

The Role of Transport Use in Adolescent Wilderness Treatment: Its Relationship to Readiness to Change and Outcomes

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Abstract

Background Considering the sensitive ethical issues related to involuntary treatment of adolescents, research investigating youth transport practices and treatment outcomes is clearly needed. Youth transport is common practice in many private pay programs, including wilderness therapy programs.

Objective This study of 350 adolescents in wilderness therapy sought to answer the following questions: (1) did youth who were transported to wilderness therapy present differently at intake than youth not transported in terms of both readiness to change and functioning? (2) Were there different outcomes for participants who were transported to the program compared to those who were not? (3) Were transport use and readiness to change predictors of overall improvement in the program?

Methods In this exploratory non-equivalent groups quasi-experimental study, youth self-report pre- and post- mean scores of the YOQ and URICA, as well as parent YOQ reports, were compared between transported and non-transported groups. Regression analyses were performed to see if transport use was predictive of overall improvement.

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Findings Results suggested that youth improved significantly regardless of transport use; however, transported youth were more likely to have larger decreases in mental health symptomatology than non-transported youth, suggesting that being transported did not have a negative impact on treatment outcomes.

Discussion While these are encouraging findings, the results represent the evaluation of a single wilderness therapy program and are limited by the research design; hence, future research is needed to increase confidence that transport does not negatively affect treatment effectiveness.

Keywords Adolescent treatment · Wilderness therapy · Outdoor behavioral healthcare · Transport · Readiness to change

Introduction

Approximately four million children and adolescents in the United States suffer from significant mental illness; however, only one in five receives treatment (National Alliance on Mental Illness 2010; National Institute for Mental Health 2005). As mental health issues in childhood and adolescence increase, systems of care for youth with serious emotional disorders and their families have evolved (Arbuckle and Herrick 2006). These systems of care include private treatment programs for adolescents. The directory of the National Association of Therapeutic Schools and Programs (NATSAP) lists 158 private pay wilderness therapy programs, residential treatment programs and therapeutic boarding schools in the United States (NATSAP 2014). All of these programs aim to provide a broad range of mental health services for youth. Wilderness therapy programs provide a treatment option somewhere in between outpatient and residential treatment in terms of intensity and length. Most wilderness therapy programs last approximately 2 months; many youth leave wilderness therapy programs and then attend a residential treatment center or therapeutic boarding school as part of their aftercare (Russell et al. 2008).

Many adolescent private pay programs, including wilderness therapy, provide involuntary treatment to adolescents. Thus, adolescent clients sometimes arrive at these programs through the use of a youth transporting service hired by their parents, a practice often referred to as being “escorted.” Youth transporting businesses are now a common component of the adolescent private pay treatment industry (CAFETY 2011). The transport process typically involves one or two transport staff taking custody of the adolescent and bringing them from home to a treatment program. If the adolescent physically resists, the transport staff may use physical force (i.e. therapeutic holds or physical restraints) to maintain the safety and completion of the transport (Safe and Sound Youth Transportation, Inc. 2015). The transport process may be as short as an hour or as long as multiple days, depending on the distance to the treatment program and method of travel. In the larger context of involuntary admission, transport is only one way of transporting youth to treatment involuntarily.

Hardy (2011) highlights how using coercion like transport to bring clients involuntarily to treatment may be essential in order to prevent more significant consequences for adolescents. He states “If not coerced into treatment, some adolescents may continue progressing in behavioral delinquency and severity of consequences. This progression can result in additional treatment barriers” (p. 92). Hence, parents may chose transport in a last

effort to help their adolescent. Though the process of transporting youth to treatment programs against their will has been discussed in the literature (Hardy 2011), there has been no outcome research on transporting youth to date. This study considers the issue of transporting youth within the larger ethical context of involuntary treatment. This study seeks to determine if transporting youth to a wilderness therapy program has a negative impact on treatment outcomes.

Ethical Implications of Youth Transport Practices

Youth transport practices must be looked at with a critical eye based on the ethical standards set by mental health professions. For example, the National Association of Social Worker's Code of Ethics (2006) highlights that a "social workers' primary responsibility is to promote the well-being of clients" (para.1.01) as well as to maintain a client's right to self-determination. Similarly, the Ethical Principles maintained by the American Psychological Association (2010) highlight the importance of respecting "the dignity and worth of all people, and the rights of individuals to ... self-determination" (Principle E). While social workers, psychologists and other clinicians may agree with parents that an adolescent client's high-risk behaviors justify the need for transporting the client to a private treatment program in order to ensure client well-being, there are ethical concerns about the use of transports (Becker 2010).

Mental health practice with adolescents must focus on the physical and emotional safety of the client, especially if the client has previously experienced trauma (Hummer et al. 2010). In order to ensure client well-being, programs and their clinical staff should make sure that youth transport companies working with their clients are regulated and licensed. However, regulations and licensing for these businesses vary from state by state (Association of Mediation and Transport Services 2013), as does regulation enforcement. Thus, youth may be put at risk of negligent, abusive or clinically questionable practices. Despite Becker's (2010) call for research on transporting practices bringing youth to programs, no research has considered the impact of transporting practices on youth.

Involuntary Treatment of Adolescents

Some critiques of adolescent transport practices focus on the coercive nature of adolescent private therapeutic programs which accompany these transports, as many private pay programs admit adolescent clients involuntarily. Huffine (2006) argues that coercive treatment of adolescents "undercuts an essential aspect of adolescent development, the achievement of autonomy" (p. 8) and highlights the right to consent and to refuse treatment as a "basic human right" (p. 30). Huffine (2006) also acknowledges that an adolescent with mental illness might not have the competence to make wise choices for himself. Hardy (2011) argues that involuntary private pay programs can be helpful or even necessary for some adolescents by providing a safe place to begin treatment, a time for evaluation and respite away from the family, and prevention of more serious consequences. Despite these varying views, a US parent has the legal right to elect treatment for his/her adolescent children and involuntarily admit their child to a mental health or psychiatric treatment program (Molnar 1997). Involuntary admission refers to when youth who do not consent to inpatient mental health treatment, are admitted by their parents regardless (Schmidt 1996). This can occur both in state and county run facilities as well in private pay or for-profit programs (Molnar 1997; Schmidt 1996). In private pay programs, when youth

are unlikely to consent to treatment, transport services are one avenue that parents can use to get youth to this treatment (Safe and Sound Youth Transportation, Inc. 2015).

Involuntary psychiatric commitment of adolescents is typically associated with adolescents posing a threat to themselves or others (Kaltiala-Heino 2010). The qualifications for involuntary psychiatric commitment in the US are regulated by state law (Menninger 2001). Some states include “being in need of treatment” as determined by a psychiatrist’s evaluation as a justification for involuntary commitment (Menninger 2001, p. 5). The justification for compulsory inpatient treatment in the private treatment industry is less clear. Parents can elect to admit their adolescent children to programs; these programs accept such children based on their own admission criteria. Even though adolescents may meet the criteria for formal mental health diagnoses, they typically do not need a diagnosis to be admitted to wilderness therapy programs (RedCliff Ascent 2012). Thus, private treatment admissions can be based primarily on parental decisions with the aid of educational consultants and/or programs’ admissions counselors and may not involve psychological evaluation prior to treatment (Independent Educational Consultants Association 2013).

Effectiveness of Involuntary Treatment

Currently, research is mixed regarding the impact of adolescent involuntary treatment. Research by Hartford et al. (1976) found that adolescents in legally-coerced substance abuse treatment had poorer outcomes than non-coerced adolescent clients in similar situations. This finding may speak to the relationship between manner of coercion and treatment efficacy. In a study of 339 adolescents in compulsory residential treatment, Nijhof et al. (2011) found clinically significant improvement from admission to discharge. More recent research supports the effectiveness of adolescent private treatment programs. Tucker et al. (2011) conducted an outcome study of NATSAP program participants, a majority of whom were involuntary clients. This study found clinically significant improvements in adolescents from admission to discharge, as reported both by youth and parents, findings which were maintained 6 and 12 months post treatment (Tucker et al. 2011; Zelov et al. 2013). Bettmann and Tucker (2011), in a study of 96 mostly involuntary adolescents participating in a private pay wilderness therapy program, found adolescent reports of parental attachment to improve, including decreased anger and increased emotional connection. Bettmann and Tucker’s (2011) study also showed negative trends in terms of trust and communication within parent-adolescent attachment. Similarly, Bettmann et al. (2011) qualitative study of attachment relationships among involuntary adolescents in wilderness therapy reported a theme of lack of trust in parents.

Readiness to Change in Involuntary Treatment

Bastien and Adelman’s (1984) study of 55 adolescents in a residential treatment program investigated issues of perceived choice, attitudes towards treatment, and treatment outcomes between mandated and voluntary clients. Bastien and Adelman (1984) found no significant differences between the attitudes towards treatment and treatment outcomes of mandated versus voluntary adolescent clients in the treatment program. However, the researchers did find that perceived choice was related to decisions to remain in treatment. They further found that perceptions of choice were related to the informed consent practices of the facility, which were used to help acclimate and involve both the mandated and voluntary adolescent clients. Bastien and Adelman (1984) posit that informed consent

practices may have more of an effect on perception of choice, attitude toward treatment, and treatment outcome than source of referral.

Snyder and Anderson (2009) assert that mandated clients in outpatient treatment are generally more resistant and less ready to change than voluntary clients. However, Snyder and Anderson's (2009) review of the literature fails to support a negative relationship between coercion and treatment outcomes. Their findings suggest that initial motivation to change may not preclude positive treatment outcomes. They note also that factors such as therapeutic alliance may mitigate clients' initial lack of motivation (Snyder and Anderson 2009). Bettmann et al. (2013) study of 189 adolescents enrolled in a private pay wilderness therapy program examined the relationships between youth functioning, readiness to change, and relapse coping skills. A key finding was the lack of a relationship between readiness to change and improvements in youth functioning or relapse coping skills. Their findings indicated that adolescents lacking motivation to change were equally likely to benefit from treatment compared to adolescents more motivated to change. Bettmann et al. (2013) did not however, delineate which youth were transported; hence it is unclear if transport impacted readiness to change or the outcomes of these youth.

Need for Outcome Research on Youth Transport Practices

Wagner et al. (1990) argue that an adolescent client who has an adversarial or coercive experience with the professionals responsible for his or her treatment may, understandably, build a weaker therapeutic alliance with those professionals. Coercive psychological treatment may even result in embitterment toward future care (Huffine 2006). But without research, it is difficult to know the impact of transporting practices on youth outcomes in treatment. Research specifically looking at the role of transport in the private pay industry is nonexistent, but vital considering the significant use of this practice within the private pay adolescent treatment industry.

To fill this gap in the research and inform practice, this study considered a sample of adolescent clients who participated in one private pay wilderness therapy program to assess the impact that being transported had on their treatment outcomes. The study was focused on answering the following questions:

1. Did youth who were transported present differently at intake than youth not transported to the program in terms of readiness to change and mental health functioning?
2. Were there different outcomes for participants who were transported to the program compared to those not transported?
3. Were transport use and readiness to change predictors of overall improvement in the program?

Regarding the first research question, there is no literature which might predict directionality here. Thus, the authors used logic as a guide: parents would likely make a decision to hire a transport service if their children had worse mental health functioning. This lower mental health functioning would likely make a parental transport much more difficult. Thus, the authors hypothesized that youth who were transported would present with worse mental health functioning at intake than their peers who were not transported. Based on literature suggesting that coercive treatment practices may result in weaker treatment alliance (Wagner et al. 1990), the authors hypothesized for the second research question that adolescents who were transported would experience worse treatment outcomes than those who were not transported. Finally, the authors predicted that, in line with Bettmann

et al. (2013) study, readiness to change would not predict overall improvement in the program.

Methods

Participants

The data for this study were collected as part of an overall program evaluation project at one private pay wilderness therapy program. In an effort to track client progress, clients and their parents were asked to participate in this study and complete measurement instruments at intake and discharge. Data were collected from 165 youth between 2006 and 2011. All participants attending the private pay wilderness therapy program were eligible for participation in the study. As shown in Table 1, there was almost an even split of male and female participants and most participants were White. On average, the participants were 16 years old (range 13–17 years) and stayed at the program for about 2 months.

Participants were defined as “transported to the program” if their parents/guardians used a youth transporting service to bring the adolescent to the program from home. Participants were defined as “not transported to the program” if their parents/guardians brought the adolescent to the program themselves from home. Analyses (Chi square and *t* test) were run to see if there were any differences between those transported and not transported to the program in terms of gender, race, adoption, age, or days at the program. No significant differences were found between the groups.

Table 1 Characteristics of adolescents enrolled in wilderness therapy program

| Characteristic | % | <i>n</i> |
|--|-----------------------|-----------------------|
| Gender (<i>N</i> = 165) | | |
| Male | 50.3 | 83 |
| Female | 49.7 | 83 |
| Race (<i>N</i> = 165) | | |
| White | 86.7 | 143 |
| African American | 1.8 | 3 |
| Asian American | 1.8 | 3 |
| Latino American | 6.7 | 11 |
| Multi Race | 2.4 | 4 |
| Not Specified | .6 | 1 |
| Transported to treatment program (<i>N</i> = 165) | | |
| Yes | 50.9 | 81 |
| No | 49.1 | 84 |
| Adopted (<i>N</i> = 165) | | |
| Yes | 16.0 | 26 |
| No | 84.0 | 137 |
| Age at admittance (<i>N</i> = 165) | <i>M</i> = 15.8 years | <i>SD</i> = 1.1 years |
| Days in program (<i>N</i> = 165) | <i>M</i> = 63.0 days | <i>SD</i> = 16.8 days |

Measures

This study used two quantitative instruments to collect data from youth participants and their parents at intake and discharge. In addition, program staff compiled demographic, diagnosis, and transport use data by reviewing electronic and paper client files at the program site.

University of Rhode Island Change Assessment (URICA)

The URICA is a self-report instrument used to measure readiness to change. This 32-item instrument includes four subscales used to assess the respondent's stage of change: pre-contemplation, contemplation, action, and maintenance. These subscales combine to yield the second-order "Readiness to Change" score, with higher scores representing higher levels of readiness to change in clients (Allen and Wilson 2003). The URICA was tested for reliability and validity and was found to be an acceptable measure of the stages of change and readiness to change for adult and adolescent psychotherapy clients (Greenstein et al. 1999).

Youth Outcomes Questionnaire (Y-OQ)

This study utilized the Y-OQ-SR 2.0 and Y-OQ 2.0 (Burlingame et al. 2005; Wells et al. 2003). The Y-OQ-SR 2.0 is a self-report instrument to be completed by youth ages 11–19. The Y-OQ 2.0 instrument is to be completed by parents/guardians about their child's symptoms. The Y-OQ 2.0 assesses a variety of behavioral and emotional problems using six subscales (Interpersonal Relations, Somatic, Intrapersonal Distress, Behavioral Dysfunction, Critical Items, and Social Problems), as well as a Total Score indicating overall functioning. These assessments possess established normative scores with well documented validity and reliability (Burlingame et al. 2005; Wells et al. 2003).

To track client outcomes and progress, the Y-OQ 2.0 instrument developers calculated clinical cut-off scores by comparing scores from a normative sample to samples of inpatient and outpatient populations (Burlingame et al. 2005; Wells et al. 2003). Clinical cut-offs for the Y-OQ youth self-report (SR) are as follows: Total Score, 47; Critical Items, 6; Behavioral Dysfunction, 11; Social Problems, 3; Interpersonal Relations, 3; Somatic, 6; Intrapersonal Distress, 17. Clinical cut-offs for the Parent Y-OQ are: Total Score, 46; Critical Items, 5; Behavioral Dysfunction, 13; Social Problems, 5; Interpersonal Relations, 4; Somatic, 5; Intrapersonal Distress, 16.

In addition to cut-off scores, a reliable change index (RCI) was derived for all measures by the instrument developers to determine changes considered clinically significant for the Y-OQ measures (Jacobson and Truax 1991). RCIs are provided in order to give clinical meaning to the findings. An individual score may decrease enough to be considered statistically significant, but that may not reflect enough change to be considered clinically significant with noticeable, meaningful change. Hence, RCIs offer another way to gauge the clinical impact of an intervention beyond statistical significance.

Research Design

This was an exploratory, non-equivalent groups, quasi-experimental, pre-post study. Youth were asked at intake and discharge to complete the YOQ-SR and URICA, while parents were asked to complete the YOQ 2.0. To ensure accurate reporting, all program staff was

trained on research survey administration by the second author. All collected data was sent to the second author, whose graduate student assistants entered all data without knowledge of the instruments' scoring mechanisms or the study aims. The de-identified data was sent in SPSS format to the lead author who performed the data analysis.

In order to ensure ethical standards for this study, the study was approved by the Institutional Review Board at the second author's university prior to data collection. The second author was a part-owner and part-time employee of the program when the data were collected. In order to manage the potential conflict of interest inherent in this research, a non-conflicted peer reviewed the data with the second author yearly to ensure an ethical and appropriate research process. In an effort to further minimize conflict of interest, all data analyses for this study were conducted by the first author who has no professional affiliation with the program.

The Wilderness Model

The eight-week treatment intervention is similar to other published descriptions of wilderness therapy interventions (Bettmann and Tucker 2011; Russell 2003, 2005). In this model, adolescents live in a wilderness environment on a continuous expedition with primary care staff and receive individual, group and milieu treatment that is supervised and delivered by licensed clinicians. A strong family component guides the treatment process and includes the development of a detailed aftercare plan to help clients transfer their learning to their daily lives post-treatment and make the transition back home or to other treatment environments. The wilderness therapy program is located in the Rocky Mountain region of the United States and is licensed by the states of Colorado and Utah.

Results

Differences at Intake Between Transported and Non-transported Youth

In order to answer our first research question regarding differences in functioning at intake, a series of independent samples *t* tests were performed to see if there were significant mean differences at intake between youth who were transported and those who were not. Specifically, mean comparisons were done for the readiness to change and Y-OQ youth and parent scores. In order to limit Type I error due to running multiple *t* tests, Bonferroni corrections were performed. As shown in Table 2, there were several areas of difference between the youth who were transported and those who were not. Although transported youth reported higher levels of dysfunction across all Y-OQ subscales and total Y-OQ scores, they were not large enough to be considered statistically significant, suggesting similar functioning between the two groups at intake. However, the parents of transported youth reported significantly higher mean levels of Social Problems ($p < .01$), as well as significantly higher Total Y-OQ scores ($p < .05$) (see Table 2).

Comparison of Outcomes Across Transport Use

To answer research question two, youth and parent data were compared at intake and discharge between youth who were transported and those who were not transported to the program.

Table 2 Comparison of transported and non-transported youth at intake

| | Transported youth <i>M (SD)</i> | Non-trans. youth <i>M (SD)</i> | <i>t</i> |
|----------------------------------|------------------------------------|-----------------------------------|----------|
| URICA | <i>n</i> = 89 | <i>n</i> = 91 | |
| Readiness to change | 6.81 (2.76) | 7.06 (3.15) | 1.98 |
| Y-OQ 2.0 youth report at intake | <i>n</i> = 84 | <i>n</i> = 88 | |
| Total Score | 71.2 (35.0) | 66.0 (31.4) | .99 |
| Critical Items | 9.4 (6.2) | 8.7 (5.9) | .81 |
| Behavioral Dysfunction | 15.3 (7.1) | 14.7 (6.9) | .50 |
| Social Problems | 9.6 (5.7) | 8.9 (5.5) | .83 |
| Interpersonal Relations | 6.0 (5.5) | 5.6 (5.1) | .37 |
| Somatic | 8.1 (5.5) | 7.4 (4.4) | .93 |
| Intrapersonal Distress | 23.6 (13.8) | 22.6 (13.1) | .50 |
| Y-OQ 2.0 parent report at intake | <i>n</i> = 74 | <i>n</i> = 82 | |
| Total Score | 96.5 (28.7) | 86.1 (27.1) | 2.22* |
| Critical Items | 8.7 (4.6) | 7.8 (4.2) | 1.3 |
| Behavioral Dysfunction | 21.6 (7.9) | 19.3 (6.9) | 1.8 |
| Social Problems | 13.1 (5.0) | 10.7 (4.7) | 3.1** |
| Interpersonal Relations | 13.6 (5.7) | 12.1 (6.1) | 1.55 |
| Somatic | 8.7 (5.1) | 7.4 (4.6) | 1.66 |
| Intrapersonal Distress | 30.7 (9.7) | 29.1 (10.0) | 1.05 |

* $p < .05$; ** $p < .01$ (Bonferroni correct p values)

Youth Report of Outcomes

Table 3 shows the youth self-report means for the Y-OQ 2.0 and the URICA readiness to change score for transported and non-transported youth at intake and discharge. Paired samples t tests were performed and effect sizes (Cohen's d) with confidence intervals calculated for all matched pairs of data. The authors utilized Bonferroni corrections here to limit Type I error. Both transported and non-transported youth reported significant increases in their readiness to change as measured by the URICA (see Table 3).

To track client outcomes and progress, the Y-OQ 2.0 instrument developers calculated clinical cut-off scores by comparing scores from a normative sample to samples of inpatient and outpatient populations (Burlingame et al. 2005; Wells et al. 2003). Based on these clinical cut-off scores, all the mean intake scores for the Y-OQ 2.0 SR were within the clinical range of dysfunction regardless of participants' transport use; however, after participating in the wilderness program, not all the means for the youth were above this clinical cut off. Among transported youth at discharge, discharge scores indicated functioning in a normative/healthy level of functioning in all but two areas. These two areas were Social Problems and Behavioral Dysfunction. Notably, the Behavioral Dysfunction subscale scores approached normative functioning. Regardless, all transported youth reported statistically significant decreases in dysfunction ($p < .001$), with strong effect sizes (d).

For non-transported youth, Y-OQ outcomes only showed a few differences compared to transported youth. The Total Y-OQ score as well as two of the subscales scores (Interpersonal Relations and Intrapersonal Distress) were at or below the clinical cut-off at discharge. Critical Items, Behavioral Dysfunction, Social Problems and Somatic were

Table 3 Youth self report mean scores at intake and discharge across transport use

| | M_{Intake} (SD) | $M_{Discharge}$ (SD) | t | d | 95 % CI (lower–upper) |
|------------------------------------|--------------------|-------------------------------|---------|------|-----------------------|
| Transported youth ($N = 59$) | | | | | |
| Y-OQ SR Total Score | 73.3 (35.7) | 45.0 (28.6) ^a | 5.26*** | 1.97 | -7.14–9.27 |
| Critical Items | 9.5 (6.1) | 5.9 (4.3) | 4.32*** | 1.55 | -0.01–2.65 |
| Behavioral Dysfunction | 15.5 (7.3) | 11.1 (7.0) | 4.13*** | 1.38 | -0.49–3.16 |
| Social Problems | 10.0 (5.7) | 4.0 (5.0) ^a | 6.85*** | 2.51 | 1.05–3.78 |
| Interpersonal Relations | 6.1 (5.9) | 2.1 (4.8) | 4.81*** | 1.67 | 0.17–2.90 |
| Somatic | 8.4 (5.6) | 5.8 (4.2) | 3.86*** | 1.19 | -0.24–2.26 |
| Intrapersonal Distress | 24.6 (14.7) | 15.9 (10.7) | 4.41*** | 1.53 | -2.22–4.26 |
| URICA readiness to change | 6.81 (2.76) | 9.17 (1.87) | 7.18*** | 2.28 | 1.80–2.98 |
| Non-transported youth ($N = 63$) | | | | | |
| Y-OQ SR Total Score | 66.5 (33.9) | 47.8 (27.9) ^a | 4.61*** | 1.35 | -7.70–8.24 |
| Critical Items | 8.4 (5.9) | 6.5 (4.7) | 2.60 | 0.80 | -0.66–1.96 |
| Behavioral dysfunction | 15.0 (7.4) | 11.9 (6.5) | 3.53* | 1.00 | -0.83–2.60 |
| Social Problems | 8.6 (5.5) | 4.2 (4.7) | 5.57*** | 2.37 | 1.01–3.53 |
| Interpersonal Relations | 5.9 (5.2) | 2.7 (4.6) | 4.99*** | 1.46 | 0.18–2.60 |
| Somatic | 7.4 (4.4) | 6.6 (4.4) | 1.34 | 0.41 | -0.68–1.49 |
| Intrapersonal Distress | 22.2 (13.9) | 16.5 (9.6) | 4.16*** | 1.08 | -2.35–3.46 |
| URICA Readiness to Change | 7.06 (3.15) | 9.75 (2.23) | 6.47*** | 2.24 | 1.69–3.01 |

Bold values represent scores above clinical cut-off of normal clinical functioning

* $p < .05$; *** $p < .001$ (Bonferroni corrected p values)

^a Decreases reflecting clinically significant changes as measured by RCIs

above the clinical cut-offs. The subscales Critical Items and Somatic did not decrease enough to be considered statistically significant at $p < .05$.

RCIs were assessed in order to see what changes were considered clinically significant. For an individual's Total score to have changed reliably according to the Y-OQ 2.0 SR, the change must be 18 points or greater. As shown on Table 3, both the Total Score and decreases in Social Problems for transported youth were large enough to be considered clinically significant as measured by the RCI. For non-transported youth, the Total Score also decreased enough to be considered clinically significant improvement.

Parent Report of Outcomes

Similar to youth reports, parents reported that their children were functioning at a dysfunctional level at intake (above clinical cut-offs) regardless of transport use (see Table 4). In addition, parents reported decreases in youth dysfunction at discharge, with all mean changes considered statistically significant ($p < .001$), even after Bonferroni corrections. As shown in Table 4, parents of transported youth reported their children to be within normative ranges in terms of overall functioning (Total Score) and in all of the six subscales. Similarly, parents of non-transported youth reported youth functioning below the clinical cut-off in all areas but Social Problems. In terms of clinically significant improvements as measured by the RCIs, the parents of both transported and non-transported youth reported similar levels of improvement on most subscales. Only Critical Items and Somatic subscales reflected small enough improvements for both groups to not be

Table 4 Youth Y-OQ 2.0 parent report mean scores at intake and discharge across transport use

| | M_{Intake} (SD) | $M_{Discharge}$ (SD) | t | d | 95 % CI (lower–upper) |
|------------------------------------|--------------------|-------------------------------|----------|------|-----------------------|
| Transported youth ($N = 47$) | | | | | |
| Total Score | 97.0 (28.3) | 32.7 (35.1) ^a | 9.01*** | 4.54 | −3.56–14.57 |
| Critical Items | 9.2 (4.7) | 4.9 (3.8) | 4.80*** | 2.26 | 0.90–3.35 |
| Behavioral dysfunction | 22.2 (8.3) | 7.4 (7.7) ^a | 8.49*** | 4.14 | 1.76–6.34 |
| Social Problems | 12.5 (5.2) | 2.1 (3.8) ^a | 8.44*** | 5.17 | 3.68–6.25 |
| Interpersonal Relations | 12.7 (5.3) | 2.6 (7.4) ^a | 9.92*** | 3.56 | 2.04–5.67 |
| Somatic | 9.1 (5.3) | 4.4 (4.8) | 5.09*** | 2.08 | 0.57–3.45 |
| Intrapersonal Distress | 31.7 (8.9) | 12.1 (12.5) ^a | 8.68*** | 7.67 | 1.55–7.67 |
| Non-transported youth ($N = 46$) | | | | | |
| Total Score | 85.4 (27.8) | 33.2 (31.2) ^a | 10.16*** | 3.96 | −4.08–12.97 |
| Critical Items | 7.7 (4.2) | 4.4 (3.8) | 5.81*** | 1.84 | 0.63–2.94 |
| Behavioral Dysfunction | 19.2 (6.6) | 9.1 (7.5) ^a | 10.1*** | 3.20 | 1.30–5.37 |
| Social Problems | 10.9 (5.0) | 3.1 (4.7) ^a | 10.6*** | 3.60 | 2.15–4.95 |
| Interpersonal Relations | 12.4 (6.1) | 1.7 (5.6) ^a | 7.49*** | 4.09 | 2.33–5.71 |
| Somatic | 7.8 (4.7) | 4.1 (4.1) | 5.59*** | 1.88 | 0.52–3.07 |
| Intrapersonal Distress | 28.7 (13.9) | 12.7 (9.6) ^a | 9.76*** | 3.04 | −0.97–5.82 |

Bold values represent scores above clinical cut-off of normal functioning

*** $p < .001$ (Bonferroni corrected p values)

^a Decreases reflecting clinically significant changes as measured by RCIs

considered clinically significant. These findings suggest that both groups regardless of transport use showed similar improvements as reflected in parent reports.

Predictors of Overall Improvements in Y-OQ Scores

To answer the third research question, the authors investigated if readiness to change and transport use were predictors of overall mean decreases in the Y-OQ scores reflecting improvements in functioning. Two different linear regression models were calculated. Predictors of changes included in the analyses were transport use, intake Readiness to Change scores, and change scores from intake to discharge for readiness to change. Demographic variables and length of treatment were also included as control variables. As shown in Table 5, the only predictor of mean change as reported by youth was transport use. Transported youth were more likely to have large decreases in dysfunction than non-transported youth. Overall, 16.0 % of the decrease in Y-OQ scores can be accounted for by the variables in this analysis ($R^2 = .16$). Unlike youth self-reports, parents' reports indicated that transport use was not a significant predictor of decrease in Y-OQ scores nor were any of the other variables included in the analysis. Further, the independent variables accounted for less change in parent-reported data than in youth-reported data ($R^2 = .09$).

Discussion

This study aimed to answer three research questions. First, the study aimed to answer: did youth who were transported present differently at intake than youth not transported to the

Table 5 Predictors of Mean Decreases in Y-OQ Scores for both Youth and Parent Reports

| Independent variables | Y-OQ 2.0 youth self report (YSR) mean decreases in Total Scores ($N = 108$) β | Y-OQ 2.0 parent report mean decreases in Total Scores ($N = 63$) β |
|----------------------------------|--|---|
| Transported (No = 0) | .19* | .18 |
| Age at admittance | .11 | -.08 |
| Gender (male = 0) | .17 | .14 |
| Minority status (White = 0) | -.07 | -.02 |
| Adopted (No = 0) | -.20 | .07 |
| Days in the program | .03 | -.02 |
| Intake readiness to change (RTC) | .17 | .20 |
| RTC change score (post-pre) | .28 | .35 |
| R^2 | .16 | .09 |
| F | 2.33* | .67 |

* $p < .05$

program in terms of readiness to change and mental health functioning? This study found notable differences between transported and non-transported youth in some areas and no difference in others. Among the areas of difference, analyses revealed that the parents of transported youth reported higher levels of Social Problems and Total Scores at intake than the parents of non-transported youth; however, differences in Total Scores may reflect primarily the differences found in Social Problems. Thus, youth who were transported were perceived by their parents as more acute at intake in terms of problematic behaviors that are socially related, including truancy, sexual problems, running away from home, destruction of property and substance abuse.

The presence of these externalizing behaviors may support possible reasons for why parents chose to transport. Parents may feel transport is a last resort when they have exhausted local treatment options and feel overwhelmed by their children's symptomatology. Notably, the youth themselves—transported and not—reported statistically similar levels of mental health symptomatology and readiness to change at intake. This finding suggests that transported youth may not be significantly different from non-transported youth or that transported youth may think themselves not very troubled. As previous research has not considered differences between these two groups, comparison to other studies is impossible. Future research should attempt to replicate this finding to ascertain what differences, if any, exist between these groups in order to better guide the treatment process.

This study also sought to answer the question: were there different outcomes for participants who were transported to the program compared to those who were not transported? Our findings suggest that both transported and non-transported youth showed similar improvements as reflected in both parent and youth reports. Comparing parent and youth reports was an important process, as there are often threats to internal validity associated with adolescent self-report data (Brener et al. 2003). Given that youth and parent perceptions about youth functioning often differ (Garland et al. 2004; Hawley and Weisz 2003), the consistency of parent and youth reports in this study triangulates the findings, increasing our confidence in their validity.

Though all youth in the study showed improvements, transported youth reported statistically significant improvements across all domains of the Y-OQ and URICA, while non-transported youth reported statistically significant improvements on most subscales (six out of eight subscales). Such findings suggest that transported youth may have benefited in a larger way from the wilderness therapy intervention than their non-transported peers, a finding which could support that transporting youth may not have a negative impact on their treatment.

This study also aimed to answer the question: were history of transport use and readiness to change predictors of overall improvement in the program? Transport use was a predictor of mean Y-OQ change, but readiness to change was not. Transported youth were more likely to have larger decreases in mental health symptomology from intake to discharge than non-transported youth.

Taken together, study findings suggest that transporting youth to the program may not have a negative impact on the programs' effectiveness. Where there were changes between transported and non-transported youth, such changes suggested greater and more positive program effect on transported youth. This may be due to the fact that transported youth had higher levels of dysfunction at intake, which allowed for more growth than non-transported youth. However, there were no significant differences reported by transported and non-transported youth at intake. Due to the lack of other research in this area, our findings cannot be compared to other research. Future research should include qualitative inquiry which explores youths' perspectives on the transporting process and its impact on outcome. Future research should also attempt to replicate this study's findings among youth in residential treatment centers, a different treatment environment but one to which youth are often transported (Illinois Children's Mental Health Partnership 2014).

It is important to note that these findings represent youth in one wilderness therapy program in particular and are not reflective of all wilderness therapy treatment. Although there are many wilderness therapy programs in existence across North America, not all are of the same quality. Clinicians and families should consider program quality when choosing this type of intervention. In fact, concern about the quality of different treatment programs led to the formation of the Outdoor Behavioral Healthcare Council (OBHC) in 1997. OBHC aims to support collaboration and best practices among wilderness intervention programs working with youth, through "promoting program standards, ethics and risk management plus facilitating outcome research on the efficacy of wilderness programs" (OBHC 2013, para. 1). The wilderness therapy program evaluated in this study is a member program of OBHC, holds to the standards and practices of this organization, and has reported previous positive impacts on youth (Bettmann et al. 2013). So the use of transport practices in this study appears to be paired with a quality treatment program. It is unclear if the outcomes would have been the same for different wilderness treatment programs. Future research is needed within a range of programs in order to build confidence that escorts truly do no harm to youth. Qualitative research is also needed to give voice to adolescent clients' subjective experiences of being transported.

Limitations

There are several limitations to this study. One is the attrition of study participants at discharge (20 %), which limits the internal validity of the study. In order to address this limitation, attrition analyses were conducted comparing participants for whom we had

matched pairs of youth self-report data at intake and discharge and participants for whom we did not. We compared the two groups in terms of gender, race, age, adoption, transport use, and likelihood to go to aftercare, as well as intake levels of functioning as measured by the Y-OQ 2.0 YSR, Y-OQ 2.0 parent report, and the URICA Readiness to Change index. Chi square and independent samples *t* tests revealed no significant differences between these two groups. Thus, despite the attrition, there do not appear to be any significant difference between the groups at intake.

A second limitation to this study relates to its research design. As a non-equivalent groups, quasi-experimental pre-post study, there was no random assignment to transport use, so this study was unable to limit threats to the internal validity of the study. Thus, we cannot assert that changes were only due to the intervention and transport use, rather than selection biases or other external factors. In addition, although youth improved by discharge, it is unclear if these changes remained once the youth left wilderness treatment. Longitudinal data would provide more confidence in the efficacy of wilderness treatment. This efficacy has been shown in some other research (Bettmann et al. 2013; Lewis 2013; Zelov et al. 2013), but needs to be further replicated.

The data shows variation among the youth in terms of improvement, as illustrated by both the effect size confidence intervals and the standard deviations of mean scores. Not all youth improved; it is unclear why some youth improved more than others. Yet, differences in gender, readiness to change, adoption, race, age, and days in the program did not predict clinical improvement. Future research should explore other factors which may predict clinical improvement in wilderness treatment in order to specify which type of clients succeeds in this environment.

Finally, while we can hypothesize that parents who used transport services for their children were likely enrolling their children in treatment involuntarily, we do not know for sure if this was done coercively or without youth input. Future qualitative research should look closely at the transport process, how transport is chosen as an option, and what that experience is for the youth who are transported.

Conclusion

This study presented findings that youth in a wilderness therapy program appear to benefit from the wilderness therapy intervention regardless of transport use. Transported youth did as well as non-transported youth in treatment, supporting the notion that the transport use may not negatively affect their treatment. These results should be interpreted with caution because this study is limited to data from only one program and lacked random assignment. Still, this exploratory study has implications for mental practice with adolescents. While transport practices generally involve adolescents heading to treatment involuntarily, such practices may be an acceptable option for parents and youth who may not receive the treatment they need otherwise, if regulated and linked with a quality wilderness therapy program.

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