

The Relationship Between Self-Reported Prior Drug Use and Treatment Effectiveness in Substance Use Disorder during Outdoor Behavioral Healthcare Treatment for Young Adult Males

Jesse Chapman

Sean Groark

Mary Mason Beale

Paige Mandas

Kayla Argo

Harold L. (Lee) Gillis, PhD

Georgia College & State University

Keith C. Russell

Western Washington University

Abstract

Substance Use Disorder (SUD) is an increasingly common disorder in North America; however, there is little research on substance use disorder treatment for young adults with SUD (Zhou, et al., 2015). Enviroshunda Creek is a ten-bed, 90-day program located in Alberta, Canada for males ages 18-24 who are diagnosed with SUD. This outdoor behavioral healthcare (OBH) program treats SUD using mindfulness-based outdoor experiences in addition to more traditional individual and group therapy. This study examined the relationship between self-reported frequency of prior drug use, measured by the Personal Involvement with Chemicals Scales (PICS), and change in treatment outcomes, measured by the Outcome Questionnaire 45.2 (OQ-45.2) and Five Facet Mindfulness Questionnaire (FFMQ). Results demonstrated clients' PICS scores at intake to be significantly positively correlated with OQ-45.2 total scores and OQ total change scores (discharge - intake). The OQ-45.2 Symptom Distress subscale was also positively correlated with PICS intake scores as was the Symptom Distress change score. In addition, PICS scores were found to be negatively correlated with the FFMQ total score and subscale intake scores on the Act with Awareness subscale. These findings suggest that clients with higher self-reported drug use at intake enter with higher symptom distress, and less awareness of their actions, than those who score lower on the PICS. Pre-treatment drug use assessment is encouraged as is progress monitoring for programs to track clients through treatment. Further research is encouraged to determine if different pre-treatment drug use reveals different treatment trajectories, as preliminary data presented indicates the trajectories are similar.

Keywords: Outdoor Behavioral Healthcare, Substance Use Disorder (SUD), OQ45.2, Personal Involvement with Chemicals Scale (PICS)

SELF-REPORTED PRIOR DRUG USE

Substance Use Disorder (SUD) is an increasingly common disorder in North America; however, there is little research on SUD treatment for young adults (Zhou, et al., 2015). SUD develops when recurrent use of alcohol and/or drugs causes clinically and functionally significant impairment, including health problems, disability, and failure to meet major responsibilities at work, school, or home (Substance Abuse and Mental Health Services Administration [SAMHSA], n.d.). There are a number of concurrent factors that influence how an individual develops SUD, including social ties, the developmental course of an individual's life, and demographics. Identifying and incorporating these factors into individualized treatment planning is critical to consider in SUD treatment and has a critical impact on SUD treatment success rates (Mueser et al., 2000).

Within the last decade, non-medical prescription opioid use (NMPO) surpassed the number of deaths due to motor vehicle accidents (Liebling et al., 2016). As far back as the turn of the century, researchers began documenting this rise in opioid-related deaths. Between 1999 and 2004, urban areas in the U.S. saw a 52% increase in prescription opioid-related deaths, while rural areas saw an alarming 371% increase in prescription opioid-related deaths (Paulozzi & Xi, 2008). In 2010, there were over 16,000 deaths from prescription opioid use, and the rate of heroin overdoses steadily increased from 2010 to 2013 (Dart et al., 2015). One explanation for this epidemic is an over-prescription of opioid drugs by physicians. Unick, Rosenblum, Mars, and Ciccarone (2013) found that rates of prescription opioid overdose predicted heroin overdoses in subsequent years. Along with the finding by the National Survey on Drug Use and Health in 2013, 79.5% of new heroin users reported prescription opioids were their first drug of choice (Dart et al., 2015). The current state of opioid use in North America has been described as an “epidemic” and is a central factor in the rise of the need for innovative SUD treatment approaches, especially for young adults (Vashishtha, Mittal, & Werb, 2017).

The purpose of this study is to report factors relating to treatment at an outdoor behavioral healthcare (OBH) program specializing in SUD treatment. Although only one form of treatment will be the focus of this study, there are many different approaches to treating the disorder. One of the most influential of these forms is integrated treatment (Mueser, Noordsy, Drake, Fox, & Barlow, 2003). This form of treatment arose in the 1980s in response to the apparent issues with co-occurring disorders that presented along with SUD (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998). This treatment approach, which has been shown to be effective, integrates SUD treatment with treatment for the co-occurring disorder into one treatment program, instead of the client getting treatment from two separate facilities (Back et al., 2016; Padwa, Larkins, Crevecoeur-MacPhail, & Grella, 2013; Weiss et al., 2007). Assessing drug involvement prior to treatment is key to understanding clients' needs.

Rowe, Liddle, Greenbaum, and Henderson (2004) conducted a review of intake data and treatment response of 182 adolescent drug users. They administered the Personal Involvement with Chemicals Scale (PICS; Winters & Henley, 1989) to assess participant involvement with chemicals when they were

SELF-REPORTED PRIOR DRUG USE

admitted to treatment. They found that comorbid adolescents did not significantly differ from adolescents with only SUD. PICS has been used in a number of SUD treatment studies (Botzet, Winters, & Stinchfield, 2006; Henderson, Dakof, Schwartz, & Liddle, 2006; Liddle, Dakof, Turner, Henderson, & Greenbaum, 2008), and is a focus of this research since it is a well-respected self-report assessment of prior drug use.

The 12-step program is the most commonly used form of SUD treatment in the U.S. and has been shown to be associated with abstinence (Bøg, Filges, Brännström, Jørgensen, & Fredriksson, 2017). This form of treatment views addiction as an illness, and through acceptance and abstinence individuals are able to overcome their illness. Psychotherapy has also been shown to be effective, and has been incorporated into various drug and alcohol rehabilitation programs (Najavits & Weiss, 1994). Cognitive-behavioral therapy views addiction as a maladaptive behavior; the aim of this therapy is to change distorted thinking and increase adaptive coping mechanisms within the client. A newer form of treatment is the assertive community treatment model. This model of treatment was created for individuals who, for one reason or another, have difficulties with stable community living. This form of treatment involves individualized care in a controlled community setting in order to affirm treatment effectiveness and maintain necessary community consistency (Boust, Kuhns, & Studer, 2005). Other psychosocial methods such as group counseling, contingency management, and residential dual diagnosis treatment have demonstrated promise as well (Drake, O'Neal, & Wallach, 2008). Psychopharmacological treatments have also been shown to be successful (Nathan & Gorman, 2015), especially in the treatment of opioid addiction.

Mindfulness-based relapse prevention is another effective form of treatment in outpatient settings (Bowen et al., 2009). This form of therapy integrates principles of mindfulness-based stress reduction and mindfulness-based cognitive therapy with core aspects of relapse prevention to encourage situational awareness and high-risk situation identification to help reduce drug use. This is achieved by training clients to accept and tolerate both positive and negative emotions, and urges such as cravings. This can be thought of using a framework of SUD treatment proposed by Garland et al. (2014a). These authors offer the idea that those with SUD are unable to control cognitive and emotional responses to stress and cues that elicit cravings and substance use. Additional research by Garland et al. (2014b) examined how nonreactivity as a treatment mechanism reduces pain severity and interference. This research concluded that mindfulness-based treatment is effective at alleviating pain in those with chronic pain issues. Understanding the cognitive-emotional effects of mindfulness as demonstrated with these studies, follows that mindfulness-based treatment is potentially able to curb cravings and substance use in those with SUD.

SUD in OBH is the prime focus of this research paper. Russell, Gillis, and Lewis (2008) state that two defining components of OBH, in comparison to other residential treatment programs, are the application of a clinical treatment model by licensed professionals and the primary use of wilderness as a treatment

SELF-REPORTED PRIOR DRUG USE

environment. In combining these two factors, OBH programs seek to treat problems with addiction and other maladaptive behaviors.

Roberts, Stroud, Hoag, and Massey (2017) used the Outcome Questionnaire 45.2 (OQ- 45.2) to evaluate changes in young adult participants' psychosocial well-being and functioning in an OBH treatment program from intake to 18 months posttreatment. They used 186 participants, ages 18-23, from the southwestern U.S. The OQ-45.2 demonstrated statistically significant reductions across all scales from intake to discharge. Findings suggest that OBH can be an effective intervention for young adults. In addition, participants showed statistically and clinically significant change during their time in the wilderness, and maintained gains up to 18 months after discharge.

Gillis, Kivlighan, and Russell (2016) used the components of engagement (MacKenzie, 1983) to predict how OQ-45.2 scores changed over time. Findings were drawn from 68 young adult males who were enrolled in the same residential OBH treatment program that is the subject of this article. Results suggest that there was a relationship between within-member engagement and between-member engagement. Within-member engagement identified how a group member's weekly engagement score varied from their average engagement score. Between-member engagement was the member's average engagement score. Clients who viewed the group as more engaged and consistent with how their peers saw engagement, showed statistically significant improvement in their OQ-45.2 scores.

Russell, Gillis, and Heppner (2015) utilized data from the same treatment program to examine the impact of mindful-based experiences (MBE) on SUD. Results were based on 32 adolescent males. These MBEs in the wilderness were hypothesized to enhance the development of mindfulness skills. Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) scores were significantly correlated with total change OQ-45.2 scores. Specifically, clients showed improvement on the non-judging and nonreactivity facets of the FFMQ. The non-judging and non-reactivity difference scores showed a significant relationship with a reduction in subjective distress, as indicated by the OQ-45.2 subscale. Overall, OBH treatment programs have a statistically significant influence on SUD, through the reduction of OQ-45.2 total scores during time in treatment. Specifically, the research illustrates significant reduction of symptomatology measured by the symptom distress subscale on the OQ-45.2 (Roberts et al., 2017; Gillis et al., 2016; Russell et al., 2015).

The purpose of this study is to examine relationships between variables related to treatment outcomes in an OBH program that focuses on SUD. Factors related to treatment include: 1) severity of substance use prior to entering treatment (PICS), 2) data from self-reported measures of treatment effectiveness (OQ-45.2), and 3) self-reported mindfulness at intake and discharge (FFMQ). Our hypothesis is that clients who score higher on the PICS at intake will show a decline in OQ-45.2 scores compared to those who score lower on the PICS at intake.

SELF-REPORTED PRIOR DRUG USE

Method

Treatment Program

Enviros Shunda Creek is a ten-bed, 90-day OBH program located in Alberta, Canada. The program is for males, ages 18-24, diagnosed with SUD. In efforts to increase self-awareness of substance use history, Shunda Creek employs MBE through adventure in nature (Russell et al., 2015). These experiences consist of one to five day trips known as “mindfulness in action” due to the treatment intentions set prior to participating in adventure activities, and the reflection on those intentions with their cohort group once clients return to base camp. MBEs are initiated by the client, and centered around treatment objectives and themes. For example, clients partake in rock climbing in the Northern Rockies. Shunda Creek emphasizes the intentional formation of relationships between the client and therapeutic staff. Through the establishment of these relationships, clients are able to relate their experiences to their treatment process and goals. For instance, fears that are felt while rock climbing may be associated with the fears of post-treatment social situations that could trigger a relapse. Clients reflect on their experiences in the moment and in post-trip reflection with their cohort group in hopes of solidifying the relevance of the experience. On average, clients participate in one trip per week of the 90-day program.

Participants

Clients at Enviros Shunda Creek were young adult males diagnosed with SUD. The population (N = 177) consisted of 42.1% who identify as white, 15.8 % whose ethnicity was grouped as other, and 11.6% who identified as indigenous. Race and ethnicity was not reported by 30.5% of clients in their intake information as this was an optional variable. The average age of Shunda Creek clients was 21.5 years, and the average length of stay averaged 79.6 days. Clients were not mandated to receive treatment. For the most part, they are voluntarily in treatment and may leave at any time. Across all clients, the top three drugs that clients reported on the PICS using prior to treatment were 1) smoking tobacco, 2) alcohol, and 3) marijuana. Of note is that when examining a subset of Shunda Creek alumni clients (n = 69), on whether opioid use was also acknowledged in their PICS assessment, 40.6% acknowledged use of an opioid while 59.4% did not.

Measures

Personal Involvement with Chemicals (PICS). The Personal Experience Inventory (PEI) was developed by Winters and Henley (1989). The Personal Involvement with Chemicals (PICS) is a subscale of the PEI. It is a 29-item assessment that asks participants to identify how frequently they used for various reasons but only for the 90 days leading up to assessment. The reasons they used could be affective (e.g. “I use when I feel lonely, I use to feel happy”) or social (e.g. “I use before going out”, “I use to feel more comfortable talking about how I feel”). The assessment also briefly asks participants to disclose lengths they

SELF-REPORTED PRIOR DRUG USE

have gone to pay for drugs or alcohol. This assessment is typically used as an intake assessment of the intensity of an individual's drug and/or alcohol use. PICS uses a 4-point response set (1 = never, 2 = once or twice, 3 = sometimes, 4 = often). The instrument has excellent psychometric properties and normative data.

Outcome Questionnaire. The Outcome Questionnaire 45.2 (OQ-45.2; Lambert et al., 1996) is a 45-question, Likert-scale outcome measure, that is designed to repeatedly assess client progress at the beginning, during, and conclusion of treatment. Using progress monitoring, the OQ-45.2 is given every two weeks at Shunda Creek. It assesses three areas of psychosocial functioning: 1) Subjective distress (e.g. "I feel no interest in things."), 2) Interpersonal relations (e.g. "I am concerned about family troubles"), and 3) Social role performance (e.g. "I work/study too much"). The OQ-45.2 is a Likert-scale instrument that contains 45 items that computes a total score, which can range from 0 to 180; with lower scores indicating high levels of psycho-social functioning and higher scores indicating lower levels. Lambert et al. (1996) found the OQ-45.2 to have test-retest reliability estimated at $r = .84$, strong overall internal consistency ($\alpha = .93$), and concurrent validity estimates ranging from $r = .60$ to $r = .88$ across several measures of psychosocial functioning.

Five Facet Mindfulness Questionnaire (FFMQ). The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a survey of trait mindfulness composed of 39 items, that is given to Shunda Creek clients at admission to and discharge from the program. It is used to measure changes in mindfulness as a result of treatment in the program. There are five different areas assessed: 1) Observing (e.g. "I pay attention to sensations, such as the wind in my hair or sun on my face"), 2) Describing (e.g. "I can easily put my beliefs, opinions, and expectations into words"), 3) Acts with Awareness (e.g. "I rush through activities without being really attentive to them"), 4) Non-judging (e.g. "I think some of my emotions are bad or inappropriate and I shouldn't feel them"), and 5) Non-reactivity (e.g. "In difficult situations, I can pause without immediately reacting"). The questions are rated on a 5-point scale that ranges from 1 (never or very rarely true) to 5 (very often or always true). When items were negatively worded, they were reverse-scored so that for each subscale, higher scores indicated greater mindfulness. In past research with nonclinical (Baer et al., 2006) and clinical (Bohlmeijer et al., 2011) samples, the FFMQ was found to be a reliable and valid measure of mindfulness.

Procedure

Clients of Enviroshunda Creek were evaluated at intake to record their drug use during the 90 days prior to enrollment. The assessment used was the PICS subscale of the Personal Experience Inventory (PEI; Winters & Henley, 1989) to assess the severity of drug use through self-report. During treatment, clients were assessed on their progress with the Outcome Questionnaire (OQ-45.2; Lambert & Finch, 1999) every 2 weeks. Additionally, clients were evaluated on their mindfulness skills with the Five Facet Mindfulness Questionnaire (Baer et al.,

SELF-REPORTED PRIOR DRUG USE

2006) at intake and at discharge. The data collection method for this study was approved by the Institutional Review Board (IRB) at Georgia College & State University.

Results

Table 1 presents clients' PICS scores at intake that were found to be significantly positively correlated with OQ-45.2 total scores at intake ($r(116) = 0.247, p = 0.007$). The OQ-45.2 Total change score (discharge - intake) was also positively correlated with PICS ($r(108) = 0.281, p = 0.003$). The OQ-45.2 Symptom Distress subscale at intake was also statistically significant ($r(117) = 0.249, p = 0.006$) as was the change subscale score (discharge - intake) ($r(109) = 0.309, p = 0.001$). There were no other statistically significant relationships between PICS and OQ-45.2 intake scores, nor were there any statistically significant correlations with any OQ-45.2 discharge scores. This indicates that clients with higher self-reported involvement with chemicals reported higher psychological distress when they first arrived at Shunda Creek; and this is attributed to scores on the Symptom Distress intake subscale accounting for the significant relationship and not the scores on the Interpersonal Relations or Social Roles subscales. The lack of statistical significance at discharge on any OQ-45.2 scores indicates that high acknowledgement of drug use at intake did not impact discharge scores, and that those with higher PICS scores had a more rapid decline of OQ-45.2 total scores, driven by the drop in Symptom Distress subscale.

Table 1

Statistically Significant Correlations, Number of Clients, Means and Standard Deviations of Data Relevant to These Analyses

Measure	PICS	p	N	Mean	SD
PICS	-		121	66.36	12.44
OQ Total Intake	0.247	0.007	117	80.60	21.72
OQ Total Change (Discharge – Intake)	0.281	0.003	109	35.83	30.03
OQ Symptom Distress Intake	0.249	0.006	118	44.82	13.64
OQ Symptom Distress Change (Discharge – Intake)	0.309	0.001	110	20.81	18.29
FFMQ Intake Total	-0.189	0.046	112	94.15	20.02
FFMQ Intake Acts with Awareness	-0.230	0.015	112	18.53	5.94

SELF-REPORTED PRIOR DRUG USE

As can also be seen in Table 1, Pearson-r correlations were conducted between PICS and FFMQ total and subscale scores at intake and discharge. PICS scores were only found to be negatively correlated with FFMQ total score ($r(112) = -0.189, p = 0.046$) and one of the five subscale intake scores: Act with Awareness ($r(111) = -.230, p = 0.015$). However, no other significant correlations were found between PICS scores and intake, discharge, and change FFMQ scores.

Table 2

Predictors of PIC Scores at Intake

Variable	PIC Scores		
	Model 1 β	Model 2 β	95 % CI
Constant	60.21**	70.95**	[61.52, 80.38]
OQ Symptom Distress Change	0.24**	0.22*	[0.07, 0.356]
FFMQ Acts with Awareness Subscale		-0.57*	[-1.03, -0.11]
R ²	0.10	0.15	
F	11.08**	8.89**	
ΔR^2		0.05	
ΔF		6.14	

Note. N=101. CI = Confidence Interval

* $p < .01$ ** $p < .001$

Furthermore, as seen in the stepwise regression reported in Table 2, Model 1 showed that the OQ-45.2 subscale Symptom Distress change predicted PICS scores $b = 2.36, F(99) = 11.08, p < .001$. When adding the FFMQ subscale intake scores Act with Awareness, R^2 increases from 0.10 in Model 1 to 0.15 in Model 2 ($R^2 = .0154, F(1, 98) = 8.89, p < .001$).

Discussion

Results indicate a statistically significant relationship between PICS scores at intake and OQ-45.2 total and symptom distress subscale scores. Additionally, the total change score and the Symptom Distress subscale change scores (discharge minus intake) were also significantly correlated with PICS scores. There were

SELF-REPORTED PRIOR DRUG USE

no statistically significant correlations between PICS scores and OQ-45 intake scores on Interpersonal Relations or Social Roles nor were any of the discharge scores significantly correlated. Results also indicate a negative relationship between PICS and the Total score and the Acts with Awareness subscale of the FFMQ. These findings suggest that clients with higher self-reported drug use at intake enter with higher symptom distress and less awareness of their actions than those who score lower on the PICS. That no statistically significant differences exist at discharge suggests that the Shunda Creek treatment model is equally effective for all clients despite prior self-reported drug use.

A subset of the total sample made up of Shunda Creek alumni clients ($n = 69$) whom had acknowledged use of an opioid prior to in their intake PICS assessment (40.6%), did not differ in their treatment trajectories while at Shunda Creek *or* in follow-up from those who did not report prior opioid use. This is preliminary data and should be viewed with caution, but is encouraging that 1) self-report survey data from alumni clients were not considered to be a biased sample since clients who had and had not relapsed responded to inquiries. Had only those who had not relapsed responded, we might suspect it to be a biased sample and 2) the preliminary data indicates that Shunda Creeks treatment program is equally effective for opioid and non-opioid users. Further study of the alumni clients is ongoing.

One strength of this study is the fact that it is an exploratory study of components of a modern crisis (Vashishtha et al., 2017). This study was able to examine how self-reported drug use and treatment effectiveness interact. The importance of this finding, if subsequent alumni data results support these preliminary findings, is that OBH is a viable, evidenced based treatment option for SUD.

These findings support the need for programs that treat SUD, either directly or indirectly, to assess prior usage at intake, and use it in planning, treatment and tracking changes in clients through progress monitoring. This study found statistically significant correlations between high prior drug use and high OQ scores as well as a lack of awareness (mindfulness). We strongly advocate the use of the PICS or a similar prior drug use assessment instrument at intake. This data can be correlated with recognized outcome measures like the YOQ 2.0 or OQ-45.2 at various points in treatment to determine if OBH is equally effective with clients who report higher prior use of drugs to those who report less use.

This study also supports the use of OBH as a treatment program with a growing evidence base (Bettmann, Russell, & Parry, 2013; Bettmann, Tucker, Tracy, & Parry, 2014; Norton et al, 2014; Russell, 2001; Russell, Gillis, & Lewis, 2008). The field of OBH is a viable treatment option for SUD. Where research needs to focus now is how OBH treats and works with SUD. OBH programs historically have done a poor job of tracking prior drug use though clients enter OBH programs do have active drug use histories (Russell, 2008). This study adds to the growing body of knowledge that OBH will continue to be seen as effective, ethical, and empowering to clients.

SELF-REPORTED PRIOR DRUG USE

Limitations

One limitation of this study is that it is a one sample study with no comparison group. There was also missing data, some of which may be from absences due to home passes, while other missing data may be a result of program dropouts. There is no way of knowing how these missing individuals would have scored had they completed all the surveys.

Future study

Further research could be conducted to examine the relationships between specific drugs of choice for clients and treatment outcomes, or whether OBH is equally effective for those with high, medium, or low prior self-reported drug use. For instance, clients with similar PICS scores but different drugs of choice may show differences in OQ-45.2 and FFMQ scores throughout treatment. These differences were not found in the alumni subsample, but may exist in the larger sample. Future studies will examine if in fact OBH is equally effective. On a more immediate and practical level, such a study will help programs like Shunda Creek assess their clients more accurately at intake and tailor treatment programs to each individual based on drug of choice, if the evidence points in that direction.

Implications

Data indicates that treatment programs such as Shunda Creek are effective for a variety of substance use severities. Clients who begin the program with varying degrees of involvement with chemicals end the program in relatively the same condition as one another. This is supported by high PICS scores and high OQ-45.2 scores at intake that are positively correlated, as well as the lack of awareness clients with high PICS scores exhibit at intake. With the understanding that programs similar to Shunda Creek are able to provide effective treatment regardless of the severity of SUD, more programs can implement these mindfulness-based experiences to create more awareness in their clients. More so, utilizing progress monitoring will allow practitioners to tailor the treatment based on clients' needs at that particular time in treatment, no matter what initial diagnoses are found. Further research is encouraged to determine if different pre-treatment self-reported drug use reveals different treatment trajectories. Preliminary data presented indicates the trajectories are similar.

SELF-REPORTED PRIOR DRUG USE

References

- Back, S. E., Killeen, T., Badour, C., Flanagan, J., Korte, K., & Brady, K. T. (2016, November). Integrated treatment of PTSD and addiction in Veterans using prolonged exposure. In Annual Convention of the International Society for Traumatic Stress Studies, Dallas, TX, USA (pp. 10-12).
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27-45.
- Bettmann, J. E., Russell, K. C., & Parry, K. J. (2013). How substance abuse recovery skills, readiness to change and symptom reduction impact change processes in wilderness therapy participants. *Journal of Child and Family Studies*, 22(8), 1039-1050.
- Bettmann, J. E., Tucker, A. R., Tracy, J., & Parry, K. J. (2014). An exploration of gender, client history, and functioning in wilderness therapy participants. *Residential Treatment for Children & Youth*, 31(3), 155-170.
- Bøg, M., Filges, T., Brännström, L., Jørgensen, A. K., & Maja Kärrman Fredriksson. (2017). 12-step programs for reducing illicit drug use. *Campbell Systematic Reviews*, 13.
- Botzet, A. M., Winters, K. C., & Stinchfield, R. (2006). Gender differences in measuring adolescent drug abuse and related psychosocial factors. *Journal of Child & Adolescent Substance Abuse*, 16(1), 91-108.
- Boust, S. J., Kuhns, M. C., & Studer, L. (2005). Assertive community treatment. *The evidence-based practice: Methods, models and tools for mental health professionals*, 31-55.
- Bowen, S., Chawla, N., Collins, S. E., Witkiewitz, K., Hsu, S., Grow, J., Clifasef, S., Garner, M., Douglass, A., Larimer, M. E., & Marlatt, A. (2009). Mindfulness-based relapse prevention for substance use disorders: A pilot efficacy trial. *Substance Abuse*, 30(4), 295-305.
doi:10.1080/08897070903250084
- Dart, R. C., Surratt, H. L., Cicero, T. J., Parrino, M. W., Severtson, S. G., Bucher-Bartelson, B., & Green, J. L. (2015). Trends in opioid analgesic abuse and mortality in the United States. *New England Journal of Medicine*, 372(16), 1573-1574.
- Drake, R. E., Mercer-McFadden, C., Mueser, K. T., McHugo, G. J., & Bond, G. R. (1998). Review of integrated mental health and substance abuse treatment for patients with dual disorders. *Schizophrenia Bulletin*, 24(4), 589-608.

SELF-REPORTED PRIOR DRUG USE

- Drake, R. E., O'Neal, E. L., & Wallach, M. A. (2008). A systematic review of psychosocial research on psychosocial interventions for people with co-occurring severe mental and substance use disorders. *Journal of Substance Abuse Treatment, 34*(1), 123-138.
- Garland, E. L., Froeliger, B., & Howard, M. O. (2014a). Effects of mindfulness-oriented recovery enhancement on reward responsiveness and opioid cue-reactivity. *Psychopharmacology, 231*(16), 3229-3238. <http://dx.doi.org/10.1007/s00213-014-3504-7>
- Garland, E. L., Manusov, E. G., Froeliger, B., Kelly, A., Williams, J. M., & Howard, M. O. (2014b). Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of Consulting and Clinical Psychology, 82*(3), 448-459. <http://dx.doi.org/10.1037/a0035798>
- Gillis Jr., H. L. L., Kivlighan Jr., D. M., & Russell, K. C. (2016). Between-client and within-client engagement and outcome in a residential wilderness treatment group: An actor partner interdependence analysis. *Psychotherapy, 53*(4), 413.
- Henderson, C. E., Dakof, G. A., Schwartz, S. J., & Liddle, H. A. (2006). Family functioning, self-concept, and severity of adolescent externalizing problems. *Journal of Child and Family Studies, 15*(6), 719.
- Lambert, M. J., & Finch, A. E. (1999). The Outcome Questionnaire. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (pp. 831-869). Mahwah, NJ: Lawrence Erlbaum Associates.
- Lambert, M. J., Burlingame, G. M., Umphress, V., Hansen, N. B., Vermeersch, D. A., Clouse, G. C., & Yanchar, S. C. (1996). The reliability and validity of the Outcome Questionnaire. *Clinical & Psychological Psychotherapy, 3*, w 249-258.
- Liddle, H. A., Dakof, G. A., Turner, R. M., Henderson, C. E., & Greenbaum, P. E. (2008). Treating adolescent drug abuse: A randomized trial comparing multidimensional family therapy and cognitive behavior therapy. *Addiction, 103*(10), 1660-1670.
- Liebling, E. J., Yedinak, J. L., Green, T. C., Hadland, S. E., Clark, M. A., & Marshall, B. D. (2016). Access to substance use treatment among young adults who use prescription opioids non-medically. *Substance Abuse Treatment, Prevention, and Policy, 11*(1), 38.
- MacKenzie, K. R. (1983). The clinical application of a group climate measure. In R. R. Dies (Ed.), *Advances in group psychotherapy: Integrating research and practice* (pp. 159-170). Madison, CT: International Universities Press.

SELF-REPORTED PRIOR DRUG USE

- Mueser, K. T., Noordsy, D. L., Drake, R. E., Fox, L., & Barlow, D. H. (2003). *Integrated treatment for dual disorders: A guide to effective practice*. New York, NY: Guilford Press.
- Mueser, K. T., Yarnold, P. R., Rosenberg, S. D., Swett, C. J., Miles, K. M., & Hill, D. (2000). Substance use disorder in hospitalized severely mentally ill psychiatric patients: Prevalence, correlates, and subgroups. *Schizophrenia Bulletin*, 26(1), 179-192. doi:10.1093/oxfordjournals.schbul.a033438
- Najavits, L. M., & Weiss, R. D. (1994). Variations in therapist effectiveness in the treatment of patients with substance use disorders: An empirical review. *Addiction*, 89(6), 679- 688.
- Nathan, P. E., & Gorman, J. M. (2015). *A guide to treatments that work, 4th ed.* New York, NY: Oxford University Press.
- Norton, C., Tucker, A., Russell, K. C., Bettmann, J. E., Gass, M. A., Gillis, H., & Behrens, E. (2014). Adventure therapy with youth. *Journal of Experiential Education*, 37(1), 46-59. doi:10.1177/1053825913518895
- OBH Council (n.d.). *About us*. Retrieved from <https://obhcouncil.com/about/>
- Padwa, H., Larkins, S., Crevecoeur-MacPhail, D. A., & Grella, C. E. (2013). Dual diagnosis capability in mental health and substance use disorder treatment programs. *Journal of Dual Diagnosis*, 9(2), 179-186.
- Paulozzi, L. J., & Xi, Y. (2008). Recent changes in drug poisoning mortality in the United States by urban–rural status and by drug type. *Pharmacoepidemiology and Drug Safety*, 17(10), 997-1005.
- Roberts, S. D., Stroud, D., Hoag, M. J., & Massey, K. E. (2017). Outdoor behavioral health care: A longitudinal assessment of young adult outcomes. *Journal of Counseling and Development*, 95(1), 45-55. doi:10.1002/jcad.12116
- Rowe, C. L., Liddle, H. A., Greenbaum, P. E., & Henderson, C. E. (2004). Impact of psychiatric comorbidity on treatment of adolescent drug abusers. *Journal of Substance Abuse Treatment*, 26(2), 129-140.
- Russell, K. C. (2001). What is wilderness therapy? *Journal of Experiential Education*, 24(2), 70-79.
- Russell, K. C. (2008). Adolescent substance-use treatment: Service delivery, research on effectiveness, and emerging treatment alternatives. *Journal of Groups in Addiction & Recovery*, 2(2-4), 68-96.

SELF-REPORTED PRIOR DRUG USE

- Russell, K. C., Gillis, H. L., & Heppner, W. (2015). An examination of mindfulness-based experiences through adventure in substance use disorder treatment for young adult males: A pilot study. *Mindfulness*, 7(2), 320-328.
- Russell, K., Gillis, H. L., & Lewis, T. G. (2008). A five-year follow-up of a survey of North American outdoor behavioral healthcare programs. *Journal of Experiential Education*, 31(1), 55-77.
- Substance Abuse and Mental Health Administration (n.d.). *Mental and Substance Use Disorders*. Retrieved from <https://www.samhsa.gov/disorders>
- Unick, G. J., Rosenblum, D., Mars, S., & Ciccarone, D. (2013). Intertwined epidemics: National demographic trends in hospitalizations for heroin-and opioid-related overdoses, 1993–2009. *PloS One*, 8(2), e54496.
- Vashishtha, D., Mittal, M. L., & Werb, D. (2017). The North American opioid epidemic: current challenges and a call for treatment as prevention. *Harm Reduction Journal*, 14(1), 7.
- Weiss, R. D., Griffin, M. L., Kolodziej, M. E., Greenfield, S. F., Najavits, L. M., Daley, D. C., Doreau, H.R. & Hennen, J. A. (2007). A randomized trial of integrated group therapy versus group drug counseling for patients with bipolar disorder and substance dependence. *American Journal of Psychiatry*, 164(1), 100-107.
- Winters, K. C., & Henley, G. A. (1989). *Personal experience inventory and manual*. Los Angeles, CA: Western Psychological Services.
- Zhou, X., Qin, B., Giovane, C. D., Pan, J., Gentile, S., Liu, Y., ... & Xie, P. (2015). Efficacy and tolerability of antidepressants in the treatment of adolescents and young adults with depression and substance use disorders: A systematic review and meta-analysis. *Addiction*, 110(1), 38-48.