

Exploring the Process of a Therapeutic Wilderness Experience: Key Components in the Treatment of Adolescent Depression and Psychosocial Development

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Abstract

Adolescent depression is a serious mental health crisis, often occurring in the context of negative psychosocial development. This study explored the efficacy of a therapeutic wilderness experience on adolescent depression and psychosocial development by measuring pre-to-post changes on the Reynolds' Adolescent Depression Scale-2 (RADS-2) and the Measures of Psychosocial Development (MPD). Participants in this study were selected from the Intercept program at Outward Bound Wilderness, a therapeutic wilderness program for youth-at-risk. This mixed methods study found clinically and statistically significant pre- to-post decreases in levels and prevalence of adolescent depression and increases in psychosocial health after a therapeutic wilderness intervention. This study also showed qualitative indicators of change in these areas. This study further demonstrated a clinically and statistically significant relationship between adolescent depression and psychosocial development, and showed statistically significant improvements in the areas of school problems, substance abuse, and family conflict. In addition, this study analyzed what process variables were related to the adolescent depression and pro-social outcomes. These findings are highlighted in this article and are presented as key components of the therapeutic wilderness experience.

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Adolescent Depression and Psychosocial Development: The Need for a Holistic Intervention

Adolescent depression has become epidemic in the United States, with statistics showing that one in five individuals may suffer from depression (Brent & Birmaher, 2002). According to the World Health Organization, depression is the second leading cause of disability for people ages 15-44 (World Health Organization, 2009). And despite the prevalence of adolescent depression alone, there is an acknowledged shortage of treatment options and providers in the field of child and adolescent mental health (Koplewicz, 2002).

The reality of this treatment gap for adolescents can be devastating. The consequences of untreated depression can lead to serious problems later in life, including suicide. Recent statistics revealed that approximately three million youth, age 12 to 17, either thought seriously about suicide or attempted suicide in 2000, and the actual suicide rate for all adolescents has increased more than 200% over the last decade (Borowsky, Ireland, & Resnick, 2001). Many teens who commit suicide suffer from undiagnosed or untreated clinical depression, and have experienced serious difficulties in school, work, and personal relationships (Weersing, Rozenman, & Gonzalez, 2008). Because of these alarming statistics, adolescent depression has been recognized as a legitimate mood disorder that affects the functioning of millions of adolescents (Koplewicz, 2002).

Most mental health practitioners agree, however, that the majority of adolescent depression can be treated; yet there is debate about the type of therapeutic intervention that best targets adolescent depression. Researchers and practitioners agree that integration of theory is needed in contemporary treatment of adolescent depression. Allen-Meares (1987) said treatment providers “need to expand their knowledge about risk factors and unique characteristics associated with depression in this population to refine the different schools of thought and to design prevention and treatment interventions” (p. 515). While the majority of research on adolescent depression has focused on the cognitive-behavioral aspects of the problem, current relational theory reinforces that “we are much more than (cognitive) representations of self; rather, they are each versions, complete functional units with a belief system, affective organization, agentic intentionality, and developmental history” (Mitchell, 2000, p. 63).

Adolescence, in particular, is an important time in one's developmental history, where the formation of one's identity takes center stage (Erikson, 1968). For this reason, this study sought to understand adolescent depression by grounding it in the context of psychosocial development. This psychosocial approach takes into consideration multiple systems and domains of development. By viewing adolescent depression in the context of psychosocial development, one may arrive at a theory base and treatment modality that addresses the developmental, neurobiological, cognitive and relational factors that give rise to adolescent depression.

Amesberger (1998) referred to wilderness therapy as a structured holistic model of treatment that addresses these multiple factors of human development and pathology. While people have speculated on the increase in general well-being associated with being outdoors (Miles, 1987), the field of wilderness therapy seeks to augment the power of the outdoors in combination with structured clinical interventions in a way that promotes psychological healing and personal growth. Although wilderness therapy is believed to serve as a powerful intervention that promotes cognitive, affective, and behavioral change (Gillis 1992), leaders in the field of wilderness therapy admit that more research is needed to understand the impact of wilderness therapy on specific emotional and psychological issues (Berman & Davis-Berman, 1994; Russell, 1999). Though the wilderness program in this study does not meet the exact criteria of wilderness therapy, it is considered a therapeutic wilderness program. According to Cason & Gillis's (1994) meta-analysis of outdoor adventure programming with adolescents, both wilderness and adventure therapy programs and basic outdoor adventure programs yielded significant effect sizes. As such, some of the research on the efficacy of wilderness therapy on adolescent depression has been referenced as a basis for understanding the impact of a therapeutic wilderness experience with this population.

Prior Research on Adolescent Depression and Wilderness Therapy

Adolescent depression is a common mental health issue seen in wilderness therapy participants. Russell's (2002) longitudinal study found that 22.4% of adolescents participating in wilderness

therapy programs were diagnosed with mood disorders. While very few studies have examined the effectiveness of wilderness therapy in dealing with adolescent depression, several outcome studies have been done on the efficacy of wilderness therapy and mood disorders.

Wall (1992) was one of the first to examine the efficacy of wilderness therapy in this area. In his study, he compared the intervention of psychopharmacology with wilderness therapy and found that wilderness therapy was as effective as the use of pharmaceutical anti-depressant medication. Wall used the Beck Depression Inventory to measure change before and after participating in a wilderness therapy program and reported that meaningful gains were made in the area of decreasing depression. Limitations of Wall's study, however, include a lack of accountability for moderating variables on participants' moods at the beginning and end of the course. Also, follow-up research was not conducted, so the long-term effects on participants' moods were not measured. However, another wilderness therapy study using the Millon Adolescent Clinical Inventory also noted pre- to post-intervention decreases in the area of depressive feelings and symptoms (Clark, Marmol, Cooley, & Gathercoal, 2004). Russell (2003) examined the pre- to post-test outcomes of wilderness therapy participants' scores on the Youth Outcome Questionnaire (Y-OQ). In this study, participants with mood disorders showed the greatest decrease in their pre- to post-test Y-OQ scores. Yet conclusive findings cannot be derived from this study alone due to the lack of a comparison group.

Nortrom's (2004) study on the efficacy of wilderness therapy on adolescent depression found 70% of adolescent clients reporting decreased depressive symptomology after treatment. Using the Reynolds' Adolescent Depression Scale-2, Nortrom found the combined data from her total sample did not show statistically significant results in the use of wilderness therapy to help lower depressive symptoms. However, when the scores for participants that had moderate to severe depression were analyzed separately, their scores dropped significantly ($p < .02$ level). Through case study narrative data, Nortrom (2004) also found that time spent alone in the wilderness was one of the components of the wilderness therapy program that made the largest impact on depressed adolescents.

The purpose of this study was to explore the efficacy of a therapeutic wilderness program on adolescent depression and

psychosocial development. The study further sought to analyze the process variables related to the adolescent depression treatment to present them as key components of the therapeutic wilderness process.

Method

Participants

Participants in this study consisted of adolescents in Outward Bound's youth-at-risk program, a 28-day wilderness canoeing and camping program called Intercept (N=21). This group consisted of males and females ages 13-17. In this study, 81% of participants were Caucasian, 14% were Hispanic, and only 5% were African American. In addition, 62% of participants in this study were boys and 38% were girls. Not surprisingly, almost 62% of participants in this study came with some kind of unipolar depressive diagnosis, and 76% of participants had previous counseling. Participants in this study matched the overall demographics of the participants in other wilderness therapy programs, as reported by Russell and Hendee (2000). Participants also possessed varying levels of substance abuse, school problems, and family conflict. The main confounding variables of age, race, gender, preexisting diagnosis of depression, and prior participation in counseling were selected as important variables for which to control. It should be noted that, socioeconomic status (SES) and previous involvement in the juvenile justice system may have also been important variables to consider however, that type of demographic information was not available. Youth with prior involvement in the juvenile justice system were excluded from this study due to ethical and logistical constraints.

Overview of Program

The Intercept program consisted of a 21-day wilderness expedition, canoeing, and rock climbing program in Northern Minnesota and South Carolina. This expedition was broken into four stages: training, main, solo, and final. Through these stages, responsibility was gradually transferred over to the participants. During training, instructors provided participants with the wilderness skills they needed to be competent in a new, unfamiliar environment. During main expedition, the group practiced these skills, while still having access to guidance from the instructors. During this phase, the

group also learned communication and problem-solving skills.

During solo, each individual spent three days and two nights at a private wilderness site apart from other participants. Instructors checked in with students several times a day, doing one-on-one interviews, and providing them with journaling exercises and other reflective assignments to foster self-awareness. After solo, the group participated in a final expedition where they were responsible for all aspects of their experience (i.e. cooking their own food, navigating, setting up camp, etc.). The role of the wilderness instructor at this point was to help the group maintain physical and emotional safety, while still letting the group work toward solving their own problems. Throughout the entire expedition, instructors met with students one-on-one to work on personal goals, to help them take responsibility for why they were in the program, and to help them think about what positive changes they could make upon returning home.

This expedition was followed by a gradual transition back into society. This transition included a visit to base camp, where participants challenged themselves through adventure activities such as white water kayaking and a high ropes course. Participants also celebrated the accomplishments of their wilderness phase with a banquet and then traveled to a nearby city for their Urban Expedition. During the Urban Expedition, participants worked in various community settings, performing community service projects. The Urban Expedition culminated with a parent/guardian seminar, where goals for home were articulated through a therapeutic conversation between the adolescents and their parents, facilitated by the instructor. Experienced wilderness instructors, who were well trained in group facilitation and basic counseling skills, led these trips. Many possessed prior experience with at-risk youth, and some held advanced mental health degrees. These trip leaders also facilitated the transitional phases of the course, both at base camp and in the urban setting. They worked with parents/guardians and their children to articulate the learning that occurred during the program, and assisted in setting goals for when the adolescent returned home. A Course Director, who also possessed extensive experience working with youth in the field, supervised them.

After the course, the field instructors provided follow-up for the students, their families, and any third parties involved in the referral process by creating a written narrative about each participant's

progress during the program. By passing on this information, it was hoped that positive changes on the course could serve as an anchor and catalyst for future change.

Design and Measures

This study explored the impact of a therapeutic wilderness experience on adolescent depression and psychosocial development. It also examined the relationship between depression and psychosocial development, as well as the influence of family conflict, substance abuse, and school problems on these constructs.

The RADS-2 was chosen to measure depression because it is developmentally appropriate and has documented reliability and validity in measuring depressive symptomology in adolescent clients (Reynolds, 2002). The RADS-2 is a 30-item, self-report questionnaire that has subscales highlighting various depressive symptoms: dysphoric mood, anhedonia/negative affect, negative self-evaluation, and somatic complaints. The RADS has become “one of the most commonly used self-report measures of depression in adolescents” (Reynolds, 2002, p. 4), and has also been used to examine the efficacy of wilderness therapy and adolescent depression (Nortrom, 2004).

The MPD was selected to measure psychosocial development because it focuses on healthy personality development rather than pathology. Its wide range of applicability and its strong theoretical foundation, made it ideal for this study. To date, the MPD has only been used in two other studies related to depression (Benson, 1992; Kruger, 1993). The MPD consists of 27 scales. Attitudes that describe the basic dimensions of personality are measured by eight Positive and eight Negative scales. The direction and degree of resolution between the Positive and Negative scales is reflected in the eight Resolution scales. Three Total scales provide measures of overall psychosocial health. Users respond to the 112 items on a separate Answer Sheet using a 5-point scale ranging from Very Much Like Me to Not At All Like Me. As Hawley (2005) stated, normal and high scores “indicate an overall positive level of conflict resolution across stages,” while low scores suggest “psychosocial stress resulting from an overall low level of resolution of stage conflicts” (p. 11).

These measurements were administered one week prior to the wilderness program and one week after it. A follow-up was also administered three months following the program. Qualitative data

were also collected via pre-course paperwork and three month, post-course phone interviews. The pre-course paperwork included parent/guardian questionnaires and student questionnaires assessing reasons for referral, level of motivation, and the family and student's goals. The post-course follow up phone interview questionnaire included open-ended questions to elicit narrative data about students' subjective experience on course, as well any attitudinal or behavioral changes students made based on their therapeutic wilderness experience. Qualitative data were subjected to multiple levels of thematic coding and narrative analysis. Additionally, this study included survey research to assess the importance of various components of the intervention. The results of this survey were correlated with the outcomes on the pre- and post-tests to understand which components were related to the biggest gains in terms of adolescent depression and psychosocial development.

Results

Changes in Depression and Psychosocial Development

Through an analysis of pre- and post-test scores on the RADS-2 and the MPD, this study found decreases in rates of depression and increases in rates of psychosocial development. This study showed an average decrease in depression of 4.3 points on the RADS-2, which, based on other RADS-2 pre-to-post studies, was seen as a clinically meaningful level of change (Reynolds, 2002). T-tests revealed statistically significant decrease in depression scores pre/post intervention ($p < .001$) with a medium effect size of .394 (Cohen, 1988).

There was also an increase of 6.1 points on the MPD, reflecting a large shift from low levels of psychosocial development to normal levels (Hawley, 2005). T-tests revealed statistically significant increases in psychosocial health via MPD scores pre/post intervention ($p < .001$) with a large effect size of .848 (Cohen, 1988). Table 1 shows the standardized mean differences used to calculate pre/post intervention effect sizes in this study.

Table 1. Standardized Mean Difference Effect Sizes for Decreases in Depression and Increases in Psychosocial Health

RADS Pre-Test Mean=54.38 SD=12.06	RADS Post-Test Mean=50.04 SD=9.84	Cohen's d .394	Effect-size Medium
MPD Pre-Test Mean=41.29 SD=8.06	MPD Post-Test Mean=47.33 SD=6.04	Cohen's d .848	Effect-size Large

Utilizing a Repeated Measures ANOVA, further statistical analyses revealed improvements in the rates of depression and psychosocial health ($p<.001$). Utilizing a Categorical Repeated Measures ANOVA, this study showed a 33.5% decrease in the prevalence of depression ($p<.001$ level) and a 52% increase in the prevalence of positive psychosocial development ($p<.001$).

This study also demonstrated a negative correlation between adolescent depression and psychosocial development ($p<.01$). This finding reaffirmed Highland's (1979) study demonstrating a psychosocial connection to depression in adolescence, paving the way to consider psychosocial interventions, such as wilderness therapy and therapeutic wilderness programs, in the treatment of adolescent depression.

Analysis of qualitative data revealed that related to depression, participants experienced a decrease in learned helplessness, an increase in self-worth, and an increased sense of future. While on course, youth reported no symptoms of depression. Upon completing the course, participants reported an actual elevation in mood, and three months post-course, 76% of youth still reported experiencing more stability in their moods. Further thematic coding of the qualitative data revealed increases in the areas of coping skills, confidence, competence, connection, and caring--all of which are important developmental assets identified in the positive youth development model (Lerner, Lerner, Almerigi, Theokas, Phelps, Gestsdottir, Naudeau, Jelcic, Alberts, Ma, Smith, Bobek, Richman-Raphael, Simpson, DiDenti Christiansen, & von Eye, 2005).

Likewise, based on data gathered from qualitative sources before and after the intervention, the study showed a 47.5% decrease in family conflict ($p<.001$); a 28.6% decrease in substance abuse

($p < .001$); and a 61.9% decrease in school problems ($p < .001$). These emergent dependent variables are important to consider because they reflect concrete behavioral change.

Exploring the Process of Wilderness Therapy

Key Therapeutic Components

Little research has been done to understand the key components of the therapeutic wilderness experience. Russell's (2000) work stands out as a seminal study highlighting several factors important to the change process. While this study showed strong outcomes related to the impact of wilderness therapy on adolescent depression and psychosocial development, there was also a need to consider which components played an integral role in the therapeutic process.

This study hypothesized and collected data on the following components as potentially explanatory variables of any observed change:

- Sex
- Age of participants
- Race (Caucasian, African American, Hispanic)
- Was the relationship with the Trip Leader Strong? (Y/N)
- Did they have a positive Solo experience? (Y/N)
- Did they have a high level of participation in challenge and adventure activities? (Y/N)
- Did they have a Positive Group experience? (Y/N)
- Did they have a high level of participation in Community Service? (Y/N)
- Did they have positive communication with their families? (Y/N)

On the last day of the program, participants were given a Survey of Course Components and asked to rate their experiences in six different areas: relationship with the trip leader, interaction with the group, level of participation in wilderness/adventure activities, solo, level of participation in community service, and communication with parents/guardians during the final seminar. As mentioned previously, some of these course components were identified in the literature as significant aspects of the change process (Russell, 2000).

For the purpose of this study, participants' responses were compared with their levels of change from pre- to post- in the areas of

adolescent depression and psychosocial development. In this way, the author could gauge what components of the intervention may have had the greatest impact in these areas. Table 2 shows the frequency of the participants' responses on this survey. No low or negative responses were reported. While this seems like a positive sign, it is important to note the halo effect that is sometimes seen in wilderness and adventure therapy research in which respondents provide higher scores if given the survey on the same day or immediately following the program (Graham & Robinson, 2007).

Table 2. Survey of Course Components

Course Component	High/Positive	Medium/Fair	Low/Negative
Relationship with trip leader	90%	10%	0%
Relationship with group	67%	33%	0%
Level of participation in wilderness and challenge activities	86%	14%	0%
Solo	76%	24%	0%
Level of participation in community service	76%	24%	0%
Communication with parents/guardians	71%	29%	0%

Table 3 shows the correlations between course components and pre-to-post test differences on the RADS-2 and the MPD. These correlations were all weak to moderate (i.e., between -0.5 and +0.5), which is not surprising given the relatively small sample size (N=21); however, there were some statistically significant correlations between explanatory variables. This, along with medium to large effect sizes, provided a rationale to perform a regression analysis in order to partition out the unique contributions of each variable.

Table 3. Correlations between Course Components and Therapeutic Outcomes as Measured by Difference in T-scores on RADS-2 and MPD pre/post

Pearson Correlation Coefficients, N = 21 Prob > r under H0: Rho=0						
	Wilderness_N	Solo_N	CS_N	PGS_N	RADS_Tdiff	SHealth_Tdiff
Age	0.51	-0.09	-0.28	-0.10	-0.33	0.24
Male	-0.04	0.48	-0.21	0.16	0.38	-0.31
African_Am	0.09	0.13	0.13	0.14	-0.31	0.64
Relationship_N						
Was there a strong relationship with the group leader?	-0.13	0.19	-0.18	0.15	0.08	0.13
Positive Group Experience	0.29	0.08	-0.16	0.22	-0.16	0.41
Wilderness_N (wilderness and challenge activities)	1.00	0.09	-0.23	0.04	0.19	0.13
Solo_N	0.09	1.00	-0.31	0.14	0.10	-0.23
CS_N (Community Service)	-0.23	-0.31	1.00	0.14	0.08	0.05
PGS_N (Positive communication during parent/guardian seminar)	0.04	0.14	0.14	1.00	-0.31	0.31

To limit the effects of the interrelated nature of the course components, further statistical analysis was conducted via a stepwise regression. This was helpful in analyzing which various course components likely predict or explain the observed changes in depression and psychosocial development. Table 4 shows these results and also highlights the negative impact that being male had on pre-to-post changes on the RADS-2 and MPD. This is not to say that males did not make positive changes, but rather that the magnitude of the change was not as great as that that of the females in the study. This finding was beyond the scope of this study; however, it is an important aspect for future research given the number of boys that are referred to wilderness therapy programs.

Table 4. Final Model of Parameters for the RADS-2 and MPD Regression Analysis of Course Components

Model & Variables	Estimate	Error	Type II SS	F	Sig
RADS-2 Intercept	-4.13	2.05	78.402	4.07*	0.05
Male	4.26	1.99	88.368	4.59*	0.05
Positive Communication with Parents/ Guardians-					
MPD Intercept	-3.98	2.15	66.232	3.44	0.08
Male	5.13	1.92	143.750	7.18**	0.01
Male	-4.97	2.09	112.861	5.63*	0.03
Positive Group Experience					
Experience	5.99	2.16	154.616	7.72**	0.01

Analysis of course components revealed that positive levels of communication during the Parent/Guardian seminar were associated with an average change in the RADS-2 scores of -3.98. While this only approached statistical significance at the 0.08 level, the small sample size, as well as the lack of current knowledge about the impact of specific therapeutic wilderness components may justify using a relaxed p-value. In this case, it is more important to begin to understand what components may be related to positive change, and to acknowledge the potential lack of statistical power due to a small sample.

Analysis also showed that a positive group experience was associated with an increase of MPD scores by 5.99, and was statistically significant at the $p < 0.01$ level. This is not surprising because the peer group is often one of the most powerful contexts in adolescence for identity development and intimacy. In wilderness therapy, the group may provide relational experiences that can help rework or resolve developmental crises and dysfunctional patterns that were not dealt with earlier (Miles & Priest, 1999).

However, because the therapeutic components of having a positive group experience and positive communication with family members occur in other intervention settings and may not be related specifically to the wilderness realm, it was important to triangulate these results with the findings from the analysis of qualitative data. Qualitative data, including the pre-course paperwork and transcripts of the follow-up phone interviews, was analyzed using narrative analysis and thematic coding (Strauss and Corbin, 1998). Coding of the qualitative data triangulated the quantitative findings of the Survey of Course Components and provided a more longitudinal perspective. While the statistical analysis of the survey of course components

measured the immediate benefits of positive communication between family members, the qualitative data gained during the follow-up phone interviews assessed the impact of the positive family communication and support 3 months post-intervention. 76% of participants reported mood stabilization, positive family relationships, and maintenance of positive gains three months out.

Certainly, there are many variables that may explain these lasting results, but these findings do reflect what has previously been cited from the literature about the role of family support in preventing relapse (Sanford, 1996) as well as the lasting impact this type of wilderness programming can have on adolescent depression (Russell, 2002). For this reason, therapeutic wilderness programs that work with depressed youth need to include a strong parent component and give families tools to improve communication and ultimately prevent relapse.

Significant Program Components Reported by Participants

While positive peer group interaction and positive family communication were the most statistically significant course components related to positive outcomes on adolescent depression and psychosocial development, the narrative data provided by participants in the qualitative section of this study highlighted several other course components that were significant. From participants' responses, three main subcategories were generated as being the most significant aspects of the therapeutic wilderness program: being in nature, challenge and adventure, and contemplation. These seem to be the main areas that left a lasting impression on participants even three months after the course. While these experiences were of great importance to the participants, one cannot definitively state that they are related to treatment outcomes; however, there seems to be theoretical linkages between the quantitative and qualitative findings of this study.

Being in nature

Interestingly, "being in nature" or "connection with nature" was not even listed on the survey of course components. Fortunately, one of the strengths of a mixed methods study is that the voices of the participants can overcome the bias or oversight of the researcher. The narrative data gathered from participants highlighted that being "out in

the wild,” “watching a sunset,” “listening to a pack of wolves howl,” “seeing the sunlight on the water”—were important components of the therapeutic wilderness experience that were related to positive affective and behavioral change. Traditional wilderness therapy literature focuses more on challenge and adventure; however, the ecopsychology movement contends that simply being in nature is the most important part of the healing process (Roszak, Gomes & Kanner, 1995). Perhaps an ecopsychology approach could shed important light on traditional wilderness programming for youth which has focused more on the role of challenge and adventure than on a connection with nature.

Challenge and adventure

Although being in nature may have had a strong impact on the overall results in this study, it is important not to devalue the traditional perspective of wilderness programming in which great importance is given to challenge and adventure. It should also be noted that the impact of physical activity on adolescent depression has been well-documented previously (Dunn & Weintraub, 2008); however, the unique wilderness context and the nature of adventure-based activities seemed to have a deeper level of intensity for participants than regular physical exercise. Participants reported that the physical challenge and adventure experiences had a powerful impact on them, and referenced a sense of personal amazement at what they accomplished in the context of the wilderness expedition. Students reported that “completing a two mile portage,” “paddling into a headwind on big water,” “paddling 180 miles” and “climbing to the top of a rock face or rappelling from a cliff,” helped them feel more confident in their ability to handle difficulties in their lives.

Contemplation

Lastly, participants used words and phrases like “reflection,” “thinking about my life,” or even “huge epiphanies.” For some students, a great deal of reflection occurred during their solo time, but others talked about time for reflection in general, whether “paddling down a river,” “during evening group meeting,” “journaling,” or in “one-on-one meetings with instructors.” Many of the youth expressed having more time to think about their lives than ever before, and reported being “away from a lot of distractions at home.” The importance of

reflection has already been highlighted by Kimball and Bacon (1993) who referred to it as contemplation and saw it as a huge benefit of being in nature because they believed it allows participants the potential to access a more spiritual dimension of the human experience. This is important for other therapeutic wilderness programs to consider, as it seems to be a necessary time for shifting one's perspective from the past to the future. Perhaps, in these times of contemplation, a youth is beginning to imagine him or herself in another place, one better than where they have been. Youth seem naturally capable of doing this, and may simply need an environment conducive for doing so.

Discussion

Limitations

There are several important limitations to consider in this study. Much of the study was based on self-report and self-administered tools which can be inaccurate and unreliable. This study also left out youth who did not have the cognitive ability to complete these tests, let alone complete a therapeutic wilderness program. Likewise, youth may not have been entirely truthful and may have underreported high risk behaviors during the follow up phone interview.

By using pre-tests and post-tests, testing threats to internal validity may have occurred. Because this study did not have a control group, there were high single-group threats to internal validity which limits this study to being exploratory in nature, design, and findings. Finally, threats to external validity in regard to the entire study were possible because of the small, non-random sample. While statistical tests were utilized, the generalizability of the results may be suspect due to the small sample size. However, if a degree of proximal similarity among various contexts is found in regards to the population, for example in other similar programs, then perhaps there may be a higher level of ecological transferability to participants in these other programs (Tashakkori & Teddlie, 2003).

One of the limitations of the qualitative data analysis in this study was the potential influence for the researcher's theoretical bias to impact the interpretation of findings and the selection of categories and themes. This was especially true in identifying the emergent dependent variable categories of school problems, substance abuse, and family conflict, which was based largely on participant self-reporting.

Collecting and analyzing self-report data in these areas could have allowed for a lot of subjective interpretation. For this reason, member checking was utilized to assess the themes generated by analysis of the qualitative data. The agreement arrived at via member checking, as well as triangulation of the data, helped validate the findings.

Important Considerations

Despite these limitations, this mixed methods study yielded promising insights into the therapeutic process of wilderness programming, especially in relationship to adolescent depression and psychosocial development. The Survey of Course Components found that positive communication with parents/guardians and a positive group experience were the two most important aspects of the program related to decreasing adolescent depression and improving psychosocial health. These therapeutic components are not unique to the wilderness setting and are often used in other treatment settings with adolescents; however, the unique therapeutic environment of the wilderness and the physical separation between youth and parents that occurs during therapeutic wilderness programs gives these treatment components more depth.

Participants' experiences in the group were influenced by being in nature, particularly being in a challenging, wilderness environment. Travelling in a wilderness environment in a group provided a level of intensity and engagement that began to break down clients' defenses and make them aware of negative patterns they may not have consciously grasped (Miles & Priest, 1999). Russell's (2003) research affirms these findings, and he believes that these opportunities for group cohesion occur in the context of peer feedback, which can help facilitate the change process even more.

Positive family communication has also been identified as a necessary therapeutic component in the treatment of adolescent issues (Robinson, Kruzich, Friesen, Jivanjee, & Pullman, 2005); however, positive communication with parents/guardians occurred only after time spent away from the family system. Harper and Russell (2008) referred to this as "meaningful separation" and saw it as an important aspect of family involvement in wilderness therapy (p. 26). This time away became meaningful as the participants reflected on how their negative behaviors affected their families.

The qualitative interviews with the participants reaffirmed this. For example, upon reflecting upon her rock climbing day as the most significant moment on her course, a female participant began crying as she talked about the strain she felt while belaying. The climber she was belaying kept falling, and it was making her nervous and hurting her arms and shoulders. After processing the experience with her instructors and her group at the end of the day, this participant had an “aha” moment. She realized that her mom must have felt exactly the way she had while belaying. She understood on a deeper level that her mom was constantly trying to support her, but had to watch her continue to fall. This newfound awareness may have helped to promote a more positive, empathically attuned conversation with her parents at the end of this girl’s course.

Conclusion

Along with providing an effective modality of therapeutic intervention for youth with depression and low levels of psychosocial health, this study reaffirmed the importance of applying systems theory to the treatment of adolescent depression and psychosocial development. Evidence of the importance of a systemic intervention was clear in this study. The role of the group experience in furthering psychosocial development was a strong indicator of the need for adolescent treatment to be partially embedded in a positive peer group in order to practice new ways of relating that promote both connection and self-definition. Kimball and Bacon (1993) once stated, “there is no such thing as individual wilderness therapy” (p. 14). While there are wilderness therapy programs that work individually with clients, it does seem that the group process is an essential component for furthering psychosocial development, which is the norm in most therapeutic wilderness and wilderness therapy programs. The development of a cooperative interpersonal framework as a part of group dynamics is a critical piece of the healing process, thus reflecting accepted ideas about group work being an important therapeutic medium (Corey, 2008).

Likewise, Kiewa (1994) speaks to the importance of the group being a safe, relational base, especially for young women, which may be able to partially explain why girls in this study made greater gains than boys in the wilderness therapy intervention. She referenced

Knapp's (1988) ideas on the need for a humane environment, which includes "factors such as respect, trust, high morale, opportunities for input, growth and renewal, cohesiveness and caring" (p. 17).

This study also showed that an effective intervention for youth with depression must include an intervention with the family. This reaffirms Sanford's (1996) earlier study in which positive relationships with parents were a key factor for youth who had been treated for depression to remain in remission. While this idea is certainly catching on in therapeutic wilderness programs, often the problem is still seen as internal to the youth. This study showed that creating opportunities for positive communication and cohesion in the family system are essential as well.

While these assertions may cause controversy for those who conduct therapeutic wilderness programs outside of a group setting or for those whose programs work solely with youth and not with families, the results of this study seem to indicate the need to treat the youth as a part of a larger system, both during the wilderness program and afterwards. This idea mirrors the relational stance that Kimball and Bacon (1993) have regarding the healing process of wilderness therapy. Just as the problems the youth in this study had were embedded in a variety of relationships—family, peers, school—their healing took place in relational contexts as well.

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