

Table 11. Average SR Y-OQ and Y-OQ scores and frequency for the incomplete data set and the 6-month data set.

	Average Admission (n) Ave. (sd)	Average Discharge (n) Ave. (sd)	Average Six-Month (n) Ave. (sd)
Client Self Report			
Incomplete Set	(n= 617) 72.89 (25.10)	(n=477) 49.10 (32.52)	(n=44) 39.09 (31.27)
Six-Month Set	(n= 103) 63.48 (32.07)	(n= 103) 46.68 (35.83)	(n= 103) 41.07 (32.24)
Parent Assessment			
Incomplete Set	(n= 569) 99.04 (26.12)	(n= 275) 52.80 (28.37)	(n= 112) 56.69 (34.26)
Six-Month Set	(n= 135) 97.99 (27.10)	(n= 135) 42.35 (35.64)	(n= 135) 50.20 (34.99)

Figure 2 shows a box plot illustrating the range of responses for all clients at admission, discharge, and at 3- and 6-month follow-up periods, and offers insight into client well-being after treatment. Figure 2 shows median scores for client self-report scores below the cut score of 46 for 3- and 6-month assessment periods. At three-months posttreatment, approximately 25% of all clients had scores between 25-45, while the other 25% had scores that ranged from 45-70. At six-months posttreatment, the range of the “box” tightened, with 50% of the scores falling between 25 and 55 (this means that 50% of scores at this time period would not statistically differ from the cut score of 46) .

Box plots: The upper and lower boundaries of the box are drawn at the 75th and 25th percentiles. The box represents 50% of all scores in the distribution. The line in the center of the box is the median, where 50% of the scores lie above or below the line. The lines extending from the box reach from the extreme highest to the extreme lowest score and represent less than 1% of the scores.

Figure 2. Boxplot depicting the range of client self-report Y-OQ scores at admission, discharge, 3-, and 6-months (Line denotes normal score of 46).

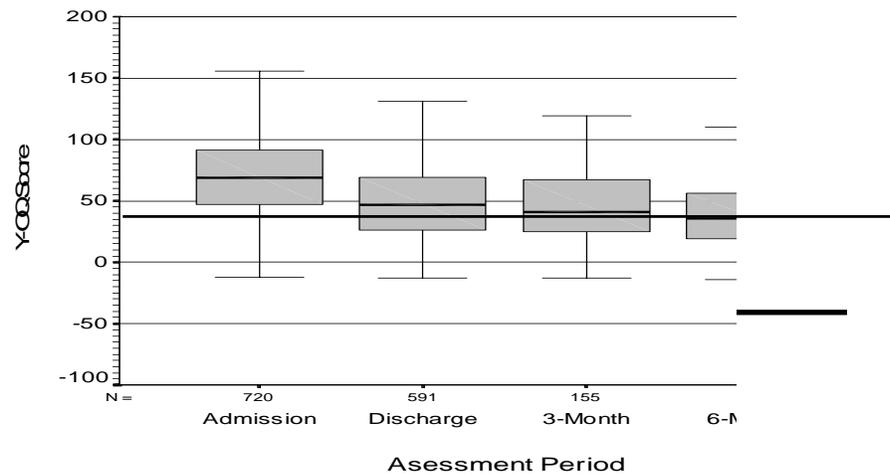
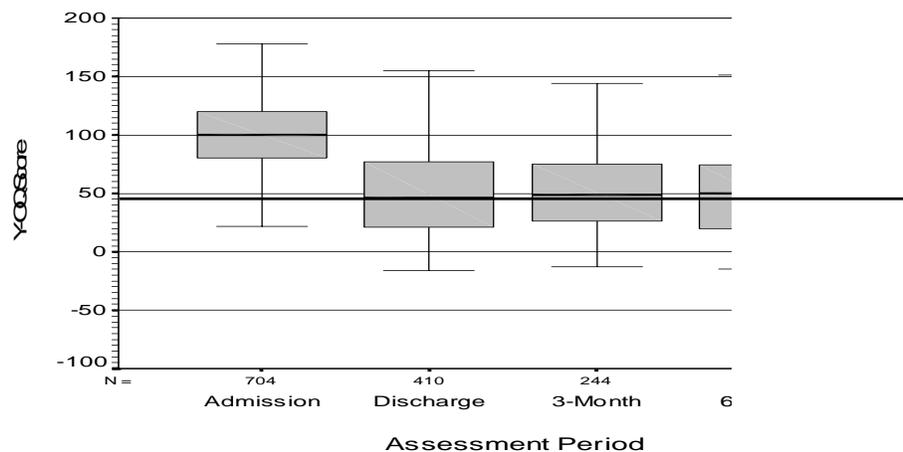


Figure 3 shows parent scores at admission, discharge, and 3- and 6-month follow-up periods. Parents’ scores indicate a median at 3- and 6-month follow-up periods that is also close to the cut score of 46. The “boxes” remain consistent in their distribution of scores at 3- and 6-months, with scores ranging from 20-70.

Figure 3. Boxplot depicting the range of parent assessed Y-OQ scores at admission, discharge, 3-, and 6-months (Line denotes normal score of 46).



Outcomes at 12-Month Follow-up Period

The data at 3- and 6-month assessments show outcomes from treatment had been maintained by clients; however, these data represent a self-selected sample that could be biased toward more favorable outcomes. To address this, a random sample of clients who had completed at least one assessment at admission or discharge were selected to ensure a more representative sample at the 12-month time period. In doing so, the non-contact bias was reduced and a more accurate assessment of client well-being at 12-months after OBH treatment was determined.

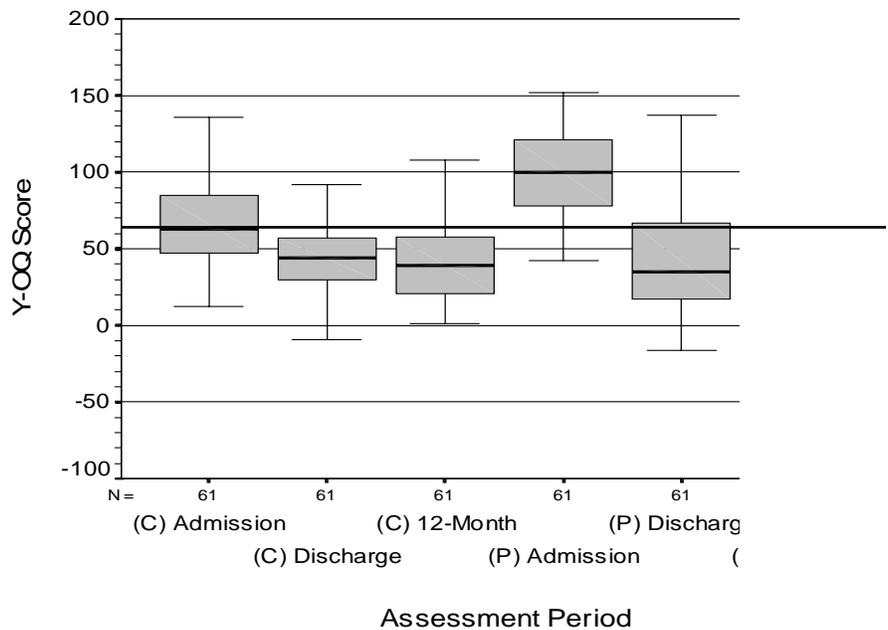
Table 12 shows that a total of 271 parents and 139 clients completed the Y-OQ questionnaire at the 12-month time period. The next process was to identify study participants who completed questionnaires at both admission and discharge. This provided data sets that yielded information regarding treatment progress (difference in scores from admission to discharge) and the resulting outcome at the 12-month time period. Clients' self report outcomes averaged 8 points under the cut-score of 46 (38.61), indicating that those clients maintained outcomes from treatment, and actually continued to improve at the 12-month follow-up period. Parent scores were almost 10 points higher (48.67), but were not significantly different than the cut-score of 46 points. Client self-reports and parent assessments indicated that OBH graduates maintained outcomes from treatment and were doing well emotionally and behaviorally at the 12-month follow-up. T-tests were run on the averages from the incomplete and complete data sets at all time periods, and significant differences were only found for parent assessed discharge scores ($t(409) = -2.519, p < .012$). This finding indicates that the randomly sampled 12-month data set had lower discharge scores than the incomplete data set (a difference of 10.16), but also had higher scores at the 12-month follow-up period (a difference of 5.83).

Table 12. Average SR Y-OQ and Y-OQ scores and frequency for the incomplete data set and the 12-month data set.

	Average Admission (n) Ave. (sd)	Average Discharge (n) Ave. (sd)	(n) Ave. (sd)
Client Self Report			
Incomplete Set	(n= 621) 71.80 (28.38)	(n=492) 50.58 (34.72)	(n=40) 37.70 (30.61)
Twelve-Month Set	(n= 99) 68.30 (34.14)	(n= 99) 47.25 (30.78)	(n=99) 38.61 (31.83)
Parent Assessment			
Incomplete Set	(n= 560) 99.04 (27.65)	(n= 266) 55.10 (32.28)	(n= 127) 42.84 (30.29)
Twelve-Month Set	(n= 144) 97.46 (28.81)	(n= 144) 44.94 (36.92)	(n= 144) 48.67 (38.25)

A data set was constructed that included both parent and client assessments for an individual client to further explore the more than 10-point difference that was found between client self-reports and parent assessments at the 12-month time period. Figure 4 shows box plots for client (c) and parent (p) scores at admission, discharge and the 12-month follow-up period for 61 randomly sampled clients for whom assessments were made by both parents and clients. Though average admission scores were noticeably higher for parents than clients (99.36 and 69.82 respectively) (see Russell, 2001, for suggestions as why they may have been differences in scores at admission), scores at discharge for parents (46.59) and clients (43.77) were not statistically different. At the 12-month follow-up period, scores were also similar, with parent assessments averaging 43.70 and clients averaging 43.34. This suggests that parents and clients were rating the adolescent consistently using the Y-OQ at follow-up periods, and that outcomes were maintained for this randomly selected data set 12-months after completion of treatment.

Figure 4. Boxplot depicting the range of parent assessed Y-OQ scores at admission, discharge, and 12-months (Line denotes normal score of 46).



Outcomes at 12-Month Follow-up Period According to Gender and Age

Outcomes at the 12-month follow-up period were further analyzed to explore differences in total Y-OQ score by age and gender. Table 13 shows that females entered treatment with more severe presenting symptoms as indicated by both client self-report and parent assessment. Females self-reported an admission score that was 26 points higher than males, and a discharge score that was also higher by more than 13 points. Males self-reported discharge scores below the cut-score of 46 (42.0), while females remained significantly higher than the discharge score (55.68). At the 12-month follow-up period, females continued to show improvement indicated by a score of 40.42, which was below the cut-score of 46. Males also improved by more than four points to a score of 37.48. At 12-months, both males and female self-report scores were below the cut-score of 46. Females continued to show improvement between discharge and 12-months evidenced by a significantly different drop in scores from 55.68 at discharge to 40.42 at 12-months ($t(41) = 2.384, p < .02$).

Parent assessments show similar patterns in the maintenance of outcomes throughout the follow-up period, though scores did rise for males and females between discharge and 12-months by 3 and 4 points respectively. Scores at 12-months remained 3 points above the cut score of 46 for males (49.66) and at the cut-score for females (46.54).

*Table 13. Average SR Y-OQ and Y-OQ scores and frequency for the 12-month data set for male and female study participants.**

		Ave. Admission <i>(n) Ave.</i>	Ave. Discharge <i>(n) Ave.</i>	Ave. 12-Month <i>(n) Ave.</i>
Client Self Report				
	Male	<i>(n=61)</i> 58.05	<i>(n=61)</i> 42.00	<i>(n=61)</i> 37.48
	Female	<i>(n=38)</i> 84.76	<i>(n=38)</i> 55.68	<i>(n=38)</i> 40.42
Parent Assessment				
	Male	<i>(n=98)</i> 94.05	<i>(n=98)</i> 46.32	<i>(n=98)</i> 49.66
	Female	<i>(n=46)</i> 104.72	<i>(n=46)</i> 42.02	<i>(n=46)</i> 46.54

*Standard deviations ranged from 22.75 to 38.67 for all scores in Table 13.

Table 14 shows clients ages 13-14 ($n=12$) reported the highest admission scores across all age groups. Discharge scores for this age group also remained high and were more than 17 points above the cut-score of 46. Clients ages 17-19 ($n=34$) reported the lowest discharge scores by more than 14 points when compared to clients ages 15-16 ($n=49$); these scores were 10 points below the cut-score of 46. Client self reports for all age groups were below the cut score of 46, indicating that outcomes at discharge were maintained. Clients ages 13-14 continued to improve during this time period, indicated by a drop in scores of more than 25 points from discharge to the 12-month follow-up period.

Parent assessments showed higher scores at admission for clients ages 13-14 ($n=16$) when compared to other age groups. At discharge, parents assessed all clients at or below the cut-score of 46, with clients ages 17-19 ($n=52$) showing the most improvement in treatment and lowest discharge score (39.31). Parents indicated a 3-5 point increase in scores from discharge at 12-months, with clients ages 15-16 showing an increase in scores to above the cut-score of 46.

*Table 14. Average SR Y-OQ and Y-OQ scores and frequency for the 12-month data set for clients classified into three age groups: ages 13-14, ages 15-16, ages 17-19.**

	Ave. Admission (<i>n</i>) Ave.	Ave. Discharge (<i>n</i>) Ave.	Ave. 12-Month (<i>n</i>) Ave.
Client Self-Report			
Ages 13-14	(<i>n</i> =12) 72.50	(<i>n</i> =12) 63.50	(<i>n</i> =12) 37.75
Ages 15-16	(<i>n</i> =49) 66.88	(<i>n</i> =49) 50.86	(<i>n</i> =49) 42.88
Ages 17-19	(<i>n</i> =34) 69.24	(<i>n</i> =34) 36.21	(<i>n</i> =34) 34.24
Parent Assessment			
Ages 13-14	(<i>n</i> =16) 107.19	(<i>n</i> =16) 45.31	(<i>n</i> =16) 48.31
Ages 15-16	(<i>n</i> =71) 96.45	(<i>n</i> =71) 46.37	(<i>n</i> =71) 51.15
Ages 17-19	(<i>n</i> =52) 95.10	(<i>n</i> =52) 39.31	(<i>n</i> =52) 44.71

*Standard deviations ranged from 24.26 to 39.14 for all scores in Table 14.

Outcomes at 12-Month Follow-up Period According to Utilization of Aftercare Services

Consideration of the utilization of aftercare services by clients is important in understanding OBH treatment outcomes. Because OBH programs are often short term interventions (average length of treatment in this study was 45 days), it is often recommended that clients enroll in aftercare programs to help them maintain therapeutic progress. Clients were categorized into two groups: 1) utilizing aftercare services, which were defined as including placement of the child in a residential facility outside of the home environment for between three and 12 months, and 2) returning to the home environment. It was beyond the scope of this study to further break down the aftercare service classifications.

Table 15 shows that 45.3% of the clients who participated in the study utilized aftercare services, while over 50% of all clients returned home after completion of treatment. Data was not available for 4.2% of the study participants.

Table 15. Number and percentage of study participants that participated in and did not participate in aftercare services.

Aftercare Services	Frequency	Percent
Yes	389	45.3
No (Home)	433	50.5
Not Available	36	4.2
Total	858	100

Table 16 reports data from all clients (incomplete data set) and shows no significant score differences at the 12-month follow-up period for those clients who utilized aftercare services and those that returned home for both client self-reports and parent assessments. A t-test was run to examine the more than 9 point difference in parent assessments at this period (52.83 and 43.17). No significant differences were found $t(196) = -1.769, p > .08$.

*Table 16. Total Y-OQ scores at admission, discharge and 12-months for clients who utilized aftercare services and those who returned home.**

		Admission (n) Ave.	Discharge (n) Ave.	12-Month (n) Ave.
AFTERCARE	Client Self-Report Y-OQ	(n=307) 73.03	(n=263) 52.42	(n=52) 41.29
	Parent Assessment Y-OQ	(n=301) 100.43	(n=158) 50.63	(n=99) 43.17
HOME	Client Self-Report Y-OQ	(n=350) 69.59	(n=282) 48.84	(n=70) 37.90
	Parent Assessment Y-OQ	(n=331) 98.34	(n=207) 53.32	(n=99) 52.83

*Standard deviations ranged from 22.42 to 40.61 for all scores in Table 16.

Table 17 reports complete data sets and shows no statistical differences in scores between those clients who utilized aftercare services and those who returned home. There were however, real differences in scores for both client self-report and parent assessments. Client self-report data show that clients who utilized aftercare services had higher scores at admission than those that returned home by more than 8 points (72.63 and 63.98) and higher discharge scores by almost 5 points (51.80 and 46.89). At the 12-month follow-up period, clients who utilized aftercare services had higher scores by more than 6 points (43.39 and 37.17). This data suggests that clients who utilized aftercare services remained above the normal cut score of 46 at discharge and programs and parents may have believed they were still at-risk of resorting to past behaviors.

Parent assessments show a different pattern of scores for these two groups. For the aftercare group, scores were higher at admission (100.18 and 95.71) and slightly lower at discharge (44.79 and 46.93). At the 12-month follow-up period, scores were also lower for the aftercare group (47.62 and 52.13).

Table 17. Average Y-OQ scores for complete data sets at admission, discharge, and 12-months for clients who utilized aftercare services and clients who returned home.

		Admission (n) Ave.	Discharge (n) Ave.	12-Month (n) Ave.
AFTERCARE	Client Self-Report Y-OQ	(n=41) 72.63	(n=41) 51.80	(n=41) 43.39
	Parent Assessment Y-OQ	(n=56) 100.18	(n=56) 44.79	(n=56) 47.62
HOME	Client Self-Report Y-OQ	(n=47) 63.98	(n=47) 46.89	(n=47) 37.17
	Parent Assessment Y-OQ	(n=70) 95.71	(n=70) 46.93	(n=70) 52.13

*Standard deviations ranged from 27.29 to 37.11 for all scores in Table 17.

Outcomes at 12-Month Follow-up Period: Differences in Six Content Areas

The six content areas of the Y-OQ are designed to assess symptoms associated with: (1) Interpersonal Distress, (2) Somatic, (3) Interpersonal Relations, (4) Critical Items, (5) Social Problems, and (6) Behavioral Dysfunction. These content areas are referred to as subscales in the Y-OQ and are outlined in detail in Figure 1 (see page 12). There are two possible ways in which subscale data can be analyzed: 1) conduct pair-wise comparisons between discharge and 12-months to look for significant differences in scores, and 2) examine the “cut scores” associated with each subscale to determine if 12-month scores were at or below these cut scores (Burlingame et al., 1996). This would indicate a return to a normal range of symptoms in each content area.

Three subscales were found to be significantly different between discharge and 12-months for client self-reports. They were: (2) Somatic (improvement made in scores), (3) Interpersonal Relations (deterioration in scores), and (6) Behavioral Dysfunction (improvement made in scores). One subscale was found to be significantly different between discharge and 12-months for parent assessments: (3) Interpersonal Relations. Scores for subscales (3) Interpersonal Relations and (6) Behavioral Dysfunction were above the cut-score for both client self-report and parent assessment.

Table 18. Y-OQ average subscale scores at discharge and 12-months, including cut-scores established by Burlingame et al. (1995) for each of the six content areas.

	Frequency	Average Discharge	Average 12-Month	Cut-Score
Client Self-Report				
Subscore 1 (Interpersonal Distress)	99	15.99	16.51	16.4
Subscore 2 (Somatic)	99	5.58	4.55	5.0
Subscore 3 (Interpersonal Relations)	99	3.88	5.52	4.4
Subscore 4 (Critical Items)	99	5.20	5.03	5.0
Subscore 5 (Social Problems)	99	12.02	12.99	12.0
Subscore 6 (Behavioral Dysfunction)	99	6.98	5.35	3.0
Parent Assessment				
Subscore 1 (Interpersonal Distress)	144	17.16	17.61	16.4
Subscore 2 (Somatic)	144	3.45	4.32	5.0
Subscore 3 (Interpersonal Relations)	144	5.96	7.77	4.4
Subscore 4 (Critical Items)	144	5.47	4.49	5.0
Subscore 5 (Social Problems)	144	10.25	10.89	12.0
Subscore 6 (Behavioral Dysfunction)	144	5.02	5.89	3.0

DISCUSSION

Study participant outcomes at 3-, 6-, and 12-month follow-ups indicated that clients are maintaining outcomes from OBH treatment at follow-up periods. The data from the random sample of study participants at the 12-month follow-up period suggest that clients are maintaining outcomes, indicated by Y-OQ and SR Y-OQ scores that, on average, continue to decline after completion of treatment. In general, results suggest that clients are making the transition from the wilderness environments of OBH into posttreatment environments successfully, be they home or aftercare programs. Future research could examine the factors that make this transition easier for the client and parents to better understand why certain clients may do better in this transition than others. However, data at the 3- and 6-month follow-up period may include a self-selected sample of clients who may be doing better than non-respondents.

Clients for whom data was available at admission, discharge and 12-months reported average improvement from 47.25 (slightly above the normal score of 46) to 38.61 at 12-months after completion of treatment. Interestingly, parents reported scores of 44.94 at discharge and 48.67 at 12-months, suggesting a slight deterioration of effects. Twelve-month scores for clients and parents are also statistically different ($t(220) = 18.49, p < .001$). Parents and clients differed by more than 30 points in average scores at admission, yet had similar scores at discharge, and at 3-, and 6-month time periods but began to differ again at the 12-month follow-up period. Perhaps adolescent clients believe they are doing well at this point in time, but parents are again becoming concerned about their child's behaviors and the feelings their child is experiencing. The differences between parent and client assessments at various periods of treatment is also an area for further research.

Due to limitations in this study, specific OBH treatment process factors that help facilitate this maintenance of outcomes is unknown. It is also beyond the scope of this study to assess which OBH-acquired skills--be they behavioral or interpersonal--most contribute to the maintenance of outcomes. How clients apply skills and lessons learned in OBH and related programs to their everyday lives has not been well documented in the literature (Hattie et al., 1997; Winterdyk & Griffiths, 1984). Some studies suggest certain process factors that may be beneficial in certain posttreatment environments. These include working with the parents and child to help improve channels of communication (Bandoroff & Scherrer, 1994); having the adolescent experience something as physically and emotionally demanding as a wilderness expedition, and thus realizing that other challenges in life may not be as intimidating (Russell, 2001); or experiencing an intense interpersonal experience through group development and cohesion that is desirable and something to strive for outside of wilderness experiences (Ewert & Heywood, 1991; Russell, 2002). Future research could address what specific process factors, skills and lessons are being developed in OBH treatment and assess how these relate to outcomes in posttreatment environments.

Gender and age were important factors that explained variance in scores in this study. Client self-reports indicated an average admission score of 58.05 for males and 84.76 for females, a difference in score of more than 26 points ($t(97) = 4.077, p < .001$). Scores remained different at discharge by more than 13 points (55.68 and 42.00), but were similar at 12-months, with a difference of less than 3 points (40.42 and 37.48). (Parent assessments showed higher scores at admission for females and below the cut-score and lower than males at discharge and 12-months). Burlingame et al. (1996) examined gender differences in Y-OQ scoring, and found no reliable differences between males and females in total Y-OQ scores, but did find differences in two subscales. Male were found to have higher behavioral dysfunctional scale scores than females, while females have higher somatic scale scores than males (p. 8). This may explain score differences between male and females. There are two observations from these findings. First, it is unclear why significant differences exist in self-report scores for males and females. *Do females respond better to OBH treatment than males? Do females report higher rates of certain symptoms at admission than males?* Second, higher scores at admission for females indicated by parent assessments may suggest that females may have more severe presenting symptoms than males. These are interesting findings that could be the focus of further research.

Client self-reports and parent assessments both indicate that older clients (ages 17-19) seem to have more favorable outcomes from OBH treatment than younger clients (ages 15-16). However, the youngest clients were shown to have the most severe presenting issues. Admission scores for both client self-report and parent assessments were 6 and 11 points higher than other age groups respectively. The youngest clients, ages 13-14, reported considerable improvement at the 12-month follow-up period, with a reduction in scores of more than 25 points during this time. Parent assessments showed a slight increase in scores for all ages from discharge to 12-months.

No statistical differences were found in average scores when comparing clients who utilized aftercare services with those who returned home. However, there were noticeable score differences. Client self-report data show that clients who utilized aftercare services had higher scores at admission and higher discharge scores. At the 12-month follow-up period, scores were still higher by more than 6 points. This may suggest that aftercare services may be warranted for these clients who had made progress in treatment but still needed the structure of aftercare services. Parent assessments show a different pattern of scores. For the aftercare group, scores were higher at admission and slightly lower at discharge and were also lower at the 12-month follow-up period. This is also an important area for further research. It may be possible to utilize a random sample of clients who would either go on to an aftercare program or return home. Differences in outcomes for these two groups could then be compared to better understand the role aftercare services may play in maintaining outcomes.

Analysis of subscale data showed a deterioration of outcomes in interpersonal relations at the 12-month follow-up period that were above the cut score, and statistically different than scores at discharge. Client self-report scores at discharge were below the cut-score, suggesting that clients may have made progress in this area from group interaction and peer relations, and through relationships established with therapeutic staff. These are two powerful factors in all therapeutic modalities that have been suggested to be enhanced through group living in wilderness environments (Ewert & Heywood, 1991; Russell, 2001 and 2002). The deterioration of outcomes in this area may reflect inabilities to have these types of interpersonal connections to peers and adults in posttreatment environments. Also, clients self-reported a significant improvement in the behavioral dysfunction content area, which may be an indication of improvement in organizing tasks, completing assignments in school, and learning how to handle frustration in more appropriate ways.

SUMMARY AND CONCLUSIONS

Conclusions from the first phase of this study reported in Technical Report 27 (Russell, 2001) are:

1. The clients enrolling in the seven OBH programs during the period of this study were predominantly male (69%) and between the ages of 16-18 (75%). Ninety-seven percent of clients who entered OBH programs and participated in the study completed treatment.
2. Clients entered treatment with a variety of disruptive behavioral, mood and substance disorders as their primary diagnoses. The most frequent disorders for those with diagnoses (56% of the total study population) were behavioral disorders (38%), including Oppositional Defiant, Attention Deficit, and Conduct Disorder. Substance Disorders (includes a wide range of substances, including alcohol, cannabis, and tobacco) comprised 31% of diagnoses, while mood disorders comprised 23%, which includes Depression, Dysthymic, or Bi-Polar diagnoses.
3. Over half (57%) of the OBH clients had received outpatient services, while 17% had utilized inpatient services prior to OBH treatment. Many (13%) had tried both types of services prior to OBH treatment.
4. Clients moved toward a normal range of symptoms after completion of OBH treatment. Client self-report mean Y-OQ scores at admission were 70.67; mean discharge scores were 47.55, indicating an average score reduction of more than 20 points. Parent assessed Y-OQ mean scores at admission were 101.19 and their mean discharge scores were 48.55, indicating an average reduction of 52.64 points.
5. OBH has positive outcomes when compared to two recent studies reported in the literature of in-home, family centered psychiatric treatment (Mosier et al., 2001) and a partial-day treatment program for referred children (Robinson, 2000) that had also measured treatment outcomes using the Y-OQ.

Conclusions from the second phase of this study assessing outcomes from OBH treatment at 3-, 6-, and 12-month follow-up periods are:

1. At the 3- and 6-month follow-up period, outcomes were maintained as indicated by client self-report scores that did not significantly differ from previous assessments; parent assessments indicated higher scores at 3-month (4 points) and 6-month (8-points) time periods when compared to discharge scores. Based on the supporting literature, differences in scores between complete and incomplete data sets, and the small sample size of clients for whom data was available at follow-up periods, these samples may be biased in the direction of more favorable outcomes. Thus, the decision was made to conduct a random sample of clients at the 12-month follow-up period in hopes of gaining a more representative and unbiased sample.

2. Client self-report and parent assessment at the 12-month follow-up period indicated that clients maintained outcomes from treatment and were doing well emotionally and behaviorally. Clients' self-reported outcomes that averaged 8 points below the cut-score of 46 (38.61), indicating that those clients had actually continued to improve up to one-year after completion of treatment. Parent scores were almost 10 points higher at 48.67, but were also close to the cut-score of 46 points. These findings suggest that clients had maintained behavioral and emotional outcomes from treatment at the 12-month follow-up period.

3. For the randomly sampled data set at 12-months (admission, discharge, and 12-months), both males and females self-reported below the cut-score of 46. Females report a higher level of symptoms at admission, indicated by a score that was more than 26 points higher than males. Parent assessments show similar patterns in the maintenance of outcomes throughout the follow-up period, though scores did rise for males and females between discharge and 12-months by 3 and 4 points, respectively.

8. For the randomly sampled data set at 12-months (admission, discharge, and 12-months), clients ages 13-14 self-reported the highest admission scores across all age groups, and also had higher discharge scores. Older clients (ages 17-19) self-reported the lowest discharge scores. Younger clients showed statistically significant improvement between discharge and 12-months, evidenced by a drop in scores of more than 25 points. Parent assessments showed similar patterns across age groups, but also indicated an increase in scores from discharge to the 12-month period by five points above the cut score (46).

9. No statistical differences were found in average scores when comparing clients who utilized aftercare services with those who returned home. However, client self-report data show that clients who utilized aftercare services had higher scores at admission and discharge than those clients who returned home. At the 12-month follow-up period, clients who utilized aftercare services had higher scores by more than 6 points. This data suggests that clients who utilized aftercare services remained above the normal cut score of 46 at discharge; OBH program staff and parents may have believed they were still at-risk of resorting to past behaviors. Parent assessments show that the aftercare group had higher scores at admission but were slightly lower at discharge and the 12-month follow-up period.

LITERATURE CITED

- Achenbach, T. M. (1991). *Manual for the child behavior checklist 14-18 and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.
- American Psychiatric Association. (1994). *Diagnostic manual of mental disorders*. (4th ed.). Washington, DC: Author.
- Bandoroff, S. (1989). *Wilderness therapy for delinquent and pre-delinquent youth: A review of the literature*. (ERIC ED377428): University of South Carolina, Columbia, SC.
- Bennett, L., Cardone, S., & Jarczyk, K. (1998). Effects of a therapeutic camping program on addiction recovery: The Algonquin Haymarket relapse prevention program. *Journal Of Substance Abuse Treatment, 15*(5), 469-474.
- Block, J. H. & Robins, R.W. (1993). A longitudinal study of the consistency and change in self-esteem from early adolescents to early childhood. *Child Development, 64*, 909-923.
- Brownell, K. D., Marlatt, G. A., Lichtenstein, E., & Wilson, G. T. (1986). Understanding and preventing relapse. *American Psychologist, 41*, 765-782.
- Burlingame, G., Lambert, M., Reisenger, C., Neff, W., & Mosier, J. (1995a). Pragmatics of tracking outcomes in a managed care setting. *The Journal of Mental Health Administration, 22*(3), 226-236.
- Burlingame, G. M., Wells, M. G., & Lambert, M. J. (1995b). *The Youth Outcome Questionnaire*. Stevenson, MD: American Professional Credentialing Services.
- Burlingame, G. M., Wells, M. G., Hoag, M. J., Hope, C. A., Nebeker, R. S., Konkell, K., McCollam, P., & Reisenger, C. W. (1996). *Manual for youth outcome questionnaire (Y-OQ)*. Stevenson, MD: American Professional Credentialing Services.
- Burton, L. M. (1981). A critical analysis and review of the research on Outward Bound and related programs. *Dissertation Abstracts International, 47/04B* (University Microfilms No. AAC812247).
- Cason, D. R., & Gillis, H. L. (1994). A meta analysis of adventure programming with adolescents. *Journal of Experiential Education, 17*, 40-47.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.). Hillsdale, NJ: Erlbaum.

-
-
- Davis-Berman, J., & Berman, D. S. (1994). *Wilderness Therapy: Foundations, theories and research*. Dubuque, IA: Kendall/Hunt Publishing.
- Deschenes, E. P., & Greenwood, P. (1998). Alternative placements for juvenile offenders: Results from the evaluation of the Nokimus Challenge Program. *Journal of Research in Crime and Delinquency*, 35(3), 267-294.
- Easley, A. T., Passineau, J. T., & Driver, B. L. (1990). *The use of wilderness for personal growth, therapy, and education*. (General Technical Report RM-193). Fort Collins, CO: Rocky Mountain Forest and Range Experiment Station.
- Eggleston, E. J. (1998). *Reflections on wilderness therapy*. In: Exploring the Boundaries of Adventure Therapy: International Perspectives. Itin, C. (Ed.). Proceedings of the 1st International Adventure Therapy Conference: Perth, Australia, July 1997. Association for Experiential Education, Boulder, CO.
- Ewert, A., & Heywood, J. (1991). Group development in the natural environment: Expectations, outcomes and techniques. *Environment and Behavior*, 23, 5, 592-615.
- Ewert, A. (1983). *Outdoor adventure and self concept: A research analysis*. Eugene: University of Oregon: Center for Leisure Studies.
- Ewert, A. (1987). Research in experiential education: An overview. *Journal of Experiential Education*, 10(2), 4-7.
- Friese, G., Hendee, J. C., & Kinziger, M. (1998). The wilderness experience program industry in the United States: Characteristics and dynamics. *Journal of Experiential Education*, 21(1), 40-45.
- Graziano, A., & Raulin, M. (1997). *Research methods: A process of inquiry*. (3rd ed.). New York: Addison Wesley Longman.
- Grotevant, H. D. & Cooper, C. R. (1986). Individuation in family relationships. *Human Development*, 29, 82-100.
- Hans, T. A. (2000). A meta-analysis of the effects of adventure programming on locus of control. *Journal of Contemporary Psychotherapy*, 30(1), 33-60.
- Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure education and Outward Bound: Out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67(1), 43-87.
- Jacobsen, N. S., & Truax, P. (1991). Clinical significance: A statistics approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59, 132-151.
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-
- Jenkins, M. (2000). The hard way. *Outside, March*, 45-52.
- Kelly, F. J. (1974). *Outward Bound and delinquency: A ten year experience*. Paper presented at the International Conference of the Association of Experiential Education, Estes Park, CO.
- Kelly, F., & Baer, D. (1968). *Outward Bound: an alternative to institutionalization for adolescent delinquent boys*. Boston, MA: Fandel Press.
- Krakauer, J. (1995). Loving them to death. *Outside, October*, 1-15.
- Lambert, M., & Cattani-Thompson, K. (1996). Current findings the effectiveness of counseling: Implications for practice. *Journal of Counseling and Development*, 74(July/August), 601-607.
- Lambert, M., Ogles, B., & Masters, K. (1992). Choosing assessment devices: An organizational and conceptual scheme. *Journal of Counseling and Development*, 70(March/April), 527-532.
- Lambert, M. J., Huefner, J. C., & Reisinger, C. W. (1996). Quality improvement: Current research in outcome management. In W. T. Stricker & S. Sheuman (Eds.), *Handbook of quality management in behavioral health*. Plenum.
- Moote, G. T., & Wadarski, J. S. (1997). The acquisition of life skills through adventure-based activities and programs: A review of the literature. *Adolescence*, 32(125), 143-167.
- Mosier, J. (1998). *The predictive validity of the Youth Outcome Questionnaire: Prognostic Assessment*. Unpublished dissertation, University of Utah, Salt Lake City.
- Mosier, J., Burlingame, G., Wells, G., Ferre, R., Latkowski, M., Johansen, J., Peterson, G., & Walton, E. (2001). In-home, family centered psychiatric treatment for high-risk children and youth. *Children's Services: Social Policy, Research, and Practice*, 4(2), 51-68.
- Pitstick, R. (1995). *Wilderness Discovery: The meaning and effects of a seven-day wilderness experience program for youth-at-risk in the federal Job Corps program* (unpublished Doctoral dissertation). Moscow: University of Idaho.
- Robinson, K. (2000). Outcomes of a partial-day treatment program for referred children. *Child and Youth Care Forum*, 29(2), 127-137.
- Rogers, C. R. (1961). *On becoming a person*. Boston, MA: Houghton Mifflin Company.
- Russell, K. C. (2002). Perspectives on the wilderness therapy process and its relation to outcome. *Child and Youth Care Forum*, In Press.
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- Russell, K. C. (2001). Assessment of treatment outcomes in Outdoor Behavioral Healthcare. (Technical Report 27). Idaho Forest, Wildlife, and Range Experiment Station, Moscow, ID: Available from the UI-Wilderness Research Center-Outdoor Behavioral Healthcare Research Cooperative (<http://www.its.uidaho.edu/wrc>).
- Russell, K., & Hendee, J. (2000). *Outdoor behavioral healthcare: Definitions, common practice, expected outcomes and a national survey of programs* (Technical Report 26). Idaho Forest, Wildlife, and Range Experiment Station, Moscow, ID: Available from the UI-Wilderness Research Center-Outdoor Behavioral Healthcare Research Cooperative (<http://www.its.uidaho.edu/wrc>).
- Russell, K. C. (2000). Exploring how the wilderness therapy process relates to outcomes. *Journal of Experiential Education*, 23(3), 170-176.
- Russell, K. C. (1999). *Theoretical basis, process, and reported outcomes of wilderness therapy as an intervention and treatment for problem behavior in adolescents*. Unpublished doctoral dissertation, University of Idaho, Moscow, ID.
- Stinchfield, R. D. N., L.; Feder, S. (1994). Follow-up contact bias in adolescent substance abuse treatment outcome research. *Journal of Studies on Alcohol*, 55, 285-289.
- Vermillion, J., & Pfeiffer, S. (1993). Treatment outcomes and continuous quality improvement: Two aspects of program evaluation. *Psychiatric Hospital*, 24, 9-14.
- Wells, M. G., Burlingame, G. M., Lambert, M. J., Hoag, M. J., & Hope, C. A. (1996). Conceptualization and measurement of patient change during psychotherapy: Development of the Outcome Questionnaire and Youth Outcome Questionnaire. *Psychotherapy*, 33(Summer), 275-283.
- Wells, S. E. (1990). *At-risk youth: Identification, programs, and recommendations*. Engelwood, CO: Teacher Ideas Press.
- Winterdyk, J., & Griffiths, C. (1984). Wilderness experience programs: reforming delinquents or beating around the bush? *Juvenile and Family Court Journal*, Fall, 35-44.
- Winters, K. C. (1999). Treating adolescents with substance use disorders: An overview of practice issues and outcomes. *Substance Abuse*, 20(4), 203-225.