

Catherine Freer Wilderness Therapy Expeditions: An Exploratory Case Study of Adolescent Wilderness Therapy, Family Functioning, and the Maintenance of Change

Nevin J. Harper · Keith C. Russell · Rob Cooley · Jacqueline Cupples

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Abstract This exploratory longitudinal case study aimed to identify practical adolescent and family outcomes following participation in a 21-day wilderness therapy program for adolescents with emotional, behavioral, and substance use problems. Results showed gender differences in presenting issues pre-treatment, significant positive changes assessed two-months post-treatment in family functioning, and adolescent behavior and mental health issues. Twelve-month assessments showed maintenance of positive outcomes coupled with deterioration in some aspects of family functioning and drug and alcohol use. Implications and suggestions for future research are discussed.

Keywords Wilderness therapy · Adolescent mental health · Family systems · Family involvement · Family function · Residential treatment programs

Introduction

Wilderness therapy (WT) has been utilized as an alternative treatment modality for adolescent clients with emotional, behavioral and substance use problems (Russell 2003).

N. J. Harper (✉) · K. C. Russell
Outdoor Education and Youth Development, University of Minnesota, 217 Cooke Hall,
1900 University Avenue SE, Minneapolis, MN 55455, USA
e-mail: nharper@umn.edu

K. C. Russell
e-mail: krussel@umn.edu

N. J. Harper
355 Gorge Road West, Victoria, BC, Canada V9A 1M9

R. Cooley · J. Cupples
Catherine Freer Wilderness Therapy Expeditions, PO Box 1064, Albany, OR 97321, USA

R. Cooley
e-mail: robcooley@cfreer.com

WT utilizes human-powered expeditions set in isolated wilderness areas that include individual and group counseling integrated with challenging activities like outdoor living skills and adventure recreation activities (Russell 2001). Meta-analyses of evaluative research on therapeutic wilderness programs suggest that the intervention produces positive outcomes for adolescents (Hattie et al. 1997), and more recent studies suggest decreases in interpersonal and intrapersonal distress (Russell 2003, 2005), and positive outcomes for adolescents with personality disorders (Clark et al. 2004). WT programs are often assumed to work with adolescent clients only and not with the family while the adolescent is in treatment, yet have been described by researchers as being delivered from a family-systems perspective (Wells et al. 2004). Research in adolescent treatment suggests families should play an integral role in working with adolescents throughout the treatment process and that outcomes are also enhanced by family involvement pre- and post-treatment (Diamond et al. 1996; Liddle et al. 2000). The assessment of how adolescent behavioral change manifests in the family context is necessary to begin identifying how residential programs such as WT can affect family function, and how families can best support positive change and treatment goals following the intervention.

Most research on WT interventions have focused on constructs such as self-concept, interpersonal skills or recidivism, yet tells us little about how potential emotional and behavioral changes may manifest themselves in a variety of post-treatment environments, specifically the family (Hans 2000; Hattie et al. 1997; Wilson and Lipsey 2000). This case study's aim was to explore practical outcomes for an adolescent and family from a WT program that could be translated into everyday post-treatment behavior in the home, at school, and with regard to specific behaviors that may have been the focus of treatment such as substance abuse or anger management issues. Specific behaviors engaged in by the family (e.g., spending time together, eating meals together, and communicating openly about issues) are reasoned to reflect positive family functioning and were used as metrics in this study to explore these issues. The goal of such an assessment is to explore more closely how a residential treatment program working specifically with an adolescent—and peripherally with a family—can impact the family system as a whole. Specific objectives of the study were to (a) identify change in adolescent and family functioning over time, (b) explore how these changes may impact family functioning, (c) understand the constancy of these changes through time, and (d) provide recommendations for further investigation of family involvement in adolescent WT. It is reasoned that family involvement in the treatment process would affect how the family supports an adolescent returning from residential treatment, thus affecting outcome. To examine the evolving nature and importance of family involvement in adolescent treatment processes, a review of literature on the subject highlights important considerations.

Family Involvement in Adolescent Treatment

The benefit of family involvement in psychological therapy for a wide range of child and adolescent pathology has been reviewed and well supported in current family-therapy literature (Diamond et al. 2003; Kazdin and Whitley 2003; Liddle 1996). Family therapy and family involvement in adolescent treatment has convincingly demonstrated increased positive benefits relative to treatment of the adolescent individually (see Cottrell and Boston 2002; Diamond et al. 1996; Fauber and Long 1991; Liddle et al. 2000).

Family systems theory has been influential in educational, developmental, and psychotherapeutic practices with children and adolescents (Cottrell and Boston 2002; Beels

2002). The theory describes the interconnected nature of individuals in social systems and recognizes that change occurring at the individual level cannot be understood in isolation; it needs to be addressed in terms of the relationships the individual has with others (Becvar and Becvar 1999). Regardless of composition or definition, the family is reasoned to operate as a system and experience interactions and reactions among its members, and can be seen as the social institution with the most influence on individuals in modern society. For the purpose of this study, family is defined as the individuals providing the essential care and support for the adolescent while in treatment. This definition recognizes biological, adopted, and legal/guardian relationships which are not uncommon in adolescent treatment settings while also providing opportunity for other significant individuals in the child's life to be recognized for their role in the change process (see also Garfat 2003; Kumpfer et al. 2003). Ultimately, mental health professionals and researchers must consider change at the individual level, and change of the system, as separate but related processes, while also recognizing the influence of their own involvement in the client's family system (Broderick 1993).

The belief that the family is intricately linked to child and adolescent emotional and behavioral well-being is shared among mental health service providers in behavioral, psycho-educational, and systems models of practice (Diamond et al. 1996). Family involvement has been demonstrated as a major predictor of outcomes in preventative work with delinquent adolescents, adolescent substance abuse, education-related problems, and as a mediator of negative peer influence (Kerr et al. 2003; Kumpfer 1999; Kumpfer et al. 2003). Child or youth-only interventions have shown to be less effective than family-based preventative interventions (Kumpfer 1999) and may even produce deteriorated negative behaviors in the case of high-risk population groups (Dishion and Andrews 1995).

Family involvement in adolescent mental health treatment is depicted as fundamental in producing lasting change (Liddle et al. 2000; Cottrell and Boston 2002). Less understood although, is how, when, and to what extent family involvement is most effective in adolescent mental health treatment (e.g., Eisler et al. 2000; Robin et al. 1995). Since families are recognized as a key component in the treatment of child and adolescent emotional and behavioral issues (Diamond et al. 1996), effort needs to be taken by mental and behavioral health service providers to include families in a manner that is guided by empirical understanding and with skills and knowledge to respectfully maintain the dignity of the family system (Dishion and Kavanagh 2003; Hill and Garfat 2003).

Families and Wilderness Therapy

WT is showing promise as an effective adolescent mental health treatment intervention for problem behaviors (Crisp and Hinch 2004; Russell 2003, 2005). Reported outcomes of WT have been primarily focused on the adolescent client (e.g., Clark et al. 2004; Russell 2003) while studies including the assessment of overall family functioning have received limited attention in literature related to WT interventions (e.g., Bandoroff and Scherer 1994; Pommier and Witt 1995). Criticism has been leveled against WT and similar adventure- and experiential-based therapeutic programs for treating families as add-on elements and not supporting family involvement in the treatment process with any theoretical justification (Burg 2001).

WT programs primarily serve adolescent clients due to fiscal and logistical constraints (e.g., distance to programs and treatment lengths averaging 50 days) which limits contact and time spent with families (Wells et al. 2004). Even more conveniently located

adventure- and experiential-based adolescent treatment programs reported providing as little as 1-h to one-full day of family involvement, with only a few programs offering multi-day family interventions (Gillis et al. 1992). Although constraints exist for substantial in-situ family involvement in adolescent WT, it is critical to understand how families are engaged in the WT process, and how outcomes that are reasoned to be effectuated by treatment manifest themselves in family systems (Bandoroff and Scherer 1994; Russell 2001, 2006; Wells et al. 2004).

Research on more inclusive family involvement in WT is limited. Studies and reviews of challenging outdoor recreation programs for families suggest increases in family communication, collective efficacy and a positive correlation to family strength (Huff et al. 2003; Freeman and Zabriskie 2002; Wells et al. 2004). Studies specifically examining family involvement in therapeutic wilderness interventions for adolescents have indicated increases in family function although long-term maintenance of change has not been consistently supported (see Bandoroff and Scherer 1994; Pommier and Witt 1995).

Bandoroff and Scherer (1994) developed and evaluated a family WT intervention consisting of a 21-day adolescent WT intervention followed by a four-day multi-family WT program focusing on structural family therapy techniques. Twenty-seven families volunteered to participate in the treatment group following their child's treatment and the 39 families that declined to participate in the family intervention served as a comparison group. Families participated in wilderness camping, short backpacking excursions, experiential activities and processing utilizing metaphors. Re-balancing of family roles was undertaken by therapists through structural therapy techniques utilizing intact-family and multi-family group work. Scores for both treatment and comparison groups showed improvement from "clinical" to "normal" levels in healthy family functioning at six weeks post-program on the Family Assessment Measure (FAM, Skinner et al. 1983). While promising outcomes resulted from the intervention, sample homogeneity and self-selection were both described as limitations to the study's findings. Additionally, the authors considered the six-week follow-up period as not being long enough to capture change occurring within the family system post-intervention.

Pommier and Witt (1995) evaluated levels of family functioning in an Outward Bound School 30-day program for juvenile status offenders which included a family training component. The intervention was described as utilizing a psycho-educational approach and was not delivered by therapeutically trained or licensed staff. Family involvement consisted of educational seminars in conflict resolution, communication, discipline, positive reinforcement, and goal setting. Parents were involved at different times during the 30-day adolescent intervention in multi-family and parent only sessions, workshops, reunions, and follow-up visits and phone calls by program staff. Significant increases in family function were found post-program as measured by the Family Adaptability and Cohesion Scale-II (FACES II, Olson et al. 1982); however, these scores regressed at three months post-program to levels assessed at intake. The authors suggested that similar intervention programs focus on program variables and designs that will promote maintenance of change experienced by participants and their families during the intervention.

Although studies reviewed suggest potential positive benefits of family involvement in WT, expressions of limited understanding of family involvement variables and subsequent outcomes exists. Methodologically, these studies include small sample sizes and lack of controls and randomization (Bandoroff and Scherer 1994; Pommier and Witt 1995). Follow-up assessments of these two interventions produced diverse results; the four-day structural family therapy intervention showed continued improvement of family functioning at six weeks post-treatment while the psycho-educational Outward Bound

intervention with family involvement intervention showed regression to near pre-treatment scores in some domains of family functioning.

WT programs need to further understand the type and depth of family involvement necessary in the treatment process, and subsequently, how this involvement relates to outcomes for adolescents and the family. By understanding how outcomes manifest themselves in family functioning, families may be better able to prepare for an adolescent re-entering their home and community following treatment, and programs may be better able to equip families with the tools and resources needed to maintain any therapeutic progress made by the adolescent. This study sought to understand adolescent and family related outcomes in the context of family as reported by the parents of the adolescent in treatment. Results will include change from pre- to 2- and 12-months post-treatment to better understand family change as experienced and reported by parents.

Case Description

Catherine Freer Wilderness Therapy Expeditions (CFWT) was selected as a case for this study because the program is short-term (3-weeks) and attempts to include families in their treatment process and follow-up practices. Also, the majority of clients return to the home environment following treatment, and not to residential extended care destinations like therapeutic boarding schools or treatment centers. CFWT began operation in 1988 in Albany Oregon and has since developed into a nationally accredited, and state licensed drug and alcohol treatment program for adolescents with emotional, behavioral, and substance use issues. Additionally, CFWT is a founding member of the Outdoor Behavioral Healthcare Industry Council (OBHIC) and affiliated Research Cooperative (OBHRC) providing industry-wide leadership for licensed and accredited wilderness treatment programs through collaborative research and professional development (Russell 2001). CFWT offers three- and seven-week (developed after data collected for this study) expeditions depending on client needs and treatment success. Expeditions generally contain cohorts of seven youth and are facilitated by a treatment team consisting of a clinical supervisor, medical supervisor, field therapists and wilderness leaders who work in collaboration to provide a safe, ethical, and meaningful intervention for each client (Russell and Harper 2006).

Wilderness therapy expeditions are managed for physical and psychological safety of clients throughout challenging program activities (e.g., expedition backpacking, rafting), adjusting to intensive outdoor living conditions (e.g., avoiding hypothermia, dehydration, and consequential animal encounters), and active participation in individual and group counseling processes. Russell and Farnum (2004) developed a model of wilderness therapy that contains four factors reasoned facilitate therapeutic change in clients unique to the milieu: (a) Wilderness as a healing factor (Kaplan 1995; Tennessen and Cimprich 1995), (b) promotion of self-efficacy through task accomplishment (Brown et al. 1989), (c) restructuring of the therapeutic relationship (Gass 1993; Russell and Phillips-Miller 2002), and (d) development of a therapeutic social group (Bandura 1977; Clark et al. 2004). It is assumed that these factors may be present in other models of treatment, but are reasoned to be enhanced in a wilderness therapy setting.

A family systems approach guides the CFWT theoretical treatment approach in that program staff support the belief that systemic change (i.e., in the family system) needs to occur to assist the adolescent in maintaining individual change experienced during their time in treatment. CFWT works with families in a number of ways: (a) Admissions staff

encourages adolescent and family members to work with therapists to identify issues and treatment goals, (b) families participate in a pre- and post-treatment all-day family meetings with therapists and field staff, (c) families are supported in undertaking their own treatment process while their child is at CFWT, and (d) families and clinical team collaborate on discharge, transition, and aftercare planning. CFWT also intentionally references the treatment group and staff as a metaphoric family system in which adolescents can learn and practice new ways of communicating and behaving (Russell and Phillips-Miller 2002). Intensive group activities and communal outdoor living practices create a micro-community similar in ways to a dynamic family system, providing ample opportunities for the clinical team to address individual and family-related issues 24 h a day over the three-week treatment period.

Three previous research studies have looked at processes and outcomes of adolescent clients in CFWT treatment programs (Clark et al. 2004; Russell 2003; Russell and Phillips-Miller 2002). Russell and Phillips-Miller (2002) explored WT program processes to identify key change elements in treatment. This qualitative analysis involved observation and interviewing of three adolescent clients in treatment at four WT program locations in the United States including CFWT. Key program processes supporting effective treatment outcomes were identified as (a) the relationship with counselor and therapist, (b) a strong peer supported group dynamic, (c) the ability of the process to facilitate reflection on life through use of solo, and (d) the challenge and structure of the process. These findings are well-aligned with literature identifying effective therapeutic factors and processes such as therapeutic alliance, group membership, and reflection and introspection (e.g., Klein et al. 2003; Sturmer et al. 2005; Yalom 1995). Following WT treatment, adolescent clients reported a desire to improve relationships with their families, abstain from drugs and alcohol and to put more effort into completing school (Russell 2000). The role of maintaining structure and routines established during WT interventions was identified by Russell (2005) as critical to assist in the transition and aftercare planning for adolescent clients.

CFWT also participated in an outcome study in which adolescent clients entering treatment presented with similar clinical scores to those reported in inpatient treatment programs such as psychiatric hospitals and rehabilitation facilities (Russell 2003). Clients were assessed by their parents using the Youth Outcomes Questionnaire (Burlingame et al. 1995) as well as a self-report version of the instrument. This study is significant in the development of WT literature in that it included a complete pre- and post-treatment sample of 895 (523 adolescent clients and 372 parents). Results demonstrated significantly reduced scores in behavioral, substance, mood, and other disorders as reported by clients and their parents. Twelve-month follow-up with a random sample of 144 showed a general trend of maintenance of change from the CFWT intervention.

Clark et al. (2004) completed the most clinically significant research in WT to date. This multi-dimensional study addressed three of the five axes of the Diagnostic Statistics Manual (DSM IV, American Psychological Association 1994) used in psychological and mental health fields to identify mental disorders. One hundred and nine adolescents participating in 21-day programs CFWT were included in this study. Significant positive outcomes were reported using the Defense Style Questionnaire-40 (Andrews et al. 1993), Millon Adolescent Clinical Inventory (MACI, Millon et al. 1993) and the Youth Outcome Questionnaire-2.0 (YO-Q, Burlingame et al. 1995). Overall, a wide variety of clinical concerns showed reduction in scores with large effect sizes; however, special attention was given to the significant results showing characterological change as it is rarely affected by short-term interventions. Findings are suggested by the authors to have long reaching

implications for WT interventions considering the negative impact and costs personality disorders have on individuals, families, and society.

Method

One WT program site was chosen for a case study design utilized to address the aims of the research (Yin 2003). The sample consisted of 252 adolescent participants enrolled in a 21-day WT program at CFWT for treatment of emotional, behavioral, or substance use diagnoses. Criterion for inclusion in the study was based on a convenience sample of client admissions between March, 2001 and February, 2002. Adolescent clients and their parents (the use of the term *parents* will hereby refer to primary caretakers or guardians of adolescents in treatment) identified for inclusion were asked to participate, and the benefits and risks associated with this study were explained. Participants were informed of their confidentiality and that their refusal to participate would, in no way, result in a change in their treatment in the program.

Parents were contacted by phone prior to admission into the program, at two-months post-treatment, and at 12-months post treatment to complete the 20–30 min survey. The two-month follow-up assessment also served as a “check-in” with parents to see how their child was doing. All phone calls and assessments were conducted by staff therapists at CFWT. At admission, assessments were collected from 221 participants yielding an 88% response rate. At two-months post-treatment, complete questionnaires were collected from 124 parents (57%), reducing the useable data set by 43%. To examine the differences between the complete data set at admission and the two-month follow-up data set, a non-response analysis was conducted that compared pre-treatment scores for adolescent clients on all variables included in the study. Only one of the 31 variables indicated a significant difference in pre-treatment scores, the degree to which the family eats dinner together ($t = 2.45, p < .015$). The group that did not respond to the survey at 2-months indicated it was more of a problem ($M = 2.93$) than the group that did have a complete two-month follow-up ($M = 3.3$). However, the groups were very similar on the other 30 variables in the study, with no pre-treatment variables close to approaching significant differences. There were also no differences between responders and non-responders in gender representation, age, or time of year that they were admitted to the program. Because of this analysis, the two-month follow-up data set is reasoned to represent the initial sample of CFWT clients. Reasons for not completing the two-month follow-up survey included (a) parents were unavailable (a total of three phone call attempts were made), (b) parents responded but data sets were incomplete, and (c) parents asked CFWT to mail the survey, but it was not returned.

A 60-item questionnaire was developed through practitioner–academic collaboration and administered to parents of CFWT adolescent clients at admission to treatment, two-months post-treatment, and again at twelve-months post-treatment. CFWT program staff and administrators sought a pragmatic approach to understand adolescent and family outcomes from the family’s point of view. The type of data envisioned by CFWT in the development of the questionnaire with academics would answer basic questions regarding family functioning and day-to-day experiences of the family rather than producing conceptualized findings derived from standard psychometric instrumentation. Questionnaire items explored a variety of family and adolescent issues including family routines and rituals at home, adolescent attendance and success at school, critical mental health issues like depression and anger management, and participation in positive community activities. Parents were asked, for example, to respond to questions about their child’s behavior,

Table 1 Constructs measured and associated questionnaire items

| Construct | Item |
|---------------------------------|--------------------------------|
| <i>Family function</i> | Family eats dinner together |
| | Family evenings' home together |
| | Parent–child conversations |
| | Child participation in chores |
| | Family time outside of home |
| <i>Adolescent behavior</i> | Anger management |
| | Violence |
| | Impulsivity |
| | Coping with ADD/ADHD |
| <i>Adolescent mental health</i> | Emotional problems |
| | Sexual activity |
| | Suicidal thoughts/ideation |
| | Eating disorders |
| | Self-harm/mutilation |
| | Drug and alcohol use |
| <i>School success</i> | Attendance |
| | Performance |
| <i>Social engagement</i> | Choosing appropriate friends |
| | Involvements in activities |

including impulsivity, propensity for violence, drug and alcohol use, and emotional problems. Additionally, some items were based on literature in family dynamics that included the level and quality of family routines such as eating dinner together and spending time in structured activities outside of the home (Benson 2002; Fiese et al. 2002). Responses were scaled as to their severity providing indicators of change from the parent's perspective. Scores ranged from: 1—an extremely serious problem, 2—a moderately serious problem, 3—somewhat of a problem, to 4—not a problem at all. Therefore, the higher the average score, the less serious the problem. A total of 60 items were reasoned to accurately assess family functioning following a WT intervention for specific adolescent problem behaviors in a family context.

Questionnaire items were post-hoc factor analyzed using varimax rotation (Kim and Mueller 1978) and 19 items were found to cluster into five distinct constructs which were then used for exploratory analysis. It was decided that a factor load of .35 was appropriate to include items for each extracted factor. Items were selected for each factor that had the highest loadings on that particular factor and which were at least .10 different than the other factors (Safren et al. 1998). The five constructs are (a) family functioning, (b) adolescent mental health, (c) adolescent behavior, (d) school success, and (e) positive social relations. Table 1 provides detail of construct formation and specific clustered questionnaire items utilized in analysis.

Results

Participants ranged from 13–18 years of age and averaged 15.5 years. Males comprised 62% of the adolescent sample which was primarily Caucasian American (92%) with 8%

Native American, Hispanic, African American and others. Primary diagnoses were substance abuse and misuse issues (61%) including cannabis, alcohol, cocaine and amphetamines, and mood and anxiety disorders (24%) including depression, post-traumatic stress, and attachment and adjustment disorders. Additionally, behavioral diagnoses of opposition defiance and conduct disorders were present, but not often identified as the primary diagnoses in treatment planning. Although the data did not provide secondary issues or diagnoses, co-morbidity was reasoned to be present in two-thirds of wilderness therapy participant samples (Russell 2006). Current literature identifies the overlap of substance, mood, and behavioral disorders as a significant clinical issue in client treatment planning, as primary diagnosis techniques do not address systemic or interrelated problems and tend to result in less favorable outcomes (Castel et al. 2006). Considerations for the issue of co-morbidity will be addressed relative to findings of this study.

Descriptive results on items are first presented to portray a snapshot of behavioral and emotional issues, which may have triggered the adolescent and family to seek treatment. This is followed by pairwise *t*-tests which examined mean differences between pre- and two-month post-treatment scores. Additional in-depth analyses of construct items were completed for pre- to two-month post-treatment scores to better understand change occurring during the three-week treatment and eight-week follow-up period. Twelve-month post-treatment analysis presented required multiple procedures to remedy statistical limitations due to sample attrition and to examine the maintenance of change on these constructs.

Descriptive Results

Descriptive results of individual items are presented in Table 2 according to gender for behavioral and mental health issues, family functioning, school performance, and social relations. By examining all of the items that scored below a 2.5 (mathematical neutral point of the scale), it is possible to list the most common issues afflicting adolescents and their families seeking treatment at CFWT. For adolescent behavior, following house rules, impulsivity, anger management and communicating with parents were the biggest issues for adolescents. Significant differences were found between males and females, with females having more serious issues with following house rules and communicating with parents. In the area of mental health, two issues stood out as being most serious, emotional problems and drug and alcohol use, with males showing more extreme problems with drug and alcohol use ($M = 1.67$ for males compared with $M = 1.98$ for females), and girls indicating emotional problems were significantly more extreme than males ($M = 1.46$ for females compared with $M = 1.87$ for males). For the family functioning items, family time outside of the home, evenings home together, parent–child conversations, and the child’s participation in chores were rated as most extreme, with males indicating significantly more extreme problems with evenings home together and parent child conversations. Females showed significantly more extreme problems for five of the six mental health items.

Examining Pre-Treatment to Two-Month Post-Treatment Score Differences

Table 3 illustrates pre-treatment and two-month post-treatment assessments that are presented by examining score differences that showed significant and non-significant

Table 2 Descriptive results of adolescent and family functioning issues pre-treatment

| | <i>N</i> Males | Pre <i>M</i> ^a | SD | <i>N</i> Females | Pre <i>M</i> ^a | SD |
|---------------------------------|-------------------|---------------------------|------|---------------------|---------------------------|------|
| <i>Family function</i> | | | | | | |
| Family evenings' home together | 136 | 1.39** | 1.10 | 74 | 1.92 | 1.28 |
| Family arguments | 136 | 2.51 | 1.2 | 74 | 2.96 | 1.2 |
| Family time outside of home | 140 | 1.96 | .203 | 80 | 1.91 | .284 |
| Child participation in chores | 133 | 1.92 | 1.55 | 75 | 2.24 | 1.76 |
| Parent–child conversations | 136 | 2.16* | 1.43 | 74 | 2.58 | 1.49 |
| Family communication together | 136 | 2.88 | .714 | 76 | 2.7 | .833 |
| Family eats dinner together | 136 | 2.96 | 1.70 | 76 | 2.93 | 1.72 |
| <i>Adolescent behavior</i> | | | | | | |
| Following house rules | 140 | 1.73 | .728 | 81 | 1.53* | .709 |
| Communicating with parents | 139 | 2.08 | .909 | 81 | 1.81* | .882 |
| Impulsivity | 140 | 1.93 | .879 | 81 | 1.81 | .882 |
| Anger management | 140 | 2.00 | .967 | 81 | 1.96 | 1.05 |
| Coping with ADD/ADHD | 104 | 2.79 | 1.15 | 51 | 2.98 | 1.18 |
| Runaway | 133 | 3.13 | 1.07 | 75 | 2.51** | 1.21 |
| Violence | 139 | 3.03 | .892 | 80 | 3.01 | 1.06 |
| Criminal activity | 139 | 2.96 | .966 | 80 | 3.20 | .933 |
| <i>Adolescent mental health</i> | | | | | | |
| Emotional problems | 138 | 1.87 | .927 | 81 | 1.46** | .672 |
| Drug and alcohol use | 140 | 1.67* | .885 | 81 | 1.98 | 1.02 |
| Sexual activity | 120 | 3.21 | .986 | 80 | 2.55** | 1.18 |
| Suicidal thoughts/ideation | 132 | 3.44 | .803 | 72 | 3.03** | 1.06 |
| Self-harm/mutilation | 127 | 3.62 | .712 | 71 | 3.21** | 1.05 |
| Eating disorders | 130 | 3.68 | .623 | 75 | 3.27** | .920 |
| <i>School success</i> | | | | | | |
| Performance | 140 | 1.63* | .808 | 81 | 1.96 | 1.03 |
| Attendance | 140 | 2.24 | 1.20 | 81 | 2.25 | 1.20 |
| <i>Social relations</i> | | | | | | |
| Choosing appropriate friends | 140 | 1.82 | .892 | 81 | 1.64 | .870 |
| Involvements in activities | 140 | 2.04 | .889 | 80 | 2.16 | 1.07 |

^a Based on a scale of 1—an extremely serious problem, 2—a moderately serious problem, 3—somewhat of a problem, 4—not a problem at all

* Significant differences found between male and female participants at $p < .05$

** Significant differences found between male and female participants at $p < .001$

differences. Items which showed significant improvement and averaged a score above three are also presented, indicating that the problem may have been addressed as a result of treatment. Finally, items associated with the construct are explored to examine how potential changes in adolescent mental and behavioral health issues may translate to enhanced family functioning.

Significant changes in the adolescent behavior construct were noted on seven of the eight items for males, and six of the eight items for females. Interestingly, items that were rated on average as a moderately serious or extremely serious problem, evidenced by

Table 3 Mean scores, differences, and effect sizes between pre-treatment and two-month post-treatment on parental reports of adolescent and family functioning

| | Males | | | Females | | | Effect size | |
|---------------------------------|-------|-------------|---------------|-------------------|----|-------------------------|---------------|-------------------|
| | N | Pre M (sd) | Post M (sd) | Effect Size | N | Pre M ^a (sd) | | Post M (sd) |
| <i>Family function</i> | | | | | | | | |
| Family evenings' together | 54 | 3.25 (1.81) | 3.83 (1.46) | .53 | 25 | 3.35 (1.69) | 3.70 (1.49) | .28 |
| Family time outside of home | 53 | 1.44 (1.24) | 1.81 (1.24) | .31 | 24 | 1.79 (1.27) | 2.32 (1.49) | .45 |
| Family arguments | 52 | 2.56 (1.56) | 1.56** (1.56) | .97 ^b | 20 | 3.42 (1.58) | 1.53** (1.68) | 6.72 ^b |
| Child participation in chores | 55 | 2.00 (1.67) | 3.08* (1.57) | .70 | 23 | 2.25 (1.83) | 3.25* (1.65) | .57 |
| Parent-child conversations | 54 | 2.89 (1.60) | 2.87 (1.44) | .02 | 20 | 2.26 (1.59) | 3.16 (1.64) | .61 |
| Family communication | 53 | 2.87 (.67) | 3.02 (.65) | .21 | 21 | 2.81 (.87) | 3.19 (.60) | .46 |
| Family eats dinner together | 52 | 3.32 (1.68) | 3.92 (1.32) | .36 | 22 | 2.80 (1.64) | 3.55 (1.88) | .44 |
| <i>Adolescent behavior</i> | | | | | | | | |
| Following house rules | 82 | 1.73 (.60) | 2.74* (.59) | .50 | 41 | 1.44 (.59) | 2.61* (1.07) | .67 |
| Communicating with parents | 82 | 2.09 (.67) | 2.89* (.65) | .89 ^b | 42 | 1.79 (.93) | 2.69* (1.00) | 1.03 ^b |
| Impulsivity | 81 | 1.93 (1.10) | 2.60* (.95) | .76 ^b | 40 | 1.83 (.86) | 2.83* (1.14) | 1.14 ^b |
| Anger management | 82 | 2.09 (.97) | 2.77* (1.02) | .77 ^b | 41 | 2.02 (1.09) | 2.86 (1.18) | .81 ^b |
| Coping with ADD/ADHD | 45 | 2.40 (1.12) | 2.87 (1.16) | .41 | 40 | 2.71 (1.) | 2.64 (1.64) | .06 |
| Runaway | 68 | 3.03 (1.10) | 3.68* (1.24) | .61 | 37 | 2.47 (1.16) | 3.29* (1.24) | .68 |
| Violence | 83 | 3.02 (.96) | 3.65* (.71) | .71 | 40 | 3.19 (1.06) | 3.71* (.71) | .50 |
| Criminal activity | 80 | 3.04 (.96) | 3.61* (.80) | .60 | 41 | 3.20 (.954) | 3.61 (.80) | .44 |
| <i>Adolescent mental health</i> | | | | | | | | |
| Emotional problems | 82 | 1.77 (.89) | 2.56* (1.07) | .86 ^b | 41 | 1.45 (.67) | 2.52* (1.09) | 1.61 ^b |
| Drug and alcohol use | 83 | 1.73 (.93) | 3.02* (1.22) | 1.47 ^b | 40 | 2.10 (1.14) | 3.27* (1.07) | 1.16 ^b |
| Sexual activity | 59 | 3.32 (.96) | 3.37 (.98) | .05 | 39 | 2.42 (1.26) | 3.13 (1.09) | .61 |
| Suicidal thoughts/ideation | 60 | 3.28 (.86) | 3.58 (.77) | .38 | 40 | 2.75 (1.14) | 3.44 (.98) | .66 |
| Self-harm/mutilation | 59 | 3.64 (.69) | 3.88 (.46) | .34 | 34 | 3.03 (1.18) | 3.45 (.95) | .40 |
| Eating disorders | 61 | 3.59 (.72) | 3.72 (.68) | .20 | 37 | 3.24 (.95) | 3.65 (.75) | .45 |

Table 3 continued

| | Males | | Females | | Effect Size | Effect size | |
|------------------------------|-------|-------------|--------------|----|-------------|--------------|-------------------------|
| | N | Pre M (sd) | Post M (sd) | N | | | Pre M ^a (sd) |
| <i>School success</i> | | | | | | | |
| Performance | 76 | 1.59 (.82) | 2.67* (1.26) | 41 | 2.03 (1.07) | 2.54 (1.28) | .50 |
| Attendance | 76 | 2.13 (1.18) | 3.2* (1.18) | 42 | 2.30 (1.22) | 2.89 (1.43) | .50 |
| <i>Social relations</i> | | | | | | | |
| Choosing appropriate friends | 77 | 1.75 (.86) | 2.74* (1.16) | 42 | 1.70 (.91) | 2.58* (1.22) | 1.02 ^b |
| Involvements in activities | 82 | 2.07 (.90) | 2.82 (1.12) | 41 | 2.28 (1.10) | 2.69 (1.19) | .39 |

^a Based on a scale of 1—an extremely serious problem, 2—a moderately serious problem, 3—somewhat of a problem, 4—not a problem at all

^b A large to very large effect size suggested by Cohen (1988)

*A score at the two-month follow-up period that is statistically different from the pre-treatment score ($p < .002$)

**A score at the two-month follow-up period that shows significant deterioration from the score at pre-treatment

average scores pre-treatment of below 2.5 (following house rules, communicating with parents, impulsivity, anger management, and coping with ADHD concerns) all showed significant improvement as a result of treatment ($p < .001$) and most showed large effect sizes, with only following house rules with a medium effect size. Despite these significant improvements, all the items remained below a rating of three (somewhat of a problem) for both males and females at the two-month follow-up period. This suggests that though improvement was made, these issues may still persist. Emotional problems and problems with drug and alcohol use both showed significant improvement in the mental health construct as well as large effect sizes, with emotional problems showing the most significant improvement of the two items, though these items were also still rated below a three. The improper use of drugs and alcohol was perceived by parents to have improved at the two-month period for both males ($M = 3.02$) and females ($M = 3.27$), and each were reasoned to be significantly improved as evidenced by large effect sizes. Other mental health measures did not show statistically significant improvement, but were also perceived as not really being a problem at the onset of treatment.

Improved performance in the school construct was more pronounced for males than females; significant improvement was noted by parents in performance and attendance for males (both also had large effect sizes greater than .90). Also of interest was the observation that all items, except attendance for males, was rated below a three suggesting again that noticeable improvement was made, but these issues still are somewhat of a problem for the adolescent and family. The only social relations issue that showed statistical improvement for females was the choice of more appropriate friends, while neither males nor females showed statistical improvement in being involved in appropriate activities with friends outside of the home or school.

When examining the family functioning variables more closely, the only variable to show significant improvement was the child participating more actively in chores. Other measures, such as family communications, and parent–child conversations yielded insignificant results. Moreover, the family arguments item for both males and females *decreased* significantly for males ($t = 3.83, p < .001$) and females ($t = 4.56, p < .001$) with very large effect sizes to a point where parents rated the item on average as an extremely serious problem. Though it seems as though the adolescent may be perceived by parents as having improved along various behavioral, and mental health parameters, the degree to which these translate into enhanced family functioning measures is one of further consideration.

Twelve-Months Post-Treatment Outcomes

Further attrition occurred in the useable data sets between 2-months and 12-months. For example, only 78% of the assessments conducted at the two-month follow-up period were again contacted successfully at 12-months. Due to this sample attrition, maximum likelihood estimations (*mle*) of missing values were calculated to maintain larger sample sizes. Maximum likelihood is a process of maintaining robustness of findings in large sample analysis though should be used judiciously in inferential analysis (Royall 1986). Replacement values are calculated through a covariance matrix accounting for expected values from assumed parameter values and the convergence of most likely values based on existing data from each subject (Tabachnick and Fidell 2001). Two-month post-treatment results are statistically more robust than the twelve-month results reported here. Subsequent interpretations and discussion were conservative.

Results from pair-wise *t*-tests analysis showed four items that were statistically different at 12-months when compared with the two-month follow-up scores. All other item scores were not statistically different. Two items (family eating dinner together and family spending time in the evening together) were in the family functioning construct and showed significant regression of scores with medium effect sizes. Suicide thoughts and ideation showed a significant improvement, as did school performance, as indicated by average ratings that increased to $M = 3.73$ for suicide thoughts and $M = 2.96$ for school performance.

Limitations

A number of limitations are present in this study. The first is the non-utilization of control groups for randomization of treatment. As with previous WT research, waitlists do not exist to establish treatment-control groups and the critical need for service for clients and their families prevents delay or refusal of treatment on ethical grounds (Russell 2003). Second, this study utilized an instrument that was developed with practitioners for practical purposes and has not been psychometrically assessed. Caution is expressed for interpretations of these exploratory results. To increase the validity of the measure's results, exploratory factor analysis was utilized to determine item clustering and is reported in Table 1. Constructs utilized in the study were reasoned to be acceptable for analysis after removing other questionnaire items. Third, *mle* data imputation was utilized to maintain the statistical strength of a large sample. This procedure is considered to have conservative estimate properties and has been suggested as a sound analytic practice if compared to paired listwise results (Tabachnick and Fidell 2001) which was completed. Family-wise Type I errors were controlled for through an increased alpha from .05 to .002 for pre- to post-difference analyses ($N = 25$ *t*-tests reported in Table 3) and .05 to .01 for twelve-month follow-up analyses ($N =$ four *t*-tests) as error compounds in repeated-measure paired sample analysis (Howell 2002).

This analysis provides a longitudinal trend analysis of the CFWT program for the five constructs identified: (a) family function, (b) adolescent behavior, (c) adolescent mental health, (d) school success, and (e) social engagement. Pre-treatment to two-month post-treatment analysis provides reasonably robust findings and contains statistically significant findings and meaningful client outcomes and a demonstration of program success. Generalization of findings may be made cautiously to other WT programs with similar treatment standards and processes.

Discussion

Findings suggest the CFWT intervention may significantly contribute to the stabilization of adolescent problem behaviors and that treatment effects may contribute to lasting change for clients and their families. The two-month post-treatment results reported in Table 4 include a follow-up period more than twice the length of the WT intervention and are reasoned to include a treatment effect from participation in CFWT as well as a family, and potentially community effect (including aftercare services), as time and life circumstances come to bear on these results. Most items were found to sustain change at the twelve-month post-treatment period in both alternative analyses. Deteriorated scores were found on two items: (a) family eats dinner together, and (b) family evening's home together.

Table 4 Mean scores, differences, and effect sizes between pre-treatment and two-month post-treatment on parental reports of adolescent and family functioning

| Construct and item | <i>N</i> | Two-Month <i>M</i> ^a | 12-Month <i>M</i> | Diff. | Effect size |
|---------------------------------|----------|---------------------------------|-------------------|--------|-------------|
| <i>Family function</i> | | | | | |
| Family eats dinner together | 74 | 3.82 | 3.19 | .626* | .65 |
| Family evenings' together | 73 | 3.81 | 3.29 | .509* | .54 |
| <i>Adolescent mental health</i> | | | | | |
| Suicide thoughts/ideation | 98 | 3.56 | 3.73 | −.445* | .23 |
| <i>School</i> | | | | | |
| Performance | 113 | 2.63 | 2.96 | −.331* | .41 |

^a Based on a scale of 1—an extremely serious problem, 2—a moderately serious problem, 3—somewhat of a problem, 4—not a problem at all

* A score at the 12-month follow-up period that is statistically different from the two-month follow-up score, $p < .01$

Improvements were seen on two items: (a) suicide thoughts and ideation, and (b) school performance.

It appears that males and females enter treatment for different reasons given their significant differences in items scores at pre-treatment. Females had significantly more problems in the areas of mental health, while males had more problems with drug and alcohol use and school performance. It appears as though the improvements made by both males and females in mental health and behavior constructs do not translate into improved family functioning as only one item in this construct showed significant improvement (child participation in chores, which can be argued to be more of a behavior than a measurement for family functioning). Additionally, the family arguments variable showed a significant increase in severity of the problem. Findings suggest that though adolescents may make progress as a result of treatment—and may maintain many of these changes for up to 1 year—these positive outcomes may not be translating into improved family functioning.

Positive outcomes noted from score improvement from pre-treatment to two-months post-treatment is in alignment with previous research in adolescent WT outcomes (see Clark et al. 2004; Russell 2003) while change in the twelve-month post-treatment scores did not show a pattern of regression previously reported in adventure-based therapeutic and educational programs (see Hattie et al. 1997; Pommier and Witt 1995). Construct effect sizes ranged from 0.63 to 0.84 and are considered large by conventional standards set in the social sciences.

While attendance and treatment adherence plagues many adolescent mental health and substance abuse interventions (Nock and Ferriter, 2005), CFWT program clients are often admitted through coercive measures and prevented from leaving, primarily due to the reality of their location in isolated environments (Russell 2006). Additionally, parents are faced with mandatory participation in their child's treatment (Russell and Hendee 2000) which, as a practice, is supported by current thinking in adolescent interventions with problem behavior, child and youth care, and family therapy (Becvar and Becvar 1999; Dishion and Kavanagh 2003; Garfat 2003). These circumstances have resulted in levels of treatment completion as high as 96% (Russell 2003; Russell and Harper 2006).

Family involvement in CFWT programs can be described in two specific contexts: (a) integrated participation in the program with their child at admission and discharge; and (b)

remotely through telephone contact with therapist, written communication with their child, and engaging in their own therapeutic processes with community resources during their child's time in treatment. Outcomes from this 21-day WT intervention show adolescent improvements as a result of treatment, however, these positive outcomes not translating into marked change in the family context. This result suggests that more intentional and direct involvement of families in the change process may be appropriate to help families address issues preventing effective family functioning. These issues can be integrated into current WT and community-based practices during adolescent treatment to more directly address systemic family dynamics. To what extent the type and duration of family involvement can contribute to resulting change and maintenance in WT is unknown.

Transition planning and aftercare have been defined as critical to the success of short-term intensive interventions such as WT (Russell 2003, 2005). The support of other mental health professionals beyond the WT intervention is critical to the successful maintenance of change for the youth and their family. Improvements in long-term sustainability of systemic family health following WT interventions may also need to include supportive community resources as the results depicted regression on items in family functioning at 12-months post-treatment (see Leichtman et al. 2001).

Russell (2003) expressed the difficulty in tracking and evaluating long-term effects of the WT intervention since adolescent clients may go on to further therapeutic boarding schools, residential treatment programs, or back into home and community settings. With this in mind, WT programs should invest available resources to enhance the capacity of families to maintain emotional and behavioral change initiated during the intervention. A key element described in current literature to assist in this regard is the therapeutic or working alliance fostered by therapists with parents. This "alliance" has shown to improve family participation, increase treatment adherence, and encourage collaborative treatment decision-making between parent and therapist; subsequently improving the effectiveness of interventions and long-term sustainability of change (Diamond et al. 2003; Hawley and Weisz 2005; Shelef et al. 2005; Liddle and Hogue 2000).

Alcohol and drug use scores regressed to near statistical significance between two- and twelve-months post-treatment while still maintaining significant improvement from pre-treatment scores ($p < 0.01$). This result is similar to findings from previous WT research (Russell 2003, 2005) where quantitative and qualitative inquiry showed parents were describing their child as doing alright, but still using drugs or alcohol. Future research may address questions of alcohol and drug abuse treatment philosophies and effectiveness regarding the spectrum of approaches including "abstinence" and "harm reduction" for adolescent populations in residential treatment.

Findings from this study demonstrate the potential effectiveness of CFWT in addressing and stabilizing problem behaviors across a variety of adolescent and family constructs. Further, findings suggest change in family systems were generally maintained one full year following the three-week WT intervention. While limitations to generalization and in interpretation exist, these findings support the clinical and practical utilization of adolescent WT in the treatment of emotional, behavioral, and substance use problems.

This case study serves as an exploratory inquiry into a practical assessment of treatment outcomes and their relation to family functioning and provides a foundation for future research and practice. Recommendations include (a) further investigation of family involvement in adolescent WT including family-related outcomes and program processes, (b) a detailed examination of how a family systems perspective is operationalized by WT programs in remote residential treatment settings, (c) utilization of qualitative and quantitative approaches to understanding mechanisms of change for both individual adolescent

clients and their families, and (d) a broader exploration of the transition period from WT interventions into the community, home, or aftercare facility including treatment planning, transitional programming, and the utilization and collaboration of community mental health services. CFWT responded to WT research outcomes published shortly after the data for this study were collected in which three-week programs were not showing the same level of change as longer interventions for all clients (Russell 2003). CWFT now provides four-week extended expeditions for families of youth for whom the clinical team recommends extended treatment following the three-week intervention. An ideal research opportunity exists to examine specific diagnoses and related treatment outcomes of clients in three- and seven-week WT interventions. It is cautiously reasoned here that four additional weeks of family involvement in WT would provide stronger therapeutic relationships between the clinical team, youth and their families, suggesting increased favorable outcomes in family functioning. Further investigation is required to illuminate WT program theory and processes that may advance its effectiveness as an alternative adolescent treatment modality.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.
- Andrews, G., Singh, M., & Bond, M. (1993). The defense style questionnaire. *Journal of Nervous and Mental Disease*, 181(4), 246–256.
- Bandura, A. (1977). Self efficacy: Toward a unifying theory for behavioral change. *Psychological Review*, 84, 191–215.
- 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.
- Becvar, D. S., & Becvar, R. J. (1999). *Systems theory and family therapy: A primer* (2 ed.). Lanham, MA: University Press of America.
- Beels, C. C. (2002). Notes for a cultural history of family therapy. *Family Process*, 41(1), 67–82.
- Benson, P. L. (2002). Adolescent development in social and community context: A program of research. *New Directions for Youth Development*, 95(Fall), 123–147.
- Broderick, C. B. (1993). *Understanding family process: Basics of family systems theory*. Newbury Park, CA: Sage.
- Burg, J. E. (2001). Emerging issues in therapeutic adventure with families. *Journal of Experiential Education*, 24(2), 118–122.
- Burlingame, G. M., Wells, M. G., & Lambert, M. J. (1995). *The youth outcome questionnaire*. Stevenson, MD: American Professional Credentialing Services.
- 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.
- Castel, S., Rush, B., Urbanoski, K., & Toneatto, T. (2006). Overlap of clusters of psychiatric symptoms among clients of a comprehensive addiction treatment service. *Psychology of Addictive Behaviors*, 20(1), 28–35.
- Clark, J. P., Marmol, L. M., Cooley, R., & Gathercoal, K. (2004). The effects of WT on the clinical concerns (on axes I, II, and IV) of troubled adolescents. *Journal of Experiential Education*, 27(2), 213–232.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cottrell, D., & Boston, P. (2002). Practitioner review: The effectiveness of systemic family therapy for children and adolescents. *Journal of Child Psychology and Psychiatry*, 43(5), 573–586.
- Crisp, S., & Hinch, C. (2004). *Treatment effectiveness of wilderness adventure therapy: Summary findings*. Clifton Hill, Australia: Neo Psychology.
- Diamond, G., Siqueland, L., & Diamond, G. M. (2003). Attachment-based family therapy for depressed adolescents: Programmatic treatment development. *Clinical Child & Family Psychology Review*, 6(2), 107–127.
- Diamond, G. S., Serrano, A. C., Dickey, M., & Sonis, W. A. (1996). Current status of family-based outcome and process research. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(1), 6–17.

- Dishion, T. J., & Andrews, D. W. (1995). Preventing escalation in problem behaviors with high-risk young adolescents: Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology, 63*(4), 538–548.
- Dishion, T. J., & Kavanagh, K. (2003). *Intervening in adolescent problem behavior: A family-centered approach*. New York, NY: Guilford Press.
- Eisler, I., Dare, C., Hodes, M., Russell, G., Dodge, E., & Le Grange, D. (2000). Family therapy for adolescent anorexia nervosa: The results of a controlled comparison of two family interventions. *Journal of Child Psychology and Psychiatry, 41*(6), 727–736.
- Fauber, R. L., & Long, N. (1991). Children in context: The role of the family in child psychotherapy. *Journal of Consulting and Clinical Psychology, 59*(6), 813–820.
- Fiese, B. H., Tomcho, T. J., Douglas, M., Josephs, K., Poltrock, S., & Baker, T. (2002). A review of 50 years of research on naturally occurring family routines and rituals: Cause for celebration? *Journal of Family Psychology, 16*(4), 381–390.
- Freeman, P. A., & Zabriskie, R. B. (2002). The role of outdoor recreation in family enrichment. *Journal of Adventure Education and Outdoor Learning, 2*(2), 131–146.
- Garfat, T. (2003). Working with families: A child and youth care approach. *Child & Youth Services, 25*(1/2), 7–37.
- Gass, M. A. (1993). *Adventure therapy: Therapeutic applications of adventure programming*. Dubuque, IA: Kendall/Hunt.
- Gillis, H. L., Gass, M. A., Bandoroff, S., Rudolph, S., Clapp, C., & Nadler, R. (1992). *Family adventure questionnaire: Results and discussion*. Paper presented at the 1991 Association of Experiential Education Conference.
- 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.
- Hawley, K. M., & Weisz, J. R. (2005). Youth versus parent working alliance in usual clinical care: Distinctive associations with retention, satisfaction, and treatment outcome. *Journal of Clinical Child and Adolescent Psychotherapy, 34*(1), 117–128.
- Hill, M., & Garfat, T. (2003). Moving to youth care family work in residential programs: A supervisor's perspective on making the transition. *Child & Youth Services, 25*(1/2), 211–223.
- Howell, D. C. (2002). *Statistical methods for psychology* (5th ed.). Pacific Grove, CA: Duxbury.
- Huff, C., Widmer, M. A., McCoy, K., & Hill, B. (2003). The influence of challenging outdoor recreation on parent–adolescent communication. *Therapeutic Recreation Journal, 37*(1), 28–37.
- Kaplan, S. (1995). The restorative benefits of nature: Towards an integrative framework. *Journal of Environmental Psychology, 15*, 169–182.
- Kazdin, A. E., & Whitley, M. K. (2003). Treatment of parental stress to enhance therapeutic change among children referred for aggressive and antisocial behavior. *Journal of Consulting and Clinical Psychology, 71*(3), 504–515.
- Kerr, M. H., Beck, K., Shattuck, T. D., Kattar, C., & Uriburu, D. (2003). Family involvement, problem and prosocial behavior outcomes of Latino youth. *American Journal of Health Behavior, 27*(S1), S55–S65.
- Kim, J.-O., & Mueller, C. W. (1978). *Introduction to factor analysis*. Beverly Hills, CA: Sage.
- Klein, D. N., Schwartz, J. E., Santiago, N. J., Vivian, D., Vocisano, C., Castonguay, L. G., et al. (2003). Therapeutic alliance in depression treatment: Controlling for prior change and patient characteristics. *Journal of Consulting and Clinical Psychology, 71*(6), 997–1006.
- Kumpfer, K. L. (1999). *Strengthening America's families: Exemplary parenting and family strategies for delinquency prevention*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention (OJJDP).
- Kumpfer, K. L., Alvarado, R., & Whiteside, H. O. (2003). Family-based interventions for substance use and misuse prevention. *Substance Use & Misuse, 38*(11–13), 1759–1787.
- Leichtman, M., Leitchman, M. L., Barber, C. C., & Neese, D. T. (2001). Effectiveness of intensive short-term residential treatment with severely disturbed adolescents. *American Journal of Orthopsychiatry, 71*(2), 227–235.
- Liddle, H. A., & Hogue, A. (2000). A family-based, developmental-ecological preventative intervention for high-risk adolescents. *Journal of Marriage and Family Therapy, 26*(3), 265–279.
- Liddle, H. A. (1996). Family-based treatment for adolescent problem behavior: Overview of contemporary developments and introduction to the special section. *Journal of Family Psychology, 10*(1), 3–11.
- Liddle, H. A., Rowe, C., Diamond, G. M., Sessa, F. M., Schmidt, S., & Ettinger, D. (2000). Toward a developmental family therapy: The clinical utility of research on adolescence. *Journal of Marital & Family Therapy, 26*(4), 485–501.

- Millon, T., Millon, C., & Davis, R. (1993). *The Millon adolescent clinical inventory*. Minneapolis, MN.
- Nock, M. K., & Ferriter, C. (2005). Parent management of attendance and adherence in child and adolescent therapy: A conceptual and empirical review. *Clinical Child and Family Psychology Review*, 8(2), 149–166.
- Olson, D. H., Portner, J., & Bell, R. Q. (1982). *Faces: Family adaptability and cohesion evaluation scales*. St. Paul, MN: University of Minnesota.
- Pommier, J. H., & Witt, P. A. (1995). Evaluation of an outward bound school plus family training program for the juvenile status offender. *Therapeutic Recreation Journal*, 20(2), 86–103.
- Robin, A. L., Siegel, P. T., & Moye, A. (1995). Family versus individual therapy for anorexia: Impact on family conflict. *International Journal of Eating Disorders*, 17(4), 313–322.
- Royall, R. M. (1986). Model robust confidence intervals using maximum likelihood estimators. *International Statistics Review*, 54(2), 221–226.
- 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). An assessment of outcomes in outdoor behavioral healthcare treatment. *Child and Youth Care Forum*, 32(6), 355–381.
- Russell, K. C. (2005). Two years later: A qualitative assessment of youth well-being and the role of aftercare in outdoor behavioral healthcare treatment. *Child and Youth Care Forum*, 34(3), 209–239.
- Russell, K. C. (2006). Brat camps, boot camps...? Exploring wilderness therapy program theory. *Journal of Adventure Education and Outdoor Learning*, 6(1), 51–68.
- Russell, K. C., & Farnum, J. (2004). A concurrent model of the wilderness therapy process. *Journal of Adventure Education and Outdoor Learning*, 4(1), 39–55.
- Russell, K. C., & Harper, N. (2006). Incident monitoring in outdoor behavioral healthcare programs: A four-year summary of restraint, runaway, injury, and illness rates. *Journal of Therapeutic Schools and Programs*, 1(1), 70–90.
- Russell, K. C., & Hendee, J. C. (2000). *Outdoor Behavioral Healthcare: Definitions, common practice, expected outcomes and a national survey of programs* (Technical Report No. 26). Moscow, ID: UI-Wilderness Research Center-Outdoor Behavioral Healthcare Research Cooperative.
- 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.
- Safren, S. A., Turk, C. L., & Heimburg, R. G. (1998). Factor structure of the Social Interaction Anxiety Scale and the Social Phobia Scale. *Behaviour Research and Therapy*, 36(4), 443–453.
- Shelef, K., Diamond, G. M., Diamond, G. S., & Liddle, H. A. (2005). Adolescent and parent alliance and treatment outcome in multidimensional family therapy. *Journal of Consulting and Clinical Psychology*, 73(4), 689–698.
- Skinner, H. A., Steinhauer, P., & Santa-Barbara, J. (1983). The family assessment measure. *Canadian Journal of Community Mental Health*, 2, 91–105.
- Sturmer, S., Snyder, M., & Omoto, A. M. (2005). Prosocial emotions and helping: The moderating role of group membership. *Journal of Personality and Social Psychology*, 88(3), 532–546.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Needham Heights, MA: Allyn & Bacon.
- Tennessen, C. M., & Cimprich, B. (1995). Views to nature: Effects on attention. *Journal of Environmental Psychology*, 15(1), 77–85.
- Wells, M. S., Widmer, M. A., & McCoy, J. K. (2004). Grubs and grasshoppers: Challenge-based recreation and the collective efficacy of families with at-risk youth. *Family Relations*, 53(3), 326–333.
- Wilson, S. J., & Lipsey, M. W. (2000). Wilderness challenge programs for delinquent youth: A meta-analysis of outcome evaluations. *Evaluation and Program Planning*, 23, 1–12.
- Yalom, I. D. (1995). *The theory and practice of group psychotherapy* (4 ed.). New York, NY: Basic Books.
- Yin, R. K. (2003). *Case study research: Design and methods* (3 ed.). Newbury Park, CA: Sage.