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Involvement in 12-step Activities and Treatment Outcomes

S. E. Zemore, M. Subbaraman, and J. S. Tonigan

Abstract

Background—This study addresses the relative importance of specific 12-step activities to recovery, and how treatment affects participation in those activities.

Method—Data were from a clinical trial testing a 12-step facilitation intervention called MAAEZ. Participants (N=508) were recruited at treatment entry. Analyses examined 8 activities measured at baseline, 7 weeks, 6 months, and 12 months.

Results—In simultaneous equations, meeting attendance and having a sponsor were the only strong and consistent predictors of abstinence across time points, though other activities (i.e., use of a home group, befriending members, service work, and reading the literature) were significant in some analyses. Treatment involvement had mixed effects on activity participation over time.

Conclusions—Contradicting research suggesting that meeting attendance contributes little beyond other 12-step activities, results highlight the importance of consistent meeting attendance and sponsorship in recovery. Results suggest a need for enhanced facilitation of key activities even in typical 12-step-oriented treatment.

Introduction

Just as there is value to understanding the mechanisms of action associated with treatment benefits, there is value to identifying the active elements of 12-step involvement. Discriminating those activities most strongly related to better outcomes can deepen our understanding of recovery and help providers assist clients in making use of the available mutual help groups. Likewise, providers have a need to know how involvement in standard substance abuse treatment affects clients' participation in 12-step activities. Although many 12-step-oriented programs aim to facilitate 12-step involvement, it is not clear whether and how much their efforts translate into participation in the activities that matter most. Accordingly, the current paper examines relationships between participation in specific 12-step activities and both substance use outcomes and involvement in formal treatment.

Prior Research on Involvement in Specific 12-step Activities

Members of 12-step groups participate in those groups in various ways. In addition to attending meetings, they may have a sponsor, sponsor others, interact outside of meetings, do service (e.g., assist at meetings and help other members), read the literature, complete the Steps, and so on. By now, it has been recognized that measures capturing these other dimensions of involvement are generally superior as predictors of outcomes to measures of meeting attendance alone. In fact, several studies, all conducted on treatment samples, have shown that meeting attendance *per se* is unrelated to substance use outcomes when also accounting for composite involvement along these other dimensions¹⁻³. Still, this work is somewhat difficult to interpret because the composite measures examined have typically

included constructs that are not strictly activities, such as considering oneself a member and having had a “spiritual awakening.”

Meanwhile, little work has addressed how engagement in specific 12-step activities relates to substance use outcomes. Nevertheless, a handful of studies now show associations between better treatment outcomes and both use of a sponsor⁴⁻⁸ and sponsoring^{9,10}. Additionally, two studies have examined a combined sponsoring/service variable. The first showed associations between the combined variable and better alcohol-related outcomes using Project MATCH data¹¹, while the second found that the same variable predicted longer sobriety in a community sample of recovering alcoholics¹². Finally, some studies have examined Step work, but with mixed and ambiguous results. For example, sampling ex-inpatients, Gilbert et al.¹³ examined a new scale assessing agreement with AA’s first 3 Steps, and found that associations with substance use outcomes varied substantially by time point, Step subscale, and dependent variable. Studying outpatients, Brown et al.¹⁴ found mostly null associations with substance use outcomes for the Brown-Peterson Recovery Progress Inventory¹⁵, though conclusions are limited by the fact that the BPRPI includes many items not directly related to the Steps (e.g., having a sponsor) or even AA (e.g., eating a well-balanced diet). Another study, recruiting from AA, found that completion of all 12 Steps was associated with lower levels of interpersonal insecurity, but did not report on substance use outcomes¹⁶. A general limitation of the forgoing studies is that relevant confounds have not been consistently addressed, including other dimensions of involvement and treatment length of stay. Thus, the unique contributions of the various forms of participation in 12-step groups have not been well-established.

Prior Research on Treatment Participation and 12-step Involvement

Also important, there is very little work on how participation in formal substance abuse treatment affects participation in specific 12-step activities. Some studies have examined meeting attendance and/or general indices of 12-step involvement, and found that treatment participation is typically associated with greater 12-step involvement, particularly if that treatment is 12-step-oriented¹⁷⁻²¹. Studies have also found that formal 12-step facilitation (TSF) interventions can be successful in increasing 12-step involvement overall^{7,22-24}, though some TSF interventions have not proven effective²⁵. Yet, little is known about the effects of standard 12-step-oriented treatment on the larger spectrum of 12-step activities, and treatment effects on meeting attendance, such as they are, cannot be assumed to translate into higher odds of obtaining a sponsor, making friends in AA, and other behaviors, which may show a disjoint pattern^{26,27}.

Main Study Questions

Our main study questions were, thus, as follows: 1) What are the unique contributions of specific 12-step activities to substance use outcomes during and after formal substance abuse treatment?, and 2) How does treatment length of stay (i.e., dosage) relate to participation in specific 12-step activities over time? Questions were addressed using data from a clinical trial comparing 12-step involvement and substance use outcomes under typical 12-step-oriented treatment to outcomes for participants receiving a 12-step facilitation intervention called MAAEZ (Making AA Easier)²⁸. Because of the ambiguity of prior research, we did not have clear expectations for relationships between the various 12-step activities and abstinence. We did expect that treatment length of stay would be positively associated with greater activity participation across follow-ups in both MAAEZ and usual care, although we hypothesized that these associations would be strongest for MAAEZ participants.

The current paper extends but does not replicate prior analyses on these same data, which established service (in the full sample) and sponsorship (in subgroups) as key mediators of MAAEZ's effects on abstinence at 12 months⁷. Here, rather than examining the mediation of condition effects, we describe predictors and unique effects of participation in the range of 12-step activities, capitalizing on data collected over the entire follow-up period to examine change over time.

Methods

Sample and Study Sites

For a complete description of the sample, sites, and design, see Kaskutas et al.²⁸. Data were collected from July 3, 2005 through May 5, 2006. Recruitment sites were two non-profit substance abuse treatment centers, one each from northern and southern California. Sites were similar in both staffing patterns and philosophy. Both offered 12-step-oriented group treatment, having roots in the Therapeutic Community method²⁹, and both were representative of the mixed-model, hybrid approach to treatment that typifies current community-based programs for alcohol and drug problems³⁰. The northern site provided day treatment and short- and long-term residential treatment, while the southern site offered outpatient and long-term residential treatment. As part of usual treatment, 4 of these 5 programs held onsite 12-step meetings and mandated attendance at both onsite and offsite meetings, requiring 3-7 meetings per week. (The exception was the day treatment program at the northern site, which recommended but did not mandate meetings.) Heavier meeting commitments tended to be required at the long-term residential programs.

All clients entering treatment during the recruitment period were eligible for the study: No formal exclusion criteria were used, although sites routinely refused those with incapacitating mental or physical problems. Sites admitted only individuals 18+ with a current abuse or dependence diagnosis. About 83% of eligible clients (N=508) consented to participation and completed baseline interviews. Follow-up interviews were completed for 81% of the baseline sample at 7 weeks; 75% at 6 months; and 76% at 12 months. To help ensure accurate responding, participants were informed that they would undergo urine screenings at follow-ups.

Design

The main study was designed to test the efficacy of a manual-guided 12-step facilitation intervention called MAAEZ (Making AA Easier). MAAEZ is a group-format intervention consisting of 6 weekly 90-minute sessions delivered by counselors who are active members of Alcoholics Anonymous (AA), Narcotics Anonymous (NA), or Cocaine Anonymous (CA). The intervention addresses the attitudes, normative influences, and control factors conceptualized to be relevant to 12-step involvement, and focuses particularly on connection with the 12-step fellowship. A quasi-experimental "OFF/ON" design³¹ was used to test whether MAAEZ improved client outcomes, in which 196 "OFF" participants received usual care (treatment as usual), and 312 "ON" participants received MAAEZ.

Measures

Twelve-step variables—Surveys at all 4 time points included a pool of items assessing participation in 12-step activities. We used this pool to assess 8 behaviors post-baseline: Meeting attendance, use of a sponsor, service work, reading the literature, social interaction with members, use of a home group, incorporation of 12-step members into the social network, and "working" the Steps. The first 4 of these were derived from the AA Affiliation Scale³², a standard, well-validated measure of 12-step involvement³². Specifically, items solicited total 12-step meetings attended in the past 30 days (continuous; log-transformed for

the current purposes), current sponsorship (yes/no), and whether the respondent performed service work at meetings (i.e., “helped newcomers, set up chairs, made coffee, cleaned up after a meeting, and so on”) or read 12-step literature since the last interview (also yes/no). Social interaction with members was assessed by averaging across one AAAS item (calling another member for help) and 3 stand-alone items (talking to someone at a meeting; asking for someone’s phone number at a meeting; and calling another member just to talk). Items were again yes/no, and the timeframe was again since the last interview. We used this 4-item composite rather than the single AAAS item because the composite had better face validity as a measure of social interaction and showed acceptable reliability across interviews (α 's>.76-.85), excluding 7 weeks (α =.68). Proportion of the respondent’s social network currently comprised of 12-step members was derived from standard questions on network size and composition developed and validated by Kaskutas et al.³³. An initial question was used to solicit total network size (that is, the number of friends and family members that the respondent sees or talks “once or more every couple of weeks”), and follow-up questions were used to establish the number among this network who both support the respondent’s abstinence and were met in AA, NA, or CA. An additional item assessed whether participants “currently [had] a home group” (also yes/no); a “home group” was defined as “an AA, NA, or CA meeting that you usually attend weekly and where you know many of the people.” Finally, respondents were asked “Which steps have you worked?” (of 1-12), and the number circled was totaled. Two AAS items were not considered for analysis because they do not assess participation in 12-step-related activities per se: that is, considering oneself a member and experiencing a spiritual awakening. Also, we did not examine sponsoring another member because so few participants reported this behavior (all N 's<15).¹ All yes/no responses were recoded so that no=0 and yes=1.

Alcohol and drug use severity—Alcohol and drug use severity were assessed at all time points using items from the Addiction Severity Index³⁴. To measure treatment outcome, items were combined to create a dichotomous variable reflecting total abstinence for the 30 days prior to follow-up (no=0 and yes=1).

Treatment length of stay—Program billing records were used to determine the total number of days each respondent spent in treatment through the 12-month follow-up. A log transformation was applied to normalize the skewed distribution of this variable.

Demographics and clinical variables—Standard demographic information was collected at baseline, including gender, age, race/ethnicity, marital status, education, employment, and income. Further, baseline surveys included 12 items from a standard motivation to change measure, the University of Rhode Island Change Assessment (URICA)^{35,36}, useful as a covariate. Consistent with Project MATCH, we created a total score by reverse-coding the Precontemplation items (3) and averaging with the Contemplation, Action, and Maintenance items (3 per scale); current alpha=.71. Scores were normalized using a reflect-and-square-root transformation³⁷.

¹Factor analyses were conducted to examine the factor structure of our activity items separately at baseline, 7 weeks, 6 months, and 12 months. For these analyses, we dichotomized all items that were not yes/no (i.e., meeting attendance, social interaction with members, incorporation of 12-step members into the social network, and number of Steps completed) based on a median split. Results were *not* strongly supportive of a multi-dimensional factor structure: Both 6-month and 12-month measures produced single-factor solutions, and while baseline and 7-week measures produced two-factor solutions, item loadings differed substantially across time points, and eigen values for the second factors were modest (i.e., 1.016 and 1.033). We thus opted to treat each activity as a separate indicator of the underlying behavior.

Analysis

Preliminary analyses were used to describe our sample; means and rates of participation in the 12-step activities over time; and associations between participation in the various 12-step activities.

A key question concerned associations between participation in our 8 12-step activities and abstinence across time. We addressed this question using multivariate logistic regressions examining associations between involvement in each activity and 30-day total abstinence at 7 weeks, 6 months, and 12 months. Three regressions were used to account for the fact that the various activities could be differentially relevant at different time points. (Ideally, such an analysis would be conducted as a single repeated-measures analysis including interactions between each activity and time, but this type of analysis was impossible here given that we had 8 activities and the resulting model would not be estimable.) Analyses were conducted by first entering each activity separately (with covariates), and then entering all activities at once to test for independent effects.

Our second question concerned associations between treatment involvement and participation in the various 12-step activities. This question was addressed using multivariate, mixed effects, generalized least squares (GLS) linear and logistic regressions modeling the impact of treatment length of stay, study condition (MAAEZ vs. Usual Care), time, and all 2-way and 3-way interactions between these variables on participation in key 12-step activities. Nonsignificant sets of 2- and 3-way interactions were removed from the final equations, and disaggregated analyses (using the same set of covariates as included in the full model) were used to examine the pattern of significant and marginally significant interactions. For both sets of analyses, those demographic and clinical variables that were significant predictors of the outcomes under study were retained for the analyses. Also, models examining treatment effects on 12-step activity participation included baseline participation in the same activity as a covariate.

Results

Sample Characteristics

Table 1 displays the sample's characteristics. Participants were about one-third women, and 49% identified as Hispanic, Black, or Other. Over one quarter of the sample reported annual household incomes of less than \$10,000. The most prevalent diagnosis was drug-only, and most had had prior treatment.

Descriptive Analyses of 12-step Activity Items

Table 2 displays the levels of participation in the various 12-step activities over time. This table suggests that meeting attendance and reading the literature rose from baseline through 7 weeks, but declined again post-treatment. Participation in the other activities, however, tended to increase with treatment and remain high, except for Step work, which showed a gradual increase throughout follow-up. Paired t-tests and tests of proportions reveal that participation in all activities was significantly higher at 7 weeks than baseline (all p 's < .01), except for Steps completed, which differed only marginally (p = .09). Additional analyses (not shown) reveal considerable within-individual change in activity participation. For example, 22% of individuals who did not have a sponsor at 6 months reported a sponsor at 12 months, whereas 21% of those who had a sponsor at 6 months reported none at 12 months.

Table 3 shows the correlations among our 12-step variables at 7 weeks. This table shows only small-to-moderate associations between participation in the various activities. Number

of Steps completed seems to show the weakest pattern of correlations, and meeting attendance the strongest. This pattern replicated well when analyzing activity scores at 6 and 12 months, though the correlations were somewhat larger overall.

Relationships between Participation in 12-step Activities and Abstinence

For the main analyses, we began by regressing 30-day total abstinence at each time point on each of the 12-step activities (separately) measured simultaneously. Results from these individual tests (not shown) confirmed that participation in each activity was strongly associated with abstinence at 6 and 12 months (all p 's < .001, except that for Steps completed, p < .05 at 6 months). At 7 weeks, associations were somewhat weaker, though the meetings, sponsorship, service, and home group variables were all significant at p < .01. The 7-week individual regressions showed weaker effects for Steps completed (OR=1.22, p < .05), social interaction (OR=1.99, p = .10), reading the literature (OR=2.07, p = .09), and 12-step members in the social network (OR=2.41, p = .13).

Table 4 presents the results of our 3 regressions predicting abstinence at each time point from our 12-step activities, entered simultaneously. Here, meeting attendance and having a sponsor were the only strong and consistent predictors of abstinence across time points. (However, sponsorship was only marginally significant at 7 weeks.) Having a home group was also significantly associated with abstinence at 6 and 12 months, and incorporation of 12-step members in the network was significant at 6 months. None of the remaining activities was significant. Counter to expectations, greater social interaction with members showed a marginally significant, negative association with abstinence at 6 months. Meanwhile, higher baseline alcohol and drug severity predicted lower odds of abstinence at 7 weeks and 12 months respectively, and greater treatment length of stay was associated with higher odds of abstinence at both 7 weeks and 12 months.

Relationships between Treatment Length of Stay, MAAEZ Condition, and Participation in Key 12-step Activities across Time

Last, Table 5 displays the results of our mixed effects regressions conducted to examine treatment effects on meeting attendance, use of a sponsor, and use of a home group across follow-ups. These activities were selected because they were the most consistent predictors of abstinence. Results show mixed effects for treatment involvement on participation. Surprisingly, there were no treatment length of stay effects on meeting attendance, regardless of condition. However, greater length of stay predicted increased use of a sponsor regardless of treatment condition, while there was a marginally significant interaction between length of stay and condition for use of a home group. Disaggregated regressions investigating this interaction (not shown) reveal that, among MAAEZ participants, longer treatment duration trended toward association with increased use of a home group (OR=1.32, p = .12), while among Usual Care participants, longer treatment duration was not associated with identification of a home group (p > .42).

In effects not related to treatment length of stay, meeting attendance showed a significant decline over time, but this decline was perhaps somewhat stronger in Usual Care (as indicated by the marginal condition by time interaction). Still, time showed significant negative effects on meeting attendance in both Usual Care (beta = -.018, p < .001) and MAAEZ (beta = -.013, p < .001; disaggregated analyses, not shown). Use of a sponsor also showed some indication of declining with time.

In each equation, baseline 12-step participation was strongly associated with participation at follow-ups. Higher baseline motivation (as measured by the URICA) was also notably and rather strongly associated with increased levels of all 3 outcomes. Greater baseline drug

severity was marginally associated with decreased odds of using a sponsor and significantly associated with decreased odds of using a home group across follow-ups, whereas older age predicted increases in meeting attendance and use of a sponsor. Last, participation in long-term residential treatment was associated with increased meeting attendance across follow-ups, compared to outpatient treatment.

Post-Hoc Analyses of Sustained Activity Participation

A prior analysis by our team on these same data⁷ established that *sustained* participation in service work (that is, reporting service at *both* 6 and 12 months) was more strongly related to abstinence at 12 months than was service at 6 months alone, and in fact, partially mediated effects for MAAEZ on abstinence. This finding, combined with the lack of effects for service in the main regressions, suggested a need to also evaluate whether *sustained* participation in each activity, measured thus, was related to 12-month abstinence. Accordingly, we conducted 5 additional regressions separately evaluating the impact of sustained service work, reading the literature, social interaction with members, incorporation of members into the network, and Step work when controlling for sustained meeting attendance, use of a sponsor, and home group (the 3 core predictors from above) as well as baseline alcohol severity, baseline drug severity, and treatment length of stay. (We did not use all variables at once in these equations given the much-reduced sample sizes, N's~325.) Where items were continuous, we dichotomized each based on median splits and recoded such that individuals scoring above the median at both 6 and 12 months were coded 1 (else 0). In these post-hoc analyses, sustained service work was a robust predictor of 12-month abstinence (OR=2.80, p<.05), as was reading the literature (OR=2.92, p<.05).

Discussion

Summary and Implications

The current study examined the relative importance of participation in specific 12-step activities to recovery. Although participation in each activity considered separately was typically a good predictor of better outcomes, in our simultaneous equation, just two variables—meeting attendance and currently having a sponsor—were consistently related to abstinence. Use of a home group was also related to abstinence at both 6 and 12 months, while the other activities showed mixed results: Incorporation of 12-step members into the network was significant at 6 months, while post-hoc analyses suggested that *sustained* involvement in service work and reading the literature at both 6 and 12 months contributed to recovery independent of the other activities. Social interactions with members and Step work, as assessed here, were not significant in any equation when controlling for the other activities.

The forgoing results underline a clear need for caution in evaluating the effects of a given dimension of participation (e.g., Step work) when other dimensions of participation have not been accounted for. Additionally, they suggest that regular meeting attendance, use of a home group, and the formation of supportive relationships— and especially, use of a sponsor—are at the core of maintaining recovery for at least one year after treatment initiation. Service work and reading the literature also seem to be important during the first year of recovery. Our results for meeting attendance (and relatedly, use of a home group) are surprising given prior research showing that associations between meeting attendance and abstinence have been strongly diminished when accounting for participation in other activities, assessed as a composite¹⁻³. However, such composites (again) have typically included constructs that are not activities *per se* (e.g., considering oneself an AA/NA/CA member) and even an established mediator of associations between 12-step involvement and abstinence; that is, spiritual change³⁸⁻⁴³. Consequently, results from these studies cannot be

interpreted as evidence that meeting attendance is irrelevant when accounting for other activities.² Another fact that may explain the weak performance for meeting attendance in prior research is that the “activity” composites, combining multiple items, are likely to have been better indicators of *all facets* of 12-step involvement (even those not assessed) compared to the single item assessing meeting attendance. Also, not all prior research has been consistent. One very recent study on adolescents (Kelly, in press) has reported that, in equations simultaneously entering meeting attendance and composite activity involvement, the effects for meeting attendance on abstinence outcomes remained significant, whereas activity involvement became nonsignificant (Kelly in press). In a subsequent analysis entering individual activities together with meeting attendance, however, contact with a sponsor outside of meetings was also significant, consistent with our strong results for sponsorship.

Findings regarding the powerful role of sponsorship are, as noted, consistent with those of other studies⁴⁻⁸ and cast some doubt on the likely efficacy of 12-step alternatives, which generally do not have analogues for sponsorship. Still, such alternatives may, of course, operate on substance use outcomes via different causal pathways. The weak effects for service work (especially) and reading the literature in the main regressions were not expected, and may be attributable to measurement issues. That is, both activities were measured using dichotomous items that provided no indication of the extent of involvement, and set low bars for participation. Pooling across the 6- and 12-month measures may have produced more reliable measures of intensity as well as duration of participation, so that in analyses of sustained involvement, both service work and reading the literature were quite strongly associated with abstinence. The null results for our indicator of social interaction with members (which focused largely on telephone contact) may also imply measurement issues. Toward that point, the Kelly study on adolescents described above found a marginally significant association between contact with members outside of meetings and abstinence when controlling for meeting attendance, which may imply that a reliable measure of interaction during meetings would have produced favorable results in the current study. The Kelly study likewise found no effect for completion of Step work.

These results will be important to informing clinicians and other service providers involved with substance abusing populations. They may also be important to refining measures of 12-step involvement. Our findings tentatively suggest that, when measuring 12-step involvement, special emphasis should be given to meeting attendance, use of a home group, and sponsorship. Other good indicators of involvement may include incorporation of 12-step members into the network, reading the literature, and service work, though refinements may be needed in assessing the latter constructs. Incorporating additional items may dilute or distort findings.

The current study also examined whether treatment involvement affects participation in the most important 12-step activities. Results suggest somewhat limited effects for treatment length of stay on participation in our three core 12-step activities. Treatment involvement did show some benefits in relation to obtaining a sponsor, regardless of study condition: That is, longer treatment duration was related to increased odds of sponsorship for both MAAEZ and Usual Care participants. This may mean that clinician support for obtaining a sponsor is already, as a rule, high. (That said, our prior work has shown that facilitation of sponsorship among particular subgroups is not optimally effective in usual treatment⁷).

²Relatedly, we did examine incorporation of 12-step members into the network in our simultaneous equations, although this variable has been shown to partially mediate associations between 12-step involvement and abstinence^{33, 44}. Nevertheless, a sensitivity analysis established that the direction, size, and significance of parameter estimates for the other activities were more or less equivalent when excluding the network variable, suggesting that inclusion of the variable was appropriate.

Meanwhile, our results show room for improvement for both usual treatment and MAAEZ in encouraging meeting attendance and use of a home group. There were no overall effects for treatment length of stay on either of these activities. Further, despite a marginally significant interaction between treatment condition and length of stay, effects for length of stay on the use of a home group within MAAEZ were weak, and there was no indication that MAAEZ affected 12-step meeting attendance. Meeting attendance, unlike the other 12-step activities, showed a reliable decline over time following the 7-week interview. These effects are noteworthy given the strong emphasis that our study sites gave to meeting attendance during treatment both within and outside of MAAEZ, and may point to the need for continuing care interventions. Still, we did find that participation in long-term residential (vs. outpatient) treatment was associated with increased meeting attendance across follow-ups, which may reflect the stronger emphasis on meeting attendance in residential care. Also, participation in all 12-step activities (excluding Step work) did increase markedly from baseline to post-treatment, suggesting that treatment attendance may have positive effects even though the effect of treatment duration is not always linear.

Finally, our study produced revealing associations between clinical variables and 12-step participation. Findings that higher baseline levels of motivation predicted increased meeting attendance, use of a sponsor, and use of a home group across follow-ups are intriguing given that motivational measures based on the transtheoretical model^{45,46}, as is the URICA, have not been consistent predictors of treatment retention⁴⁷⁻⁵². While URICA scores were likewise unrelated to treatment retention in the current study, these findings suggest that the URICA does capture important aspects of treatment motivation and can predict change in 12-step activities during and after treatment, perhaps because both the URICA and AA emphasize problem recognition. Also intriguing were findings suggesting that higher baseline drug severity was a risk factor for decreased use of a sponsor and identification of a home group, whereas older age facilitated meeting attendance and use of a sponsor. It is not yet clear why greater drug severity would be related to lower 12-step engagement, but these effects, based on post-hoc analyses, seems to be independent of the effects of drug severity on abstinence outcomes at follow-ups. Numerous studies have likewise found a relationship between older age and greater 12-step involvement^{53,54}. Though a formal mediational analysis is beyond the current scope, post-hoc analyses provide some evidence consistent with mediation of age's effects on abstinence via 12-step involvement: In bivariate models, older age was significantly associated with higher odds of abstinence at both 6 and 12 months, but in the corresponding models incorporating 12-step activities shown in Table 2, age was nonsignificant ($p's > .48$). This may suggest a need to focus on younger populations in 12-step facilitation efforts.

Limitations and Future Directions

A key limitation of the current study is that it remains unclear how well results regarding treatment effects generalize across programs. Treatment curricula may differ widely, so it will be important for the current results to be tested in other programs. Further, measurement issues associated with the assessment of 12-step activity participation may have contributed to the pattern of results, so that, for example, better measures of Step work or social interaction with members could yield different results. Finally, the relative contributions of 12-step activities may vary over the temporal course of recovery⁵⁵, so it will be important for future studies to use a longer temporal lens.

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Table 1

Baseline sample demographics (N=508).

Variable	Estimate
Gender	
Male	67%
Race	
White	52%
Hispanic	22%
Black	20%
Other	7%
Education	
Any college/technical school	46%
Employment status	
Part/full-time	37%
Annual household income	
<\$10,000	26%
\$10-\$49,999	42%
>\$50,000	32%
Marital status	
Married/living with partner	28%
Diagnosis	
Alcohol dependence only	17%
Drug dependence only	43%
Alcohol and drug dependence	23%
No dependence diagnosis	18%
Prior treatments	
None	34%
1-2	38%
3+	28%
Age in years: Mean (range)	36 (18-65)

Table 2

Means and rates of participation in 12-step activities over time.

Continuous Variables	Baseline: Mean (SD) (N=508)	7 weeks: Mean (SD) (N=410)	6 months: Mean (SD) (N=379)	12 months: Mean (SD) (N=384)
30-day meeting attendance (range 0-75)	10.08 (12.08)	15.37 (10.76)	13.53 (13.28)	10.95 (12.33)
Social interaction with members (range 0-1)	0.52 (0.39)	0.69 (0.31)	0.71 (0.34)	0.67 (0.39)
Prop. of 12-step members in network (range 0-1)	0.10 (0.23)	0.16 (0.27)	0.25 (0.31)	0.24 (0.30)
Steps completed (range 0-12)	2.17 (2.94)	2.42 (2.03)	3.41 (2.80)	4.18 (3.34)
Dichotomous Variables	Baseline: Percentage (N=508)	7 weeks: Percentage (N=410)	6 months: Percentage (N=379)	12 months: Percentage (N=384)
Use of a sponsor	26%	65%	67%	59%
Service work	50%	64%	60%	59%
Reading the literature	76%	92%	79%	71%
Use of a home group	41%	60%	63%	64%

Table 3

Correlations between 12-step variables at 7 weeks.

	Use of a sponsor	Service work	Reading the literature	Social interaction w/ members	Use of a home group	Incorp. of members in network	Steps completed
30-day meeting attendance	.44***	.41***	.37***	.48***	.33***	.33***	.16**
Use of a sponsor		.21***	.27***	.54***	.32***	.27***	.15***
Service work			.29***	.32***	.23***	.22***	.10*
Reading the literature				.32***	.18**	.08†	.04
Social interaction with members					.33***	.34***	.09†
Use of a home group						.17***	.09†
Incorporation of members in network							.07

Note.

*** p<.001

** p<.01

* p<.05

† p .10.

Table 4

Relationships between 12-step activities measured at 7 weeks, 6 months, and 12 months, and 30-day total abstinence at the same time points

Predictor Variable	30-day abstinence at 7 weeks: Adjusted OR (95% CI)	30-day abstinence at 6 months: Adjusted OR (95% CI)	30-day abstinence at 12 months: Adjusted OR (95% CI)
12-step Variables			
30-day meeting attendance	1.58 (1.12, 2.22)**	1.56 (1.11, 2.18)**	1.55 (1.02, 2.35)*
Use of a sponsor	1.83 (0.93, 3.61) [†]	2.12 (1.07, 4.21)*	2.19 (1.02, 4.73)*
Service work	0.87 (0.31, 2.44)	1.76 (0.87, 3.57)	1.63 (0.77, 3.41)
Reading the literature	1.47 (0.79, 2.73)	0.95 (0.45, 2.01)	1.18 (0.47, 2.99)
Social interaction with members	0.48 (0.16, 1.45)	0.36 (0.13, 1.03) [†]	0.69 (0.25, 1.93)
Use of a home group	1.30 (0.70, 2.40)	1.95 (1.03, 3.70)*	3.26 (1.58, 6.70)***
Incorporation of members in network	0.90 (0.26, 3.09)	3.96 (1.10, 14.31)*	0.80 (0.16, 3.92)
Completion of the Steps	1.14 (0.98, 1.33)	0.99 (0.89, 1.10)	1.01 (0.92, 1.10)
Covariates			
Baseline alcohol severity	0.27 (0.10, 0.72)**	0.78 (0.30, 2.06)	1.02 (0.38, 2.75)
Baseline drug severity	1.62 (0.18, 14.86)	0.23 (0.03, 1.85)	0.07 (0.01, 0.78)*
Treatment length of stay	1.55 (1.22, 1.99)***	1.22 (0.95, 1.55)	1.37 (1.05, 1.78)*

Note.

p<.001

**
p<.01

*
p<.05

[†]
p .10.

Table 5

Relationships between treatment length of stay, MAAEZ condition, and 12-step activities across time.

Variable	Meeting attendance: Adjusted beta (95% CI)	Use of a sponsor: Adjusted OR (95% CI)	Use of a home group: Adjusted OR (95% CI)
Main Theoretical Variables			
Treatment length of stay (Los.)	0.092 (-0.046, 0.230)	1.47 (1.15, 1.88) **	0.84 (0.56, 1.26)
Condition (MAAEZ vs. Usual Care)	-0.475 (-1.091, 0.141)	1.14 (0.67, 1.92)	0.33 (0.05, 2.08)
Time	-0.013 (-0.023, -0.002) *	0.99 (0.98, 1.00) †	1.00 (0.97, 1.03)
Los. × Condition	0.101 (-0.052, 0.253)	---	1.46 (0.93, 2.30) †
Los. × Time	-0.001 (-0.004, 0.001)	---	1.00 (1.00, 1.01)
Condition × Time	0.005 (-0.001, 0.011) †	---	0.99 (0.98, 1.01)
Los. × Condition × Time	---	---	---
Covariates			
Baseline level of outcome	0.267 (0.199, 0.335) ***	10.19 (4.97, 20.91) ***	6.14 (3.52, 10.75) ***
Baseline alcohol severity	-0.131 (-0.289, 0.027)	0.62 (0.33, 1.17)	0.63 (0.34, 1.17)
Baseline drug severity	-0.064 (-0.732, 0.603)	0.17 (0.02, 1.34) †	0.12 (0.02, 0.92) *
Baseline motivation	0.544 (0.212, 0.877) ***	3.23 (1.16, 9.04) *	6.84 (2.47, 18.94) ***
Age	0.013 (0.005, 0.021) ***	1.04 (1.01, 1.06) **	1.00 (0.98, 1.03)
Short-term resi. (vs. outpatient)	0.073 (-0.166, 0.313)	0.70 (0.35, 1.37)	0.88 (0.45, 1.71)
Long-term resi. (vs. outpatient)	0.248 (0.034, 0.461) *	1.21 (0.63, 2.32)	1.27 (0.67, 2.40)

Note.

p<.001**
p<.01*
p<.05†
p .10.