HHS Public Access

Author manuscript

Psychol Addict Behav. Author manuscript; available in PMC 2018 February 01.

Published in final edited form as:

Psychol Addict Behav. 2017 February ; 31(1): 54–60. doi:10.1037/adb0000235.

Lifetime Alcoholics Anonymous Attendance as a Predictor of Spiritual Gains in the Relapse Replication and Extension Project (RREP)

J. Scott Tonigan,

Department of Psychology, Center on Alcoholism, Substance Abuse & Addictions, University of New Mexico

Elizabeth A. McCallion,

Department of Psychology, Center on Alcoholism, Substance Abuse & Addictions, University of New Mexico

Tessa Frohe, and

Department of Psychology, Center on Alcoholism, Substance Abuse & Addictions, University of New Mexico

Matthew R. Pearson

Department of Psychology, Center on Alcoholism, Substance Abuse & Addictions, University of New Mexico

Abstract

This study investigated the association between extent of lifetime attendance in Alcoholics Anonymous (AA) and spiritual gains among treatment seeking adults for alcohol use disorder (AUD). Participants included 246 individuals from two of the three sites in the Relapse Replication and Extension Project (Lowman, Allen, Stout, 1996). Baseline characteristics included 63% male, 39.9% single, and the average age was 34 years (SD=8.2). The Alcoholics Anonymous Involvement questionnaire (AAI; Tonigan, Connors, & Miller, 1996) was used to assess lifetime AA attendance. The Religious Beliefs & Behaviors Questionnaire (Connors, Tonigan, & Miller, 1996b) was used to assess spirituality. Percent days abstinent (PDA) and drinks per drinking day (DPDD) were measured using the Form 90. At baseline, adults with more extensive AA histories were more severely alcohol impaired although they were no older relative to adults with less past AA exposure. Clear patterns of AA engagement were found between the high-low AA history groups over follow-up, with adults with less AA experience reporting less AA participation across a swath of AA-specific measures. Gains in spiritual practices significantly mediated AA-related benefit as measured by PDA and DPDD. Tests for moderated-mediation indicated that the magnitude of the mediational effect of spiritual gains did not differ between high-low AA history groups. Having an extensive AA history did not advantage (or disadvantage) adults in mobilizing future spiritual practices that are prescribed in AA. Clinical assessment of client AA history is

Correspondence concerning this article should be addressed to: J. Scott Tonigan, Center on Alcoholism, Substance Abuse and Addictions, 2650 Yale SE, Albuquerque, NM 87106, jtonigan@unm.edu.

important, however, because it predicts both the nature and extent that clients may participate in AA.

Keywords

Alcoholics Anonymous; spirituality; alcohol treatment outcomes; Relapse Replication and Extension Project

Alcoholics Anonymous is the most popular mutual-help program for alcohol problems and 12-step facilitation, based upon AA doctrine and practice, is one of the prevailing therapeutic models in the United States (Substance Abuse and Mental Health Services Administration, 2014). There is strong evidence that AA attendance is predictive of increased abstinence (Humphreys, Blodgett & Wagner, 2014; Magura et al., 2013; Wilcox, Pearson, & Tonigan, 2015) and that active encouragement to attend AA accounts for the superiority of 12-step treatment when complete abstinence is the goal of treatment (Tonigan, 2005). Well known, spiritual progress is the cornerstone of the AA program of recovery (AA, 2001). Lesser known, over a dozen prospective studies have now documented that gains in AA prescribed spiritual practices actually do explain, in part, the direct association between AA attendance and later abstinence. Meta-analytically summarizing this literature, in Magill et al. (2015), Tonigan reported that frequency of AA attendance is significantly, albeit modestly, associated with increased spiritual practices (r_w = .22; 9 studies), which is, in turn, related to increased abstinence (r_w = .13; 9 studies).

Little is known about the specific spiritual practices in AA that predict increased abstinence. Generally, composite measures of AA-related spiritual practices have been used by investigators, measures such as the popular Religious Behaviors and Background questionnaire (RBB; Connors et al., 1996a) which combines narrow religious practices, e.g., reading Holy scripture, and broader dimensions such as prayer and meditation. Work by Tonigan and colleagues (2013) suggest that it is the broader and more inclusive aspects of spiritual practices that account for salutary effects of spirituality in AA. Specifically, they compared the strength of the mediational effect of spiritual practices in AA among early AA affiliate using three scoring methods of the RBB; the total score, the two psychometrically developed subscales of the RBB, and a modified version of one of the RBB subscales, God Consciousness, which included only the measurement of a self-descriptor item and the frequency of thinking about God, prayer, and meditation. This latter modified scale outperformed all others. It appears, then, that AA prescriptions for daily prayer and mediation as well as the reciting of AA approved prayers such as the Serenity Prayer at times of uncertainty or distress (AA, 2002) are among the more salient spiritual active ingredients accounting for increased abstinence.

The focus of this paper is to investigate factors that may influence the extent that prayer, meditation, and thinking about God are mobilized among early AA affiliates. Clearly, it is clinically important to identify those client characteristics, beliefs, and/or behaviors that influence the acceptability of spiritually-based content in 12-step therapy and that will be most likely to mobilize spiritual gains in AA. Frequently reported, self-reported atheists are significantly less likely to attend AA (Kelly et al., 2011; Tonigan, Miller, & Schermer, 2002;

Zemore, 2007) and to engage in spiritual practices prescribed in AA (Connors, Tonigan & Miller, 2001). Unfortunately, this client attribute lacks clinical utility in determining what emphasis to place on spiritual practices such as prayer in 12-step therapy given the relatively small percentage of atheists in the U.S. (estimated 3.1%; Pew Research Center, 2015). Also unfortunate, client attributes that may have clinical utility have not been supported. Connors and colleagues (2001), for example, posited that comfortability or familiarity with spiritual practices would facilitate greater 12-step treatment compliance and increase AA attendance relative to cognitive behavioral (Morgenstern et al., 2001) and motivational enhancement therapies (Miller, 1995). Here, greater "comfortability" was defined by higher levels of daily religious and spiritual practices. This hypothesis was not supported in Project MATCH. Alternatively, in an exploratory study Kelly and Hoeppner (2013) investigated if gender moderated the mobilization of AA-related spiritual gains. While gender differences were observed on some mechanisms of change in AA (i.e., negative affect self-efficacy), they reported that females and males did not differ in the extent that spiritual gains accounted for AA-related benefit.

The current study will explore, among treatment seeking adults, whether history of prior AA participation moderated either the mobilization of prayer, mediation, and thinking about God and/or the extent to which gains in these spiritual practice predicted increased abstinence. Logically, people with more extensive knowledge and experiences with the AA program and fellowship may engage more rapidly in what AA has to offer. In turn, extent of past AA exposure may moderate the cognitive-behavioral processes of change accounting for AA benefit and/or the speed in which these mechanisms, such as spiritual gains, become influential. Of course, the opposite argument can be made. Specifically, individuals seeking alcohol treatment with extensive AA histories may perceive that AA was not helpful. In this situation, one may predict that individuals with more extensive AA histories would engage in AA less readily when encouraged to do so. One may also argue that, as evidenced by current treatment-seeking behavior, the spirituality change mechanism had not been *appropriately* mobilized in the past among these individuals and, thus, will have a low probability of being mobilized in the future.

The selection of past AA history as a potential moderating variable has attractive features. It is highly relevant to clinicians. It is common, for example, for AA members to cycle in and out of AA during their lifetime (Kelly et al., 2010), and a majority of clients already have extensive AA histories when they present for treatment (Humphreys, Kaskutas & Weisner, 1998). Contending with this wide variability in the past AA experiences of clients, evidence-based strategies for tailoring spiritually-based interventions would be quite valuable. Related, an "index" score representing extent of AA history can be computed for all individuals when it is conceptualized as a continuum. As such, this moderator has high utility in that it applies to all treatment-seeking individuals. Finally, it is relatively easy and inexpensive to measure extent of past AA history. This is an important consideration in the context of shrinking resources and rising demands on treatment providers.

Using data from the multi-site Relapse Replication and Extension Project (RREP; Lowman, Allen, Stout, 1996), the present study had three primary aims. The first aim was to compare AA affiliation patterns among treatment-seeking individuals with and without extensive

histories in community-based AA. The second aim was to investigate whether history of AA involvement was associated with the efficacy of AA participation on alcohol outcomes. The third aim was to examine whether history of AA involvement moderated the extent to which AA participation mobilized increases in prayer, mediation, and thoughts about God or the extent to which these spiritual practices mobilized improved alcohol outcomes.

Method

Participants and Procedures

RREP consisted of three research sites (Buffalo, NY; Providence, RI; Albuquerque, NM) that collectively recruited 563 participants. Due to the inclusion criteria for the current study, we retained 246 individuals from the total sample. RREP participants were recruited from multiple treatment centers and met diagnostic criteria for alcohol abuse or dependence during the previous 6 months (see Table 1 for demographic information). Participants did not have any other drug diagnoses that were more severe than their alcohol problem, had not used drugs intravenously in the past 6 months, were without major psychiatric disorder or gross cognitive impairment, and had completed alcohol detoxification. Trained and experienced research staff conducted all study assessments and each research site used over twenty-four instruments to measure domains that have been empirically supported to predict relapse. Overall, the RREP study sought to replicate Marlatt's taxonomy of relapse participants and to further describe prospective designs to identify additional predictors of relapse.

The current study required that all included participants had complete baseline data to ascertain lifetime AA attendance from the AAI as well as the baseline and six-month measure of spirituality (RBB). The Providence, RI, site did not include spirituality in their baseline questionnaires; therefore we were only able to include two of the three research sites (Buffalo, NY and Albuquerque, NM) in this study. Follow-up rates for the 246 individuals in this study were good; rates at 2, 4, 6, 8, 10, and 12-months were 96.7%, 95.1%, 91.1%, 89.0%, 88.2%, and 84.9%, respectively. Eighty-three percent of the 246 participants (n = 205) were interviewed at all follow-up points.

Measures

Form 90—The Form 90 semi-structured interview was used to retrospectively collect daily information about alcohol use (Miller, 1996). The Form 90 was administered at all assessment interviews. Two outcome measures of alcohol use were computed from this measure: proportion of days abstinent from alcohol (PDA) and drinks per drinking day (DPDD). PDA was defined as the number of days abstinent from alcohol divided by the total number of days in the assessment period. DPDD was defined as the number of drinks consumed per drinking day divided by the number of drinking days in a period (abstinent days not included in the denominator). Frequency of days AA was attended was collected using the Form 90. Total day's AA was attended at a given follow-up was divided by the number of days in the assessment window to adjust for between-subject variability in length in time between follow-up interviews.

Alcoholics Anonymous Involvement Scale—The Alcoholics Anonymous Involvement Scale (AAI) was used to assess lifetime AA attendance (Tonigan, Connors, & Miller, 1996). In addition to collecting information on the total number of days of lifetime AA attendance, the AAI asks participants to complete 13 items related to involvement in AA attendance and activities. These items include, considering one's self to be a member of AA, going to 90 meetings in 90 days, celebrating an AA birthday, and having and/or being a sponsor.

Religious Background and Behavior—The Religious Background and Behavior self-report questionnaire measures spiritual and religious behaviors (S/R) and practices (Connors, Tonigan, & Miller, 1996a). At baseline, the 13-item inventory inquired about lifetime (6 items) and past year S/R practices (7 items) while the six and 12-month follow-up version only asked about S/R practices since the last interview. Exploratory Factor Analyses led to the construction of two subscales in the unveiling psychometric paper: God Consciousness and Formal Religious Practices, both of which have excellent test-retest stability, r = .94 and .96, and high internal item consistency, = .76 and = .81, respectively. Subsequent psychometric work (Tonigan et al., 2013) has led to a modification in the two RBB scales such that one item, practice of meditation (item 2c), has been shifted from the Formal Religious Practices scale to the God Consciousness scale. With this background, the Modified God Consciousness (MGC) scale used in this study was created by summing items 1, 2a, 2b, and 2c. Item 1, a self-descriptor, was coded 1 = Atheist through Religious coded = 5. All remaining items in the MGC scale used an 8-point Likert scale in which Never = 1 and More then Daily is coded 8 when asking about frequency of thinking about God (2a), prayer (2b), and meditation (2c). The MGC scale can thus yield scores that range from 4 through 29.

Results

At baseline, 246 participants reported their lifetime days of AA attendance collected from the AAI (136 from Buffalo research site and 110 from the Albuquerque site). This reduced sample was divided on responses to this item. For the entire sample, the mean number of lifetime AA days was 90.93 (SD = 193.67) and the median AA lifetime days was 20. Because of the strong recommendation in AA to attend 90 meetings in 90 days, and because a 90-in-90 may reflect a deeper commitment to prescribed AA practices, we divided our sample using a mean-split. This decision resulted in 194 (79%) participants assigned to the low-AA lifetime group and 52 (21%) participants to the high-AA lifetime group. A 2x2 chi square analysis indicated that there was no relationship between AA lifetime history (low/high) and recruitment site, χ^2 (1) = 2.21, p < .14.

Aim 1

Our first aim sought to compare adults assigned to the low and high AA history groups on baseline demographic variables and patterns of AA participation during the course of the study. Shown in Table 1, a clear pattern emerged in demographic characteristics between participants with and without extensive AA histories. On one hand, the low/high AA groups did not differ in age, years of education, gender, or marital status. Likewise, the two groups

did not differ in the proportion of abstinent days (PDA) in the 90-day period before study recruitment nor in their endorsement of spiritual practices as measures by the MGC scale. In contrast, participants with extensive lifetime AA histories reported, on average, significantly higher rates of unemployment, alcohol dependency, higher drinking intensity (DPDD), and AA attendance in the 90-days prior to recruitment. Finally, relative to all other ethnic/racial groups a significantly disproportionate high number of White participants reported extensive AA histories.

Table 2 displays the practice of 12-step activities over the course of the study by the extent of AA lifetime history of participants. For the four categorical variables in Table 2 (labeled, *Percent*), sixteen 2 × 2 chi square analyses were conducted to assess whether extent of AA history moderated the endorsement of each AA-specific practice at each time point. Only one chi square analysis was non-significant using an unprotected Type I error rate ($\alpha = .05$). At the 6-month follow-up, high and low AA history participants reported relatively equivalent rates of having a spiritual awakening. At all time points, a higher percentage of participants with extensive AA lifetime histories reported higher rates of attending AA, considered themselves AA members, had an AA sponsor, and experienced a spiritual awakening in AA. Interestingly, a higher percentage of participants considered themselves AA members than actually attended AA meetings, a finding identified in both low and high AA history groups.

Three analytic approaches were used to compare frequency of AA meeting attendance of the two AA history groups (Table 2). First, seven independent t-tests indicated that the group with more extensive AA histories reported, on average, significantly higher rates of AA attendance at all assessment points relative to the low AA history group. Here, between-group effect size estimates adjusted for small sample bias (Hedges g) ranged from g = .41 (2 month) to g = 1.13 (6 month). Second, using GLM that included baseline AA attendance as a covariate we contrasted the two groups at each of the six follow-up assessments. This perspective indicated that, relative to initial baseline mean values; high-low AA groups only differed significantly at the 6 and 8-month follow-ups (Wald Chi Square = 9.67 (1), $p < .002$ and Wald Chi Square = 10.59 (1), $p < .001$, respectively). Finally, a conditional multilevel growth model (MLM) was conducted to first assess if frequency of AA meeting attendance changed over the 15-month period (intake, 2, 4, 6, 8, 10, and 12 months) followed by testing if our AA lifetime classification variable moderated changes over time in AA attendance. Two covariates, baseline marital status and total ADS score, were entered as level 1 predictors of self-reported AA attendance. The AA lifetime classification variable was dummy coded and was entered in level 2 of the model. The cross-level interaction term (time x AA classification variable) was significant, indicating that the rate of change in AA attendance varied systematically by extent of prior AA history, $t = 3.49$, $p < .001$. Here, AA attendance declined significantly more rapidly over time for the low AA group over the 15-month period, $t = -7.97$, ($b = -.022$), $p < .001$ compared to the high AA group.

Aim 2

This aim investigated the lagged association between frequency of days AA meeting attendance and later alcohol use, and how such associations may be moderated by our AA

lifetime classification variable. Table 3. provides descriptive information on three measures of alcohol use over 15 months divided by high and low prior AA histories. Lagged multilevel modeling (MLM) was used to address this aim with proportion of days of 12-step attendance modeled as a random effect (baseline, 2, 4, 6, 8, and 10) separately predicting later PDA and DPDD (months 1, 3, 5, 7, 9, and 11). Fixed covariates included baseline marital status and the total ADS score. With the two covariates, time, intercept, and AA attendance (level 1) in the model, AA attendance was a significant predictor of later increases in PDA, t = 3.66, (b = 7.54, p < .001), but not reductions in drinking intensity (DPDD), t = −1.06 (b = −.86, p < .29).

Building on this lagged MLM, we included the AA classification variable (level 2) to see if extent of AA lifetime history moderated AA-related benefit. Regarding the PDA outcome measure, the low AA history group reported a positive and significant relationship between AA attendance and increased abstinence over the course of the study, t = 2.31 (b = 5.91), p < .022. Relative to the low-AA group, the strength of the association between AA attendance and later abstinence was not significantly different for the high AA history group, t = 1.43, p < .15. Considering DPDD, no association between AA attendance and reductions in later drinking intensity was found for either the low or high AA history groups, (Low: t = −.35, b = −.33, p < .73; High: t = −1.10, b = −1.77, p < .27). Collectively, findings indicated that AA attendance was predictive of increased abstinence, but not drinking intensity when drinking occurred, and that these associations were not moderated by the extent of prior AA experiences of study participants.

Aim 3

Our third objective was to assess if the extent of AA history at baseline moderated two pathways of interest: (1) the extent that AA attendance mobilized prayer, meditation, and thoughts of God (*a* path), and (2) the extent that these spiritual practices predicted increased abstinence and reductions in drinking intensity (*b* path). *Mediation*. Testing this objective first involved conducting two simple mediation analyses for our primary drinking outcomes, PDA and DPDD, via the product-coefficient approach with bias corrected bootstrapping (Hayes, 2013). Here, proportion of days of 12-step attendance for months 1–6 was used as the independent variable, the dependent measure was either PDA or DPDD months 7–12 and the mediator was the MGC spirituality score collected at six months. Covariates in the model included the baseline value of the dependent measure, the MGC score, marital status, and the total ADS score.

Strong support was found for the assertion that our combined measure of increased AA-prescribed prayer, meditation, and thoughts of God (months 1–6) explained AA-related benefit. Specifically, proportion of days of 12-step attendance was significantly and positively associated with increases in these spiritual practices (PDA: b = 2.86, t = 2.20, p < .029; DPDD: b = 3.01, t = 2.31, p < .022), and, in turn, such practices significantly predicted increased PDA (b = 1.74, t = 4.20, p < .001) and decreased DPDD (b = − .360, t = −2.22, p < .028). The indirect effects were significant for both PDA (95% CI = 1.48–11.85) and DPDD (95% CI = −3.08 –.21).

Moderated Mediation—Tests for moderated mediation followed Hayes' (2013) recommendation to test the isolated interaction terms associated with the *a* and *b* paths. The interaction for the *a* path was defined as the product term, AA life history (high-low; dummy coded) x AA attendance months 1–6 while the b path interaction term represented the product term, AA life history (high-low; dummy coded) x changes in the MGC spirituality scale months 1–6. The four covariates used in simple mediation models were included in the tests for moderated mediation.

As a preliminary step to understand the nature of the MGC scale we examined pre-post means at the item level for three items in the MGC scale (Table 4). T-tests indicated that, at baseline, the two AA history groups did not differ on frequency of thoughts of God ($p <$ .61), prayer ($p < .09$), and meditation ($p < .65$). Likewise, using GLM which controlled for baseline values of the dependent measure there were no significant between-group mean differences in thoughts about God ($p < .20$), prayer ($p < .12$), and meditation ($p < .45$) at the six-month follow up. Translating the means in Table 4 to the RBB item response scale, at baseline participants reported praying about once a week, thought about God twice weekly and only meditated about once a month. Noteworthy, in collapsing the two AA history groups paired t-tests indicated that, relative to baseline, study participants reported significantly more use of prayer ($p < .04$), meditation ($p < .04$), and thoughts of God ($p <$ .05) at the six-month follow up.

None of the four interaction terms in the tests for moderated mediation (path *a* and *b* x two dependent measures, PDA and DPDD) were significant, and the largest obtained t- value was, $t = -1.34$, $p < .18$. In other words, extent of prior AA history did not influence the significant and positive association between AA attendance and later gains in three specific spiritual practices. Likewise, extent of AA history did not influence the significant influence of spiritual gains in increasing abstinence and decreasing drinking intensity.

Discussion

Study findings underscore both the importance of considering the extent of 12-step lifetime attendance when making clinical referrals to AA as well as the conundrum facing clinicians when making such referrals. Specifically, adults with more extensive 12-step histories were significantly more likely to attend 12-step programs, they attended significantly more frequently, and they engaged in prescribed 12-step activities, such as acquiring a sponsor, significantly more often relative to adults with less extensive 12-step histories. Given the long standing finding that problem severity predicts AA affiliation, it was not surprising that adults with more extensive AA histories were more severely impaired, reported drinking at higher intensities, and 79% of these adults were currently unemployed. Noteworthy, the two AA history groups did not differ in age and, as such, more extensive AA histories of our participants cannot be explained simply by having more time to accumulate AA-related experiences. It seems reasonable to suggest, therefore, that core messages in the AA literature (2001) focusing on loss of control and powerlessness may have greater appeal and resonate more clearly among adults at the more severe end of the alcohol dependence spectrum.

In spite of clear differences in levels of AA engagement, the striking finding was that high and low AA history groups did not differ in drinking outcomes, and that AA attendance was equally important for both groups in explaining increased abstinence. Herein lays the challenge for clinicians. On one hand, clients with little-to-no prior AA exposure may be the least likely to be successfully referred to attend AA. On the other hand, once engaged these adults report relatively equal benefit in terms of increased abstinence as the more easily facilitated and more severely impaired clients. We recommend that future research into the perceived barriers for attending AA consider prior AA experiences as a moderating variable.

Consistent with previous reports, we found that gains in spiritual practices of AA affiliates partially accounted for the salutary effects of AA on increased abstinence and decreased drinking intensity. This is an important replication given the broad eligibility criteria of the study, the absence of randomization, and the naturalistic features of the RREP study. Equally important, findings provided an initial view of the types and frequency of use of three spiritual practices that predict increased abstinence. Specifically, early AA affiliates tended, on average, to report more frequent use of thoughts about God and prayer relative to the practice of meditation. This disparity in use may simply reflect pre-AA knowledge and use of specific spiritual practices, but it also may reflect a differential emphasis within AA, especially when encouraging early AA members to adopt spiritual practices. Given the diversity in the types of prayers encouraged in AA, (e.g., petitionary, ritualistic, and colloquial) our findings indicate the need for future research to eschew measures of global prayer frequency in favor of more specific measures that distinguish between the different kinds of prayer prescribed in AA.

Contrary to expectations, extent of previous AA attendance was unrelated to the mobilization of spiritual practices and the extent that spiritual practices influenced abstinence. In short, individuals with more extensive knowledge of AA practices were not advantaged (or disadvantaged) in adopting spiritual practices prescribed in AA relative to AA neonates. This finding is perplexing and raises important questions. Why were past learning effects muted among individuals with more extensive AA histories? Did the novelty of AA prescribed spiritual practices for AA neonates differentially enhance readiness for adopting these practices relative to individuals more familiar with AA prescribed practices? From a dose-response perspective, why did qualitatively different levels of *current* AA engagement between the two AA history groups fail to produce different rates of spiritual gains? And, most broadly, do our findings apply to other documented mechanisms of change in AA such as increased abstinence-based self-efficacy? Addressing these questions in future research will significantly advance our understanding of how, and under what conditions, AA-related benefit is realized.

Important to note, this study had limitations. First, study aims and inclusion criteria led to a substantial reduction in the RREP sample. As a result, caution should be exercised in generalizing and comparing our findings to the larger RREP sample and publications. Second, follow-up assessments in this study were conducted in two-month increments, but the measure of spirituality, the RBB, was only administered at baseline, six, and 12-month follow-up. More frequent assessment of spirituality, especially during the early course of AA participation, would have been desirable. Third, it is not clear how findings would differ

using other operational definitions of high-low AA histories. Alternative definitions may consider altering the number of days of prior AA attendance to designate AA history status as well as including other markers of AA commitment such as extent of working the 12 steps.

Conclusions

In sum, practitioners encounter clients with different AA histories and such histories appear to predict the extent and ways that adults engage in AA in the future. While AA attendance was positively associated with later increases in abstinence *regardless* of the extent of past AA involvement, findings also indicated that, over time, frequency of AA attendance declined more rapidly for those clients with less extensive AA histories. Finally, we found no support for the notion that the beneficial effects of spiritual gains in AA was moderated by the AA histories of study participants. Collectively, clinical assessment of the AA history of clients is useful because it provides critical information about likely patterns of future AA affiliation, but it may be relatively unimportant for anticipating the acceptability and benefits of prescribed spiritual practices in AA.

Acknowledgments

This research was supported by the National Institute on Alcoholism and Alcohol Abuse (NIAAA, R01-AA022328; PI: Katie Witkiewitz). J. Scott Tonigan is supported by a career mentoring award (K24-AA021157) from the NIAAA. Matthew R. Pearson is supported by a career development award (K01-AA023233) from the NIAAA. No author has conflicts of interest.

References

Alcoholics Anonymous. Alcoholics Anonymous World Services. 4. 2001.

Connors, GJ., Tonigan, JS., Miller, WR. Religiosity and responsiveness to alcoholism treatments. In: Longabaugh, R., Wirtz, PW., editors. Project MATCH hypotheses: Results and causal chain analyses. Vol. 8. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; 2001. p. 166-175.Project MATCH Monograph Series

Connors G, Tonigan JS, Miller WR. The Religious Background and Behavior Instrument: Psychometric and normed findings. Psychology of Addictive Behaviors. 1996b; 10:90–96.

Connors GJ, Tonigan JS, Miller WR. A measure of religious background and behavior for use in behavior change research. Psychology of Addictive Behaviors. 1996a; 10(2):90.

Hayes, AF. Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York: The Guilford Press; 2013.

Humphreys K, Blodgett JC, Wagner TH. Estimating the Efficacy of Alcoholics Anonymous without Self- Selection Bias: An Instrumental Variables Re- Analysis of Randomized Clinical Trials. Alcoholism: Clinical and Experimental Research. 2014; 38(11):2688–2694.

Humphreys K, Kaskutas LA, Weisner C. The relationship of pre-treatment Alcoholics Anonymous affiliation with problem severity, social resources and treatment history. Drug and Alcohol Dependence. 1998; 49(2):123–131. [PubMed: 9543649]

Kelly JF, Stout R, Magill M, Tonigan JS, Pagano M. Mechanisms of behavior change in Alcoholics Anonymous: does AA improve alcohol outcomes by reducing depression symptoms? Addiction. 2010; 105:626–636. [PubMed: 20102345]

Kelly JF, Hoeppner BB. Does Alcoholics Anonymous work differently for men and women? A moderated multiple-mediation analysis in a large clinical sample. Drug and Alcohol Dependence. 2013; 130(1):186–193. [PubMed: 23206376]

Kelly JF, Stout RL, Magill M, Tonigan JS, Pagano ME. Spirituality in recovery: A lagged mediational analysis of Alcoholics Anonymous' principal theoretical mechanism of behavior change. Alcoholism: Clinical and Experimental Research. 2011; 35(3):454–463.

Lowman C, Allen J, Stout RL. The Relapse Research Group. Replication and extension of Marlatt's taxonomy of relapse precipitants: overview of procedures and results. Addiction. 1996; 91:51–71.

Magill M, Kiluk BD, McCrady BB, Tonigan JS, Longabaugh R. Active ingredients of treatment and client mechanisms of change in behavioral treatments for alcohol use disorders: Progress 10 years later, Alcoholism: Clinical and Experimental Research. 2015; 39(10):1852–62.

Magura S, McKean J, Kosten S, Tonigan JS. A novel application of propensity score matching to estimate Alcoholics Anonymous' effect on drinking outcomes. Drug and Alcohol Dependence. 2013; 129(1):54–59. [PubMed: 23040721]

Miller, WR. Motivational enhancement therapy manual: A clinical research guide for therapists treating individuals with alcohol abuse and dependence. DIANE Publishing; 1995.

Miller, WR. Form 90: A Structured Assessment Interview for Drinking and Related Behaviors: Test Manual. US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism; 1996.

Morgenstern J, Morgan TJ, McCrady BS, Keller DS, Carroll KM. Manual-guided cognitive-behavioral therapy training: A promising method for disseminating empirically supported substance abuse treatments to the practice community. Psychology of Addictive Behaviors. 2001; 15(2):83. [PubMed: 11419234]

Pew Research Center. America's changing religious landscape. 2015 May 12. Retrieved from: http://www.pewforum.org/2015/05/12/americas-changing-religious-landscape/

Substance Abuse and Mental Health Services Administration. National Survey of Substance Abuse Treatment Services (N-SSATS): 2013. Data on Substance Abuse Treatment Facilities. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. BHSIS Series S-73, HHS Publication No. (SMA) 14–489

Tonigan JS. Examination of the active ingredients of Twelve-Step Facilitation (TSF) in the Project MATCH outpatient sample. Alcoholism: Clinical and Experimental Research. 2005; 29(2):240–241.

Tonigan JS, Miller WR, Schermer C. Atheists, agnostics and alcoholics anonymous. Journal of Studies on Alcohol and Drugs. 2002; 63(5):534–41.

Tonigan JS, Rynes KN, McCrady BS. Spirituality as a change mechanism in 12-step programs: a replication, extension, and refinement. Substance Use & Misuse. 2013; 48(12):1161–1173. [PubMed: 24041178]

Tonigan JS, Connors GJ, Miller WR. Alcoholics Anonymous Involvement (AAI) scale: Reliability and norms. Psychology of Addictive Behaviors. 1996; 10(2):75–80.

Wilcox CE, Pearson MR, Tonigan JS. Effects of long-term AA attendance and spirituality on the course of depressive symptoms in individuals with alcohol use disorder. Psychology of Addictive Behaviors. 2015; 29(2):382–91. [PubMed: 26076099]

Zemore SE. A role for spiritual change in the benefits of 12-step involvement. Alcoholism: Clinical and Experimental Research. 2007; 31(3):76–79.

Table 1

Baseline Sample Characteristics

	Low AA (n = 194)	High AA (n = 52)	p[1]	Total (N = 246)
Demographics				
Male %	63.1	64.2	.89	63.3
Ethnicity/Race			.04	
White % (n)	73% (93)	27% (34)		51.6%
African American % (n)	88% (49)	12% (7)		
Hispanic % (n)	83% (35)	17% (7)		
Other % (n)	81% (17)	19% (4)		
Single %	39.5	41.5	.79	39.9
Unemployed %	55.2	79.2	.001	60.0
Age in Years *M* (*SD*)	33.5 (8.14)	35.7 (8.10)	.08	33.94 (8.20)
Years Education *M* (*SD*)	12.3 (2.11)	12.46 (2.4)	.62	13.33 (2.16)
Alcohol Use				
Alcohol Dependence Score *M* (*SD*)	19.86 (8.94)	27.15 (7.67)	.001	21.42 (9.18)
Percent Days Abstinent[2] *M* (*SD*)	45.67 (29.69)	49.26 (30.13)	.44	46.43 (29.96)
Drinks Per Drinking Day *M* (*SD*)	16.39 (11.52)	22.03 (12.03)	.002	17.56 (11.83)
Help Seeking				
Proportion Days Outpatient *M* (*SD*)	.21 (.41)	.31 (.47)	.19	.23 (.42)
Proportion 12-Step Days *M* (*SD*)	.01 (.04)	.14 (.22)	.001	04 (.12)
RPB-MGC *M* (*SD*)	18.88 (6.33)	19.47 (6.08)	.54	19.00 (6.27)

[1] unprotected probability value

Table 2

Practice of Prescribed AA Activities by Extent of AA History

	BL	2	4	6	8	10	12
Percent Complete Abstinence							
Low AA History	18.7	65.1	64.9	37.4	42.2	43.0	35.0
High AA History	51.4	84.3	84.0	64.7	61.7	60.0	63.3
Days AA Attendance *M* (*SD*)							
Low AA History	.01 (.04)	.30 (.36)	.30 (.36)	.06 (.14)	.15 (.27)	.16 (.28)	.06 (.15)
High AA History	.14 (.22)	.44 (.33)	.43 (.34)	.29 (.35)	.32 (.38)	.28 (.35)	.27 (.34)
Percent AA "Members"							
Low AA History	37.1			49.3			44.3
High AA History	80.8			81.1			66.7
Percent with AA Sponsor							
Low AA History	10.8			30.3			34.2
High AA History	71.2			61.1			40.0
Percent Spiritual Awakening							
Low AA History	22.2			37.7			41.0
High AA History	46.2			48.6			35.6

Table 3

AA Attendance and Alcohol Use by AA Life History Status

	Assessment Point						
	BL	**2**	**4**	**6**	**8**	**10**	**12**
Percent Attending AA							
Low AA History	1%	48.1%	43.5%	37.7%	37.8%	38.0%	40.9%
High AA History	0%	52.9	56.0%	40.8%	48.9%	47.8%	62.2%
Percent Days Abstinent *M* (*SD*)							
Low AA History	45.7 (29.8)	87.3 (22.0)	83.4 (26.9)	82.0 (26.1)	80.4 (30.2)	81.2 (30.8)	81.8 (28.9)
High AA History	48.7 (30.2)	91.6 (20.4)	89.1 (20.5)	84.0 (25.8)	85.3 (22.6)	81.7 (29.2)	86.9 (26.8)
Drinks per Drinking Day *M* (*SD*)							
Low AA History	16.4 (11.5)	5.3 (7.8)	6.1 (8.1)	6.6 (7.3)	7.5 (9.9)	6.9 (8.2)	7.1 (8.8)
High AA History	22.0 (12.0)	8.5 (13.4)	6.4 (9.8)	9.3 (10.9)	5.9 (6.7)	8.1 (11.4)	4.9 (8.0)

Table 4

Mean (SD) Frequency of Three AA-Prescribed Spiritual Practices at Baseline and Six-Months by AA Life History

Prescribed Spiritual Practices	Low AA History (n = 194)		High AA History (n = 52)		Baseline p Value
	Baseline	6-Months	Baseline	6-Months	
Frequency of Prayer	5.12 (2.45)	5.46 (2.40)	5.77 (2.37)	6.10 (2.04)	.09
Frequency of Meditation	3.50 (2.47)	3.85 (2.60)	3.33 (2.37)	4.20 (2.51)	.65
Thoughts about God	6.18 (2.07)	6.41 (2.04)	6.35 (2.08)	6.85 (1.59)	.61