Outdoor Behavioral Health Care: Client and Treatment Characteristics Effects on Young Adult Outcomes

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Abstract

A lack of clarity exists regarding how different clients respond to outdoor behavioral health care (OBH). In this study, specific client and treatment characteristics were assessed for 186 young adults completing an OBH therapeutic wilderness program. Clinical outcomes were measured with the Outcome Questionnaire–45.2. Hierarchical linear modeling results indicated no differences at intake, in change trajectories while in treatment, or at 6- and 18-months follow-up. Treatment gains and maintenance post-discharge were similar regardless of participant age, length of stay, gender, primary diagnosis, or therapist. Findings serve as additional support for the utility of OBH for a range of clients. Results are detailed and implications, limitations, and future research directions are discussed.

Keywords

wilderness therapy, outdoor behavioral health care, young adult outcomes

Young adults need effective mental health treatment. Consider Substance Abuse and Mental Health Services Administration (SAMHSA) data from 2012 and 2013 estimating one in five young adults experience mental illness. In addition, 6.4% of young adults (ages 18-25) had a co-occurring substance use disorder along with a mental illness diagnosis (SAMHSA, 2013). Indeed, "addressing the behavioral health needs

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of this age group is a critical public health issue as mental health disorders are associated with residential instability, lower educational attainment, unemployment, and poorer access to health services" (SAMHSA, 2013, pp. 8-9). Supporting young adults with mental health and substance use issues can be challenging, as a majority of young adults with mental illness do not receive mental health services. Of the 40% who did receive treatment between 2010 and 2012, 9% received some sort of targeted substance abuse treatment (SAMHSA, 2013).

Outdoor behavioral health care (OBH) is a unique specialty treatment modality growing in prevalence over the last 30 years (Hoag, Massey, Roberts, & Logan, 2013; Russell, Gillis, & Lewis, 2008). OBH, often referred to as wilderness or adventure therapy, initially began by serving adolescents. It utilizes the inherent value of contact with nature to promote health (Maller, Townsend, Pryor, Brown, & St. Leger, 2006) combined with therapeutic programming, group living, and trained staff (Russell, 2001). Supported by promising outcomes, OBH programs have expanded to work more and more with young adult clients (Russell et al., 2008). Hoag and colleagues (2013) found statistical and clinically significant change in well-being outcomes for young adults in OBH. However, there have not yet been any published studies focused on how young adult client characteristics and treatment variables influence how clients change while in wilderness therapy treatment and post-discharge. This gap leaves questions around how clients comparatively fare in wilderness. Answers to these questions could inform the OBH field in general, and OBH programs working with young adult clients in particular.

Outdoor Behavioral Health Outcomes

Past studies have primarily focused on outcomes and not necessarily client or program characteristics related to those outcomes (Tucker, Smith, & Gass, 2014). The outcomes research tracking young adults post-discharge from inpatient treatment has generally looked at substance use abstinence as opposed to mental health (Hesse, Austin, Lykke, & Oestrich, 2009; Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011). Adventure therapy is a term often used synonymously with wilderness therapy to represent work with clients involving outdoor activities and experiential learning (Bowen & Neill, 2013). In concluding their thorough meta-analysis on adventure therapy outcomes, Bowen and Neill (2013) declared that, "further investigation is needed to better understand the considerable variability in adventure therapy outcomes" (p. 43).

The research that has been done to look at predictors of change in OBH has been done with adolescent participants. Research examining how demographic factors such as age, gender, and presenting problem effect inpatient or OBH treatment outcomes has generally found few differences (Bowen & Neill, 2013; Hair, 2005). A meta-analysis of 18 studies looking at residential outcomes for adolescents concluded that "individual characteristics such as diagnosis identified at admission appear to have a negligible association with successful discharge" (Hair, 2005, p. 570). Bowen and Neill's (2013) published review of adventure therapy outcomes and moderators found that the participant characteristics of mean age, sample source, race, gender, population, and presenting problem

explained only 27% of the variance. These findings suggest that there is a gap in the knowledge surrounding what types of clients do best in OBH programs and how clinicians and program directors can tailor the experience based on client characteristics to increase effectiveness.

There has yet to be a substantial study looking at moderators or predictors of change for young adults in wilderness therapy programs. To support young adults and refine treatment options, "it is essential to understand the mental health and co-occurring substance use issues in this population and how these problems impact their ability to succeed in life" (SAMHSA, 2013, p. 10). Young adulthood is a challenging life stage, given mental illness and substance use rates are greater than other population subgroups (Pottick, Bilder, Vander Stoep, Warner, & Alvarez, 2008). Currently, increasing numbers of young adults are utilizing OBH for inpatient treatment (Russell et al., 2008). Meaningful change has been evidenced for adolescents in OBH programs (Magle-Haberek, Tucker, & Gass, 2012), and a recent study found similar findings for young adult clients (Hoag et al., 2013). Researchers are attempting to determine moderators of change in inpatient treatment for adolescents (Bowen & Neill, 2013; Hair, 2005); however, similarly focused research with young adult clients in OBH programs is lacking.

The aim of this study was to fill gaps in the literature by looking at how age, gender, primary diagnosis, therapist assignment, and length of treatment influence the overall well-being of young adults over time.

Selection of Constructs

Age

The increase of OBH utilization by adults (Russell et al., 2008) suggests that understanding the effectiveness of this modality across different ages is needed. Tucker, Javorski, Tracy, and Beale (2013) researched the influence of adventure therapy and predictors of change including age. They found no differences in their predominantly adolescent sample (N = 1,335) and called for continued research to understand if adventure-based therapies were "equally effective across age groups" (p. 175). Two other adolescent studies within the OBH field also found that outcomes did not vary for participants when looking at age (Behrens & Satterfield, 2011; Tucker et al., 2014). This study will look to see the impact of age within a young adult population in OBH.

Gender

Recent estimates indicate that more than 60% of young adults with a mental health diagnosis are female (SAMHSA, 2013). However, OBH studies regularly report samples composed of considerably more males than females (Hoag, Massey, & Roberts, 2014; Hoag et al., 2013; Russell et al., 2008). Indeed, Hoag, Massey, and Roberts (2014) reported females constitute less than 20% of OBH clients. Lambert et al. (2004) found no outcome differences between males and females in both clinical and non-clinical

settings. However, gender has been found in multiple studies to be a predictor of change in OBH (Hoag et al., 2013; Magle-Haberek et al., 2012; Russell, 2003; Tucker et al., 2014). Tucker and colleagues (2014) examined a large data set of 896 adolescents in OBH and found that females were much more likely to experience significant improvement than males. Similarly, Russell (2003) found females had significantly different scores at admissions, yet by discharge, their scores had reduced 49% more than male clients over the course of treatment in an OBH program. Hoag et al. (2013) found significantly higher scores for female clients than male clients at admission, but the difference was not significant by discharge. The authors called for more research into the differences between genders in OBH stating, "This gender trend of females in wilderness therapy entering at a higher level of dysfunction and showing greater change merits more study and could have important implications for clinicians and wilderness programs" (Hoag et al., 2013, p. 9).

Primary Diagnosis

There has been limited research examining the impact of presenting problems on outcomes in OBH. The research that has been done has shown mixed results with the only difference being found with severe mental illness or mood disorders (Hesse et al., 2009; Russell, 2003; Tucker et al., 2014). Diagnostic information has been found to have no predictive value related to successful completion of inpatient (as measured by abstinence from substance use) dual diagnosis treatment (Hesse et al., 2009). The one exception the authors noted was for clients diagnosed with thought disorders such as schizophrenia. Hesse et al. (2009) also suggested their findings indicated clients presenting with anxiety seemed to have more struggles than those with depressive symptoms. In two other more recent, separate studies, presenting issue was found to have no predictive value for determining which clients were more likely to report clinical change after being treated in OBH or adventure therapy (Hoag, Gass, et al., 2014; Tucker et al., 2014). This led the authors of one of the studies to conclude that OBH was equally as valuable for a wide range of adolescent clients (Tucker et al., 2014). Conversely, in a thorough assessment of outcomes in OBH programs, Russell (2003) found that clients diagnosed with mood disorders experienced the most improvement.

Therapist Assignment

The therapist is an essential component of an OBH-based intervention. However, unlike outpatient therapy, the therapist is only one facet of the therapeutic mechanism at play in a wilderness therapy experience. Group process, trained field staff, the wilderness itself, and program curriculum are all additional factors that influence client outcomes (Association for Experiential Education, 2014). In a 2003 study that utilized the Outcome Questionnaire–45.2 (OQ-45.2) to assess well-being and hierarchical linear modeling to analyze the results, the researchers found that outpatient therapy clients had vastly different outcomes depending on the therapists they worked with (Okiishi, Lambert, Nielsen, & Ogles, 2003). The authors asserted that their analysis

provided "the clearest evidence that there are indeed significant difference amongst therapists in the outcomes of their psychotherapy clients" (Okiishi et al., 2003, p. 370). Furthermore, on finding meaningful therapist effects in a separate study, Anderson, Ogles, Patterson, Lambert, and Vermeersch (2009) concluded that there are significant differences in outcomes for outpatient therapy clients based on the clinician. Understanding the impact of the therapist on outcome will help the field understand where appropriate resources and energy should be invested to best improve outcome. It will also help illuminate how wilderness therapy may be similar or different than more traditional therapeutic approaches in the mechanisms of change.

Length of Stay

Wilderness therapy is a resource intensive, expensive intervention with a low staff to client ratio (Russell, 2001). Understanding the shortest necessary time needed in a wilderness setting to maximize outcomes could open up this intervention to a wider range of clients of various socioeconomic status. Harnett, O'Donovan, and Lambert (2010) highlighted the ethical responsibility of looking at length of stay in treatment when they ask "if on average, more therapy is better, how much therapy is enough?" (p. 1). Little research has examined length of stay in inpatient settings for optimum well-being. Gordon et al. (2006) found that length of stay for adults in inpatient alcohol dependency treatment was not predictive of relapse at 3-months post-discharge. In one large study, reliable change was found after seven individual therapy sessions with each successive session having a decreasing amount of impact on the client's well-being (Lambert et al., 1996). However, Harnett et al. (2010) reported that their finding of reliable change after the 10th week (participating in once weekly therapy sessions) was consistent with other findings. OBH is a more intensive therapeutic environment where one might expect reliable change to be made in a shorter length of time. For example, Hoag et al. (2013) found that young adults, on average, reported significant change by Week 5.

Method

For this institutional review board (IRB) approved study, a convenience sample ($N = 186$) was drawn from an OBH program's existing data set gathered between May 2011 and June 2012. Eligible participants were those completing the programs' 35-day minimum length of stay requirement. Participants were informed they could decline to participate in the study and that doing so would not change or otherwise influence aspects of their treatment. Participant demographics are summarized in Table 1. The sample was composed of 153 young men and 33 young women. Participants age at intake ranged from 18 to 32 years ($M = 20.3$, $SD = 2.59$ years). Length of stay ranged from 5 to 22 weeks ($M = 10.1$, $SD = 2.46$ weeks) in the wilderness. Participants' primary diagnoses were mood disorders (39%), substance use disorders (30%), and anxiety disorders (13%), while pervasive development, behavior, and attachment disorders combined to account for the remaining 18%. Substance use disorders were the most

Table 1. Participants Age, Length of Stay, Primary Diagnosis, Therapist and Gender.

Variable	N	M ± SD
Age	186	20.31 ± 2.59 years
Length of stay	186	10.06 ± 2.45 weeks
	n	%
Primary Dx		
Mood	71	38
Substance	56	30
Anxiety	26	14
Other	33	18
Therapist caseload		
Clinician 1	33	17.7
Clinician 2	36	19.4
Clinician 3	36	19.4
Clinician 4	43	23.1
Clinician 5	38	20.4
Gender		
Male	153	82.3
Female	33	17.7

frequently listed co-occurring disorder (75%). In program, participants were distributed fairly evenly in terms of the five Caucasian staff therapists' caseloads. Caseloads were a function of rolling admissions and ranged from 43 study participants (23%) working with one clinician to 33 (18%) participants working with another. All five therapists are licensed: one female and one male psychologist; one female and one male master's-level licensed professional counselor; and one male master's-level marriage and family therapist. Post-discharge, 83% of participants indicated receiving some form of continued care, such as residential or sober living, job support, outpatient therapy, academic coaching, or other supportive transition services.

Treatment

The OBH program's overall structure and progression was similar across participants; however, treatment plans were individualized based on participant need. Each week, therapists provided a minimum of 2 hr of direct counseling (individual and group). Groups were composed of participants working with the same therapist. Participants lived nomadically backpacking through Southwestern Utah with trained field staff teaching outdoor living skills and directing here-and-now process work to learn from the intra- and interpersonal dynamics that arose. Living skills included traditional bow drill fire making, building shelters, Leave No Trace camping, and self-care. The therapists joined the group for 2 days each week to conduct individual and group therapy sessions and to create a treatment plan for the week. Treatment plans included assignments such

as bibliotherapy, running a group session on an assigned topic, experiential exercises facilitated by staff, and cognitive therapy skills training.

Outcome Measure

OQ-45.2. The OQ-45.2 is a widely used assessment instrument in patient-focused outcome research to assess client change (Lambert et al., 2004). Highly sensitive to psychological fluctuations, it is used to track changes during and after therapy. The 45 items assess key personal and social characteristics related to quality of life across three subscales: Subjective Distress, Interpersonal Relationships, and Social Role Performance to assess client well-being and treatment effectiveness (Lambert et al., 2004). Likert-type response options range from 0 (*never*) to 4 (*almost always*). Subscales were developed from research pointing to the importance of relationships in life satisfaction, the prevalence of anxiety symptoms across disorders, and the premise that "a person's intrapsychic problems and symptoms can affect their ability to work, love, and play" (Lambert et al., 1996, p. 251). The total score ranges from 0 to 180 and is a composite of all three subscales, including not only measurement of distress but also endorsement of health and positive variables.

Extensively used to measure psychological distress, the OQ is internally consistent (αs range = .70-.93) and test–retest reliable (correlations range = .78-.84; Lambert et al., 2004). Concurrent validity has been assessed with comparable measures and all were significant beyond the .01 level: Symptom Checklist 90R (.88), Social Adjustment Rating Scale (.81), and the Inventory of Interpersonal Problems (.81) (Lambert et al, 2004). Reliability (β_0) was evidenced for OQ scores in the present study ranging from .68 to .95.

Data Collection and Handling

Initial participant assessments were conducted within the first week of enrollment in the OBH program. Within-program data were collected in paper-and-pencil form at Weeks 1, 3, 5, and at the time of discharge. Six- and 18-month follow-up measures were distributed and collected via email. Those not responding within 1 week were sent an email request reminder. A similar procedure was followed for the 18-month follow-up, except a US$10 gift card to an outdoor gear store, iTunes, or Amazon was offered as an incentive. All data were entered into outcome tools, double-checked for accuracy, and then exported to SPSS for analyses. Week 1 response rates included 85% of participants ($n = 159$); 82% ($n = 153$) at Week 3; 81% ($n = 150$) at Week 5; and 70% ($n = 131$) at time of discharge. Post-discharge, 44% of participants ($n = 81$) responded at 6-month follow-up, while 39% ($n = 79$) responded at the final 18-month follow-up.

Age at intake and therapist assignment was gathered from a review of participant demographics. The total OQ score at discharge, 6 months, and 18 months determined participants' overall psychological distress. Gender was listed on the initial application completed by the participant. Primary diagnosis was listed on the participants'

discharge summary completed by the treating therapist. The top three most common diagnoses of anxiety, mood, and substance use disorders were each coded separately with all other diagnoses (pervasive development, behavior, and attachment disorders) being combined. Length of stay was calculated based on admission and discharge dates.

Data Analysis

Hierarchical linear modeling (HLM) was selected to address this study's research questions. HLM is considered appropriate as it offers a flexible method for analyzing correlated data typical of repeated-measures designs (Carey, 2014). This allowed for nuanced analysis of nested longitudinal data while examining multivariate effects (Raudenbush & Bryk, 2002). Unlike other repeated-measures approaches (i.e., ANOVA) that discard all results from a subject based on a single missing data point, hierarchical linear models "allow other data on such subjects to be used as long as the missing data meets the so-called missing-at-random definition" (Seltman, 2012, p. 357). Utilizing the greater research control of HLM, the intercept and rate of change was allowed to vary across participants (Carey, 2014).

A three-piece time-trend model (Jaggars & Xu, 2015) was used to analyze data given the unequal time spacing between administrations. Timepiece 1 spanned treatment Weeks 1 through 5 (Times 0, 1, and 2). One unit of time equated to 2 weeks. Timepiece 2 included data collected from Week 5 to Discharge (Times 2 and 3). Time between assessment Week 5 and discharge varied among participants due to differing lengths of stay in treatment. The third timepiece captured change from discharge (Time 3) to 6-months post-discharge (Time 4), up through 18-months post treatment (Time 5). Each unit of time within this timepiece was 6 months.

On IRB approval, a two-step analytic process was used to examine the influence of age, gender, therapist assignment, primary diagnosis, and length of stay on OQ scores. First, main effect results were assessed to understand if there were systematic differences across the time frame as a result of the covariates. Next, each covariate's interaction with time was examined to see if there were differences in change trajectories across the five covariates. This model determined if participants had either differing baselines or rates of change. To further assess for any differences, the covariates' influence on each individual timepiece was examined.

Results

The statistical models assume Level 1 residuals and Level 2 random effects are normally distributed in the population. Examining sample values from the fitted models empirically validated these assumptions had been met. Histograms of estimated Level 1 residuals and Level 2 random effects were approximately normally distributed. Furthermore, bivariate scatterplots of Level 1 residuals against predicted values did not indicate problems with the fitted models (i.e., homoscedasticity, model misspecification, or influential cases).
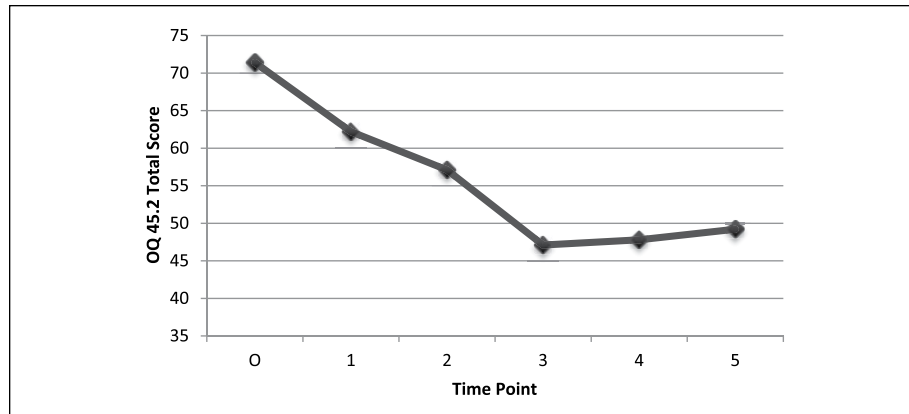
Figure 1. Mean OQ-45.2 total score results over time.
Note. OQ = Outcome Questionnaire. Time 0 = Week 1; Time 1 = Week 3; Time 2 = Week 5;
Time 3 = Discharge; Time 4 = 6 months post; Time 5 = 18 months post.

Prior to primary analysis, missing data were analyzed to determine if data were missing at random or due to systematic reasons (e.g., non-response bias; Gay, Mills, & Airasian, 2009). To this end, discharge non-responders Week 1 OQ total scores were compared with the overall sample Week 1 mean scores. Because primary analyses for this study extend beyond discharge, scores were similarly compared between Week 1 and 18-month follow-up. There was no difference between responders ($M = 70.02$, $SD = 24.30$) and non-responders at discharge; $t(227) = 0.309$, $p = .76$. In addition, there was no difference between scores of those responding Week 1 and participants who did not respond at 18-month follow-up ($M = 72.0$, $SD = 24.34$), $t(293) = 0.201$, $p = .84$.

Figure 1 details participants' mean OQ total scores across the six time points. The participants in this study began with a mean OQ total score of 71. Scores exceeding 63 indicate the client is in the patient/nonfunctional range endorsing more symptoms of distress than an individual found in the community (Lambert et al., 2004). Table 2 displays both main effect and covariates by time interaction overall Omnibus results. Main effect results found in Table 2 illustrate statistically significant change occurred in Timepiece 1, $F(1, 558) = 40.85$, $p < .0001$, and Timepiece 2, $F(1, 558) = 34.75$, $p < .0001$, with no differences found in Timepiece 3. This indicates that participants experienced statistically significant change while in treatment and change leveled off post-discharge. Interestingly, there were no significant systematic differences found across the five covariates. In addition, the predictor by time analysis results found in Table 2 indicate participants as a whole varied in their rates of change within Timepiece 1, $F(1, 558) = 9.11$, $p = .0027$, and Timepiece 2, $F(1, 558) = 8.23$, $p = .0043$, yet no variation was found across the covariates in change trajectories across time. Table 3 displays the findings documenting no significant differences in change trajectories within each timepiece. These findings suggest all participants seemed to benefit similarly from their participation in an OBH intervention regardless of their gender, age, primary diagnosis, assigned therapist, or length of stay.

Table 2. Main Effect and Covariates by Time Overall Omnibus Results.

Effect	Main effect			Covariates by time interaction		
	df	F	p	df	F	p
T1	(1, 558)	40.85	<.001	(1, 528)	9.11	.003
T2	(1, 558)	34.75	<.001	(1, 528)	8.23	.004
T3	(1, 558)	1.52	.218	(1, 528)	1.98	.160
Age	(1, 175)	0.04	.835	(1, 175)	0.31	.581
Gender	(1, 175)	0.20	.651	(1, 175)	1.61	.206
Dx	(3, 175)	0.46	.711	(3, 175)	0.87	.456
Thrpst	(4, 175)	0.71	.587	(4, 175)	1.07	.372
LoS	(1, 175)	0.54	.463	(1, 175)	0.26	.613

Note. T1= Timepiece 1, T2 = Timepiece 2, T3 = Timepiece 3, Dx = diagnosis, Thrpst = therapist, LoS = length of stay.

Table 3. Covariate by Timepiece Results.

Effect	df	F	p
T1 × Age	(1, 528)	0.61	.435
T2 × Age	(1, 528)	0.09	.760
T3 × Age	(1, 528)	0.00	.991
T1 × Gender	(1, 528)	1.40	.237
T2 × Gender	(1, 528)	1.30	.254
T3 × gender	(1, 528)	1.14	.287
T1 × Dx	(3, 528)	0.39	.760
T2 × Dx	(3, 528)	0.96	.413
T3 × Dx	(3, 528)	0.09	.963
T1 × Thrpst	(4, 528)	0.88	.479
T2 × Thrpst	(4, 528)	1.37	.243
T3 × Thrpst	(4, 528)	0.34	.851
T1 × LoS	(1, 528)	0.02	.902
T2 × LoS	(1, 528)	1.18	.278
T3 × LoS	(1, 528)	2.12	.146

Note. T1= Timepiece 1, T2 = Timepiece 2, T3 = Timepiece 3, Dx = diagnosis, Thrpst = therapist, LoS = length of stay.

Discussion

Age

Findings from this study mirror previous research results looking at the effects of adventure and nature-based counseling approaches with both adolescent participants (Tucker et al., 2014) and adults (Bidell, 2010; Hoag et al., 2013). The therapeutic benefits of OBH is not surprising given that adventure-based counseling has previously been found

to have positive influence on adults (Bidell, 2010). This study adds to our understanding of the influence of age on OBH outcomes for young adults by suggesting that the starting points and trajectories did not differ as a function of age. Present study findings, combined with Hoag et al.'s (2013) significant findings, suggest that OBH is effective for young adults of varying ages.

Gender

Previous research in OBH has indicated a marked difference in intake scores and change trajectories by gender Magle-Haberek et al. (2012). However, present study results suggest no statistically significant differences between males and females. Hoag et al. (2013) reported that females entered OBH with OQ scores 9 points higher at Week 1 than males and 5.5 points lower at discharge. In the present study, females at Week 1 had an OQ score 6.9 points higher than males yet at discharge reported a score 8.5 points lower than males. This difference was not statistically significant, potentially due to the small sample of women (n = 33). Nevertheless, it brings up a question as to whether gender has a direct effect on outcomes or is moderated by the phenomenon of clients with greater initial distress reporting more dramatic improvements in wilderness therapy (Hoag et al., 2013). Magle-Haberek et al. called for additional research to investigate the differences in outcomes between males and females in OBH. This investigation could be complicated due to the trend of women being admitted to wilderness with greater initial distress (Hoag et al., 2013) thereby increasing the chance that they make greater changes while in treatment.

Primary Diagnosis

Inconclusive and conflicting results from previous OBH research relating the impact of diagnosis on outcomes spurred the necessity of further examination (Hesse et al., 2009; Hoag, Massey, et al., 2014; Russell, 2003; Tucker et al., 2014). Participants in the present study had similar starting points and change trajectories regardless of the four diagnostic categories examined in this study. This indicates participants benefited similarly from their involvement in OBH. These findings are congruent with multiple recent findings (Hoag, Gass, et al., 2014; Tucker et al., 2014). This likely is due to increased intention and selection during admissions intake screening and placement to assure appropriateness of fit within an OBH program. The admissions placement process also creates an intentional procedure in which therapist expertise and treatment planning is matched with client needs. In addition, the evolving clinical expertise occurring within the industry has increased the chance that the therapists and staff are better prepared to work with a variety of presenting problems (Hoag, Massey, & Roberts, 2014).

Therapist Assignment

Whereas Okiishi et al. (2003) found dramatic differences when looking at therapist effects, this study found no significant covariation between client outcomes and therapist assignment. These findings may have been affected by the fact that all five therapists

worked within the same program, utilized similar resources, and had extensive experience working in OBH programs. An additional interpretation could be that additional change agents found in wilderness therapy (Russell, 2001) outside of the clinician may compensate for the differences found in previous studies assessing therapist influence (Anderson et al., 2009; Okiishi et al., 2003). Examples of other potential change agents could include group processes, presence of non-clinical trained staff, influence of being in nature, expeditionary living, and the curriculum provided across an OBH experience (Association for Experiential Education, 2014).

Length of Stay

Assessing how length of stay associates with treatment outcomes is important in the pursuit of understanding optimal lengths of stay within the restrictive wilderness environment. Participant distress levels in this study at Week 1 and their rates of change did not vary significantly when looking at the effect of length of stay. One interpretation of this finding is that the treatment team is making appropriate decisions regarding the necessary length of stay for participants. This allows for all clients to benefit similarly from their participation in wilderness therapy. Similar to the intentionality given through admissions screening, length of stay decisions are made in a clinically informed and intentional manner. The use of individualized treatment plans (Hill, 2007) and variable lengths of stay informed by evolving clinical needs creates a dynamic program tailored to the clients.

However, the non-significant main effect results indicated participants who had greater distress at Week 1 did not stay longer than those with lesser distress. Also, examinations of effect of the covariates interaction with time showed those with longer lengths of stay did not evidence greater gains. These findings open the question of whether clients directly benefit from more time in this intensive treatment modality and highlight the need for additional research to determine clients' optimal length of stay.

Limitations

A limitation of this study was the size of the sample and attrition. This increased the chance of Type II errors when looking at the impact of the predictors hypothesized to influence outcomes. This was especially evident when looking at gender with only 33 young women participating in the study. Furthermore, the sole use of the OQ-45.2 to evaluate well-being may have limited ways in which well-being is experienced by the participants.

An additional common challenge of field-based outcome research emphasizing external validity designed to directly inform practice is the various possible confounding variables found within the study (Heppner, Wampold, & Kivlighan, 2007). The participants in the study interacted with a variety of different direct care staff, numerous and constantly evolving group dynamics, and unique experiential challenges and lessons that emerged from a here-and-now process. These variables introduce more challenge in the quest to identify the change agents in OBH.

Recommendations

The utilization of varied measures and strategies to assess well-being and perceived value of participation in an OBH program across demographic and treatment variables could help in the continued quest to better understand how clients are served by wilderness therapy. The OBH industry would also benefit from a joint study across similar programs examining the influence of various demographic and treatment variables within a larger sample size.

OBH is a unique treatment that has shown some promising results. However, as Bray (2014) highlighted, high costs that are often not covered by insurance prohibits clients from having access to this form of treatment. Further research is needed to understand the dose-response relationship (Harnett et al., 2010) to pinpoint how much time in treatment produces the most change within the shortest amount of time necessary. This research could potentially help open up this form of treatment to clients who currently cannot afford a longer length of stay.

Declaration of Conflicting Interests

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