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Predicting Attrition in the Treatment of Substance Use Disorders

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Abstract

Objective: The purpose of this study was to examine the problem of attrition in the treatment of substance use disorders. The authors analyzed the retention rates of 191 participants who were assigned to an episode of substance abuse treatment. Two types of attrition, the first due to participants withdrawing prematurely from treatment and the second due to participants failing to complete a posttest survey, were investigated. Relationships were found between severity of the substance use disorder and a tendency to withdraw prematurely from treatment. Though the study is far from perfect, the authors strongly believe that it confirms the importance of a rigorous alliance between therapist and client, especially for those likely to disengage early.

Method: Participants provided a self-report assessment of their substance use patterns on a pretest survey, and also received a clinical assessment of psychosocial functioning. The scores from these two instruments were used to calculate an index quantifying the severity of substance use disorders. When scale data began to suggest that the severity of the disorder correlated with retention rates, the authors conducted more complex statistical analyses to determine which elements of the participants' profile were most likely to predict attrition.

Results: A significant finding of the study is that attrition can be predicted with some certainty. When the probability of premature disengagement is predicted, decisions can be made to direct participants to supportive environments that foster therapeutic alliance and increase readiness for treatment. In spite of being a reliable predictor of attrition, however, these variables explained only about 27% of variance in therapy outcomes.

Conclusion: Recommendations for future research are made, including the need to highlight the importance of contextual factors, such as therapeutic alliance and motivational interviewing, on client retention. Future research could identify new predictors, and raise questions about others. Prospective studies should be theory-driven, should utilize measures of known reliability and validity, and should employ statistical methods appropriate to the hypothesis or theory under investigation.

Keywords: Substance abuse treatment; Substance use disorder; Retention; Attrition; Alcoholism; Drugs; Therapeutic alliance; Motivational interviewing

Introduction

One of the notions of substance abuse treatment is that people must hit "rock bottom" before they are ready for recovery. So pervasive is the notion that, sometimes when people fail to achieve total abstinence from substances during treatment, they are told to leave and come back when they are "ready." Although therapists would not expel an anxious client from treatment for having a panic attack, or a depressed client for being sad, proponents of the rock bottom theory may be quick to assume that clients who relapse in substance abuse treatment need to hit rock bottom before they can begin to recover.

Another variation of this notion is that people who have hit rock bottom have nowhere to go but up, so they are more likely to show improvement simply by regression to the mean. But although these views may have some conventional wisdom to support them, the research is mixed as to whether they are valid [1]. At this point, it is unclear that the data support either side of this debate.

There are relevant questions, however, that revolve around the issue of attrition. For example, are those with very severe substance use disorders more or less likely to complete treatment? Conventional wisdom would suggest that clients with a severe substance use disorder are highly motivated to complete treatment and gain mastery over the issues that brought them to treatment. But is this a valid assumption?

Although the vexing problem of attrition is a concern for all professionals working in the mental health arena, the highest attrition rates have been reported in substance abuse treatment programs, meaning that those with a substance abuse problem are more likely to disengage prematurely from treatment than those with other psychosocial problems [2]. For the purpose of this study, the problem of attrition was examined with two basic questions in mind. Can attrition be predicted, and can a strategy be devised for addressing it in such a way that those likely to withdraw prematurely from treatment are motivated to remain in treatment for the duration?

Before examining the subject of attrition, therapists might consider that there are two well-known models of therapy associated with improved rates of retention due to their attention to contextual factors of treatment. Therapeutic alliance and motivational interviewing have been shown to be powerful deterrents to client attrition [3].

Therapeutic alliance

The literature discusses the impact of contextual factors, such as therapeutic alliance, upon retention. In fact, some advocates of the model would go so far as to say that therapeutic alliance *is* the treatment program. To clarify, therapeutic alliance refers to the collaborative aspect

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of the relationship between therapist and client within the context of treatment [4]. Without a robust working relationship between therapist and client, substantial progress toward treatment goals is unlikely. The concept of therapeutic alliance encompasses three primary components: (1) an agreement between therapist and client about the goals to be accomplished through treatment, (2) an agreement about the therapy tasks and objectives needed to accomplish those goals, and (3) an emotional bond between therapist and client that permits the client to make therapeutic progress.

An important finding that has emerged from a considerable number of studies is that positive alliance formed early in treatment seems to predict ultimate therapeutic success across a spectrum of clinical issues and treatment modalities [5]. This is significant because many clients with a substance use disorder report unsatisfactory relationships within their social environment, and a history of poor social and family relationships. Therefore, it would follow that positive therapeutic alliance would be critical to success with substance use disorder clients. Additional challenges to forming positive alliance may arise because many clients with a substance use disorder are likely to deny the problem, show hostility toward the therapist, do not want to be in treatment, and present with a history of treatment failures.

In one meta-analytic review, Martin, Garske, and Davis [6] reported that although the correlation between therapeutic alliance and treatment outcomes is positive and moderate, the effect is consistent regardless of the variables posited to influence it. Moreover, the correlation between therapeutic alliance and treatment outcomes does not appear to be influenced by other variables, such as the type of outcome measure used in the study, the type of outcome rater, the time of alliance assessment, the type of alliance rater, the type of treatment provided, or the publication status of the study.

Meier, Donmall, Barrowclough, McElduff, and Heller [7] asserted that clients in substance abuse treatment reporting weak therapeutic alliance tend to withdraw from treatment significantly sooner than those reporting strong alliance. This effect was demonstrated despite confounding factors such as psychological well-being, treatment motivation and readiness, coping strategies, and attachment style. According to De Leon [8], retention predicts outcomes, and the stronger the therapeutic alliance, the better the retention in treatment. Therefore, it could be said that attending to therapeutic alliance can help reduce the risk of premature treatment disengagement.

Motivational interviewing

The importance of therapeutic alliance for predicting clinical outcomes is well documented in the literature. What is less known are the specific processes that contribute to a robust collaborative relationship [9]. Not long ago, Carroll et al. [10] demonstrated that the motivational interviewing model of cognitive-behavioral therapy in the treatment of substance use disorders is correlated with significantly better retention rates than comparable interventions, possibly due to the method's proficiency at fostering social support, secure attachment, and a sense of psychological well-being. It is noted that these elements are closely associated with therapeutic alliance. This finding was supported by Moos [11] who reported that motivational interviewing is positively correlated with the common components of effective treatment such as social support, goal direction, self-efficacy, and coping skills, or what he calls the "active ingredients" of rewards that possibly might compete with the conventional desired effects of substance use. Aside from its connection to therapeutic alliance, motivational interviewing has been shown to contribute to treatment efficacy by influencing client participation and certain therapy delivery mechanisms [12], and to increase client engagement in treatment [13].

Miller and Rollnick [14] defined motivational interviewing as a cognitive-behavioral interviewing style with the goal of resolving conflicts between the advantages and disadvantages of behavior change, thereby increasing the motivation to achieve positive change. A meta-analysis of 30 clinical trials of motivational interviewing found that it is more effective than no treatment, and as effective as other common substance abuse treatments [15].

Marlatt and Witkiewitz [16] also proposed that motivational interviewing is a key component in predicting behavior change, especially in the treatment of substance use disorders. Motivation may relate to substance abuse treatment in two distinct ways--motivation for positive behavior change and motivation to engage in problematic behaviors. Marlatt and Witkiewitz define motivation as "the conscious or unconscious stimulus for action towards a desired goal" or "that which gives purpose or direction to behavior" (p. 12). Thus, in terms of substance abuse treatment, motivation could be defined as the stimulus for action toward abstinence from, or reduced use of, substances (first type of motivation), or the stimulus for engaging in substance use (second type of motivation).

Relevant data from Project MATCH [17] indicate that therapeutic interventions containing motivational elements are effective in reducing alcohol use, alcohol-related problems, and health consequences of alcoholism. These measures yield similar outcomes even when compared with longer, more intensive alternative approaches. Similarly, Allen [18] affirms that a robust therapeutic alliance enhances the therapy experience by providing greater flexibility, negotiation, and motivation enhancement. The narratives around therapeutic alliance support the premise that the "why" of therapy is as important as the "what," and that through helping activities such as motivational interviewing, clients feel understood, and see these activities as useful. This type of collaboration seems to help the client and therapist feel connected, and to work together toward a common goal.

In summary, it appears that therapeutic alliance increases retention, not by whether or not the client likes the therapist, but by whether or not the therapeutic relationship motivates the client to achieve treatment goals. The strength of the relationship creates an emotional bond that conveys the therapist's optimism and motivation for solving problems, thereby helping the client feel confident about engaging tasks that are needed for recovery. It seems, therefore, that alliance, motivation, and retention are intertwined.

Hypothesis and research question

The present study hypothesizes that intake devices might be useful for predicting attrition patterns vis-à-vis clients who disengage prematurely from treatment. Rephrased succinctly, "Will logistic regression analysis predict attrition patterns for clients in substance abuse treatment?" If attrition patterns are predicted, and intake devices predicting attrition are identified, then treatment strategies increasing retention and improving outcomes can be developed as well.

Method

Participants

A convenience sample of 191 adults, 155 males and 36 females ranging in age from 19 to 63 with a mean age of 37 and median age of 35, agreed to participate in an outcome study conducted at a community mental health center on the outskirts of a major United

States city. Participants in the study had been referred to substance abuse treatment at the center by family members, physicians, schools, legal sources, employers, or via self-referral, though it should be noted that the majority of participants were court-mandated to treatment. Participants came from a wide variety of backgrounds, and were representative of the communities from which they were referred. The center was equipped to provide outpatient and inpatient substance abuse treatment, psychiatric services, and 24-hour access to emergency services, as well as a wide variety of consultation and education programs.

Traditionally, males have comprised a greater proportion of the substance abuse population, and this study was no exception as males constituted 81% of the sample. In general, men are more than five times as likely to have an alcohol problem, and two or three times as likely to have a drug problem as women [19]. The proportion of males in this study, therefore, was judged to be consistent with the population of interest.

Participants in the study met with a qualified therapist to receive the same 90 minute clinical assessment that all individuals seeking services at the center receive to determine their need, if any, for substance abuse treatment. The need for such treatment was appraised using diagnostic criteria developed by the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) [20] defining a substance use disorder as a problematic pattern of substance use leading to clinically significant impairment or distress.

The study received university Institutional Review Board (IRB) approval ensuring that ethical guidelines for research with human participants were followed. Researchers and therapists alike adhered to clinical procedures for acquiring informed consent and protecting confidentiality. No incentives of any kind were offered other than the satisfaction of knowing that participation in the research could contribute to a better understanding of substance abuse treatment.

Instruments

How researchers and practitioners measure substance use patterns can have a profound impact on the results of any study. Throughout the United States and around the world, various treatment agencies employ sundry intake devices to determine the severity of substance use patterns and related problems from both a recent and lifetime perspective. Some of the more commonly used measures include the Addiction Severity Index (ASI) from National Institutes of Health (NIH), Substance Abuse Subtle Screening Inventory (SASSI) from Multi-Health Systems (MHS), and the Simple Screening Instrument for Alcohol and Other Drugs (SSI-AOD) from the Center for Substance Abuse Treatment (CSAT).

As previously mentioned, participants were assessed by a qualified therapist and were screened for presenting problems, physical and mental health status, risk behaviors, substance use disorders, and medication management issues. To increase confidence in the accuracy of the screening, participants received both a clinical assessment of psychosocial functioning as measured by an instrument created by the Praed Foundation [21] and known as the Adult Needs and Strengths Assessment, as well as a self-report assessment known as the Simple Screening Instrument for Alcohol and Other Drugs [22].

Adult Needs and Strengths Assessment (ANSA)

Participants received an Adult Needs and Strengths Assessment which is based upon an in-depth clinical interview using a scoring system to support decision-making with respect to level of care and service planning. The ANSA has demonstrated good reliability and validity, and uses a clinical algorithm that determines an ordered Level of Need (LON) ranging from one to five, with one indicating less severe and five more severe psychosocial problems. These scores can change during treatment, and participants received an ANSA reassessment at least once every six months during the course of treatment, as well as a termination assessment upon completion of treatment. According to the Praed Foundation, the reliability index of the ANSA is 0.75 with vignettes, 0.86 with case records, and above 0.90 with clinical cases.

Construct validity has been demonstrated by analyzing the relationship between ANSA scores and level of care decisions made by case managers and others with regard to symptoms, risk behaviors, and functioning. For example, Nelson and Johnston [23] examined ANSA scores for a group of 272 participants over a two-year period to evaluate whether the scoring system was useful in predicting clinical placement for psychiatric treatment. Analyses showed that 85.9% of original LON placements were classified correctly, supporting the supposition that the ANSA scoring system is a valid and reliable tool for decision-making with regard to level of care and service planning.

Over and above the LON score of the ANSA, it was noted that three additional domains of the ANSA hold special interest due to the potential direct and indirect impact of these domains on attrition, namely substance use disorders, criminal behavior, and community connection. The ANSA operationally defines substance use as the use of alcohol and other drugs, the misuse of prescription medications, and the inhalation of any substance. Criminal behavior is defined operationally as behavior and status offenses that may result from failing to follow required behavioral standards. And the operational definition of community connection encompasses involvement in the cultural aspects of life in the community. The scores from these three domains not only contributed to participants' overall ANSA LON appraisal, but were selected in the research for regression analyses.

Simple Screening Instrument for Alcohol and Other Drugs

In addition to the ANSA *clinical assessment*, substance use patterns were measured using a *self-report survey* known as the Simple Screening Instrument for Alcohol and Other Drugs (SSI-AOD) as developed by the Center for Substance Abuse Treatment of the Substance Abuse and Mental Health Services Administration (SAMHSA) (see Appendix A). The SSI-AOD contains 16 dichotomous questions designed to screen for substance abuse problems occurring within the past six months. The SSI-AOD is in the public domain and for years has been a reliable tool for screening and assessment. Kills-Small, Simons, and Stricherz [24] evaluated the criterion validity of the SSI-AOD and found that the instrument correctly classified approximately 70% of the participants while demonstrating moderate to strong correlations with substance frequency, consumption, and problem indices.

For the purposes of this study, the instrument was modified to include only seven questions derived from the DSM-IV-TR criteria for diagnosing a substance use disorder. Although there is no known precedent for doing so, some questions were excluded from the original instrument because they were thought to be self-evident (i.e., have you gone to anyone for help because of your drinking or drug use?), beyond the scope of treatment (i.e., have you had any health problems?), or unrelated to the DSM-IV-TR criteria (i.e., have any of your family members ever had a drinking or drug problem?).

Procedures

In the treatment setting for this sample, multiple decisions are

made to determine what treatment modalities clients will receive based on their ANSA LON scores. Clients who received an LON score of one, two, or three were referred to an outpatient treatment program equipped to treat less severe substance use disorders. Those assessed with an LON score of four or five, as well as those unable or unwilling to maintain abstinence from substances during treatment, were referred to an intensive outpatient treatment program equipped to treat more severe substance use disorders. Others determined to be appropriate for an inpatient option, most often because they continued to remain unable or unwilling to maintain abstinence from substances, were referred to a residential treatment program equipped to treat the most severe substance use disorders.

All clients were screened at intake for co-occurring mental disorders. Those diagnosed with co-occurring disorders, as well as those deemed as likely to benefit from pharmacotherapy, were referred for psychiatric assessment and medical management to augment their treatment regime. Participants in all modalities were expected to maintain abstinence from substances during treatment as evidenced per self-report, and by random drug and alcohol screens.

When participants began treatment, they were invited to complete a battery-style pretest survey that asked seven dichotomous questions concerning the past six months. The questions were adapted from the SSI-AOD, and were designed to create a snapshot evaluation such that any change from a positive response to a negative response indicated improvement. Spanish translation was available. The questions were as follows:

During the past six months. . .

- Have you used alcohol or other drugs?
- Have you been unsuccessful in trying to cut down or quit drinking or using drugs?
- Has drinking or other drug use caused problems between you and your family or friends?
- Have you been arrested or had other legal problems?
- Have you lost your temper or gotten into arguments or fights while drinking or using other drugs?
- Do you spend a lot of time thinking about or trying to get alcohol or other drugs?
- Do you feel bad or guilty about your drinking or other drug problem?

Scores from the adapted SSI-AOD were cross-referenced with ANSA LON scores, and were used not only to inform placement decisions, but also to assess changes in the severity of substance use patterns over the course of treatment. Within the first 90 days subsequent to discharge, an attempt was made by a team of psychology interns and therapists to contact participants. Those participants who stayed through the duration of their scheduled treatment episode and were available to be contacted following discharge were invited to complete a posttest battery with the same seven questions as were asked on the pretest. As with other interventions, some attrition was expected.

Analysis

Tests for internal consistency reliability using Cronbach's alpha yielded a reliability coefficient of 0.75 on the adapted SSI-AOD pretest. Substance use patterns, ANSA scores, age ranges, and education categories were converted into scale data, with differences measured according to indices created for those data (see Appendix B).

Results

Of the 191 participants consenting to engage the study, 139 completed the treatment program while 52 did not complete the episode of treatment proposed by their therapists (see Table 1). Fifteen participants were unavailable for the posttest because their phone numbers were incorrect, their answering service was not functioning, or they did not return phone calls (see Table 2). One participant reportedly was incarcerated following treatment, and another had died.

Table 3 indicates that the group comprised of participants disengaging prematurely from treatment did not differ statistically in terms of age or education from those who completed treatment. However, those who withdrew did have more severe pretest substance abuse and psychosocial problems than those who completed treatment. This difference was seen in higher pretest scores on the adapted SSI-AOD survey for participants who withdrew (M = 4.15) versus those who completed (M = 3.12). This also was seen in higher ANSA LON pretest scores for those who withdrew from treatment (M = 3.17) versus those who completed treatment (M = 2.83).

Demographic	*n*	%
Race		
European American	23	44
African American	15	29
Hispanic	14	27
Marital Status		
Not married/never married	41	79
Married/living together Divorced/separated/widowed	4 7	8 14
Occupation		
Employed	13	25
Unemployed	39	75

Note: N = 52

Table 1: Descriptive statistics of participants who did not complete treatment.

Demographic	*n*	%
Race		
European American	2	13
African American	8	53
Hispanic	5	33
Marital Status		
Not married/never married	10	67
Married/living together	4	27
Divorced/separated/widowed	1	7
Occupation		
Employed	6	40
Unemployed	9	60

Note: N = 15

Table 2: Descriptive statistics of participants unavailable for posttest.

Measure	Withdrawing (Std. deviation)	Completing (Std. deviation)	*p*-value
Age	2.62 (1.03)	2.73 (1.29)	< 0.05
Education	2.94 (0.87)	3.05 (0.78)	< 0.05
Positive responses to SSI-AOD questions	4.15 (2.06)	3.12 (1.92)	< 0.05
ANSA Level of Need assessment	3.17 (0.83)	2.83 (0.99)	< 0.05

Note: N = 52 withdrawing from treatment, N = 124 completing treatment.

Table 3: Independent sample t-tests of those withdrawing from treatment versus those completing treatment.

In light of the results from the examination of the attrition group, an analysis was conducted to investigate the group of participants unavailable for the posttest. Table 4 indicates that those unavailable for the posttest did not differ statistically in terms of age or education from those available for the posttest. However, those unavailable for the posttest did have less severe pretest substance abuse and psychosocial problems. This difference was seen in lower scores on the adapted SSI-AOD survey for participants unavailable for the posttest (M = 2.73) versus those who were available (M = 3.12). This also was seen in lower ANSA LON scores for those unavailable for the posttest (M = 2.20) versus those available for the posttest (M = 2.83).

The research began to provide insight on the ability to predict attrition by building a bridge between participants' responses to the adapted SSI-AOD pretest survey questions coupled with their ANSA clinical assessment scores, toward a profile of those likely to withdraw from treatment. The adapted SSI-AOD pretest scores and ANSA scores were selected because a significant statistical difference was observed between those who completed treatment and those who withdrew prematurely.

It was expected that more severe pretest substance abuse and psychosocial problems would give participants greater motivation to complete treatment and resolve such problems because of the "rock bottom" principle suggesting that sometimes people have hit bottom with nowhere to go but up. However, this expectation was not supported by research data showing that those with more severe problems actually were less likely to complete treatment. When the data began to suggest a correlation between severity of the substance use disorder and retention, complex analyses were performed to ascertain which elements of a participant's profile were most likely to predict attrition.

Table 5 indicates that a binary logistic regression analysis was conducted to investigate whether age, sex, education, scores on the adapted SSI-AOD survey, scores on the ANSA Level of Need assessment, Substance Use Disorder assessment scores, Criminal Behavior assessment scores, or Community Connection assessment scores significantly predicted attrition. A logistic regression was chosen in order to fulfill the general purpose of predicting a binary dependent or criterion variable from several predictor and control variables. To measure the percentage of variance within the dependent variable (attrition) that could be explained by the predictors (age, sex, education, the adapted SSI-AOD survey, the ANSA Level of Need assessment, Substance Use Disorder assessment, Criminal Behavior assessment, Community Connection assessment), a model summary was created revealing that the predictors explained 27% of the variance of the dependent variable (Nagelkerke R Square = 0.27). This means that the potential may exist to discover much more about the explanation for attrition by examining contextual factors within the therapeutic process.

However, when all eight aforementioned predictor variables were included in the model, scores on the adapted SSI-AOD survey and scores on the Substance Use Disorder clinical assessment were found to be significant predictors of attrition. Moreover, the power to predict attrition grew substantially when the Community Connection assessment of the ANSA was added to the model. The interpretation of this analysis could be that, because of time limitations during intake, the assessment process could be streamlined by relying primarily on SSI-AOD survey scores and scores on the Substance Use Disorder and Community Connection domains of the ANSA to predict attrition.

Measure	Unavailable (Std. deviation)	Available (Std. deviation)	*p*-value
Age	3.00 (1.20)	2.73 (1.29)	< 0.05
Education	2.87 (0.74)	3.05 (0.78)	< 0.05
Positive responses to SSI-AOD questions	2.73 (1.87)	3.12 (1.92)	< 0.05
ANSA Level of Need assessment	2.20 (1.08)	2.83 (0.99)	< 0.05

Note: N = 15 unavailable for posttest, N = 124 available for posttest.

Table 4: Independent sample t-tests of those unavailable for posttest versus those available.

Variable	*B*	*SE*	*df*	*p*
Age	-0.184	0.161	1	0.253
Sex	0.454	0.450	1	0.313
Education	0.076	0.235	1	0.748
SSI-AOD survey	0.277	0.100	1	0.005
ANSA Level of need	-0.042	0.252	1	0.869
ANSA Substance use disorder	1.558	0.497	1	0.002
ANSA Criminal behavior	0.133	0.267	1	0.617
ANSA Community connection	0.555	0.205	1	0.007

Note: N = 191, B = Beta, SE = Standard Error, df = Degrees of Freedom, p = Significance

Table 5: Predictors of attrition.

Discussion

As was noted earlier, of the 191 participants in the study, 139 completed the treatment program while 52 did not. This 27% attrition rate is comparable to the 25.4% rate reported in the literature [25]. The attrition rate in this study may have been elevated slightly, in part, because one therapist in the program took an extended medical leave of absence, causing some clients to seek services elsewhere.

The results of the analyses are important because treating a substance use disorder often can be discouraging and frustrating. Published clinical evidence makes it luminously clear that relapse is the rule rather than the exception, and that many clients disengage prior to completing treatment. So why bother? One answer is that when efficacious treatment is provided under the right circumstances, treatment can lead to dramatic recovery. As imperfect as existing treatment programs are, the literature demonstrates that when clients are offered an effective approach to substance abuse treatment, attrition can be reduced. One important implication of the regression analysis is that it is possible to predict attrition when clients begin treatment with more severe substance use and psychosocial problems. The binary logistic regression analysis found that, counter to conventional wisdom surmising that people with more severe problems will be highly motivated to engage therapy and address those problems, such individuals were found to be less apt to embrace a full episode of treatment.

Although the data unveiled this exigent possibility, the research offered some hope by suggesting that an attempt might be made to reduce attrition by placing these individuals in a more supportive environment. For example, decisions could be made to direct participants who are likely to disengage prematurely from treatment into modalities that are known to foster strong therapeutic alliance, or to provide assistance for those who are likely to disengage to increase their level of community connection. Another way of looking at these results is that those who are not yet ready for substance abuse treatment can be identified with some certainty, and strategies can be devised to increase their readiness, such as starting with motivational interviewing techniques. Furthermore, the SSI-AOD, as well as the Substance Use Disorder and Community Connection domains of the ANSA, should

be given prominence as they appear to identify the most salient threats to retention.

Limitations and Future Research

Though the focus of the study was to examine predictors of attrition, the absence of a no-treatment comparison group limits the methodological claims that can be made from this study. For example, the lack of a comparison group may overstate attrition that occurs naturally since participants entering substance abuse treatment may improve without intervention. Therefore, simply through regression to the mean, some participants may improve such that they no longer need treatment.

Even more seriously, attrition may produce an effect whereby treatment outcomes are elevated. This may occur because participants highly motivated to complete treatment also are motivated to maintain abstinence from substances, which may explain why the current analyses on attrition showed that those who did not complete treatment reported more severe substance abuse and psychosocial problems.

The low occurrence of marriage and the high occurrence of unemployment among participants may suggest that lack of social support or lack of meaningful employment plays a significant role in creating patterns of attrition. This is consistent with what the literature reveals [26]. It is worth noting that those unavailable for the posttest reported less severe substance abuse and psychosocial problems. In addition, relapses and co-occurring disorders may have been confounding factors in this study. Future research should seek to understand what correlation, if any, exists among these variables.

Adapting the SSI-AOD comparison instrument reduces the precision of the analysis and restricts the arguments made by this study. In addition, it would be interesting to know if the modality of treatment provided (outpatient, intensive outpatient, residential) had any impact on the post-measure data. Unfortunately, there were not enough cases in the study to explore this variable. It is hoped that future research will provide a richer understanding of the processes and outcomes of treatment, and will produce some important themes for how treatment efficacy can be enhanced by attending to contextual factors.

Conclusions and Recommendations

The data presented within this paper should not be interpreted simplistically as suggesting that one approach to service provision is better than another. It does suggest, however, that there is logic to the premise that individuals experiencing problematic forms of substance use are likely to benefit from a multifaceted approach to treatment that takes into account a range of severity with regard to substance use patterns.

If therapists are searching for approaches to substance abuse treatment that can reduce attrition, they may want to consider the importance of therapeutic alliance and motivational interviewing. These elements are associated with improved retention rates, and may provide the foundation for strengthening a bond component that will encourage clients to remain in treatment for the duration. And if therapists need a quick-reference guide for clinical placement, the SSI-AOD and the Substance Use Disorder domain of the ANSA seem to be the most precise forecasters of client readiness.

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Appendix A

Simple Screening Instrument for AOD Abuse
Self-Administered Form

Directions: The questions that follow are about your use of alcohol and other drugs. Your answers will be kept private. Mark the response that best fits for you. Answer the questions in terms of your experiences in the past six months.

During the last six months. . .

1. Have you used alcohol or other drugs? (such as wine, hard liquor, pot, coke, heroin or other opiates, uppers, downers, hallucinogens, or inhalants)
___ Yes ___ No

2. Have you felt that you use too much alcohol or other drugs?
___ Yes ___ No

3. Have you tried to cut down or quit drinking or using drugs?
___ Yes ___ No

4. Have you gone to anyone for help because of your drinking or drug use? (such as Alcoholics Anonymous, Narcotics Anonymous, Cocaine Anonymous, counselors, or a treatment program)
___ Yes ___ No

5. Have you had any health problems? For example, have you:
___ Had blackouts or other periods of memory loss?
___ Injured your head after drinking or using drugs?
___ Had convulsions, delirium tremens ("DTs")?
___ Had hepatitis or other liver problems?
___ Felt sick, shaky, or depressed when you stopped?
___ Felt "coke bugs" or a crawling feeling under the skin after you stopped using drugs?
___ Been injured after drinking or using?
___ Used needles to shoot drugs?
Check "yes" if at least one of the eight items above is checked.
___ Yes ___ No

6. Has drinking or other drug use caused problems between you and your family or friends?
___ Yes ___ No

7. Has your drinking or other drug use caused problems at school or at work?
___ Yes ___ No

8. Have you been arrested or had other legal problems? (such as bouncing bad checks, driving while intoxicated, theft, or drug possession)
___ Yes ___ No

9. Have you lost your temper or gotten into arguments or fights while drinking or using other drugs?
___ Yes ___ No

10. Are you needing to drink or use drugs more and more to get the effect you want?
___ Yes ___ No

11. Do you spend a lot of time thinking about or trying to get alcohol or other drugs?
___ Yes ___ No

12. When drinking or using drugs, are you more likely to do something you wouldn't normally do, such as break rules, break the law, sell things that are important to you, or have unprotected sex with someone?
___ Yes ___ No

13. Do you feel bad or guilty about your drinking or drug use?
___ Yes ___ No

The next questions are about lifetime experiences. . .

14. Have you ever had a drinking or other drug problem?
___ Yes ___ No

15. Have any of your family members ever had a drinking or drug problem?
___ Yes ___ No

16. Do you feel that you have a drinking or drug problem now?
___ Yes ___ No

Score	**Degree of Risk for AOD Abuse**
0-1	**None to low**
0-2	**Minimal**
≥ 4	**Moderate to high**

Appendix B

Scale Data Indices

SEX:	
Male	1
Female	2
RACE/ETHNICITY:	
Black/African American	1
White/European American	2
Hispanic/Latino/Latina	3
Native American	4
Asian/Asian American	5
Pacific Islander	6
Other	7
AGE:	
18 - 24	1
25 - 34	2
35 - 44	3
45 - 54	4
55 - 64	5
65+	6
MARITAL STATUS:	
Not married/never married	1
Married/living together	2
Divorced/separated/widowed	3
EDUCATION:	
Elementary (0 to 8 years)	1
Some high school (1 to 3 years)	2
High school graduate (4 years)	3
Some college (1 to 3 years)	4
College graduate (4 years or more)	5
OCCUPATION:	
Production worker	1
Professional specialty	2
Sales	3
Service industry	4
Technical	5
Transportation or material moving	6
Law enforcement	7
Military	8
Entertainment	9
Other	10
None	11
SURVEY QUESTIONS:	
Yes	1
No	2
ANSA LEVEL OF NEED:	
Mild	1
Moderate	2
Moderately severe	3
Severe	4
Profound	5
ATTRITION:	
Completed treatment	1
Did not complete treatment	2
Unable to contact	3