

The Co-Relation of Alcoholics Anonymous Participation to Alcohol and Other Drug (AOD) Treatment Outcomes

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A sample of 301 clients from a large substance abuse treatment facility was surveyed utilizing a pretest/posttest design. Participants completed measures both prior to participating in outpatient treatment and then approximately 7 months after discharge. Twelve-step participation was measured, along with effects of the individual 12 steps, to determine any contribution to treatment outcomes, including spirituality, health, mental health, and alcohol and other drug (AOD) outcomes. Analyses were conducted to determine if participation changed over the study period and whether it impacted outcomes after treatment. Results indicated that participation and the effects of the individual steps were not statistically significant in relation to many treatment outcomes. However, these factors were important in the development of client spirituality.

INTRODUCTION

Twelve-step treatment, including Alcoholics Anonymous and related self-help groups, remains the most utilized treatment modality in the United States and many substance use clients will have some form of contact with these treatment principles (Timko, Moos, Finney, & Lesar, 2000; Tonigan, Connors, & Miller, 2003). There is general agreement that 12-step modalities are relatively effective in reducing substance use and some consequences of use (McLellan et al., 1993; Moos & Moos, 2004). A large national study comparing several popular modalities, including 12-step, found the examined modalities were equally effective in reducing substance use outcomes,

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even when controlling for individual client differences (Tonigan, Miller, & Connors, 2000). Extant literature has also determined that 12-step treatment generally compares favorably to no treatment, which further supports the importance of the 12-step modality (Moos, 2003).

While there has been a surge in scientific activity investigating the effectiveness of the 12-step approach, there is still relatively little known concerning specific mechanisms for substance use change or the effect on psychosocial outcomes (Tonigan, Miller, & Connors, 2000). Both affiliation and participation with Alcoholics Anonymous (AA) have proven significant in an overall reduction of drinking severity and an increase in the rates of abstinence (McKellar, Stewart, & Humphreys, 2003; McLellan et al., 1993; Moos & Moos, 2004). The link to other psychosocial outcomes, however, remains unresolved. Results indicate a moderate relationship between AA participation and both purpose in life and mental health, but these and other areas of psychosocial functioning are in need of continued study (Emrick, Tonigan, Montgomery, & Little, 1993; Owen et al., 2003; Tonigan, 2001).

Another specific outcome in need of study is that of client spirituality, as spirituality is an integral operational principle for the 12-step modality (Miller, 2003; Miller & McCrady, 1993). Twelve-step tenets generally propose that alcohol abuse and dependence is incompatible with spirituality and the only hope for sobriety is to accept help by directing one's life toward a higher power (Miller, 2003). While empirical evidence supports the importance of the higher power, spiritual support, and the use of prayer or meditation to success in treatment, other spiritually related aspects of treatment, such as forgiveness, were found to be insignificant to the recovery process (Carroll, 1993; Fiorentine & Hillhouse, 2000; Green, Fullilove, & Fullilove, 1998). With incomplete results, treatment programs utilizing spiritual foundations, such as AA and many other 12-step programs, need further examination to clarify both the nature and scope of any spiritual contribution, as the exact mechanism by which these spiritual elements or dimensions operate is unclear (Miller, 2003).

Also unclear is the contribution of the individual steps. While some steps, such as the identification of a higher power, have been examined, there is an overall dearth of knowledge on the contribution of the steps to treatment outcomes. It is possible that different steps may be more important for particular individuals during various phases of recovery or impact different categories of outcome. Such step mechanisms through which any effect may operate is of particular importance (Owen et al., 2003). In addition, much of the research has utilized samples that exclude substances other than alcohol and more information is needed to discern any possible differences between user populations and substances (Miller & McCrady, 1993).

Although empirical evidence suggests 12-step elements, such as participation and some of the steps, may play a role in successful treatment of addictions, some basic questions concerning the effect of treatment on

outcomes remain unaddressed. In an effort to further elucidate the role of 12-step elements on treatment outcomes, this project had four specific aims: (a) Investigate the relationship between 12-step participation and individual step effects at the beginning of outpatient treatment (pretest) and pretest scores on measures of severity of substance use, consequences of substance use, spirituality, health, mental health, quality of life, and social support; (b) Determine any change in client's 12-step participation between treatment (pretest) and 7 months after discharge from outpatient treatment (posttest); (c) Investigate the relationship between 12-step participation and individual step effects prior to treatment (pretest) on treatment outcomes (severity of substance use, consequences of substance use, spirituality, health, mental health, quality of life, and social support) at posttest; and (d) Investigate the relationship between 12-step participation and individual step effects after discharge (posttest) on treatment outcomes at posttest.

METHOD

Treatment Setting

The setting for the study was a large, comprehensive treatment facility that offers multiple facets of alcohol and other drug (AOD) treatment at several locations. Treatment is conceptualized as a continual process that begins, if necessary, with medical detoxification, continues with intensive inpatient treatment, and is completed through participation in outpatient services. Upon completion of inpatient services, clients are referred to outpatient services at either the main location or one of several satellite locations geographically closer to the client's residence.

During treatment, clients follow a treatment plan that includes both individual and group treatment. Participation in AA or another relevant self-help group (e.g., Narcotics Anonymous) is also encouraged. Education as to the nature of addiction and discharge planning are also included in the course of treatment.

While the particular emphasis of treatment may differ slightly depending on which particular stage the client is currently participating in, the overall treatment philosophy is a traditional 12-step approach combined with many aspects of the medical model of addictions. The treatment protocol strongly emphasizes abstinence and continued participation in AA or a related self-help group after discharge.

Procedure and Design

After approval from the university's institutional review board, data were collected from clients over a 2-year period utilizing a pretest/posttest design.

The overall design protocol was to survey clients immediately upon entrance into outpatient treatment and then 7 months after discharge from outpatient treatment. In an effort to control for any possible location differences in treatment delivery, only the main facility and the largest satellite location were sampled. All clients referred to outpatient treatment in these two locations for the study period were asked to participate. A total of 426 clients were admitted to outpatient programs at both locations during the study period. Of those, 421 clients completed pretest surveys. Pretest surveys were generally completed during a scheduled group meeting time and took approximately 1 hour to complete after a complete explanation of the project was presented.

Upon discharge from treatment, clients were placed on a list and contacted by phone approximately 7 months after discharge to update contact information and verify their willingness to participate in the project. If clients agreed to continue in the project, posttest surveys were then mailed to participants with a postage paid return envelope. Posttest surveys contained the identical measures as the pretest surveys. Once the posttest survey was received, a \$30 money order was sent to the participant. The return rate was 71%, with 301 clients completing and returning the posttest surveys. The inability to contact clients upon discharge was the major reason (93%) for nonparticipation. Several of the clients (4%) were not interested in further participation, one client was incarcerated, and one client had died during the follow-up period. Analyses, which were independent samples *t* tests, indicated no significant differences in any study variables between participants and those that did not participate, including spirituality, at pretest.

Sample

The analyzed sample consisted of 301 clients. The clients had been discharged from outpatient treatment for an average of 30 weeks (range 28–32 weeks). The sample was 49% female, 51% male, and had a median age of 35 years (range 18–58 years). The majority of the participants were Caucasian (80%), with 15% of the sample reporting their ethnicity as African American and 5% described their ethnicity as Hispanic, Asian, or other. The largest group in the sample (30%) reported some college or post-high school education. Those with a high school diploma (21%) were the next largest category, followed by those participants with a General Education Development (GED) test (12%). The majority of the sample was employed at least part time (59%), with 40% reporting that they were currently unemployed. Many clients (49%) had some involvement with the criminal justice system, with driving under the influence (DUI; 27%) being the largest reported issue. A majority of the clients (62%) had some form of treatment history; 38% reported that this was their first treatment episode. Alcohol was the primary drug for most clients (70%), followed by cocaine (11%) and heroin (6%).

Measures—Independent Variables

TWELVE-STEP PARTICIPATION (ATTENDANCE AND INVOLVEMENT)

Participation in the treatment program and in 12-step self-help groups was measured using the Twelve-Step Participation Questionnaire (TSPQ; Tonigan, Connors, & Miller, 1996). The TSPQ measures the degree to which clients have participated in 12-step programs, including which particular steps have been addressed. The normative sample included 1,726 clients participating in the national Project Match study. Varimax rotation was used, with the number of factors based on eigenvalues greater than 1.00. The results led to a two-factor solution: Attendance (TSPQ A) and Involvement (TSPQ B). Internal consistency was .85 for the entire scale and .85 and .77 for each of the subscales, Attendance (5 items) and Involvement (8 items), respectively. This instrument has also been used in previous research with strong internal consistency (Montgomery, Miller, & Tonigan, 1995).

INDIVIDUAL STEP EFFECTS

The effects of each individual step were measured with the General Alcoholics Anonymous Tools of Recovery (GAATOR 2.1; Montgomery, Miller, & Tonigan, 1995). The GAATOR 2.1 measures elements of the 12-step philosophy that are closely associated with each step of the 12-step program. Internal consistency for the scales was reported as good and confirmatory factor analysis indicated that the measurement of scale construct was robust (Vick, Tonigan, & Miller, 2000). In previous research this instrument was demonstrated with a Cronbach's alpha of .92 and a Spearman-Brown split-half reliability of .90 (Montgomery, Miller, & Tonigan, 1995).

Measures—Dependent Variables and Treatment Outcomes

SEVERITY OF SUBSTANCE USE

The substance use severity variable was conceptualized using the Timeline Followback (TLFB) method developed by Sobell and Sobell (1995). Using a calendar, participants indicate the substances used in the past month as well as the amount of each substance. The total number of days that the client used any substance was used to indicate the severity of use. Memory aides, such as holidays that occur within each month, were used to help increase accuracy. This method has proven reliable in previous research and has demonstrated acceptable psychometric characteristics with a variety of samples (Sobell & Sobell, 1995; Wunschel, Rohsenow, Norcross, & Monti, 1993).

CONSEQUENCES OF SUBSTANCE USE

The consequences of substance use were measured using the Inventory of Drug Use and Consequences (InDUC; Tonigan & Miller, 2002). This 50-item self-report instrument was designed to measure adverse consequences of substance use, such as hangovers and problems in employment and relationships. Testing found acceptable psychometric characteristics (Tonigan & Miller, 2002).

DEPRESSION

Depressive symptoms were measured using the Center for Epidemiological Depression Scale-Revised Version (CESD-R; Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). The CESD-R is a 20-item scale of depressive symptoms, including 4 reversed items, where patients rate the frequency of depressive symptoms on a 0 to 4 scale in relation to how they felt during the past week. A total score is obtained by summing the responses to all of the items. This measure is widely used and has demonstrated good psychometric properties with many populations in a variety of research (Eaton et al., 2004).

HEALTH

The World Health Organization Psychiatric Disability Schedule, Version II, (WHODAS II) was utilized to measure participant health. This instrument uses 36 items to measure six domains and 3 items for an overall rating. Psychometric testing of the WHODAS II has been rigorous and extensive, undergoing reliability and validity testing in 16 locations across 14 countries. Health services research studies (to test sensitivity to change and predictive validity) were conducted in locations throughout the world in 2000. Psychometric testing identified a two-level hierarchical structure: individual items loaded onto one of six domains, which in turn load onto a general disablement factor (for more information, the reader is referred to <http://www.who.int/icidh/whodas/index.html>).

QUALITY OF LIFE

Quality of life was measured using the Quality of Life Inventory (QLI; Ferrans & Powers, 1992). This 66-item instrument measures both satisfaction and importance regarding various aspects of life. Importance ratings of life are used to weight satisfaction responses, so that scores reflect satisfaction with valued domains. The QLI utilizes five subscales: Health and Functioning, Psychological/Spiritual, Social and Economic, Family, and an overall score. Numerous studies have verified the reliable and valid properties of the QLI, with reliability scores ranging from .70 to .98 (Ferrans & Powers, 1992).

SOCIAL SUPPORT

The Sources of Social Support (SOSS) measure is a direct self-report instrument providing a measure of the perceived availability of social support from various sources deemed relevant to the social network of the respondent group. Ratings are made separately for emotional and practical support available from each source. A typical format involves separate ratings of emotional and practical support from at least eight persons (e.g., spouse, employer) or groups of persons (neighbors, relatives, coworkers). Versions have been developed for use with adolescent and adult samples. A five-step rating scale from *none at all* (1) to *a great deal* (5) is used. The separate summed scores for emotional and practical support are summed to provide a total or overall support score. Standard scoring requires that a sum across relevant and rated sources (those sources available in the respondent's network) be obtained and averaged, thus returning the SOSS scale scores on the 1 to 5 individual rating scale metric. The SOSS has demonstrated acceptable psychometric characteristics (Koeske & Koeske, 1989, 1990, 1993).

DEMOGRAPHIC CHARACTERISTICS

Information on age, ethnicity, and gender was collected for all participants. Also surveyed were whether the client had a criminal history and whether the charge was a crime against person or property. The client's drug history, including drug of choice, age of first use, and length of use, was collected. The client's pretest treatment history, which measured the number and length of previous treatment episodes, was recorded. Similarly, at posttest it was determined whether the client had been readmitted to treatment after discharge. Lastly, the length of this particular treatment episode, including the length of any inpatient treatment or detoxification, was collected.

RESULTS

Research Aim 1

The first research aim investigated the relationship between pretest 12-step participation (TSPQ), step effects (GAATOR), and pretest client scores on the study variables. The analysis for this aim followed a two-part approach. First, the relationships were tested using correlations. Second, significant correlation results were then tested using multiple regression analyses. It should be noted that only significant predictors from significant regression models were included in the results tables. In an effort to explore both the effects of overall attendance/involvement and the individual steps, the TSPQ (attendance/involvement) scales were analyzed separately from the GAATOR (individual step effects) scales.

Few significant correlations occurred when testing most of the measured treatment outcome variables; the GAATOR Step 3 was significantly correlated with Mental Health ($r = .181, p < .05$) and Step 4 with Quality of Life ($r = .168, p < .05$). The correlation results for Spirituality, however, were generally stronger (Table 1).

Regression analyses were then performed using these significant correlation results. Neither the Mental Health nor the Quality of Life models achieved significance. Both the attendance (TSPQ A) and involvement (TSPQ B) subscales were significant factors for several spirituality models (Table 2). Several steps, particularly Step 3 and Step 9, were statistically significant individual variables in the eight overall significant regression models (Table 3).

Research Aim 2

The second research aim explored change in 12-step participation, both generally (using the TSPQ) and by working individual steps (using the GAATOR), from pretest to posttest. This aim was addressed utilizing paired t tests. One of the TSPQ (TSPQ B, Involvement) subscales and nine of the GAATOR individual step scales demonstrated significant change from pretest to posttest (Table 4). To determine if measured change may have been due to demographic factors (gender, age, ethnicity, and involvement with the criminal justice system, drug of choice, treatment readmission, or treatment history), mixed model repeated measures analyses of variance (ANOVAs) were conducted. Given the large number of analyses being conducted, the type 1 error rate was adjusted with a Bonferroni correction to .001. None of these results were significant, demonstrating that the reported change of 12-step effects was generally not due to the influence of any of the tested demographic factors.

Research Aim 3

The third research aim explored the impact of pretest 12-step participation and individual steps on posttest outcomes. Essentially this aim explored how the client's experience with 12 steps *before* this new treatment episode might affect any treatment results. This aim also followed a two-step procedure with significantly correlated 12-step scales (Step 1) used in regression models (Step 2). As in the first aim, all significant correlation results were included in testing the overall regression model, but only those variables achieving significance in the regression equations were included in the tables. The GAATOR Step 9 was significantly correlated with social support ($r = .172, p < .05$), but did not result in a significant regression model. Posttest spirituality, however, appeared to be more strongly correlated with 12-step effects (Table 5) and also produced significant regression models on many spiritual dimensions for both overall attendance/involvement (TSPQ A/B; Table 6) and the individual step effects (GAATOR; Table 7).

TABLE 1 Correlation Results for Pretest 12-Step Effects and Pretest Spirituality

	Daily spiritual experience	Meaning	Values and beliefs	Forgiveness	Private religious practices	Religious and spiritual coping	Organizational religiosity	Commitment
TSPQ A	.229**	.148	.001	.075	.326**	.161	.338**	.036
TSPQ B	.235*	.083	.022	.245**	.347**	.183*	.177	.140
GAATOR Step 1	.268**	.337**	.158	.042	.248**	.302**	.118	.230**
GAATOR Step 2	.560**	.573**	.242**	.305**	.435**	.534**	.215**	.390**
GAATOR Step 3	.683**	.629**	.296**	.461**	.557**	.654**	.309**	.514**
GAATOR Step 4	.342**	.232**	.045	.247**	.385**	.174*	.084	.227**
GAATOR Step 5	.140	.159	.196*	.113	.208*	.157	.004	.074
GAATOR Step 6	.396**	.490**	.136	.281**	.390**	.332**	.216**	.307**
GAATOR Step 7	.401**	.396**	.223**	.306**	.347**	.433**	.125	.273**
GAATOR Step 8	.452**	.497**	.307**	.296**	.336**	.401**	.153	.284**
GAATOR Step 9	.543**	.481**	.169*	.294**	.503**	.376**	.181*	.422**
GAATOR Step 10	.407**	.383**	.172*	.126	.384**	.251**	.195*	.280**
GAATOR Step 11	.131	.050	.027	.127	.019	.047	.087	.053
GAATOR Step 12	.378**	.422**	.183*	.229**	.373**	.321**	.100	.326**

$N = 301$; * $p < .05$, ** $p < .01$.

TABLE 2 Regression Results for Pretest Spirituality from Pretest 12-Step Participation (TSPQ)

	β	t	p
Daily Spiritual Experience Model $R^2 = .089, F = 5.65, p = .005$			
TSPQ A	.197	2.08	.040*
Private Religious Practices Model $R^2 = .29, F = 13.72, p = .000$			
TSPQ A	.285	3.20	.002**
TSPQ B	.250	2.78	.006**
Forgiveness Model $R^2 = .079, F = 7.43, p = .007$			
TSPQ B	.245	2.73	.007**
Religious and Spiritual Coping Model $R^2 = .064, F = 5.03, p = .047$			
TSPQ B	.183	2.01	.047*
Organizational Religiousness Model $R^2 = .24, F = 18.60, p = .000$			
TSPQ A	.338	4.31	.000

$N = 301$; * $p < .05$, ** $p < .01$.

TABLE 3 Regression Results for Pretest Spirituality from Pretest Individual Step Elements (GAATOR)

MMRS Scale predictor	Daily spiritual experience model $R^2 = .55, F = 16.49,$ $p = .000$			MMRS Scale predictor	Values and beliefs model $R^2 = .20, F = 3.88,$ $p = .000$		
	β	t	p		β	t	p
GAATOR Step 3	.541	5.57	.000	GAATOR Step 4	.389	3.65	.000
GAATOR Step 9	.257	2.73	.007	GAATOR Step 8	.233	1.99	.049
MMRS Scale predictor	Forgiveness model $R^2 = .24, F = 5.30,$ $p = .000$			MMRS Scale predictor	Religious and spiritual coping model $R^2 = .49, F = 12.79,$ $p = .000$		
	β	t	p		β	t	p
GAATOR Step 3	.502	4.01	.000	GAATOR Step 3	.582	5.61	.000
				GAATOR Step 9	.187	2.33	.021

$N = 301$.

Research Aim 4

The last research aim addressed the relationship of posttest 12-step elements (TSPQ, GAATOR) and posttest treatment outcomes. This aim followed the identical analysis procedure as aims 1 and 3 with regression models preceded by correlational analyses. Unlike the previous analyses, however, there were

TABLE 4 Pre- and Posttest 12-Step Participation and Individual Step Changes

12-Step scale	Pretest		Posttest		Pre- and posttest comparison	
	<i>m</i>	<i>SD</i>	<i>m</i>	<i>SD</i>	<i>t</i>	<i>p</i>
TSPQ B (Involvement)	2.17	2.41	3.51	3.49	3.77	.000***
GAATOR Step 2	8.73	1.70	9.22	2.25	2.66	.009**
GAATOR Step 3	5.89	1.53	6.24	1.62	2.42	.017*
GAATOR Step 4	4.25	1.19	5.49	7.19	2.07	.040*
GAATOR Step 5	2.46	.807	2.68	.885	2.58	.011*
GAATOR Step 6	8.07	1.71	8.94	3.97	2.34	.021*
GAATOR Step 7	2.92	.730	2.94	.801	2.86	.005**
GAATOR Step 8	9.66	2.19	11.64	10.45	2.27	.025**
GAATOR Step 9	4.39	1.27	2.64	.809	15.64	.000***
GAATOR Step 10	2.33	.774	6.15	10.13	4.57	.000***

N = 301.

a number of significant correlation results with both 12-step measures and posttest outcomes. Table 8 has the correlation results for health, mental health, quality of life, social support, and posttest substance use severity. No significant regression analyses were produced from these correlation results. The correlation results for 12-step elements and spirituality are displayed in Table 9. Several regression models also achieved significance with the results in Table 10 (TSPQ) and Table 11 (GAATOR).

DISCUSSION

The results provide some possible insight into the workings of the 12-step modality. The overall trend was that both attendance at 12-step groups as well as involvement with the groups increased significantly over the study period. Further, individual step work also increased from outpatient discharge to the 7-month follow-up. These findings suggest that, more than simply attending the meetings, these clients made a choice to become integrally involved in their recovery process through attention to the step protocol.

A major finding of this study is a failure to verify an association between participation in the 12-step treatment and psychosocial outcomes such as health, quality of life, and mental health. This result was consistent through all phases of the study: prior to clients entering treatment, during the outpatient treatment, and after discharge from treatment. Similarly these results fail to support previous findings associating 12-step participation with significantly reduced substance use (McKellar et al., 2003; McLellan et al., 1993; Moos & Moos, 2004). While client reduction of alcohol and other drugs was statistically insignificant, there was positive change on all

TABLE 5 Correlation Results for Pretest 12-Step Elements and Posttest Spirituality

	Daily spiritual experience	Meaning	Values and beliefs	Forgiveness	Private religious practices	Religious and spiritual coping	Organizational religiousness	Commitment
TSPQ A	.183*	.003	.028	.051	.279**	.181*	.342**	.198*
TSPQ B	.175	.058	.016	.245**	.277**	.202*	.177	.033
GAATOR Step 1	.229**	.066	.059	.038	.166*	.178*	.111	.040
GAATOR Step 2	.334**	.106	.052	.274**	.247**	.294**	.202*	.327**
GAATOR Step 3	.396**	.144	.130	.415**	.329**	.358**	.290**	.358**
GAATOR Step 4	.259**	.080	.154	.222**	.223**	.214**	.078	.093
GAATOR Step 5	.097	.025	.000	.102	.025	.084	.003	.031
GAATOR Step 6	.311**	.100	.082	.253**	.201*	.224**	.202*	.168*
GAATOR Step 7	.286*	.098	.115	.276**	.180*	.262**	.118	.187*
GAATOR Step 8	.287**	.096	.146	.267**	.151	.211*	.144	.132
GAATOR Step 9	.323**	.117	.087	.264	.242**	.216**	.170*	.221**
GAATOR Step 10	.259**	.105	.019	.113	.207*	.143	.182*	.142
GAATOR Step 11	.105	.022	.018	.114	.060	.122	.082	.179*
GAATOR Step 12	.276**	.026	.016	.206*	.234**	.181*	.094	.156

$N = 301$; * $p < .05$, ** $p < .01$.

TABLE 6 Regression Results for Posttest Spirituality from Pretest 12-Step Participation (TSPQ)

	β	t	p
Daily Spiritual Experience Model $R^2 = .034, F = 4.99, p = .027$			
TSPQ A	.183	2.24	.027*
Private Religious Practices Model $R^2 = .14, F = 9.60, p = .000$			
TSPQ A	.271	2.95	.004**
TSPQ B	.187	2.03	.045*
Forgiveness Model $R^2 = .060, F = 7.43, p = .007$			
TSPQ B	.245	2.73	.007**
Commitment Model $R^2 = .20, F = 5.89, p = .016$			
TSPQ A	.198	2.43	.016*

$N = 301$; * $p < .05$, ** $p < .01$.

TABLE 7 Regression Results for Posttest Spirituality from Pretest Individual Step Effects (GAATOR)

	β	t	p
Forgiveness Model $R^2 = .24, F = 5.30, p = .000$			
GAATOR Step 3	.451	3.50	.001
Religious and Spiritual Coping Model $R^2 = .15, F = 2.57, p = .009$			
GAATOR Step 3	.313	2.35	.020

$N = 301$.

measured treatment outcomes from beginning of treatment to follow-up, which supports an important claim of clinical significance.

There were significant results, however, with regards to client spirituality. Attendance at 12-step groups and involvement in the groups were significantly related to higher client spirituality throughout the course of treatment. The positive effect on spirituality is further substantiated through an examination of individual step results. Steps 9, 11, 12, and particularly Step 3, were strongly related to increased spirituality for these clients. Further, the significant results of Steps 11 and 12 in this study are consistent with AA theory citing the importance of prayer or meditation and spiritual awakening (Miller, 2003). Again, it was interesting to discover that these effects existed prior to, during, and after formal discharge from treatment.

The focus of these significant steps—surrender (Step 3), forgiveness (Step 9), prayer or meditation (Step 11), and spiritual awakening (Step 12)—may tap identical constructs as the measured spiritual dimensions and may effect interpreting the results. At this point it is difficult to determine whether

TABLE 8 Correlation Results for Posttest 12-Step Effects and Posttest Outcomes

	Quality of life	Social support	Health	Mental health	Consequences of use	Posttest severity of use
TSPQ A	.305**	.206*	.019	.010	-.001	-.084
TSPQ B	.067	.187*	.124	.159	-.057	-.161
GAATOR Step 1	.053	.125	.021	.205*	-.101	-.299**
GAATOR Step 2	.038	.123	.100	.184*	-.133	-.200*
GAATOR Step 3	.044	.129	.170*	.209*	-.137	-.207*
GAATOR Step 4	.046	.090	.028	.097	-.021	-.073
GAATOR Step 5	.068	.058	.141	.155	-.122	-.225*
GAATOR Step 6	.032	.096	.090	.213**	-.107	-.171*
GAATOR Step 7	.022	.119	.028	.221**	-.241**	-.242**
GAATOR Step 8	.070	.207*	.322**	.182*	-.100	-.110
GAATOR Step 9	.029	.164*	.108	.239**	-.171*	-.207*
GAATOR Step 10	.081	.183*	.311**	.148	-.073	-.069
GAATOR Step 11	.104	.047	.231**	.250**	-.174*	-.191*
GAATOR Step 12	.063	.093	.146	.281**	-.191*	-.249**

$N = 301$; * $p < .05$, ** $p < .01$.

the changes are step effects, general spirituality, or some combination of both constructs. Even considering this caveat, the results lend support for the importance of spirituality, whether of a 12-step nature or a more generic category, in successful maintenance of treatment gains (Avants, Warburton, & Margolin, 2001; Flynn, Joe, Broome, Simpson, & Brown, 2003).

LIMITATIONS

Several limitations should be taken into account when interpreting the results. First, there was a nonresponse rate of 29%. This nonresponse rate was due, to a significant degree (94%), to the difficulty in locating this fairly mobile population. Analyses were conducted to demonstrate that data loss was not due to pretest variables, which should boost confidence in the results. This was a treatment sample of convenience. Participants in the analysis completed treatment, and it is possible that those not completing treatment differ significantly in some unmeasured manner from noncompleters.

CONCLUSION

The important question of 12-step treatment efficacy naturally arises from these results. Can 12-step treatment claim to be effective when many important areas of clients' lives are apparently unaffected by participation in the modality? First, there is the issue of clinical significance. The vast majority

TABLE 9 Correlation Results for Posttest 12-Step Effects and Posttest Spirituality

	Daily spiritual experience	Meaning	Values and beliefs	Forgiveness	Private religious practices	Religious and spiritual coping	Organizational religiousness	Commitment
TSPQ A	.371**	.098	.018	.073	.333**	.296**	.073	.199*
TSPQ B	.377**	.235**	.017	.153	.376**	.372**	.050	.156
GAATOR Step 1	.351**	.260**	.061	.063	.329**	.337**	.111	.220**
GAATOR Step 2	.695**	.355**	.214*	.134	.458**	.599**	.146	.512**
GAATOR Step 3	.718**	.430**	.122	.123	.571**	.619**	.151	.547**
GAATOR Step 4	.008	.014	.026	.067	.010	.046	.055	.022
GAATOR Step 5	.326**	.143	.007	.067	.255**	.285**	.039	.174*
GAATOR Step 6	.359**	.106	.141	.066	.213*	.292**	.030	.181*
GAATOR Step 7	.502**	.240**	.154	.037	.275**	.435**	.093	.340**
GAATOR Step 8	.212*	.098	.043	.025	.272**	.205*	.054	.255**
GAATOR Step 9	.497**	.290**	.025	.059	.409**	.383**	.018	.349**
GAATOR Step 10	.161	.070	.012	.045	.242**	.161	.056	.224**
GAATOR Step 11	.683**	.321**	.167*	.123	.521**	.649**	.112	.538**
GAATOR Step 12	.466**	.143	.056	.024	.345**	.414**	.023	.252**

$N = 301$; * $p < .05$, ** $p < .01$.

TABLE 10 Regression Results for Posttest Spirituality from Posttest 12-Step Participation (TSPQ)

	β	t	p
Daily Spiritual Experience Model			
$R^2 = .22, F = 19.46, p = .000$			
TSPQ A	.288	3.70	.000***
TSPQ B	.297	3.81	.000***
Meaning Model			
$R^2 = .06, F = 8.19, p = .005$			
TSPQ B	.235	2.86	.005**
Religious and Spiritual Coping Model			
$R^2 = .18, F = 15.50, p = .000$			
TSPQ A	.219	2.74	.007**
TSPQ B	.311	3.90	.000***
Commitment Model			
$R^2 = .04, F = 5.94, p = .016$			
TSPQ A	.199	2.44	.016*

$N = 301$; * $p < .05$, ** $p < .01$, *** $p < .001$.

TABLE 11 Regression Results for Posttest Spirituality from Posttest Individual Step Effects (GAATOR)

	β	t	p
Daily Spiritual Experience Model			
$R^2 = .56, F = 14.04, p = .000$			
GAATOR Step 3	.338	2.49	.014*
GAATOR Step 11	.235	2.16	.032*
Meaning Model			
$R^2 = .23, F = 3.27, p = .000$			
GAATOR Step 3	.546	3.04	.003**
GAATOR Step 12	.254	2.26	.026*
Religious and Spiritual Coping Model			
$R^2 = .45, F = 9.21, p = .000$			
GAATOR Step 11	.455	3.76	.000***
Commitment Model			
$R^2 = .38, F = 6.75, p = .000$			
GAATOR Step 3	.353	2.195	.030*
GAATOR Step 11	.325	2.51	.013**
GAATOR Step 12	.220	2.18	.031*

$N = 301$; * $p < .05$, ** $p < .01$, *** $p < .001$.

of clients did improve in the measured outcomes and there were numerous correlation results; just not enough change or predictive power to place them in the statistically significant category. Further, there are studies with larger samples that have found some direct effects (McKellar et al., 2003; McLellan et al., 1993; Moos & Moos, 2004). Change of any kind may be considered positive in the complex world of AOD treatment.

Another consideration is the mechanism through which the 12-step modality operates. One possible mechanism delineates a positive change in spirituality through interaction with 12-step treatment that then leads to cessation of substance use (Gorsuch, 1993; Miller, 2003). This mechanism describes either a moderating or mediating relationship of client spirituality and treatment outcomes that is consistent with AA's teaching of spiritual awakening. According to AA, spiritual awakening is a term used to describe an entire personality change sufficient to promote recovery. A major component of such a personality change is spiritual in nature (Miller, 2003).

Indeed, some authors claim that the spiritual change discussed in the AA literature is a direct result of embracing a higher power, which subsequently leads directly to successful cessation of the use of substances (Green et al., 1998; Schaler, 1997). Further, there is evidence that spiritual change may be important in achieving positive outcomes, particularly within a 12-step modality (Horstmann & Tonigan, 2000; Jarusiewicz, 2000).

More research is required to elucidate the exact mechanism through which the critical factors operate, but certainly these results support the idea that spiritual change is desirable and, indeed, necessary for success in a 12-step modality.

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