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Effectiveness of Making Alcoholics Anonymous Easier (MAAEZ), a group format 12-step facilitation approach

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Abstract

Most treatment programs recommend clients attend 12-step groups, but many drop out post-treatment. The effectiveness of “MAAEZ” (Making AA Easier), a manual-guided intervention designed to help clients connect with individuals encountered in AA, was tested using an “OFF/ON” design (n=508). MAAEZ effectiveness was determined by comparing abstinence rates of participants recruited during ON and OFF conditions, and studying the effect of the number of MAAEZ sessions attended. At 12 months, more clients in the ON condition (vs. OFF) reported past-30-day abstinence from alcohol (p=.012), drugs (p=.009), and both alcohol/ drugs (p=.045). In multivariate analyses, ON condition participants had significantly increased odds of abstinence from alcohol (OR=1.85) and from drugs (OR=2.21); abstinence odds also increased significantly for each additional MAAEZ session received. MAAEZ appeared especially effective for those with more prior AA exposure, severe psychiatric problems, and atheists/agnostics. MAAEZ represents an evidence-based intervention that is easily implemented in existing treatment programs.

INTRODUCTION

Twelve-step groups such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) are widely available as a source of support for individuals with alcohol and drug problems, and involvement in AA and NA has been associated with alcohol and drug abstinence in dozens of studies (e.g., (Kaskutas, Ammon, & Weisner, 2004; R. H. Moos & Moos, 2006; Ouimette, Moos, & Finney, 1998; Thurstin, Alfano, & Nerviano, 1987; Timko, Moos, Finney, & Lesar, 2000). Given the reductions in treatment intensity, length of stay, and limited funding for aftercare treatment associated with managed care and today’s climate of fiscal constraint (Schmidt & Weisner, 1993; Weisner, McCarty, & Schmidt, 1999), 12-step groups are an increasingly important adjunct to specialty treatment. However, treatment graduates severely underutilize AA and NA, with most dropping out after their stays in formal treatment (Kaskutas, Ammon, Delucchi et al., 2005; Kelly & Moos, 2003; R. Moos, Schaefer, Andrassy, & Moos, 2001; Tonigan, Connors, & Miller, 2003). This has prompted interest in manual-guided Twelve Step Facilitation (“TSF”) interventions that uniformly introduce clients to AA/ NA in a way that sustains meeting attendance and promotes involvement in AA activities that are associated with better drinking outcomes, such as having AA friends (Kaskutas, Bond, &

Humphreys, 2002). This paper reports on the substance use outcomes in a trial of one such intervention, “MAAEZ” (Making AA Easier), a group format, 6-session TSF intervention designed to help treatment clients connect with individuals they encounter in AA. MAAEZ offers a manual-guided introduction to the 12-step culture.

Results from prior TSF trials are encouraging, if not entirely consistent. Project MATCH included a TSF condition focusing on the first 3 steps of AA/NA during 12 one-on-one sessions, and compared that to cognitive behavioral therapy (CBT) and motivational enhancement therapy (MET) among alcohol-dependent individuals. Alcohol abstinence rates were 5% to 10% higher for TSF than for CBT or MET at the 1-year follow-up in the outpatient arm, but not in the aftercare arm which was recruited after inpatient treatment (Project MATCH Research Group, 1997). Only the outpatient arm was followed at 3 years, with abstinence rates again 10% higher for the TSF condition (Project MATCH Research Group, 1998). Outpatients without psychiatric problems had higher abstinence rates in TSF than CBT at 1 year, but not at 3 years; but at higher levels of psychiatric severity, TSF performed equally well compared to CBT at both follow-ups. Conversely, among those with social networks supportive of drinking, TSF outpatients had higher abstinence at 3 years, but not at 1 year.

Another outpatient study randomized veterans to standard AA referral or to an intensive referral condition in which arrangements were made for the patient to attend a meeting with a self-help group volunteer. Abstinence rates from both alcohol and drugs were 10% higher for intensive referral at both the 6- and 12-month interviews (Timko & DeBenedetti, 2007). Intensive referral was especially effective in reducing alcohol/drug problem severity among those with less prior AA meeting attendance (Timko, DeBenedetti, & Billow, 2006), a finding consistent with the pattern of effects for TSF in Project MATCH, where TSF was superior only for outpatients who (unlike the aftercare arm) had not been exposed to AA during a recent stay in inpatient treatment.

A detoxification study applied standard motivational interviewing techniques to encourage participation in AA/NA in a single, one-on-one TSF session, and compared it to a brief advice condition to attend AA/NA (Kahler, Read, Ramsey, Stuart, & McCrady, 2004). Those in TSF with less prior 12-step involvement drank less at the 6-month follow-up, while those with more prior exposure to AA and NA did better in the brief advice condition (Kahler et al., 2004).

Three other studies focused on group-oriented TSF. Maude-Griffin and colleagues delivered Project MATCH-based TSF and CBT to cocaine dependent individuals in a combined group and individual format (Maude-Griffin et al., 1998). African American patients with strong religious beliefs and individuals with low abstract reasoning abilities who were assigned to TSF were more likely to abstain from cocaine, while depressed clients did better in CBT. Brown and colleagues (Brown, Seraganian, Tremblay, & Annis, 2002) implemented a Project MATCH-based TSF in group format for comparison to Relapse Prevention (RP) groups as aftercare. There were no main effects, but outcomes were superior in TSF for several subgroups: women had less severe alcohol problems at follow-up; those with high levels of psychiatric problem severity had higher abstinence rates; and those with multiple substance use profiles had less severe alcohol/drug problems at follow-up. Wells and colleagues focused on the first 3 steps of AA/NA/CA (Cocaine Anonymous) and compared it to RP in group format, studying outpatients whose drug of choice was cocaine (Wells, Peterson, Gainey, Hawkins, & Catalano, 1994). No differences in drug use emerged, but less alcohol use was reported over time for TSF subjects.

The majority of the above TSF interventions concentrated on introducing clients to the first three steps of AA; this emphasis may, in part, influence the mixed findings illustrated in the TSF trials. These first steps suggest that individuals admit they are powerless over alcohol,

and that they surrender to a higher power for relief. Many new members receive counsel from AA sponsors and other experienced AA members about these concepts, which frequently arise in AA meetings. In developing MAAEZ, we questioned the wisdom of developing a 12-step facilitation intervention that would replicate what AA members do so well. We instead focused on helping clients interact with people they will meet in AA/NA, thinking that if we “kick-started” that process, clients would benefit more from the help that AA members readily offer to newcomers.

Here we report on the main effects of the MAAEZ intervention on alcohol/drug abstinence at 6- and 12-month follow-ups, using both intent-to-treat and as-treated analyses. We then consider effectiveness within subgroups in which differential TSF effects have been previously suggested. Since the MAAEZ trial recruited clients from outpatient treatment and long- and short-term residential programs, we also study MAAEZ outcomes by type of program.

METHODS

Sample and Study Sites

All clients entering treatment at the participating sites were eligible for the study. We recruited clients from 7/3/05 to 5/5/06. The treatment programs did not admit clients with incapacitating mental or physical health, clients younger than age 18, or individuals who do not have a current alcohol/drug abuse or dependence diagnosis.

Two longstanding non-profit treatment sites participated, one each from northern and southern California. Client stays were paid for by state block grants to the programs offered at the study sites, or by client insurance. The northern California site offered three types of programs: day treatment and short-term residential treatment, each of 1-month duration, and long-term residential treatment that could last as long as 12 months. The southern California site provided two programs: outpatient treatment (up to 6 months in duration) and long-term (up to 9-month) residential treatment. Staffing and program philosophy were similar at all programs: all are 12-step-oriented programs with historic roots in the Therapeutic Community method (Troyer, Acampora, O'Connor, & Berry, 1995), and are representative of the mixed-model, hybrid approach to treatment that is common in community-based programs (Borkman, Kaskutas, & Owen, 2007). Treatment was provided primarily in group format, with usual care including addiction education, relapse prevention, stress and anger management, family education, introduction to the 12 steps of AA/NA/CA, and process groups. Staff mainly consisted of licensed master's level counselors and state-certified alcohol/drug counselors.

During the first phase of long-term residential care (about 1 month), clients at our sites were not allowed to leave the premises or have visitors. Since MAAEZ homework involved attending outside meetings and socializing with the AA community, clients were recruited at the two long-term residential programs after completing phase 1.

Prior to conducting the baseline interview, signed informed consent was obtained from 508 eligible clients (an 82% participation rate), with 75% re-interviewed by telephone at 6 months (n=380) and 76% at 12 months (n=384). Client incentives for these interviews totaled \$100 (\$20 at baseline and \$40 at 6 and 12 months). In addition, every study participant was scheduled for a urinalysis, at either their 6 or 12-month follow-up (even-numbered study id's at 6 months, odd at 12 months; \$20 incentive). We compared gender, age, and race of the 508 who participated in the study to the 114 who refused, and found no significant differences.

Study design

A quasi-experimental (Campbell & Stanley, 1963) “OFF/ON” design was used to avoid contamination of study condition, which might occur with a classic randomized design since

those in the ON condition could discuss MAAEZ content with those in the OFF condition during other treatment groups. MAAEZ effectiveness was determined primarily by comparing outcomes of those in the ON and OFF conditions. A single ON condition followed the OFF condition at each site, so counselors would not be used to delivering MAAEZ content once the OFF condition began. During the OFF condition, usual treatment was delivered. Thus, clients in the OFF condition were not exposed to MAAEZ; they received usual care, which included education in the 12 steps and attendance at 12-step meetings. In the ON condition, 6 weekly MAAEZ sessions replaced 6 usual care 12-step education groups. After completing MAAEZ, clients returned to the usual care groups. Because our quasi-experimental design involved a nonequivalent control condition for comparison to the MAAEZ intervention (i.e., participants were not randomized to study conditions; Campbell & Stanley, 1963), several steps were taken to strengthen our ability to infer MAAEZ effectiveness. These included a nested control condition, tracking of historical events, and extensive comparisons of the characteristics of clients recruited during the ON vs. OFF conditions (see *Preliminary Analysis*).

MAAEZ intervention

MAAEZ aims to overcome resistance to 12-step groups by changing participants' attitudes towards the people in AA/NA/CA, addressing the perceived social desirability of becoming involved in AA/NA/CA, and increasing participants' ability to control and manage their experiences with 12-step meetings, their choice of people with whom they become involved, and their interpretation of the 12-step philosophy.

MAAEZ consists of six weekly 90-minute sessions delivered in group format by counselors who are active members of AA, NA, or CA, and are experienced in running usual care groups. Each session is outlined on a laminated two-sided sheet that indicates lecture points, issues for discussion, recommended length of time to spend on the issue, take-home messages, and homework assignments for the week. To implement the intervention, two MAAEZ sessions are conducted weekly: the *Introductory* session (for new clients and clients who have completed the core sessions), and one of the four core sessions (for continuing clients).

At the *Introductory* session, the new clients are encouraged to discuss their prior experience with AA/NA/CA. After completing the four core sessions, client return to the *Introductory* session as graduates so that they can experience the benefits of helping (Zemore, 2007; Zemore & Kaskutas, 2004; Zemore, Kaskutas, & Ammon, 2004; Zemore & Pagano, in press). Graduates talk about the homework they did last week, discuss their overall experience with MAAEZ, talk about how they now feel about AA and the people in AA, and respond to client concerns about AA. At the end of the *Introductory* session, clients learn how to use the meeting directories. Homework is to attend a meeting they never attended before.

The four core MAAEZ sessions, which can be attended in any order, are *Spirituality*, *Principles Not Personalities*, *Sponsorship*, and *Living Sober*. *Spirituality* provides clients with a wide range of "spirituality" definitions that do not all require religious orientation. The homework assignment after that session is to talk to someone who has more sobriety than the client, after a meeting. *Principles Not Personalities* deals with myths about AA, different types of meetings, and meeting etiquette. Homework after that session is to ask someone for his/her phone number, and speak with him/her on the phone before the next MAAEZ session. *Sponsorship* explains the function of an AA sponsor, offers guidelines for picking someone appropriate, and includes role-playing to practice asking for a sponsor and overcoming a rejection. Homework that week is to get a temporary sponsor. In *Living Sober*, tools for staying sober are tackled: relapse triggers, service, and avoiding "slippery" people, places and things. Homework for this session is to socialize with someone in AA who has more sobriety.

MAAEZ Fidelity

To assure fidelity to the manual, a sample of introductory sessions and the four core MAAEZ sessions at each study site was observed using a structured form. An informed consent statement approved by the Institutional Review Board of the Public Health Institute was read by the observer prior to each session observation. Our key indicator of counselor fidelity to the manual was the mean proportion of topics on the session outline that were covered. Two observed groups had very low fidelity to the manual, covering only 33% of the topics; removing these outliers, the range in the proportion of topics covered was 64% to 99%. On average, fidelity to the manual was high, with 90% of the *Introductory* session topics covered; 88% of the *Spirituality, Principles Not Personalities*, and *Living Sober* session topics covered; and 80% of the *Sponsorship* session topics covered. There were no significant differences in treatment fidelity between counselors or study sites.

Measures

Baseline—Standard demographic information was collected. We measured religiosity using the question on religious self-definition from the Religious Beliefs & Behaviors scale (Connors, Tonigan, & Miller, 1996) that offers choices of religious, spirituality, unsure, agnostic, atheist. Current alcohol and drug diagnoses were ascertained using the Quick-DIS (Diagnostic Interview Schedule Quick Form for Substance Abuse/Dependence) (Bucholz, Marion, Shayka, & Marcus, 1996; Bucholz et al., 1991). Alcohol, drug, and psychiatric problem severity for the past 30 days were assessed using the Alcohol Severity Index (ASI) (McLellan et al., 1992).

We asked respondents how many heavy drinkers/users they saw regularly, and used this to assess moderating influence from the social network. Prior treatment service utilization was assessed by how many episodes of alcohol or drug treatment they had in their lifetime, including the current episode. Lifetime AA/NA/CA meeting attendance was measured using a question from the AA Affiliation Scale (Humphreys, Kaskutas, & Weisner, 1998) which offers respondents categorical response categories (none, 1-29 meetings, 30-90, 91-499, 500+). The AA Affiliation Scale has high internal consistency overall ($\alpha=.86$) and among sub-samples ($\alpha=.84$ for African Americans, $.87$ for women) (Humphreys et al., 1998). Our measure of AA involvement considered seven AA activities from the AA Affiliation Scale (*ever considered yourself a member of AA/ NA/ CA; ever called a member for help; currently have a sponsor; ever sponsored anyone; read literature; done service; had a spiritual awakening or conversion experience*), and two additional measures that address AA activities emphasized in MAAEZ (*have a home group; ever asked for a phone number at a meeting*). We created an index (0-9) representing a count of the number of activities endorsed. We also asked about the number of AA/NA/CA meetings attended in the past 12 months (baseline) and since the last interview (6, 12 months).

Follow-up—Our primary outcomes at 6 and 12-months, abstinence from alcohol, from drugs, and from alcohol and drugs, used the ASI questions on past 30-day use. A dichotomized (yes/no) last 30-day abstinence status was created from the ASI for use in logistic regressions.

Treatment received—Billing records were used to determine the number of days each respondent spent in treatment. We also created a “dose” variable to represent the number of MAAEZ sessions each participant attended. These data were collected from sign-in sheets at MAAEZ sessions. ON participants received 0 to 6 doses, and OFF participants all received doses of 0.

Data Analysis

Analyses were conducted using SPSS release 15.0. Chi-square tests were conducted for categorical variables, and t-tests and ANOVAs were used with continuous variables. We judged significance at $p < .05$. No Bonferroni corrections for multiple tests were made, as to be conservative in terms of uncovering potential biases and confounders.

A series of preliminary analyses was undertaken to describe the sample and identify biases arising from our quasi-experimental design or study implementation. We compared the baseline characteristics, length of stay, and MAAEZ dose of long-term residents, short-term residents, and outpatients; of those lost to follow-up vs. successfully re-interviewed; and of those recruited during the OFF vs. the ON condition. Historical analyses were conducted to determine whether differences in outcome between conditions could have been driven by unmeasured differences between clients, treatment environment, or larger historical context.

In studying MAAEZ effectiveness, we first conducted an intent-to-treat analysis focusing on study condition. Next, we conducted an as-treated, dose-response analysis, using the dose variable described above. This allowed us to combine the two samples, rather than looking only within the ON condition participants for a dose effect, which would have less statistical power. Last, we looked at MAAEZ effects among subgroups of interest, as well as among subgroups that prior TSF-oriented studies have suggested as moderators, focusing on alcohol and drug abstinence at 12 months.

RESULTS

Preliminary Analysis

Sample characteristics (Table 1)—A total of 508 eligible participants enrolled in the study (211 long-term residents, 136 short-term residents, and 161 outpatients). Table 1 presents the sample characteristics associated with the three program types, and indicates any significant differences in client make-up associated with program type. Of the 16 characteristics considered, only three were similar at each type of program: age, social network composition, and prior exposure to AA/NA/CA (which was very high: 96% at long-term residential, 91% at outpatient, and 86% at short-term residential). Long-term residents tended to be non-white, unmarried, without a high school diploma, unemployed, poor, and to have a drug (or both alcohol and drug) dependence diagnosis. In contrast, most short-term residents were white, had attended at least some college, were employed full-time, and reported annual incomes at or above \$50,000. The outpatients were demographically similar to the short-term residential clients, although not as many were of high socio-economic status or alcohol dependent only. Compared to the outpatients, both long-term and short-term residents had higher drug and psychiatric problem severity, and more reported prior treatment. Short-term residents had worse alcohol problems than long-term residents or outpatients, and reported less involvement in AA activities. Thus there is no pattern in the utilization and severity profile of participants at a given program type.

Attrition—We checked whether loss to follow-up at either 6 or 12 months was associated with study site, program type, and condition. One significant difference ($p < .001$) emerged, with proportionately fewer long-term residential clients interviewed at 12 months (65%) than short-term residential and outpatients (82% and 83% respectively). We also looked for differences in baseline demographics, diagnoses, prior service utilization and problem severity between those who completed the 6-month interview and/or the 12-month follow-up interview versus those who did not. Although 25% was lost at either follow-up, few significant differences emerged. Those lost to follow-up at 12 months were more likely to have reported less than a college education, unemployed status, lower income, and a drug-dependence only

diagnosis (all p 's $<.05$). This also reflects the demographic profile of the long-term residents whose attrition similarly was higher.

Urinalysis results—Although we had aimed to conduct drug tests on half of the participants at each follow-up, only 8.3% ($n=43$) provided samples for urinalysis. We believe that so few participants provided urinalysis samples because sample collection required them to return to the study sites to up to 12 months after finishing the course of treatment, a task that not many were willing or able to do. Thus it was not appropriate to replicate our outcomes analysis as we had planned (i.e., converting the self-report for cases with positive urinalysis and negative self-reported drug use, and re-running the analysis). Five of the 6 who tested positive for drugs reported past 30-day drug abstinence. However, we have no reason to suspect that false negatives would be systematically higher in the ON condition.

Length of stay—The mean length of stay was 112 days for long-term residents ($SD=80$), 33 days for short-term residents ($SD=32$), and 44 days for outpatients ($SD=42$). Length of stay did not differ significantly by condition, either overall or within program type.

MAAEZ dose—Among those in the ON condition ($n=312$), 5.8% never attended MAAEZ (either dropped out of treatment or missed the group), and 14.4% attended only the *Introductory* session. Twenty-nine percent attended two or three sessions, 37% attended four or five sessions, and 19% attended all six. The overall mean MAAEZ dose was 3.7 sessions ($SD=1.8$), with an average dose of 4.0 sessions in long-term residential ($SD=1.6$), 3.8 sessions in short-term residential ($SD=1.5$), and 3.0 sessions in outpatient ($SD=2$ sessions); this difference across treatment types was significant ($p<.001$). We also compared the MAAEZ dose for clients attending the 4-week programs (short-term residential and day patients) versus all others; the mean number of MAAEZ sessions were, respectively, 3.6 ($SD=1.9$) and 3.8 ($SD=1.5$), $p=.41$.

Condition differences—Since differences in client make-up during the ON and OFF condition could represent potential confounders of a MAAEZ effect, we compared clients recruited in each condition on baseline demographics, substance abuse diagnosis, prior AA and treatment utilization, and problem severity (alcohol, drug, and psychiatric). We found no differences in demographics, diagnosis, or prior treatment exposure. Psychiatric problems at baseline were more severe among ON than OFF condition participants (respective mean ASI composite scores were 0.38, $SD=0.27$ and 0.30, $SD=0.26$, $p<.001$). As noted above, we also checked for differences in length of stay associated with condition, overall and within program type, finding none.

Historical effects—To determine whether differences in outcome between the ON and OFF condition could be driven by unmeasured differences either between clients, the treatment environment, or the larger historical context, we implemented a nested control condition in our design (Cook & Campbell, 1979). This involved two sequential OFF conditions, OFF1 and OFF2, at one of the study sites (northern California), timed so that OFF2 coincided with the ON condition at the other site (southern California). With this design, if improved outcomes in the southern California ON condition were due to historical events and not MAAEZ, we should see improved outcomes in OFF2 compared to OFF1 in northern California. Instead, we found that abstinence rates in OFF1 were not significantly different from those in OFF2 at either 6 or 12 months (p 's $>.10$). This suggests that differences in outcomes between the ON and OFF conditions were not driven by unmeasured client differences arising from external historical events.

We also tracked potential historic events that might have confounded condition effects. Starting at the onset of data collection and ending at the last 12-month interview, we monitored local

and national events that could relate to changes in the population of individuals seeking chemical dependency treatment, as well as treatment efficacy. An Associate Scientist reviewed three key sources of news in the alcohol/drug field: the *Join Together* website, *Alcoholism and Drug Abuse Weekly*, and the monthly *Amethyst* newsletter published by the National Council on Alcoholism and Drug Dependence (NCADD) of San Fernando Valley. Several developments occurred during the recruitment period, including a drop in the number of individuals covered by employer-provided healthcare, accompanied by shifts to Medicaid coverage; an increase in addiction problems credited to Hurricane Katrina; the launch of a website devoted to brief TSF; expanded access to medication-assisted treatment for individuals with opiate addictions; cuts to Medicaid totaling about \$1 billion; continued rises in prescription drug abuse; and the entry of several celebrities into rehabilitation programs, including Lindsay Lohan, Britney Spears, and Al Gore's son. The results from the historical outcomes analysis reported above indicate that none of these events were powerful enough to substantially affect the outcomes of our trial because if an event powerful enough to affect abstinence outcomes had occurred during either period, we would expect OFF1 outcomes to differ from OFF2 outcomes in the historical outcome analysis. Nonetheless, drops in employer-provided healthcare would have minimal effect on the populations presenting at our sites because both sites accept clients with and without private insurance or Medicaid. The celebrities mentioned entered treatment during the OFF condition, and should thus, if at all, have biased results in favor of the OFF condition (since one might expect lower-severity clients during that time).

Determination of potential confounders and other covariates—To be considered a confounder, a variable must be significantly associated with condition and outcome (Miettinen & Cook, 1981; Rothman, 1975). Of the 16 variables (listed in Table 1) that we explored in this manner, only one emerged as significant: marital status.

We decided to control for two additional variables in studying MAAEZ effectiveness, program type and length of stay, even though they did not fulfill the requirements for being a confounder. As reported above, program type was strongly correlated with length of stay ($r=0.435$, $p<.001$) and with a number of demographic, severity, and service utilization characteristics. Both program type and length of stay also related to outcome. And although neither measure was associated with condition (the treatment variable of interest in our intent-to-treat analysis), program type and length of stay were associated with MAAEZ dose ($p<.01$ and $p<.001$, respectively) which we studied in our as-treated analysis. Note that we replicated our intent-to-treat and as-treated analyses without these additional control variables to verify that this was indeed a conservative approach.

Analysis of MAAEZ effects

Abstinence rates, by condition (Table 2)—Rates of past 30-day abstinence from alcohol, from drugs, and from both alcohol and drugs (total abstinence) prior to the 6-month interview were high in both conditions. However, at the 12-month follow-up, proportionately more clients in the ON condition reported past-30-day abstinence from alcohol (82% vs. 72%, $p=.012$), from drugs (92% vs. 83%, $p=.009$), and from both alcohol and drugs (79% vs. 71%, $p=.045$). Furthermore, the relative improvement in abstinence rates for those in the ON condition compared to those in the OFF condition was 12.7% for abstinence from alcohol, 9.3% for abstinence from drugs, and 10.4% for abstinence from both alcohol and drugs.

Dose-response analysis (Figure 1)—We next studied 12-month abstinence rates as a function of MAAEZ dose received (“as-treated” analytic strategy). At the level of zero MAAEZ sessions, the rate of abstinence from both alcohol and drugs for the 30 days prior to the 12-month interview was about 70%. This includes those in the MAAEZ condition who attended

zero MAAEZ sessions (n=18) and all participants in the OFF condition (n=196). At the level of three MAAEZ sessions, almost 80% were abstinent at 1 year. Of those receiving the full, intended MAAEZ dose, 90% were abstinent. Figure 1 shows that a perfectly linear relationship between dose and abstinence is not present; however, the test for linear trend was significant ($p=0.018$). The abstinence rates change only slightly (by 1 to 4%) between those attending 0 vs. 1, 2 vs. 3, 3 vs. 4, and 4 vs. 5 sessions, but abstinence rates go up between those attending 1 vs. 2 sessions (from 67% to 77% abstinent) and 5 vs. 6 sessions (where abstinence increased by almost 20%).

Multivariate analysis of MAAEZ effects (Tables 3a, 3b)—In our multivariate, intent-to-treat analysis of 12-month outcomes (Table 3a), those recruited during the ON condition had a significantly increased odds of abstinence from alcohol ($OR=1.85$) and from drugs ($OR=2.21$). The odds ratio for total abstinence did not quite achieve statistical significance ($OR=1.58$; $p=0.063$). Results for the as-treated multivariate analyses (Table 3b) extended to all three outcomes, with the odds of abstinence from alcohol, from drugs, and from both alcohol and drugs all increasing significantly ($p<.05$) for each additional MAAEZ session received.

We re-ran the above analyses without controlling for length of stay and program type. Findings were very similar to those shown in Tables 3a and 3b, with no substantive changes in significance levels or the magnitude of the effect.

Subgroup analyses (Table 4)—We then conducted subgroup analyses of MAAEZ effectiveness with respect to alcohol abstinence, drug abstinence, and total abstinence for the 30 days prior to the 12-month follow-up interview, based on study condition (“intent-to-treat” strategy) and as a function of MAAEZ dose (“as treated” analytic strategy). Since the MAAEZ effect in the multivariate intent-to-treat analysis of total abstinence was borderline significant ($p=0.063$), our presentation of the disaggregated analyses focuses on the as-treated results. Table 4 presents the findings for MAAEZ dose effects on alcohol and drug abstinence at 12 months, showing the odds ratios for each increase in MAAEZ dose. These subgroup analyses controlled for marital status, program type, and length of stay. A higher MAAEZ dose appears especially effective for these groups: unmarried individuals; those with less than a high school education; those who are drug dependent; those who are at or above median ASI severity for psychiatric problems; those with prior treatment exposure, and individuals who had attended over 90 AA/NA/CA meetings in their lifetime; those who are atheist, agnostic, or unsure of their religious beliefs; and those with networks without any heavy alcohol or drug users. MAAEZ dose was marginally ($p<.10$) associated with alcohol/drug abstinence for men, white clients, clients below median ASI alcohol problem severity, and long-term residents. In addition, for each additional MAAEZ session attended, long-term residents had significantly higher odds of alcohol abstinence ($OR=1.35$, $p=0.020$), and short-term residents had higher odds of drug abstinence ($OR=1.51$, $p=0.030$) (results not shown).

In the subgroup analyses by condition (results not shown), significant condition effects emerged within three stratum in which MAAEZ had only approached significance in the dose analysis: males ($OR=1.99$, $p=0.027$), whites ($OR=2.08$, $p=0.032$), and those with ASI alcohol problem severity scores below the median ($OR=2.02$, $p=0.046$). MAAEZ condition approached statistical significance for those with drug problems at or above the median.

DISCUSSION

This quasi-experimental study of the MAAEZ intervention in real-world treatment programs found significantly higher rates of past 30-day alcohol abstinence, drug abstinence, and abstinence from both alcohol and drugs for respondents in the ON condition at the 12-month follow-up interview compared to those in the OFF. The magnitude of the MAAEZ effect was

similar to those reported in other TSF studies such as Project MATCH (Tonigan et al., 2003) and the intensive referral study (Timko & DeBenedetti, 2007; Timko et al., 2006): an abstinence rate about 8% to 10% higher than that of the comparison group(s). Both intent-to-treat and as-treated multivariate analyses found a MAAEZ effect for alcohol abstinence and for drug abstinence; the as-treated analysis found a significant dose effect for total abstinence as well. The study was conducted in outpatient programs, long-term residential programs, and a short-term residential program, where existing recovering counselors delivered MAAEZ with high fidelity to the manual. Findings were consistent whether or not we controlled for program type and length of stay. The study programs represent hybrid 12-step-oriented programs for treating both alcohol and drug dependent clients, and participants were heterogeneous in terms of demographics, diagnosis, and prior service utilization. Given the robust 12-month bivariate results and the consistent multivariate results obtained across techniques and outcomes, we conclude that MAAEZ represents an evidence-based TSF intervention, widely applicable to the chemical dependency treatment field.

The especially high abstinence rate (92%) among the 59 participants who attended all 6 MAAEZ sessions may point to the power of peer helping that MAAEZ participants found when returning to the *Introductory* session to share their MAAEZ and AA experience with MAAEZ newcomers. It also could be an artifact of higher motivation among those attending more sessions, although our multivariate analyses controlling for length of stay also found an effect for higher MAAEZ dose. The result is consistent with earlier work we have done on helping, which found that peer helping during treatment was associated with more AA attendance following treatment, which in turn led to better outcomes (Zemore & Kaskutas, 2008; Zemore et al., 2004). Given the emphasis on professional counseling, peer helping may be underemphasized in treatment programs, but could be an effective tool that is easily implemented.

Guided by findings of superior effects among specific subgroups for prior TSF interventions, we also conducted extensive disaggregated analyses. Our findings are consistent with positive TSF effects for one subgroup considered in the literature, those with high psychiatric severity. We found a strong, consistent MAAEZ effect among those with ASI psychiatric problem severity at or above the median in our sample. This is similar to Brown et al., who found that TSF was particularly effective for those with high psychological distress (Brown et al., 2002). However, other TSF studies have had different results with respect to psychiatric comorbidity. Those with psychopathology did equally well in TSF and CBT in Project MATCH, but depressed clients did better in CBT than in TSF in Maude-Griffin's study (Maude-Griffin et al., 1998). Many have expressed concern that AA may be inappropriate for those with psychiatric problems (American Psychiatric Association, 1995; Noordsy, Schwab, Fox, & Drake, 1996), but empirical evidence of AA's effectiveness has begun to paint a different picture (Morgenstern et al., 2003; Morgenstern, Kahler, & Epstein, 1998; Ouimette, Gima, Moos, & Finney, 1999). Given the high level of concurrent mental health disorders among treatment-seeking clients, MAAEZ is especially promising for those at the high end of the severity spectrum.

Our results for prior AA exposure also diverge from prior work on TSF effectiveness. For example, TSF results in Project MATCH and the intensive referral study favored those with less prior AA meeting exposure, while the opposite was the case with MAAEZ. Furthermore, we found that MAAEZ was more effective among those with prior treatment episodes. MAAEZ's emphasis on connecting with the AA fellowship and culture may have given these recidivistic clients a new way of viewing AA and AA members that had been unfamiliar to them in past experiences with AA. Given the high AA drop-out rates (i.e., about half of newcomers drop out in less than a month; Alcoholics Anonymous, 1990) and the recidivistic nature of treatment (72% among those recruited in long-term residential programs in our study

alone), interventions that tangibly help clients to try AA again, with an open mind and greater involvement with AA members, are needed. Based on anecdotal evidence and our own observations at AA meetings and among treatment clients, we believe there are many individuals who attend AA but tend to sit around the edges, arriving late and leaving early and never connecting much with the people in the program. We believe MAAEZ meets the needs of these people especially. Book and Randall (2002) have noted that social anxiety pervades among many alcoholics, so it makes sense that such individuals may not know how to introduce themselves to people at AA. Timko's intensive referral intervention connected clients with an AA member who met them at a meeting, which may have been just what a neophyte needs to spark a relationship with AA. MAAEZ results suggest that those with more prior experience in AA may need more than that. Similarly, in Project MATCH, clients learned about acceptance and surrender, concepts probably helpful to AA newcomers but somewhat "old hat" to those with lots of AA exposure. This interpretation is supported by Kahler's finding of a positive effect for their very brief TSF intervention only among those with minimal prior AA/NA experience (Kahler et al., 2004). Since different types of TSF appear necessary based on past AA experience, providers may want to consider matching different TSF approaches based on prior AA exposure.

Our results also differed from prior research in terms of religiosity. Maude-Griffin found that those with strong religious beliefs did better in TSF, while we found a greater MAAEZ effect for those who were atheist, agnostic or unsure of their religious beliefs. Maude-Griffin studied African American clients, for whom the church and religiosity are powerful sources of social and emotional support. In contrast, many of our participants were secular, and our MAAEZ spirituality session did focus on introducing clients to a new, more neutral and accepting way of experiencing the talk about god and spirituality that they inevitably encountered in AA.

We also found stronger MAAEZ effects among demographic subgroups not previously identified in prior TSF studies. These included males, non-married individuals, and those without high school diplomas. The social encouragement from MAAEZ homework may have been especially helpful for those living alone or without a partner. Further, the practical homework assignments may have appealed most to those with less formal education who may become frustrated by the didactic nature of some substance abuse treatment (Kaskutas, Ammon, Witbrodt et al., 2005).

Other subgroups with strong MAAEZ effects were those with drug problems at or above median severity, and those whose alcohol problems were below median severity; this is a puzzling pair of findings. Perhaps neither group had seriously considered AA, thinking it was only for alcoholics, until they heard in MAAEZ that they could go to AA, and would be welcomed. MAAEZ may have also made them feel more comfortable in AA. Our study included those with alcohol and/or drug problems, so there may have been considerable overlap of individuals within the high drug severity and low alcohol severity groupings.

Last, we found a greater MAAEZ effect for those without heavy alcohol and drug users in their social network at baseline. At its 3-year follow-up, Project MATCH found a greater TSF effect among outpatients with high network support for drinking at study entry. It may be that having fewer heavy drinkers in one's social network takes precedence during the first year of abstinence, while having skills to cope with heavy drinkers is more important 3 years after treatment. Perhaps Project MATCH TSF inoculated participants from negative pressure from heavy drinkers, whereas MAAEZ reinforced the positive influence of social networks without any heavy drinkers or users. We plan to explore social network variables (including support for drinking, support for quitting, support from 12-step members) in forthcoming mediational analyses of MAAEZ. MAAEZ is grounded in the Theory of Planned Behavior (Ajzen, 1985), and aims to overcome resistance to 12-step groups by changing participants' attitudes,

subjective norms and perceived control regarding 12-step involvement. Thus we will study not only changes in social networks, but also how clients viewed what would happen (including what their friends would think) if they became involved in AA/NA/CA. We also will look in-depth at how MAAEZ participation was associated with AA involvement, a key theoretical mediator of MAAEZ's effects. Evidence of reasonable mechanisms of action, that are consistent with our theoretical model, would lend further confidence in the effectiveness of MAAEZ.

Study Limitations

Although the study had a strong response rate at the 12 month follow-up interview (76%), an attrition bias was present that limits the generalizability of these results. Individuals with a lower socioeconomic status and who only had a drug diagnosis were under-represented at follow-up. However, since the MAAEZ effect was stronger among those with severe drug problems, this implies that our results actually may underestimate MAAEZ effectiveness. In addition, our quasi-experimental design had less power than a traditional randomized trial. However, randomization would have introduced contamination and thus reduced the internal validity of such a trial. Our historical content analysis, which tracked potential events that might have impacted the effectiveness of 12-step facilitation, noted both increases and decreases in substance abuse treatment funding as well as high-profile entrants into treatment during the recruitment period. Still, our empirical comparison of the two OFF conditions found no difference in outcomes that might suggest a historical effect, so we feel confident that MAAEZ effectiveness is not an artifact of the study design.

We also conducted multiple subgroup analyses, introducing the potential for Type I error. The consistency of results between the intent-to-treat and as-treated analyses mitigates this concern somewhat, and suggests some robustness of effect within particular subgroups. Another limitation was our inability to widely validate self-reported drug use in the sample as had been planned, and the discordance between drug tests and self-reported drug use among those few who did provide urine samples and tested positive for current drug use. The rates of past 30-day abstinence from alcohol and drugs in our study are about 10%-15% higher than those reported in other studies (see, for example, (Weisner, Mertens, Parthasarathy, & Moore, 2001; Witbrodt et al., 2007)). Still, we have no reason to believe that false positives would have been more common in the ON condition, so this issue should not detract from the findings regarding MAAEZ effectiveness. One final limitation is the small number of ON condition clients who received a full MAAEZ dose (barely 20%). This reflects the reality of service delivery in real-world treatment programs, in which clients cannot be expected to complete treatment. Thus, this health services trial of MAAEZ has strong external validity.

Our analyses did not account for the potential impact of the group dynamic on outcome (Kenny, Mannetti, Pierro, Livi, & Kashy, 2002). In group-administered treatment, participants interact with one another and can influence one another's behavior, causing interdependence of observations. Statistical models can address this problem by considering the intra-class correlation (ICC) among those in the same group to judge significance (Baldwin, Murray, & Shadish, 2005; Kenny & Judd, 1986; Morgan-Lopez & Fals-Stewart, 2006). Failure to account for this group effect can increase the likelihood of finding a statistically significant difference between treatment conditions that appears to be due to condition, but is in fact caused by the group effect. Even a small group effect ($ICC=.05$) can increase type 1 error by 20% (Varnell, Murray, Hannan, & Baker, 2001). The bias associated with the group dynamic increases as group size, number of sessions, and group stability increase (Baldwin et al., 2005; Kenny & Judd, 1986; Kenny et al., 2002).

We considered whether we needed to correct for ICC in our study. Group sizes were modest, with about 6 at the introductory sessions and 12 at the core sessions, and the number of sessions

was small (6). Also, group stability was low: 25%-75% turn-over at each core session attended, and 50% turn-over at each introduction session, with half newcomers and half attending as graduates. Given the limited size of the groups, the small number of sessions, and the high turn-over arising from the intervention's design, it is not clear that we should expect a group effect at all from MAAEZ. Furthermore, power for detecting significant condition differences within the latent classes would be limited were we to correct for ICC, such that we would be unable to determine definitively whether results discordant from those presented here were due to ICC or power. Because ON condition clients returned to usual care after the MAAEZ intervention, still another group dynamic was encountered by study participants. For these reasons (some of which flow from the structure of MAAEZ, others from the study design and available sample), we decided not to implement a statistical adjustment for group membership in our study.

Conclusion

MAAEZ participation led to higher abstinence rates in the sample overall and in important subgroups including unmarried individuals, those with more severe psychiatric problems, individuals who were atheists, agnostics, or unsure of their religious beliefs, clients who had been to treatment before, and those with more prior AA exposure. MAAEZ is brief and easily implemented in existing residential and outpatient treatment programs by simply laminating the MAAEZ session outlines included in the manual. The manual is available free of cost from the senior author.

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ABSTINENCE RATES AS A FUNCTION OF MAAEZ DOSE

Figure 1.

TABLE 1

Sample characteristics by program type

		LONG-TERM RESIDENTIAL	SHORT-TERM RESIDENTIAL	OUTPATIENT
		<i>n</i> ₁ = 211	<i>n</i> ₂ = 136	<i>n</i> ₃ = 161
		%	%	%
Demographics	Gender *			
	Male	67.8	74.3	59.0
	Female	32.2	25.7	41.0
	Age			
	18-29	30.0	27.9	34.2
	30-39	29.5	29.4	29.8
	40-49	32.4	26.5	26.1
	50+	8.2	16.2	9.9
	Race/Ethnicity ***			
	White	41.2	63.2	56.5
	Black	26.1	19.9	10.6
	Hispanic	24.6	10.3	26.7
	Other	8.1	6.6	6.2
	Marital Status ***			
	Married/live w/ partner	19.9	43.4	25.5
	Other	80.1	56.6	74.5
	Education ***			
	< High School	36.0	8.8	26.1
	HS graduate/GED	27.5	32.4	27.3
	Some College/Tech	31.8	39.7	32.3
	College Degree+	4.7	19.1	14.3
	Employment ***			
	Full or Part-time	15.6	63.2	43.5
	Unemployed	65.4	22.1	39.1
	Other	19.0	14.7	17.4
	Income ***			
	< 10 K	42.6	6.5	26.2
	10k - 29,999k	29.5	16.8	22.3
	30k - 49,999k	16.3	23.4	15.5
	50k +	11.6	53.3	35.9

		LONG-TERM RESIDENTIAL	SHORT-TERM RESIDENTIAL	OUTPATIENT
		<i>n</i> ₁ = 211	<i>n</i> ₂ = 136	<i>n</i> ₃ = 161
		%	%	%
DSM Diagnosis ***				
	Alcohol Only	8.1	30.1	18.0
	Drug Only	47.4	37.5	40.4
	Alcohol and Drug	26.1	20.6	19.9
	Undiagnosed	18.5	11.8	21.7
Religiosity **				
	Atheist/Agnostic/Unsure	12.0	27.4	20.6
	Spiritual/Religious	88.0	72.6	79.4
Social Network				
	No heavy users	59.2	49.3	56.5
	Some heavy users	40.8	50.7	43.5
Service Utilization and Severity	Prior treatment ***			
	Yes	71.8	66.9	57.8
	No	28.2	33.1	42.2
#Lifetime Meetings **				
	None	4.3	14.0	9.3
	1-29	29.9	43.4	31.7
	30-90	18.0	13.2	20.5
	91-499	36.5	22.8	28.0
	500+	11.4	6.6	10.6
AA Involvement (# of activities, out of 9) ^I ***		4.76 (2.37)	2.96 (2.45)	4.14 (2.85)
ASI Alcohol Score ^I **		0.27 (0.29)	0.36 (0.32)	0.24 (0.26)
ASI Drug Score ^I ***		0.17 (0.15)	0.15 (0.13)	0.10 (0.10)
ASI Psych Score ^I ***		0.35 (0.28)	0.39 (0.26)	0.26 (0.23)

^I AA Involvement score and ASI's presented as mean (sd)

* p < .05

** p < .01

p < .001

TABLE 2
Bivariate analyses of abstinence rates at 6 and 12 months (past 30 days), by condition (“intent-to-treat”)

	6 MONTHS			12 MONTHS		
	OFF <i>n</i> = 147	ON <i>n</i> = 232	2-sided <i>p</i>	OFF <i>n</i> = 150	ON <i>n</i> = 232	2-sided <i>p</i>
<i>Outcome (past 30 days)</i>						
Abstinent from alcohol and drugs	74.1	77.6	0.260	70.7	78.9	0.045
Abstinent from drugs	85.0	89.7	0.119	83.3	91.8	0.009
Abstinenence from alcohol	78.9	82.3	0.244	71.5	81.9	0.012

TABLE 3

a: 12-Month Outcomes, "Intent-to-Treat" (condition effects)						
	ABSTINENT FROM ALCOHOL & DRUGS		ABSTINENT FROM DRUGS		ABSTINENT FROM ALCOHOL	
	OR	CI	OR	CI	OR	CI
ON condition (vs. OFF)	1.58	0.98, 0.56 ^(*)	2.21	1.17, 4.19	1.85	1.12, 3.05
Length of Stay	1.01	1.00, 1.01	1.00	0.99, 1.01	1.01	1.00, 1.01
Married (vs. not)	0.97	0.57, 1.65	1.06	0.52, 2.13	0.92	0.53, 1.60
Short term residential (vs. long-term res.)	0.68	0.34, 1.35	0.97	0.38, 2.48	0.73	0.35, 1.50
Outpatient (vs. long-term res.)	0.83	0.43, 1.61	0.81	0.34, 1.90	0.85	0.43, 1.69
b: 12-Month Outcomes, "As-Treated" (dose effects)						
	ABSTINENT FROM ALCOHOL & DRUGS		ABSTINENT FROM DRUGS		ABSTINENT FROM ALCOHOL	
	OR	CI	OR	CI	OR	CI
MAAEZ Dose	1.12	1.01, 1.26	1.25	1.06, 1.47	1.13	1.01, 1.28
Length of Stay	1.01	1.00, 1.01	1.01	0.99, 1.01	1.01	1.00, 1.01
Married (vs. not)	0.96	0.56, 1.62	1.03	0.51, 2.08	0.91	0.53, 1.58
Short term residential (vs. long-term res.)	0.65	0.32, 1.31	0.93	0.36, 2.37	0.70	0.34, 1.46
Outpatient (vs. long-term res.)	0.86	0.44, 1.66	0.87	0.37, 2.05	0.88	0.44, 1.75

(*)
p = 0.063

TABLE 4

Within-Group Analyses, “As-Treated”: Odds Ratios for Abstinence from Alcohol and Drugs at 12 months (past 30 days), for Each Increase in MAAEZ Dose ¹

<i>subgroup</i>	<i>n</i>	OR	95% C.I.
Gender			
Women	127	1.07	0.89, 1.30
Men	245	(1.15 [*])	0.99, 1.32
Ethnicity			
Non-White	178	1.12	0.94, 1.33
White	194	(1.15 [*])	0.98, 1.35
Marital status ²			
Non-Married	261	1.18 [*]	1.03, 1.36
Married	111	1.06	0.85, 1.31
Prior treatment exposure			
Not 1 st treatment episode	233	1.18 [*]	1.02, 1.36
1 st treatment episode	133	0.99	0.81, 1.21
Education			
Less than High School	91	1.41 [*]	1.01, 1.97
High School +	281	1.10	0.97, 1.24
Diagnosis			
Alcohol Dependent	67	0.89	0.68, 1.17
Drug Dependent	154	1.27 [*]	1.04, 1.55
Alcohol & Drug Dependent	87	1.13	0.91, 1.40
Undiagnosed	64	1.05	0.72, 1.53
ASI composite scores			
Alcohol ≥ median	181	1.09	0.93, 1.28
Alcohol < median	190	(1.17 [*])	0.99, 1.38
Drug ≥ median	182	1.12	0.96, 1.31
Drug < median	187	1.07	0.90, 1.28
Psych ≥ median	183	1.24 [*]	1.04, 1.48
Psych < median	186	1.00	.85, 1.19
Program Type ³			
Long Term Residential	128	(1.22 [*])	0.99, 1.51
Short Term Residential	112	1.07	0.88, 1.31
Outpatient	132	1.04	0.84, 1.28

<i>subgroup</i>	<i>n</i>	OR	95% C.I.
# Lifetime Meetings			
None	31	0.95	0.51, 1.76
1-29	128	1.04	0.86, 1.25
30-90	65	1.06	0.78, 1.42
91+	148	1.30 [*]	1.05, 1.61
AA Involvement (mean # of activities, out of 9)			
≥ median	217	1.12	0.96, 1.31
< median	155	1.11	0.94, 1.33
Religiosity			
Atheist/Agnostic/Unsure	76	1.35 [*]	1.03, 1.77
Spiritual/Religious	293	1.07	0.95, 1.22
Social Network Composition			
No heavy users	206	1.24 [*]	1.04, 1.47
Some heavy users	166	1.03	.88, 1.21

¹ Controls for marital status, length of stay, and program type.

² Does not control for marital status

³ Does not control for program type

(^{*}) p < .10

* p < .05

** p < .01

*** p < .001