An Assessment of Outcomes in Outdoor Behavioral Healthcare Treatment

Keith Russell
University of Idaho

ABSTRACT: Outdoor behavioral healthcare (OBH) is an emerging treatment that utilizes wilderness therapy to help adolescents struggling with behavioral and emotional problems. The approach involves immersion in wilderness or comparable lands, group living with wilderness leaders and peers, and individual and group therapy sessions facilitated by licensed therapists in the field. OBH also offers educational and psychoeducational curriculum all designed to reveal and address problem behaviors, foster personal and social responsibility, and enhance the emotional growth of clients. The extant studies on the effectiveness of OBH and wilderness therapy reveal consistent lack of theoretical basis, methodological shortcomings and results that are difficult to replicate. This publication reports the results of an outcome assessment for adolescent clients who received treatment in seven participating OBH programs that averaged 45 days in length from May 1, 2000 to December 1, 2000. Adolescent client well-being was evaluated utilizing the Youth Outcome Questionnaire (Y-OQ) and the Self Report-Youth Outcome Questionnaire (SR Y-OQ) (Burlingame, Wells, & Lambert, 1995). Complete data sets at admission and discharge were collected for 523 client self-report and 372 parent assessments. Results indicated that at admission clients exhibited presenting symptoms similar to inpatient samples, which were on average significantly reduced at discharge. Follow-up assessments using a random sample of clients found that on average, outcomes had been maintained at 12-months posttreatment.

KEY WORDS: adolescent treatment; problem behaviors; outcome assessment; wilderness therapy.

Introduction

Outdoor behavioral healthcare (OBH) is an emerging treatment service in mental health practice for adolescents with emotional, behavioral, psychological and substance use disorders. More than 100 OBH programs in the United States annually serve more than 10,000 clients and their families (Russell, 2003). The recent growth in the number of programs and clients served suggests that OBH programs are becoming more accepted. This may be due to their alternative treatment approach

Correspondence should be directed to Dr. Keith Russell, Outdoor Education, University of New Hampshire, NH Hall, Durham, NH 03824; e-mail; keith.russell@unh.edu.

that includes a wilderness challenge model that is appealing to parents and resistant adolescents unwilling to commit to treatment due to the stigma associated with traditional approaches (Davis-Berman & Berman, 1994). OBH is a relatively new term that grew out of the formation of the Outdoor Behavioral Healthcare Industry Council (OBHIC) in 1996 (Hendee, 1999). The term was developed by practitioners to depict more accurately the range of treatment programs available to adolescents that integrate wilderness therapy practice with traditional treatment approaches. OBH is regarded more as a type of treatment program, similar to outpatient treatment or residential treatment, rather than a therapeutic modality (e.g., family therapy, cognitive-behavioral therapy, wilderness therapy, or adventure therapy).

Despite longevity of practice and anecdotal evidence of the positive benefits of wilderness therapy for adolescents (Hattie, Marsh, Neill, & Richards, 1997), few studies have used sample sizes of sufficient size and standardized and reliable measures to document treatment efficacy (Cason & Gillis, 1994; Davis-Berman & Berman, 1994). To the contrary, a few highly publicized negative incidents in questionable programs resulting in client deaths or injury casts a shadow on OBH programs (Jenkins, 2000; Krakauer, 1995). This has created increasing oversight of program operations and the impetus in many states to establish minimum standards of operation. This was also led to the establishment of OBHIC in 1996 to develop standards of care in outdoor treatment. In a recent survey of more than 100 OBH programs, 88% are currently licensed by State agencies, and more than half (57%) are nationally certified by some accrediting agency like Council on Accreditation (COA) or Joint Council on Accreditation of Healthcare Agencies (JCHAO) (Russell, 2003). This percentage is likely to increase due to recent passage of state regulations in Idaho and Oregon, and the development of standards in Montana and other states.

OBH programs are often misperceived in the popular media as utilizing a military like approach (Krakauer, 1995). Research has shown that this may be an inaccurate depiction of the treatment approach, as most OBH programs take an empathetic and self-discovery approach to working with troubled adolescents compatible with basic counseling approaches (Bandoroff & Scherer, 1994; Davis & Berman, 1994; Rogers, 1961; Russell, 2000; Russell & Phillips-Miller, 2002). A major appeal of OBH programs as an alternative to residential treatment is their wilderness challenge approach that provides an alternative for resistant adolescents who have often tried other counseling and treatment options that have failed to provide demonstrable outcomes (Russell, 2000).

Several reviews of literature have examined outcomes associated

with the effects of OBH and related wilderness programs on participants (Burton, 1981; Cason & Gillis, 1994; Easley, Passineau, & Driver, 1990; Ewert, 1983, 1987; Friese, Pittman, & Hendee, 1995; Gibson, 1979; Gillis, 1992; Gillis & Thomsen, 1996; Hattie et al., 1997; Levitt, 1982; Moore & Russell, 2002; Moote & Wadarski, 1997; Russell, 1999; Winterdyk & Griffiths, 1984). Two findings are generally reported as outcomes from participation in OBH programs and have been corroborated in meta-analyses: a) personal development, including enhanced self-concept and a more internalized locus of control (Hans, 2000; Hattie et al., 1997), and b) interpersonal development and the development of appropriate and adaptive social skills (Hattie et al., 1997). These meta-analyses have also shown that programs with therapeutic intentions (similar to OBH program primary objectives) for troubled adolescents also have shown larger effect sizes than wilderness programs for recreation or personal growth (Hans, 2000; Hattie et al., 1997). Despite reports of positive benefits and documented growth in the number of OBH programs serving adolescents in the last decade, very few studies have tested how well OBH works to effect change in adolescent clients across multiple programs with sufficient sample sizes and using consistent definitions and instrumentation. Independent variables such as program length, leadership experience, age, gender and other client demographics are often not included in the analysis. Also, most outcome research has relied on methodologies that make it difficult to replicate studies from one program or setting to the next. Systematic reviews of research emphasize the lack of a theoretical basis in most studies, the poor psychometric properties of instruments used to assess outcome, methodological shortcomings, and a general lack of comparable findings (Cason & Gillis, 1994; Gillis, 1992; Hattie et al., 1997; Winterdyk & Griffiths, 1984).

This study addresses some of these limitations in reporting results from an analysis of client outcomes in seven participating OBH programs, utilizing an adolescent outcome assessment questionnaire called the Youth Outcome Questionnaire (Y-OQ) (Burlingame et al., 1995). First, theory and practice of OBH treatment utilizing a wilderness therapy approach is presented to better understand the intervention. Next, research methods are presented, including participating programs, sampling, instrumentation, client and parent assessment procedures, limitations and potential bias in the method, and data analysis. Finally, results from the study are presented including: a) client demographics, including age, gender, diagnoses according to the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) (American Psychological Association, 1994), and history of prior treatment; b) treatment outcomes at discharge measured by client self-report and

parent assessment, c) a discussion of differences between parent and client assessments, and d) assessment of client well being at 12-months after completion of treatment.

Outdoor Behavioral Healthcare and Wilderness Therapy

OBH programs integrate existing knowledge of traditional treatment approaches and modalities for adolescents with the unique developmental needs of the adolescent through dynamics inherent in group living in outdoor environments. OBH treatment is delivered using a team approach that consists of a: a) clinical supervisor (MS or Ph.D. in psychology, counseling, family therapy or a related field), who is responsible for the clinical treatment of the adolescent and who oversees the clinical operations of the program; b) medical supervisor (medical doctors or licensed registered nurse), who is responsible for the medical care and treatment of the adolescent; c) field therapist (licensed therapist, family therapist or counselor, masters level social worker), who is responsible for the development, implementation and follow-up of the individual treatment plans guiding the care and treatment of clients; and d) wilderness leaders or guides, who are responsible for the day-to-day living, safety, and travel of client groups while on an expedition. OBH programs are often used where other treatments have failed in order to address critical issues of substance abuse, suicide ideation, or other severe problem behaviors in adolescents. It is important to note that many times OBH programs are used as a beginning step in treatment, where parents and concerned mental health professionals will utilize aftercare services, including residential or outpatient, at the conclusion of treatment to maintain the therapeutic progress that has been made.

The therapeutic modality guiding OBH treatment has been termed wilderness therapy, which has been defined in numerous ways by various authors (see Russell, 2001). Davis-Berman and Berman (1994) define wilderness therapy as involving "the careful selection of potential candidates based on a clinical assessment and the creation of an individual treatment plan for each participant, where outdoor activities are aimed at creating changes in targeted behaviors and group psychotherapy is practiced by qualified professionals" (Davis-Berman & Berman, 1994, p. 140). Crisp (1998) notes in a review of several programs operating in the United States under the guise of wilderness therapy that the therapeutic paradigms include "generic group therapy and group system models, inter-personal behavioral models, the experience of natural consequences, and modified group psychotherapy applied into a wilderness activity setting" (p. 6).

Though each program draws from many therapeutic paradigms unique to their approach, common therapeutic factors are found across programs. Key therapeutic factors that distinguish it from other counseling and treatment approaches found to be effective in treating adolescents with a variety of emotional and behavioral disorders include: a) the promotion of self-efficacy through task accomplishment facilitated by natural consequences in wilderness living (Hans, 2000), b) a restructuring of the therapist-client relationship (Russell, 2001), and c) the promotion of group cohesion and development through group and outdoor living (Bandoroff & Scherer, 1994; Davis Berman & Berman, 1994; Russell, 2001).

Promotion of Self Efficacy Through Task Accomplishment

Treatment approaches that focus on gradual development of self competence in relation to real-life problems and settings have been shown to have optimal treatment effects (Brown, Stetson, & Beatty, 1989). The gradual development of self efficacy in OBH treatment is accomplished through numerous daily living tasks that are real, immediate and concrete, and which become increasingly difficult as the process unfolds. Self efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events in their lives and is mediated through cognitive, motivational, affective and selection processes (Bandura, 1994). Research on the effects of OBH programs on self efficacy has focused on task specific domains of self efficacy and has shown that OBH programs can enhance certain aspects of self efficacy within a narrow task-specific domain. Hans (2000) conducted a meta-analysis of the effects of wilderness and adventure programs on locus of control and found that subjects across all studies became significantly more internal and self efficacious as a result of participation in programs. More importantly, the meta-analysis concluded that adventure programs with a goal of primary therapy (reflecting OBH programs in this study) had a significantly higher mean effect size (0.64) than those that reported goals of education or development (0.35) (p. 47). Hattie et al. (1997) also noted enhanced self efficacy and self-concept in a meta-analysis of the effects of adventure and wilderness programming on participants.

Restructuring of the Therapist-Client Relationship

The treatment team also engages in the same wilderness experience as the clients, eating the same foods and sleeping under the same tarps, restructuring the therapist-client relationship with which most adolescent clients are accustomed from previous counseling or therapy. As Gass (1993) states, ". . . while still maintaining clear and appropriate

boundaries, therapists become more approachable and achieve greater interaction with clients" (p. 9). Because of this unique relationship that is built with the treatment team, discussion and discourse can often occur without the constraints of time and accustomed roles found in many traditional therapeutic environments. Russell (2002) qualitatively examined four OBH programs that utilize wilderness therapy and found that a key treatment process factor noted by adolescent client case studies was the enhanced therapeutic relationship with staff. Subjects noted that therapists and wilderness leaders were easy to talk to and helped them identify core issues driving their problem behaviors.

Promotion of Group Cohesion and Development through Group Living

Most clients that enter OBH treatment have substance use and dependence issues that are an important focus of treatment (McCord, 1995; Russell & Phillips-Miller, 2002). Peer influences are perhaps the most powerful predictor of adolescent substance abuse and are a developmentally appropriate factor to integrate into treatment strategies (Winters, Latimer, & Stinchfield, 1997). Moreover, those approaches that utilize the peer influences have been shown to be more effective in reducing the frequency of substance use after treatment (Bangert-Drowns, 1988). OBH facilitates these factors through group and communal living in the outdoors requiring communication, patience and trust. Group cohesion and development throughout the experience help establish a set of norms and expectations which play key roles in helping the adolescent develop a healthy prosocial identity (Erikson, 1963). Peer feedback facilitated by enhanced group cohesion found in the unique and intense living experience plays a key role in treatment (Hattie et al., 1997). Examples of activities that facilitate the development of group cohesion include cooking and completing numerous other tasks in teams, psycho-educational group counseling sessions and the processing of inevitable group conflicts that arise. Those who have experienced deep concern about their sense of worth and their ability to relate to others are empowered through these processes (Russell & Phillips-Miller, 2002).

Method

Participants

The study sample included 858 adolescent clients who enrolled in OBH treatment between May 1, 2000 and December 1, 2000 in seven participating programs in the study. The majority of participants were

male (69%) and between the ages of 16–18 years old (75%). Participants were primarily diagnosed with a variety of disorders according to DSM-IV criteria, including Oppositional Defiant Disorder (29%), substance disorders (26%), and depression disorders (15%). Over half of the OBH clients (57%) had received outpatient services prior to enrolling in an OBH program, and 17% had received prior in-patient treatment services. For those clients agreeing to participate in the study, 97% completed their OBH treatment.

Providers

Seven OBH treatment programs licensed by their respective state agencies in Oregon, Utah, Arizona, and Idaho belonging to the Outdoor Behavior Health Care Industry Council (OBHIC) provided treatment. Two programs were three-weeks in length, four were eight-weeks in length and one program was 180 days in length, where clients remained in a residential facility at the conclusion of the 21-day wilderness phase of treatment. Treatment length averaged 45-days across all providers. Discharge assessments were taken for the longer program at the conclusion of the wilderness phase of treatment to more closely reflect the treatment process of the other programs in the study. The differences in program lengths provided an opportunity to compare and contrast intensive short term wilderness treatment with longer term treatment. Each program had a clinical supervisor, masters level therapists or counselors who periodically visited on-going groups in the field (3–6 day intervals), and primary care wilderness leaders and assistants with at least two years' experience who were with the clients on a continual basis in wilderness settings.

Outcome Measure

The Youth-Outcome Questionnaire (Y-OQ) and SR Y-OQ (herein referred to simply as the Y-OQ except where distinction is important) offers parent assessment and adolescent self-reports designed for repeated measurement of client emotional and behavioral symptoms (e.g. at admission, during therapy, at termination, and at follow-up intervals) (Burlingame et al., 1996; Lambert & Cattani-Thompson, 1996; Lambert, Ogles, & Masters, 1992; Lambert, Huefner, & Reisenger, 1996; Russell, 2000; Wells, Burlingame, Lambert, Hoag, & Hope, 1996; Wells, 1990). The 64 items contained in the Y-OQ are summed across six content areas to produce a total score. The higher the Y-OQ score, the more serious the adolescent's symptoms.

Vermillion and Pfeifer (1993) outline four major criteria to consider in evaluating an outcome assessment device, and the Y-OQ appears to meet these criteria (Burlingame et al., 1996). Estimates of the Y-OQ

internal consistency range from .74 to .93 with a total scale estimate of .96. Test-retest reliability scores are also above .70, indicating moderately high temporal stability. High correlations exist between the Y-OQ total and subscale scores, and other frequently used assessment instruments (Wells et al., 1996b). For example, scales on the Child Behavior Checklist (Achenbach, 1991) correlate highly with parallel sub-scales on the Y-OQ. Specific subscale reliability coefficients for three of the subscales, (Interpersonal Distress, Interpersonal Relations, and Behavior Dysfunction) are moderate to high (.69–.93) suggesting homogeneity of content within each subscale (Giranda, 2000). Internal consistency estimates are lower (.54–.83) for the Social Problems, Somatic and Critical Incidents given the broader content tapped in these scales. These estimates are deemed suitable for making comparisons of subscale scores across clients (Burlingame et al., 1996).

The Y-OQ instrument can be easily administered by staff at each OBH program and only takes ten minutes for 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). Thus, the Y-OQ assesses the psychological symptomatic and social functioning of the adolescents, which reflects the goals of OBH treatment and is a well-normed and easily administered outcome measure with good internal consistency and test-retest reliability.

The validity of the Y-OQ rests upon its ability to detect periodic change made by the client during treatment. 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). Based on cut-off scores developed by Jacobsen and Truax (1991), the Y-OQ has identified score intervals where normative functioning by the adolescent is indicated. When certain cutoff scores are reached, the client is said to have "clinically improved" or reached a normal distribution of symptoms (Wells, Burlingame, Lambert, Hoag, & Hope, 1996). For the Y-OQ, this is indicated by a score of 46. Therefore, if a client's score moves into a range lower than 46 after treatment, they might be labeled "recovered." The Y-OQ manual also suggests that if a client's score "decreases by 13 points or more, they have attained a significant amount of symptom reduction" (Burlingame et al., 1996, p. 7) (See also McGrath, 2000 for review of psychometric properties and retest analysis of the Youth Outcome-Questionnaire). These criteria were used in this study to relate the change in parent assessment and adolescent self-report scores from admission to discharge and at the 12-month follow-up period, as well as statistical analysis of mean differences.

Procedures

A time series research design with a single baseline assessment was used in this study (Graziano & Raulin, 1997) to address the following research questions: a) To what extent did positive outcomes result from OBH treatment, as measured by Y-OQ and SR Y-OQ composite score and content area score differences between admission and discharge? b) How did treatment outcome vary according to age, gender, and DSM-IV diagnosis? c) How did treatment outcome vary according to program length? d) To what extent did clients maintain outcomes 12-months posttreatment?

Parents or legal guardians of clients enrolling at each participating program between May 1 and December 1, 2000, were included in the study after consent was received. Of the 1,035 clients and their parents asked to participate in the study, 858 agreed (83%). Most cited confidentiality concerns as a primary reason not to participate. The confidentiality of parents or 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 a parent or legal guardian were asked to complete the Y-OQ questionnaire at admission. After each adolescent client officially completed their treatment program, the client and parents or legal guardians were again asked to complete a Y-OQ questionnaire. Their assessment at discharge was based on their communication and contact with their child while he/she was in treatment, communication with the therapist responsible for their care, contact with their child at graduation ceremonies, and time spent with the child immediately following treatment.

Past research on treatment outcomes has shown that non-respondent study participants at follow-up time periods may have poorer outcome than respondents (Stinchfield, Niforpulos & Feder, 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 at 3- and 6-month follow-up periods indicated a low response rate, leading to potential bias. Therefore, it was determined that the most accurate way to ensure a more representative sample at the 12-month time period was to contact by phone 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. Parents were selected for contacting because they 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 694 parents of the original 858 who agreed to participate in the study completed at least one questionnaire at admission or discharge (81%). To test for differences in mean treatment scores at discharge and 12-months using a pair-wise t-test, sample sizes of 138 parents and 78 clients were calculated using a power equation that would yield a power of .80 at an $\alpha = .05$ 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 was ordered randomly 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). Parents who completed a 12-month assessment but did not complete 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 based on parent referrals.

Results

Results indicated that the OBH clients participating in the study had reduced behavioral symptoms at discharge as measured by both client self-report and parent assessments using the SR Y-OQ and Y-OQ (see Table 1). For client self-reports, group means decreased by an average of 21.59 points from 70.53 (SD = 32.85) to 48.95 (SD = 31.23) between admission and discharge (61% response rate). Parent assessments decreased 51.95 points from 100.28 (SD = 28.52) at admission to 48.33 (SD = 37.48) at discharge, more than twice the improvement reported by clients (43% response rate).

Statistical change was evidenced by pairwise t-tests of client self-report and parent ratings at admission and discharge ($t(522) = 14.38$, $p < .000$ and $t(371) = 24.932$, $p < .001$). The actual score reduction in client self-reports exceeded 13 points between admission and discharge for 55% of client self-reports, but exceeded 13 points for 85% of parent assessments. The Y-OQ manual further suggests that a normal range of functioning would be indicated by Y-OQ scores of 46 or less (Burlingame et al., 1996). Though average Y-OQ scores at discharge for client self-report and parent assessment are 48.95 and 48.33 respectively, and are close to the suggested normal functioning score, results show

Table 1
Mean Y-OQ Scores at Admission, Discharge for Client Self-Reports and Parent Assessments

N	*Period*	*M*	*SD*[1]	*Mean Difference*
Client Report SR Y-OQ				
523	Admission Y-OQ Score	70.53	32.85	20.07*
523	Discharge Y-OQ Score	48.95	32.23	
Parent Assessment Y-OQ				
372	Admission Y-OQ Score	100.19	28.35	51.64*
372	Discharge Y-OQ Score	48.55	37.47	

Note. Y-OQ = Youth Outcome Questionnaire (Burlingame, Wells, & Lambert, 1995).
*Indicates clinically significant change was demonstrated as a result of treatment.

that 43% of client self-reports and 46% of parent assessment scores at discharge were within the normal range (46 or lower).

Results showed reductions across all subscores contained in the Y-OQ for both client self-report and parent assessment. These subscales include content areas designed to assess symptoms associated with: (1) Interpersonal Distress, (2) Somatic, (3) Interpersonal Relations, (4) Critical Items, (5) Social Problems, and (6) Behavioral Dysfunction.[1] Because each of the scales has different score ranges, it is difficult to compare absolute reduction in scores. For example, (1) Intrapersonal Distress has a range from –4 to 68, while (2) Somatic has a range from 0 to 32. However, it is possible to examine the "cut scores" associated with each subscale to determine if discharge 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 domain at discharge.

When using these cut-score criteria, client self-reports indicated three subscales that were at or below the subscale cut-score at discharge: (3) Interpersonal Relations, (4) Critical Items and (6) Behavioral Dysfunction. Parent assessments also show three subscales with discharge scores at or below the cut score: (2) Somatic, (4) Critical Items and (6) Behavioral Dysfunction. Two subscales were similar for both client and parent assessment (4) Critical Items, and (6) Behavioral

Dysfunction) with a difference noted in clients self-reporting change at or near the cut score in (3) Interpersonal Relations and parents (2) Somatic.

Differences Between Parent and Client Scores

Parent assessment scores consistently indicated higher levels of dysfunction for their children than did the adolescent's self-report of their problems. Yet, at discharge, scores were not statistically different. This is an interesting finding that will warrant further research and validation with other studies that have used both the Y-OQ and the SR Y-OQ. To further examine this idea, 243 cases were selected for which there were complete data sets (client self-report and parent assessment for each client) available to determine if there were differences between parent and client interpretation of admission and discharge symptoms. A t-test showed differences in mean scores at admission ($t(28) = -14.70$, $p < .000$) but no differences at discharge. To further explore this, a Pearson correlation coefficient was also calculated for the relationship between parent and client scores at admission and discharge. A weak correlation was found at admission ($r(588) = .284$, $p > .05$) and discharge ($r(330) = .268$, $p > .05$), indicating a weak linear relationship between the two variables at each time period. It is unclear why these differences in scores exist and is difficult to compare this finding to studies reported in the literature using the Y-OQ because only parent assessments are reported (Mosier et al., 2001; Robinson, 2000).

Outcomes According to Age, Gender, and Diagnoses

Client self-report score reductions were similar across all ages, except for thirteen- and nineteen-year olds whose score reductions were significantly greater ($p < .000$). An increase in reductions in scores from younger clients to older clients was also noted. Parent assessments showed similar reductions across all age groups, with 14- and 18-year olds having slightly higher reductions. Client self-report and parent assessment of 13-year olds was the highest noted reduction for all age groups. Both males and females showed clinically significant score reductions for both client self-report and parent assessments. Females had significantly higher admission scores than did males for both client self-report and parent assessment (15.32 and 13.86 higher scores respectively). Discharge scores remained higher for self-report female scores, but were similar to males for parent assessment scores. Reductions between admission and discharge were 49% greater for females than for males in client self-report and 31% greater for females in parent assessments.

Specific diagnoses were made for 481 of the 858 study participants (56%) (clients may have been diagnosed with more than one disorder; primary diagnoses only are reported here). 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, Dysthymic Disorder and Bi-Polar Disorder accounted for 22.4% of the diagnoses.

There were complete sets of data for 358 client self-reports and 210 parent assessments of the 481 clients who had a primary diagnosis. Table 2 shows consistent and significant reductions in scores for all diagnoses. Average scores for client self-report were similar at discharge, with mood disorders showing the greatest reduction in scores (32.80). Parent assessment also showed similar score reductions across all diagnoses with substance disorders representing the highest discharge score, and which were statistically different than the other disorders ($p < .01$).

Treatment Outcome According to OBH Treatment Length

Table 3 shows outcomes by four common OBH program models which are primarily distinguished by treatment length, based on how and to what degree the outdoor setting is utilized which include: a) contained expedition programs (CE), where clients and the treatment team remain together on a wilderness expedition (three weeks in length); b) continuous flow expedition (CFE) programs where the treatment team, and clients rotate in and out of on-going groups on wilderness expedition (8-weeks in length); c) base camp expedition (BE) programs that have structured base camps in natural environments and take expedition outings for two weeks (6-weeks in length); and, d) residential expedition (RE) programs, that use wilderness expeditions as a treatment tool to augment residential services (25-weeks in length).

A two-way repeated measures ANOVA was conducted comparing the Y-OQ scores of clients and parents at admission, discharge, and 12-month follow-up across treatment model. A significant effect was found for both client ($F(6, 190) = 2.561$, $p < .05$) and parent scores ($F(2, 280) = 3.296$, $p < .01$). Follow-up protected pairwise t-tests found that all four

Table 2
Mean Y-OQ Scores at Admission, Discharge and 12-Months for Client Self-Reports and Parent Assessments According to Primary Diagnoses

	N	*Admission M Y-OQ Score*	*Discharge M Y-OQ Score*	*Mean Difference in Y-OQ Score*
Client Self-Report				
Behavior Disorders	103	70.07	46.31	23.75**
Substance Disorders	145	69.50	48.06	21.44**
Mood Disorders	76	78.79	45.99	32.80**
Other	31	56.97	41.32	15.65**
Total	358			
Parent Assessment				
Behavior Disorders	53	97.30	43.75	53.55**
Substance Disorders	99	104.13	55.97	48.16**
Mood Disorders	39	100.21	40.51	59.69**
Other	19	102.47	42.05	60.42**
Total	210			

Note. Y-OQ = Youth Outcome Questionnaire (Burlingame, Wells, & Lambert, 1995).
Standard deviations of scores for diagnoses were similar to reported admission and discharge scores.
Behavior disorders include Oppositional Defiant, Attention Deficit, and Conduct Disorders. Substance Disorders include disorders associated with substance abuse or dependence. Mood disorders include Depression, Dysthymia and Bipolar Disorders. Other disorders include Anxiety and Adjustment Disorders.
**$p < .001$

OBH models indicated significant differences between admission and discharge scores for both client self-report and parent assessments. Continuous flow expedition (CFE) programs demonstrated the greatest reduction in composite scores across all program models. The shorter contained expedition (CE) programs, showed the least reduction in scores, and client self-reports revealed less reduction than did parents. The longer residential expedition (RE) programs, which for this study assessed change in clients after 21-days in the wilderness phase of treatment, showed reductions in scores for both clients and parent assessments, though parent assessed score reductions were consider-

Table 3
Mean Y-OQ Scores at Admission, Discharge and 12-Months for Client Self-Reports and Parent Assessments According to Treatment Model and Length

Model	*Length*	*Assessment*	*N*	*Admission M Y-OQ Score*	*Discharge M Y-OQ Score*	*M Difference*	*Statistical Significance*
Contained Expedition	3-weeks	Client	172	70.42	52.22	18.20	**
		Parent	134	100.47	61.04	39.52	**
Continuous Flow	8-weeks	Client	143	64.93	39.42	25.51	**
		Parent	150	99.19	35.75	63.44	**
Base Camp	7-weeks	Client	122	78.59	47.55	31.04	**
		Parent	26	99.88	54.81	45.08	**
Residential Expedition1	24-weeks	Client	44	68.36	55.73	12.64	**
		Parent	29	104.52	50.83	53.69	**

Note. Y-OQ = Youth Outcome Questionnaire (Burlingame, Wells, & Lambert, 1995).
1. Base camp assessments were completed after the wilderness phase of the treatment, which was on average 3-weeks after the client had been admitted into treatment. After this phase the client returns to the residential facility.
**Statistically different means between admission and discharge ($p < .000$).
Standard deviations of scores for diagnoses were similar to reported admission and discharge scores.

ably higher than client self-reports. It is important to note that the CFE programs that spend the longest time in wilderness (8-weeks), showed greater score reductions than other models, except BE programs, which showed higher reductions in client self-reports.

12-Month Follow-Up Assessment

A randomly sampled set of clients' (n = 99) self-reported outcomes at 12-months after completion of treatment 8 points under the cut-score of 46 (38.61), indicating that from discharge to treatment scores improved by more than 8 points (8.64), but which were not statistically different ($t(98) = 2026$, $p < .028$). (See Table 5 for the complete client self-report and parent assessment data set.) Parent assessment scores (n = 144) showed a slight real increase in scores from discharge to 12-months (from 44.94 to 48.67) but were also not statistically different ($t(143) = -.998$, $p = .320$). A data set that contained both client self-report and parent assessments for the same clients was created to examine the more than 10 point difference in scores at the 12-month time period (n = 61). No statistical differences were found between parent and client scores at discharge and 12-months for these clients ($t(60) = .109$, $p < .913$). A Pearson correlation coefficient was calculated for the relationship between client self-report scores and parent assessments. A moderate correlation was found ($r(118) = .551$, $p < .05$) indicating a reliable relationship, but not a strong one.

The majority of the clients in the 12-month data set were aged 15–19 (83% of client self-reports and 85% of parent assessments). Table 4 shows client self-report scores at discharge that revealed clinically significant improvement during treatment (greater than 13-points) for clients ages 15–19. Younger clients (ages 13–14) did not self-report significant change during this time period, though scores did improve by 9 points. Older clients (17–19) reported the lowest discharge scores, 10 points below the cut score of 46 (36.21). At the 12-month follow-up period, clients across all age groups continued to make improvement as indicated by lower scores from discharge that were also below the cut score of 46. Clients ages 13–14 showed considerable improvement between discharge and 12-months as evidenced by a drop in scores of almost 25 points. Females' self-reported scores were 26 points higher than males at admission, and 13 points higher than males at discharge. At 12-months, however, scores for both males and females were not statistically different from each other and were below the cut score of 46. Parent assessments showed a clinically significant change in scores from admission to discharge, but only the 17–19 year olds were assessed below the cut score of 46 at 12-months. Interestingly,

Table 5
Mean Y-OQ Scores at Admission, Discharge, and 12 Months for Client Self Reports and Parent Assessments by Incomplete and Complete Sets of Data

	Admission M Y-OQ			*Discharge M Y-OQ*			*12-Month M Y-OQ*	
	N	*Score*	*SD*	*N*	*Score*	*SD*	*N*	*Score*	*SD*
Total Assessments at Admission, Discharge, and 12-Months									
Parent	560	99.04	29.45	266	55.10	40.73	77	42.84	35.32
Client	621	71.80	33.27	492	50.58	32.03	40	37.70	37.70
Clients with Complete Data Sets at Admission, Discharge, and 12-Months									
Parent	144	97.46	28.02	144	44.94	35.42	144	48.67	39.63
Client	99	68.30	34.14	99	47.25	30.78	99	38.61	31.83

Note. Y-OQ = Youth Outcome Questionnaire (Burlingame, Wells, & Lambert, 1995).

Table 4
Mean Y-OQ Scores at Admission, Discharge and 12 Months for Client Self-Reports and Parent Assessments According to Gender and Age

	N	*Admission M Y-OQ Score*	*Discharge M Y-OQ Score*	*12-Month M Y-OQ Score*
Client Self-Report				
Ages 13–14	12	72.50	63.50*	37.75**
Ages 15–16	49	66.88	50.86*	42.88**
Ages 17–19	34	69.24	36.21*	34.24**
Male	61	58.05	42.00*	37.48**
Female	38	84.76	55.68*	40.42**
Parent Assessment				
Ages 13–14	16	107.19	45.31*	48.31
Ages 15–16	71	96.45	46.37*	51.15
Ages 17–19	52	95.10	39.31*	44.71**
Male	98	94.05	46.32*	49.66
Female	46	104.72	42.02*	46.54**

Note. Y-OQ = Youth Outcome Questionnaire (Burlingame, Wells, & Lambert, 1995.
*Indicates movement of greater than 13 points on Y-OQ from admission to discharge showing clinically significant improvement.
**Indicates that the Y-OQ score at 12-months was below the cut-score of 46 established by Burlingame et al. as indicating "normal" symptomotology.
Standard deviations of scores for diagnoses were similar to reported admission and discharge scores.

there were no significant differences in parent assessed scores explained by gender.

It was not possible to analyze differences in the 12-month follow-up scores by program model because it produced small sample sizes for each model. Programs were classified into two groups according to treatment length. Shorter programs (21-days) reported significantly higher scores at discharge compared to the longer programs (56-days) for both client (46.52 and 55.97) ($t(583) = -3.504$; $p < .000$) and parent assessments (44.53 and 62.56) ($t(133) = -4.574$; $p < .000$). However, no differences in scores were present at the 12-month follow-up period.

Discussion

Limitations

There are several limitations and potential sources of error or bias in this study. The first limitation to note is that no control group was utilized and there was no random assignment of treatment. This is due primarily to the fact that excess demand does not exist in private placement programs which are often used in research to establish control groups; parents will often times go to another program with openings because of the urgency of their needs. Of the 858 client and parent units who agreed to participate in the study, complete data sets of admission and discharge scores were provided by 372 parents (43%) and 523 adolescent clients (61%).

A potential source of bias may exist in the present study from parents and client units who initially agreed to participate in the study, but failed to complete both their admission and discharge questionnaires. These participants could be different from respondents who provided complete data sets. Fewer parents responded with both admission and discharge scores (43%) than did clients (61%). Many clients agreed to participate in the study, yet failed to complete the Y-OQ ($N = 180$). This could be due to their anger and resistance to the treatment process at admission. Many parents completed one Y-OQ but did not mail back the other, resulting in several incomplete data sets ($N = 359$).

To address this limitation, Y-OQ scores for both parents and clients with full sets of data (admission, discharge, and 12-months) were compared to parent and client scores at each time period that were collected but were not part of a complete data set. This analysis showed differences for parent discharge assessments only, with scores for the complete 12-month data set (44.94, $N = 144$) lower than for the larger sample (55.10, $N = 266$). These differences were significant ($t(408) = 2.519$; $p = 012$). This suggests that for the randomly sampled complete 12-month data set, clients may have been doing significantly better than clients from the larger sample, lending some bias to the results. However, 12-months scores for the randomly sampled data set were not statistically different than other 12-month scores collected. The client self-report 12-month data set is not statistically different from the incomplete set and appears to reflect client well-being. To further address missing data, missing Y-OQ scores were estimated at each time period using a linear interpolation in SPSS™. At each time period (admission, discharge, and 12-months) the mean tabulated for the estimate data point differed between 0 points at the minimum and 2 points at the maximum, indicating no significant differences in means from the estimated and complete data set. Also, it is noted that the estimated mean was lower than the actual means for each time period.

Despite these limitations, there are several implications from this study. First, findings from this study indicate that participating in OBH treatment reduced behavioral and emotional symptoms of clients immediately following treatment, as measured by both client self-report and parent assessments using the Youth Outcome Questionnaire (Y-OQ; Table 5). Also, scores at 12-months suggest that clients either maintained therapeutic progress initiated by treatment, and according to client self-report data, continued to improve. Third, subscale analysis offers insight into specific aspects of behavioral and emotional well-being that are potentially impacted by OBH treatment. Clients and parents showed agreement at discharge in assessing two subscales as being significantly improved: Behavioral Dysfunction and Critical Items. These findings are consistent with the goals of OBH treatment: stabilizing adolescents emotionally and helping them address their patterns of problem behavior (Russell, 2003). Also of interest were the Behavioral Dysfunction and Interpersonal Relations subscales that were above the cut-score at 12-months for both client self-report and parent assessment. This could reflect the difficulties that parents and adolescent clients have in trying to return to home, school and/or peer environments that prior to treatment, may have perpetuated problem behaviors.

Fourth, client self-report score reductions were similar across all ages, except for thirteen- and nineteen-year olds whose score reductions were significantly greater ($p < .000$). Burlingame et al. (1996) found no reliable differences across age groups in outpatient and inpatient sample scores at admission, but did note that 15–17-year olds reported higher behavioral distress when compared to younger age groups. Higher behavioral distress at admission, combined with the finding on OBH effect on the subscale associated with behavioral dysfunction, may help to explain this incremental increase in score reductions for older clients. Gender also explained some variance in Y-OQ scores at admission and discharge, with females reporting higher scores at admission and discharge, but also continuing to improve as indicated by significantly lower scores between discharge and 12-months. Burlingame et al. (1996) examined gender differences among in-patient, outpatient, and normal samples. No reliable differences were found between males and females in total Y-OQ scores, but differences were noted in two subscales. Males were found to have higher behavioral dysfunctional scale scores than females, while females report higher somatic scale scores than males (p. 8). This may help to explain score differences between male and females at various time periods. Mosier et al. (2001) and Robinson (2000) also reported no significant differences between male and female clients in outcome assessments using the Y-OQ in assessing effectiveness of in-home, family centered and partial-day treatment interventions respectively. These findings suggest that female clients are as responsive to OBH treatment as males, despite the fact that males outnumber females in enrollment by about four to one.

Differences in outcomes were found across program models which were driven by program length. Programs were classified into one of two groups: long term (greater than 50 days) and short term (21 days). Though admission scores and score reduction resulting from treatment were similar when comparing short- and long-term programs, significant differences in discharge scores were noted, with shorter programs reporting higher discharge scores. At 12-months, no differences were found in scores, indicating that though clients in shorter programs may not have progressed as far as a result of treatment, they continued to improve posttreatment. This finding could lead to further research into the discussion of what is the appropriate length of stay in the wilderness. Interesting questions are: At what point has the adolescent gotten what they could from the wilderness intervention (21-days or 50 days)? At what point should adolescents shift their focus to applying these skills in realistic home, school, and peer environments? Or, are longer programs necessary for clients exhibiting certain pretreatment characteristics (i.e., substance dependence and/or behavioral problems)?

This study showed that clients who were randomly sampled at 12-months had maintained outcomes, and according to self-report, had actually continued to improve. This is an important finding because 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). Also, very few long term assessments of client outcomes in OBH related programs have been conducted. 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 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) 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).

However, several longitudinal studies have failed to conclude signifi-

cant 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 demonstrate the importance of aftercare and relapse prevention in maintaining outcomes (Winters, 1999). However, this study suggests that OBH programs with an appropriate focus on transferring effects to posttreatment and aftercare environments can be effective in the long term for adolescents with emotional and behavioral problems.

To help explain these 12-month findings it is important to identify to what degree aftercare services were utilized by clients in this study. Aftercare was defined as enrolling in or being placed in a: a) residential treatment facility, b) inpatient hospitalization, c) therapeutic boarding school, or d) halfway house outside of the primary care givers residence. Clients that did not enroll in aftercare facilities were categorized as returning home to their family environment. No significant differences were found in clients that utilized aftercare services and those that did not. There are several limitations to these results, and they should be interpreted with caution. First, data were not gathered as to length of stay or graduation from these aftercare services. Second, for those clients that did return home, it was not clear to what degree they utilized outpatient services, alternative schools, weekly Alcoholics Anonymous meetings, or other services available. Due to constraints in data collection procedures, this information was not available. It is not clear what role aftercare played in all clients in this study, making any recommendations or conclusions from this finding suspect.

However, these findings are surprising given past meta-analyses of long term effects of wilderness programs that have shown consistent

fading effects of the intervention (Hattie et al., 1997; Winterdyk & Griffiths, 1984). Other studies have reported a period of depression experienced by participants after completing long term wilderness experiences (Greenway, 1990). These findings may suggest that OBH programs effectively prepare adolescents for aftercare environments, be they home or other residential services. However, it also may show that clients may have utilized a variety of aftercare services to help maintain this progress and that these services must be better tracked and accounted for. This is difficult for programs and researchers to do as clients are often times very difficult to locate up to 6 months posttreatment. This is an interesting finding that will require future research to better understand posttreatment experiences and the role of aftercare in that process.

This study should be viewed as the first and necessary step in evaluating the effectiveness of OBH programs that utilize wilderness therapy. It is reiterated here that no control was used in this study and attrition was a potential limiting factor in interpreting results. It is also not clear which aspects of OBH treatment are effectuating change in clients. As noted earlier, there are several promising domains that could lend insight into various process level characteristics, including OBH treatment impacts on client self efficacy, the strength of the working alliance between staff and clients, and the level of group cohesion established through the dynamics of wilderness living. Understanding how these process factors relate to outcome could be an important step in understanding how the treatment works and for whom it is most appropriate.

This study also addressed limitations that were found in the literature on OBH treatment and wilderness therapy. A common theoretical approach guided OBH treatment delivered by programs participating in this study, consistent methods were used across programs to generate larger sample sizes that have not been previously reported, and a consistent and reliable instrument with sound psychometrics was used to evaluate treatment effectiveness, as has been used in other studies (see Robinson, 2000; Mosier et al., 2001). Also, both parent and client assessments were reported which strengthened the validity of the findings.

This study demonstrated that OBH treatment using wilderness therapy approaches can be effective in reliably and significantly reducing the behavioral and emotional symptoms of adolescents who resemble in-patient populations in terms of presenting pathology. Because transition and aftercare is such an important factor for adolescents completing OBH treatment, future research could more clearly assess the role aftercare plays in maintaining therapeutic progress. Also, future research in OBH treatment could better identify for whom the intervention is most appropriate using comparison studies between OBH treat-

ment and outpatient, residential and in-home treatment. Also, cost effectiveness studies could be employed to compare the relative cost of OBH treatment to other approaches. This study also found that 97% of all clients who entered treatment completed treatment. Given that most clients who enter OBH treatment are resistant to the process (Russell & Phillips-Miller, 2002), and that coercion into treatment may be a barrier to change (Prochaska & DiClemente, 1992), this is an important finding. Because there are no direct studies of the impact of coercion on treatment effects reported in the adolescent substance abuse literature (Winters, 1999), this would also seem like an important subject for future research. It is the hope that findings from this evaluation of OBH treatment will lead to future research to better understand this emerging treatment approach.

Notes

1. (1) Interpersonal Distress: Assesses change in emotional distress including anxiety, depression, fearfulness, hopelessness, and self harm. (2) Somatic Assesses: change in somatic distress typical in psychiatric presentation, including headaches, dizziness, stomachaches, nausea, and pain or weakness in joints. (3) Interpersonal Relations: 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. (4) Critical Items 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. (5) Social Problems Assesses: changes in problematic behaviors that are socially related, including truancy, sexual problems, running away from home, destruction of property and substance abuse. (6) Behavioral Dysfunction: Assesses change in a child's ability to organize tasks, complete assignments, concentrate, handle frustration, including items on inattention, hyperactivity, and impulsivity.
2. Significant differences noted in the text of the manuscript refer to clinically significant change indicated by a change in score of greater than 13 points. Differences that are statistically significant will be thus noted and accompanied by the appropriate test statistic.
3. This was not included in the primary analysis to difficulty and limitations of this data source . Aftercare services include a broad range of interventions, from inpatient hospitalization to weekly AA meetings in the adolescent's home town. Because these were difficult to define and track, aftercare in this analysis was noted as a categorical variable (yes, no) and was defined as consisting of 6-months in a residential aftercare facility. We are currently conducting two-year follow-up phone calls to establish 24-month client well-being and have clients provide a clearer picture of their aftercare involvement.

References

Achenbach, T. M. (1991). *Manual for the child behavior checklist 14–18 and 1991 profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

American Psychological Association (1994). *Diagnostic manual of mental disorders.* (4th ed.). Washington, DC: Author.

Bandoroff, S., & Scherer, D. G. (1994). Wilderness family therapy: An innovative treatment approach for problem youth. *Journal of Child and Family Studies, 3*(2), 175–191.

Bandura, A. (1994). Encyclopedia of human behavior. In V. S. Ramachaudran (Ed.), *Encyclopedia of mental health.* San Diego, CA: Academic Press.

Bangert-Drowns, R. L. (1988). The effects of school-based substance abuse education: A meta-analysis. *Journal of Drug Education, 18,* 243–264.

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.

Brown, S. A., Stetson, B. A., & Beatty, P. A. (1989). Cognitive and behavioral features of adolescent coping in high risk drinking situations. *Journal of Addictive Behaviors, 14,* 43–52.

Burlingame, G. M., Wells, M. G., Hoag, M. J., Hope, C. A., Nebeker, R. S., Konkel, K., et al. (1996). *Manual for youth outcome questionnaire (Y-OQ).* Stevenson, MD: American Professional Credentialing Services.

Burlingame, G. M., Wells, M. G., & Lambert, M. J. (1995). *The Youth Outcome Questionnaire.* 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.

Castellano, T. C. & Soderstam, I. R. (1992). Therapeutic wilderness programs and juvenile recidivism: A program evaluation. *Journal of Offender Rehabilitation, 17*(3/4), 19–46.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* (2nd ed.). Hillsdale, NJ: Erlbaum.

Crisp, S. (1998). *International models of best practice in wilderness and adventure therapy: Implications for Australia.* Paper presented at the Exploring the Boundaries of Adventure Therapy: International Perspectives. Proceedings of the International Adventure Therapy Conference, Perth, Australia, July 23–30, 1997.

Davis, J. S., & Berman, D. (1994). *Wilderness Therapy: Foundations, theories and research.* Dubuque, IA: Kendall/Hunt Publishing.

Davis-Berman, J., & Berman, D. S. (1994). Therapeutic wilderness programs: A national survey. *Journal of Experiential Education, 17*(2), 49–53.

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.* (No. General Technical Report RM-193). Fort Collins, CO: Rocky Mountain Forest and Range Experiment Station.

Eggleston, E. J. (1998). *Reflections on wilderness therapy.* Paper presented at the Exploring the Boundaries of Adventure Therapy: International Perspectives. Proceedings of the International Adventure Therapy Conference., Perth Australia, July 23–30, 1997.

Erikson, E. H. (1963). *Childhood and society.* New York: Norton.

Ewert, A. (1983). *Outdoor adventure and self concept: A research analysis.* Eugene, OR: 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. T., Pittman, J. T., & Hendee, J. C. (1995). *Studies of the use of wilderness for personal growth, therapy, education, and leadership development: An annotation and evaluation.* Moscow, ID: Wilderness Research Center.

Gass, M. (1993). *Adventure Therapy: Therapeutic applications of adventure programming.* Dubuque, IA: Kendall/Hunt Publishing.

Gibson, P. M. (1979). Therapeutic aspects of wilderness programs: A comprehensive literature review. *Therapeutic Recreation Journal, 13*(2), 21–33.

Gillis, H. L. (1992). *Therapeutic uses of adventure-challenge-outdoor-wilderness: Theory*

and research. Paper presented at the Coalition for Education in the Outdoors, State University of New York, October 9–11.
Gillis, H. L., & Thomsen, D. (1996, 1997). *Research update of adventure therapy (1992–1995): Challenge activities and ropes courses, wilderness expeditions, and residential camping programs.* Paper presented at the Coalition for Education in the Outdoors, Martinsville, IN, October 12–14.
Giranda, M. (2000). *A validity study of the youth-outcome questionnaire and the Ohio scales.* Unpublished Dissertation, Department of Psychology, Pace University, New York.
Graziano, A., & Raulin, M. (1997). *Research methods: A process of inquiry.* (3rd ed.). New York, NY: Addison Wesley Longman.
Greenway, R. (1990). *An eighteen year investigation of wilderness therapy.* (Technical Report No. RM-193): USDA Forest Service.
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.
Hendee, J. C. (1999). New outdoor behavioral healthcare research cooperative founded at the University of Idaho. *International Journal of Wilderness, 6*(3), 39.
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.
Jenkins, M. (2000). The hard way. *Outside, March,* 45–52.
Kelly, F., & Baer, D. (1968). *Outward Bound: an alternative to institutionalization for adolescent delinquent boys.* Boston, MA: Fandel Press.
Kelly, F., & Baer, D. (1969). Jesness inventory and self concept measures for delinquents before and after participation in Outward Bound. *Psychological Reports, 25,* 719–724.
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., & Reisenger, 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.
Levitt, L. (1982). *How effective is wilderness therapy: A critical review.* Paper presented at the Third Annual Conference for the Wilderness Psychology Group, Morgantown, WV, July 8–9.
McCord, D. M. (1995). Toward a typology of wilderness-based residential treatment program participants. *Residential Treatment for Children and Youth, 12*(4), 51–60.
McGrath, L. D. (2000). Youth Outcome Questionnaire: A multiwave instruments' susceptibility to retest artifacts. *Dissertation Abstracts International: Section B: The Sciences & Engineering, 60*(9-B), 4896.
Moore, T., & Russell, K. C. (2002). *Studies of the use of wilderness for personal growth, therapy, education, and leadership development: An annotation and evaluation.* (Technical Report Available at *www.its.uidaho.edu/wrc/publications).* Moscow, ID: University of Idaho-Wilderness Research Center.
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., et al. (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.
Prochaska, J. O., & DiClemente, C. C. (1992). Stages of change in the modification of problem behaviors. In M. Hersen, R. M. Eisler & P. M. Miller (Eds.), *Progress in behavior modification.* (pp. 184–214). Sycamore, IL: Sycamore Press.
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. (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.
Russell, K. C. (2000). Exploring how the wilderness therapy process relates to outcomes. *Journal of Experiential Education, 23*(3), 170–176.
Russell, K. C. (2001). What is wilderness therapy? *Journal of Experiential Education, 24*(2), 70–79.
Russell, K. C. (2003). A nation-wide survey of outdoor behavioral healthcare programs for adolescents with problem behaviors. *Journal of Experiential Education, 25*(3), 322–331.
Russell, K. C., & Phillips-Miller, D. (2002). Perspectives on the wilderness therapy process and its relation to outcome. *Child and Youth Care Forum, 31*(6), 415–437.
Stinchfield, R., Niforopulos, 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., Burlingame, G., Lambert, M., Hoag, M., & Hope, C. (1996). Conceptualization and measurement of patient change during psychotherapy: Development of the outcome questionnaire and the youth outcome questionnaire. *Psychotherapy, 33*(2), 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.
Winters, K. C., Latimer, W. W., & Stinchfield, R. (1997). Examining psychosocial correlates of drug involvement among clinic referred youth. *Journal of Child and Adolescent Substance Abuse, 9*(1), 1–17.