



The effects of sponsorship in 12-step treatment of injection drug users

Byron L. Crape, Carl A. Latkin *, Alexandra S. Laris, Amy R. Knowlton

John Hopkins University, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, MD 21205, USA

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Abstract

What contributes to sustained abstinence from injection drug use by those who participate in community-based Narcotics Anonymous (NA) and Alcoholics Anonymous (AA) is not well understood. We know that sponsorship is a central element in these programs. To investigate the relationship between sponsorship and abstinence, we evaluated NA/AA sponsorship over a 1-year period in a longitudinal study of 500 former and current injection drug users in inner-city Baltimore recruited from the community-at-large, independent of treatment center affiliation. The findings indicated that having a sponsor in NA/AA for this population was not associated with any improvement in 1-year sustained abstinence rates than a non-sponsored group. However, being a sponsor over the same time period was strongly associated with substantial improvements in sustained abstinence rates for the sponsors, controlling for involvement with community organizations, NA/AA meeting attendance, marital status, employment, participation in drug and alcohol treatment centers and HIV status. Involvement in community organizations was also strongly associated with successful abstinence, controlling for the same variables. Of those participants involved with community organizations, more than half reported involvement in church activities. Our investigation suggests that, for NA/AA sponsors in this study population, providing direction and support to other addicts is associated with improved success in sustained abstinence for the sponsors but does little to improve the short-term success of the persons being sponsored. © 2002 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction

The advent of cheap “crack” or “rock” cocaine and increases in heroin drug use in inner-cities have alarmed public health researchers and policy makers (Substance Abuse and Mental Health Services Administration, 1996, 1997; Isikoff, 1989). There are insufficient affordable drug and alcohol treatment slots in the inner-city to meet the demand (Washton and Stone-Washton, 1991; Zweben and Payte, 1990) and methadone treatment services are severely stretched (Nurco et al., 1991); hence, it is important to identify alternative cost-effective approaches.

There are also other obstacles to effective treatment coverage. A major challenge facing treatment programs

is to reduce the high relapse rates of abstaining cocaine and heroin addicts, especially during their first post-treatment year (McAuliffe et al., 1991; Tims et al., 1991; McAuliffe et al., 1986). Identifying modalities that help prevent chronic relapse is considered by many researchers to be the most important research question in the field of addictions (Hall et al., 1991; Tims and Leukefeld, 1986).

The most cost-effective alternatives to drug and alcohol treatment centers and methadone services are the community-based 12-step programs, in particular Narcotics Anonymous (NA) and Alcoholics Anonymous (AA). These programs were founded and are run by the addicts and alcoholics themselves and are widely believed by addictions specialists to be effective in reducing the risk of chronic relapse (Jaffe, 1995; Johnson and Chappel, 1994; Millman, 1988). However, until recently, published research that examined the effectiveness of 12-step programs produced ambiguous results.

* Corresponding author. Tel.: +1-410-955-3972; fax: +1-410-955-7241.

E-mail address: Clatkin@jhsph.edu (C.A. Latkin).

Prior to 1995 these studies were mostly inconclusive and sometimes contradictory. This was due in part to poor study design such as lack of random assignment, small sample sizes and faulty outcome measures (Tonigan et al., 1996b). However, more recent well-designed controlled trials and observational studies have consistently indicated that 12-step programs are effective in helping addicts maintain abstinence (Ouimette et al., 1997; Weiss et al., 1996; Project Match Research Group, 1997; Wells et al., 1994). These controlled trials and other recent research also indicate that improved outcomes are not so much a result of participant characteristics and motivations but appear to be *innately* associated with the 12-step programs themselves (Ouimette et al., 1997; Project Match Research Group, 1997; Wells et al., 1994; McKay et al., 1994).

Because of the high relapse rate in drug treatment center populations, several investigators have suggested that addiction research should focus on identifying factors and modalities that are most effective in preventing chronic relapse (Leukenfeld et al., 1991; Stimmel, 1991). There are many recent studies comparing different treatment modalities in formal treatment programs. However, there is a dearth of studies designed to evaluate community-based 12-step programs utilized by inner-city injection drug users. Almost all of the previous published research examined 12-step programs associated with treatment centers and the majority of these included only alcoholics. Very few studies have examined the effectiveness of community-based 12-step programs apart from formal treatment programs (Miller and Kurtz, 1994). Unfortunately, the results from these 'nested' studies on alcoholic 12-steppers may not be generalizable to those independent inner-city NA/AA programs attended by injection drug users. Not only might the effectiveness of community NA/AA programs differ from treatment center 12-step programs, but inner-city NA/AA attendees may also differ from those who participate in treatment centers. Studies have suggested that substance abusers with comorbid substance use disorders and major depression are more likely to seek out help at a drug and alcohol treatment center than those without these conditions (Grant, 1997).

Studies of alcoholics and those 12-step programs associated with treatment programs have found 12-step meeting attendance to be associated with abstinence. Although these studies suggested that regular NA/AA *attendance* was associated with abstinence, the *number* of meetings attended per week was not (Egelko et al., 1996; Sheeren, 1988; Hoffman et al., 1983; Pettinati et al., 1982). In addition, studies indicated that having a sponsor, above and beyond regular AA meeting attendance and participation, is

associated with increased likelihood of successful abstinence (Caldwell and Cutter, 1998; Morgenstern et al., 1996; Sheeren, 1988).

Having a sponsor and becoming a sponsor after some years of abstinence are highly encouraged by NA and AA literature. Sponsors are selected by the unsponsored or offered services by a sponsor. Normatively, sponsors in NA and AA provide their sponsees 12-step instruction, a set of codified procedures to promote abstinence, to improve relationships and to inspire fundamental changes in life-style. Each step is designed to progressively deal with different problems and issues to stimulate different areas of growth. Sponsors in NA and AA generally provide peer counseling, crisis intervention, guidance and life direction, encouragement and spiritual advise for the 12-stepper that they are sponsoring (personal communications with NA/AA participants, 1997–1998; Narcotics Anonymous, 1993, 1988; Humphreys and Noke, 1997). Some authors argue that acquiring and using a sponsor represents a turning point towards successful abstinence, but these views lack quantitative support (Marron, 1993).

The impact of being a sponsor is purported by the organizations and members of NA and AA to positively contribute not only to the recovery of the person being sponsored but to the sponsors' recovery as well (personal communications with NA/AA members 1997–1998; Narcotics Anonymous, 1993, 1988). There is some research supporting this association in AA (Cross et al., 1990). Both NA and AA program literature and some treatment specialists claim that sponsorship has one advantage over that of professional therapy because 12-step sponsors are all recovering addicts and alcoholics. It is believed that this shared experience provides for better insights into the problems particular to addicts (Narcotics Anonymous, 1988; Condelli and De Leon, 1993).

Few studies have examined the role of community-based 12-step programs in a *community-at-large* injection drug-using population. So in this context, the role of 12-step program features such as sponsorship is incompletely understood. Our investigation examined the impact of 12-step sponsorship, having a sponsor and being a sponsor, on a sample of inner-city former and current heroin and cocaine injection drug users. This investigation is based on a prospective study of this population. Unlike previous studies, participants in this study were recruited from the community-at-large. Given this difference, this study population includes a much larger proportion of users not interested in abstaining from drug use, a population with an average lower socio-economic status than those reportedly associated with treatment programs, and may more closely reflect the treatment challenges facing urban areas.

2. Methods

2.1. Study population

We based this investigation on surveys given every 6 months to the 503 baseline participants in the Social Affiliations in Injectors' Lives study (SAIL), an on-going study of psychosocial functioning of current and former heroin and cocaine drug injectors in inner-city Baltimore, Maryland (Knowlton et al., 2000). SAIL study participants were recruited in 1994–1995 from the AIDS Linked to Intravenous Experience study (ALIVE), an on-going prospective study of the natural history of HIV disease among injection drug users (Vlahov et al., 1991).

ALIVE participants were recruited from February 1988 to March 1989. Eligibility criteria for the ALIVE study included persons 18 years of age and older who had injected drugs sometime during the previous 10 years. A total of 85.7% of the 2921 ALIVE study participants was recruited by word of mouth from a friend or another participant. Only 5.6% of these participants reported first learning about the study through drug treatment programs. At the ALIVE baseline, based on self-reporting, the median age of participants was 34, 90% were African American, 81% male, 72% made less than \$5000 legal annual income, 55% had 12 years or less education, 77% were unemployed, 36% had been homeless, 66% had been incarcerated and 75% had been arrested, 51% had been treated for drug abuse in the past, 90% injected drugs within the same calendar year and 24% were HIV positive (Vlahov, 1994; Vlahov et al., 1991). The SAIL study population used for this investigation is a subcohort of this larger ALIVE cohort.

2.2. Variables

To evaluate the impact of 12-step sponsorship, participants in the SAIL study were classified at baseline into four groups for analyses: (1) those persons who reported not currently participating in either NA/AA ($N = 352$), (2) the "Not-Sponsored" group, those persons who reported currently participating in NA/AA but not having a sponsor nor having been a sponsor ($N = 57$), (3) the "Sponsored" group, those persons who reported currently participating in NA/AA and reported having a sponsor but never being a sponsor ($N = 62$), and (4) the "Sponsors" group, those persons who reported currently participating in NA/AA and reported having a sponsor and being a sponsor ($N = 29$). Data for the analyses was extracted from the SAIL survey given at baseline and from the two SAIL follow-up surveys given approximately 6 and 12 months after baseline. This data was supplemented by HIV testing and other survey information provided by the ALIVE

study. Those persons who reported attending NA/AA meetings and being a sponsor but not having a sponsor were excluded from analysis because there were so few ($N = 3$); it is very uncommon in NA and AA to be a sponsor without having a sponsor (NA/AA participants, 1997–1998).

Based on preliminary assessments, no distinction was made between NA and AA participation and sponsorship for this analysis. There were no substantive differences in abstinence rates nor any essential differences in baseline characteristics between those study participants who reported utilizing both NA and AA, only NA and only AA. Baltimore NA and AA structure, function and purpose were fundamentally the same, and the few NA and AA comparisons in the literature suggested other similarities between the two self-help organizations.

Of those study participants who reported attending at least NA or AA, 49.3% (73/148) attended both NA and AA, 45.6% (66/148) attended only NA and 6.1% (9/148) attended only AA. These three groups were distributed uniformly throughout the sponsorship categories noted above ($P = 0.71$) and had similar success in successful abstinence as defined in Section 2.3 (40.6, 41.9 and 33.3% respectively, $P = 0.89$). In addition, two of the authors observed more than 20 different NA and AA Baltimore-area meetings and reviewed both NA and AA program literature. NA and AA closely followed the same 12 steps, speaker and step meetings were run in similar fashion, and special features such as home groups and sponsors functioned similarly in both. For both the objective was abstinence from all substance abuse, both drugs and alcohol. In addition, many participants who attended both NA and AA meetings indicated that they saw no functional differences between the two, often freely attending whichever meeting was most convenient. Historically, before NA split from AA in 1953, narcotics addicts who were seeking abstinence attended AA meetings (Marron, 1993). The literature of the two organizations is also similar; indeed, much of the NA literature was based on original AA literature (personal communications with NA/AA participants, 1997–1998; Narcotics Anonymous, 1988; Alcoholics Anonymous, 1976, 1953). Finally, one of the few published studies that compares AA and NA indicates that prior affiliations with either Alcoholics Anonymous or Narcotics Anonymous/Cocaine Anonymous has essentially identical patterns of current and past utilization of formal and informal helping resources, suggesting further similarities (Humphreys et al., 1998b).

The demographic variables from the SAIL baseline survey used in the analysis were current age, gender, ethnicity (African American), marital state (currently married or not married), main partner (currently having a main partner or not) and employment status

(currently unemployed or employed). The drug-use variables currently using (cocaine/crack or heroin), using in the last 4 weeks, injection cocaine use (“do you ever inject cocaine?” or “... heroin and cocaine together?”), injection heroin use (“do you ever inject heroin?” or “... heroin and cocaine together?”), clean time (if not currently using), and daily alcohol use (“during the past 6 months how often did you have a drink containing alcohol, for example”) were from the SAIL baseline and follow-up surveys. The methadone use and duration of methadone use variables were extracted from the SAIL follow-up survey that was conducted approximately 1 year after baseline.

Other SAIL baseline variables used in the analysis include history of mental illness... (“ever had or told by a health professional that you have a mental illness — for example, depression, schizophrenia, or serious trouble with nerves?”), drug and alcohol treatment center (attending or belonging), drug user and homeless groups (attending or belonging), community involvement (attending or belonging to at least one community organization unrelated to drugs or alcohol, e.g. church activities, veterans’ groups and school-related organizations such as PTA). In addition, SAIL baseline variables used in the analysis as the criteria for dividing up groups included attending or belonging to NA or AA, having a sponsor, and sponsoring anyone. The ever-homeless variable came from the first SAIL follow-up survey approximately 6 months after the SAIL baseline survey.

Variables from the ALIVE surveys included income < \$5000/year (based on the question “total income before taxes last year?”), education: high school graduate (based on the question “highest grade.. completed?”; G.E.D. is considered equivalent to high school graduation for this analysis). HIV status at SAIL baseline was determined from HIV-testing every 6 months in the ALIVE study. If the last ALIVE study HIV test result prior to SAIL baseline was negative, they were coded as negative.

2.3. Operational definition of abstinence

The longitudinal outcome variable *abstinence* was defined as a success if at the SAIL study baseline and at the two subsequent SAIL study visits a participant consistently reported no current use of cocaine or heroin. Reported current use of cocaine or heroin at any visit was considered failed abstinence.

Defining abstinence as three consecutive reports of no drug-use spaced 6-months apart poses some complications. On initial observation, it appears that this definition of abstinence may substantially inflate the number of successful abstainers by including those participants who had reported not currently using at the time of the visit but who had used drugs sometime

during the 6-months between visits. However, preliminary analyses suggested that most participants who reported currently not using at a visit interview had not used for a substantial period of time. Furthermore, not everyone who used between visits should be excluded from the count of abstainers. On their way to successful abstinence, many addicts have temporary lapses of drug use. So, it is not unreasonable to consider some of these participants with between-visit lapses as successful abstainers. Finally, constraining the definition of abstinence by requiring three consecutive visits of reported current no-use increases the likelihood of excluding chronic relapsers. Based on these observations, the operational definition was judged valid for this investigation.

2.4. Attrition

Overall, there was a 20.4% attrition rate (102 out of the 500 participants used in this investigation) over the 1-year study period. Part of this loss-to-follow up was due to deaths and incarcerations. During the study period 32 of the participants who dropped out of the study were matched to Maryland State death certificates and an additional 12 were matched to persons incarcerated. These 44 persons were included in all analyses examining dropout rates.

To evaluate whether study drop-outs biased the results of this investigation, we conducted an assessment comparing baseline characteristics of drop-outs to those participants remaining in the study. In the preliminary analysis, baseline characteristics between those dropping out and those remaining in the study were strikingly similar. Sponsorship group dropout rates were essentially identical. Overall, women dropped out at only slightly higher rates than men (22.6 vs. 19.0% respectively, chi-squared $P = 0.43$). HIV-negative participants dropped out at ever slightly higher rates than HIV positive participants (21.1 vs. 24.3% respectively, chi-squared $P = 0.74$). Those graduating from high school dropped out at rates of 18.0% compared to 21.9% for non-graduates (chi-squared $P = 0.38$). Those with a history of mental illness dropped at non-significant higher rates of 21.2% compared to 16.9% for those without a history of mental illness (chi-squared $P = 0.41$). Married participants dropped-out at slightly higher rates of 20.7% versus that of 18.4% for the unmarried (chi-squared $P = 0.79$). Median baseline ages for drop-outs and those remaining in the study were nearly equal, 38 years and 39 years respectively. There was essentially no difference in drop-out rates between those attending and those not attending community activities not drug-related (21.5 vs. 20.0% respectively, chi-squared $P = 0.77$). Likewise, 21.5% of those currently using cocaine or heroin at baseline dropped out, comparable to 19.0% of those not currently using co-

caine or heroin (chi-squared $P = 0.57$). There was neither statistical significance nor substantial differences in any of these demographic and social factors. With the strong similarities between drop-outs and those remaining in the study, lost-to-follow up was unlikely to substantially bias the results in this investigation.

2.5. Statistical analyses

Bivariate analyses were conducted on baseline social and economic conditions of the study population by sponsorship group and on drug-related characteristics by sponsorship group. The multi var ate models utilized logistic regression analyses, with outcomes of not injecting at baseline and not injecting over the three consecutive study visits (abstinence). The same covariates were used for both logistic regression analyses, applying forward stepwise selection and excluding covariates from the final models with P -values greater than 0.15. Some of the study population was not included in these logistic regression analyses because they were missing values in the original covariate list. Multivariate logistic regressions were conducted again for both outcomes; however, this time only the short list of covariates included in the final models ($P \leq 0.15$) were used. Due to missing values for non-significant covariates some of the study population, previously missing from the first logistic regression analysis ($P > 0.15$), were now included in the second analysis. The second logistic regression analyses were intended to include more of the study population. There were no systematic

patterns of missing data to bias the second logistic regression analyses, and there were no substantial changes in the results from the first analyses. The statistical packages SAS 6.12 and EpiInfo 6.3 were used for all analyses.

3. Results

3.1. Baseline characteristics

Out of the original 503 SAIL baseline participants, 500 SAIL participants were used in the analysis for this investigation. The three SAIL participants excluded from analysis were participants who reported attending NA/AA meetings and being sponsors but were never sponsored. They formed a separate sponsorship group that was too small for adequate statistical analysis.

Table 1 summarizes selected baseline characteristics of the study population by sponsorship status. The study participants were predominantly middle-aged inner-city former and current heroin and cocaine injectors. The majority was unemployed black men. At baseline 56% of the study participants reported current use of heroin and cocaine. Half of the study participants reported previously being homeless. A quarter of the participants reported a history of diagnosed mental illness, of which nearly half reported that they suffered from depression and nearly 30% reported being diagnosed as manic-depressive (bipolar). Out of those reporting currently injecting heroin and/or cocaine, 74%

Table 1
Baseline characteristics of former and present cocaine and heroin injection drug users categorized by: (1) those persons attending neither narcotics anonymous nor alcoholics anonymous, (2) those attending but not having a sponsor, (3) having a sponsor but never being a sponsor, and (4) those having a sponsor and being a sponsor^a

Variables	No NA/AA (# 1) $N = 352$	NA/AA (# 2) not-sponsored $N = 57$	NA/AA (# 3) sponsored $N = 62$	NA/AA (# 4) sponsors $N = 29$	Total $N = 500$	P -value ^b
Gender (% female)	35.8 (126/352)	49.1 (28/57)	35.5 (22/62)	48.3 (14/29)	38.0(190/500)	0.16
Race (% African American)	95.8 (318/332)	92.5 (49/53)	94.9 (56/59)	96.4 (27/28)	95.3 (450/472)	0.95
Age in years (median)	39 (352)	40 (55)	38 (62)	40 (29)	39 (498)	0.78
Unemployed (%)	82.6 (290/351)	84.2 (48/57)	83.9 (52/62)	44.8 (13/29)	80.8 (403/499)	0.001
Main partner (%)	56.2 (182/324)	65.4 (34/52)	63.2 (36/57)	62.5 (15/24)	58.4 (267/457)	0.49
Married (%)	6.8 (24/351)	7.1 (4/56)	8.1 (5/62)	17.2 (5/29)	7.6 (38/498)	0.25
Community involvement (%)	19.0 (67/352)	36.8 (21/57)	51.6 (32/62)	51.7 (15/29)	27.0 (135/500)	0.001
HIV+ (%)	38.7 (135/349)	31.6 (18/57)	27.4 (17/62)	51.7 (15/29)	37.2 (185/497)	0.10
Education: HS grad (%)	49.4 (166/336)	46.3 (25/54)	53.2 (33/62)	51.7 (15/29)	49.7 (239/481)	0.89
History mental illness (%)	22.2 (78/351)	27.8 (15/54)	33.9 (21/62)	13.8 (4/29)	23.8 (118/496)	0.11

^a The percentages are followed in parentheses by the number of persons reporting the indicated characteristic over the total number reporting in that group, except for age where median years are reported. Missing values are excluded.

^b The P -values for all variables except age were based on the chi-squared statistic. The age P -value is based on the non-parametric Wilcoxon test.

Table 2
Substance-use related characteristics by former and current cocaine and heroin drug injection users categorized by: (1) those persons not attending NA/AA meetings, (2) those attending but not having a sponsor, (3) having a sponsor but never being a sponsor and (4) those having a sponsor and being a sponsor^a

Variables	No. NA/AA (1)	NA/AA (2) not-sponsored	NA/AA (3) sponsored	NA/AA (4) sponsors	<i>P</i> -value ^b
Not using at baseline (%)	34.4 (121/352)	61.4 (35/57)	61.3 (38/62)	93.1 (27/29)	0.001
Abstaining for 1 year (%)	24.2 (64/264)	44.7 (21/47)	39.1 (18/46)	75.0 (18/24)	0.001
Clean time in months (median)	12 (114)	9 (35)	8.5 (38)	60 (27)	0.0002
Methadone Tx 3rd visit	11.6 (32/276)	42.6 (20/47)	26.1 (12/46)	12.5 (3/21)	0.001
Daily alcohol use (%)	17.9 (63/352)	8.8 (5/57)	8.1 (5/62)	3.5 (1/28)	0.023
Drug homeless groups (%)	4.3 (15/352)	17.5 (10/57)	24.2 (15/62)	17.2 (5/29)	0.001
Drug & Alc Tx center (%)	9.7 (34/352)	43.9 (25/57)	43.6 (27/62)	20.7 (6/29)	0.001
Attending both NA and AA (%)	0 (0/352)	42.1 (24/57)	53.2 (33/62)	55.2 (16/29)	0.2 ^c

^a The indicated values are followed in parentheses by the number of persons reporting the indicated value over the total number reporting for that group except for 'Clean Time' where median number of months are reported. Missing values are excluded.

^b The *P*-values for all variables were based on the chi-squared statistic except for 'clean time', which was based on the non-parametric Wilcoxin test and 'Attending Both NA and AA' which was based on the chi-squared test for trend.

^c The *P*-value based on the chi-squared test for trend statistic included only the not-sponsored, sponsored and sponsors groups.

(206/279) reported that they inject heroin, 76% (213/279) reported that they injected cocaine and 64% (179/279) reported injecting both heroin and cocaine. Only 14% (39/279) of those reporting currently using at baseline were using illicit drugs by means other than injection. More than a third (37%) of the study population was HIV positive at baseline and more than two-thirds (68%) of the participants reported a legal income less than \$5000 for the previous year. All groups had similar distributions in age, gender, race, and having a main partner. Of those who reported involvement in community organizations not drug-related, 56.3% (76/135) attended church and church activities.

3.2. Sponsorship

In some respects the Sponsored group (group 3) was more similar to the Not-Sponsored group (group 2), but in others it was more similar to the Sponsors group (group 4). The Sponsored and Not-Sponsored groups were more similar in employment, marital status, HIV status, and history of mental illness, but the Sponsored group was more similar to the Sponsors group in community involvement (not drug-related).

Some striking differences and similarities are found in Table 2 in median clean times. Abstainers in the Not-Sponsored and Sponsored groups had nearly identical median clean time (9 months vs. 8.5 months respectively) and differed substantially from the median clean time of the Sponsors group (60 months).

Between the Sponsored and the Not-Sponsored groups there were neither substantial differences in proportions of baseline drug use ("Not Using At Baseline") nor abstinence rates ("Abstaining for One Year"). However, when asked about perceptions of drug use (not shown in tables), 40.0% (10/25) of the Sponsored baseline current-users reported having re-

duced drug use; whereas only 17.4% (4/23) of the Not-Sponsored baseline current-users reported reducing drug use (chi-squared $P = 0.085$). The proportion of the Sponsored group reporting a recent reduction in drug-use was 2.7 times greater than that of the Not-Sponsored group (not shown in tables).

The Not-Sponsored group had a much higher rate of participants in methadone treatment than that of the Sponsored group, as shown in Table 2. When asked at the third SAIL visit about methadone treatment, 42.6% of the Not-Sponsored group indicated they were on methadone, whereas only 26.1% of the Sponsored group indicated they were on methadone.

3.3. Multivariate analysis of abstinence

The two multivariate logistic regression results are provided in Table 3 for each of the outcomes of interest: not currently using at baseline and abstinence over 1 year. Covariates included in the initial logistic regression analyses for both outcomes were being-a-sponsor, having-a-sponsor, community involvement not drug-related, NA/AA attendance, drug and alcohol treatment center participation, HIV status, employment, age, marital status, history of mental illness, gender, race, education and income.

Being a sponsor was strongly associated with not currently using at baseline as well as with abstinence. The odds were nearly 7 times greater that a member of the Sponsors group reported not using illicit drugs at baseline when compared to the other study participants, after adjusting for involvement in community groups not drug-related, attending NA/AA meetings, attending a drug and alcohol treatment center, HIV status, employment and age 44 years or older (fourth quartile). The odds were more than 3 times greater that a member of the Sponsors group maintained abstinence

over 1 year than that of the other participants, after adjusting for involvement in community groups not drug-related, marital status, employment status, attending AA/NA meetings, attending drug and alcohol treatment centers, HIV status, and older age. The covariates having-a-sponsor, gender, race, high school graduation, the younger three age quartiles and history of mental illness were excluded from the final models for both outcomes. The older age covariate, 44 years and older, contributed to the explanatory power of the outcome of not currently using at baseline, but dropped out of the abstinence model. Marriage, on the other hand, was dropped from the not currently using model but was included in the abstinence model.

Community involvement that was not related to drug programs was the second most important factor for both not currently using at baseline and for maintaining abstinence over 1 year, adjusting for the covariates included in the final models.

4. Discussion

The participants in this study were distinct from most published studies in that they were *not* associated with a particular treatment program. These study participants were recruited from the community-at-large and as such reflect the larger community of inner-city injection drug-users better than those from treatment centers. Unlike treatment center participants who may be attempting to stay clean, many more of our community-based study population wanted to continue injection drug-use. So, it is not surprising that 70% of our study population were not attending NA/AA meetings, a much higher percentage than those exiting substance abuse programs.

The incredibly high mortality rate in our study group of 6.4% per year reflects the social conditions in which they live. Diseases such as HIV and hepatitis, drugs cut with toxic substances, overdoses, violence, suicide, and even cold winter nights all place this population of inner-city Baltimore at high risk for premature death. It is extraordinary that any program helps to maintain abstinence in the context of such a complex and multi-faceted collage of problems.

So, how can 12-step sponsorship possibly contribute to successful abstinence in such an environment? Various operative theoretical frameworks have been provided to explain how having-a-sponsor and being-a-sponsor work. Regardless of whether the NA/AA is perceived as a treatment environment or an identity shaping community, the *receiving* of direction and support from a sponsor or *providing* this direction and support as a sponsor is widely believed to be important in sustaining abstinence (Roberts et al., 1999; Humphreys and Rappaport, 1994; Rappaport, 1993). Recent research has confirmed that, in the context of mutual-aid group, *giving help* is a predictor of improved psychosocial adjustment and *receiving help* that supports cognitive reframing was associated with improved social adjustment (Roberts et al., 1999). These attributes are believed to improve feelings of self-value and social usefulness, to provide models of successful behaviors and public commitment to behavior change, and to improve relationships and strengthen new social networks. The role of sponsor is also valued in the community and, to maintain this role, sponsors may be further motivated to continue their own abstinence. All of these potentially improve the resolve of the addict to maintain abstinence.

Table 3
Two multivariate logistic regression results based on stepwise selection with a $P = 0.15$ cutoff using different outcome response variables and the same initial covariates for both as indicated^a

Baseline outcome: reported not injecting at baseline ($N = 490$)			Abstinence outcome: reported not injecting three visits 6 months apart ($N = 395$)		
Covariate	Odds ratio	95% C.I.	Covariate	Odds ratio	95% C.I.
Being a sponsor	6.75	(1.45, 31.52)	Being a sponsor	3.19	(1.02, 10.02)
Community involvement	2.73	(1.68, 4.43)	Community involvement	2.29	(1.33, 3.94)
NA/AA attendance	2.28	(1.34, 3.88)	Married	1.92	(0.79, 4.66)
Drug & Alcoh Tx Center	1.96	(1.09, 3.53)	Drug & alcoh Tx Center	1.85	(0.97, 3.53)
HIV+	1.79	(1.14, 2.80)	NA/AA attendance	1.72	(0.93, 3.19)
Employed	1.71	(0.98, 2.99)	Employed	1.69	(0.91, 3.13)
Age ≥ 44 years	1.59	(0.97, 2.62)	HIV+	1.59	(0.95, 2.66)

^a The covariates history of mental illness, gender, race (black vs. other), education (high school graduate or GED), the lower three age quartiles, marriage status (married vs. not married), income ($> \$5000$ last year) and having-a-sponsor dropped out of the multivariate logistic regression runs for the outcome current heroin or opium use with an inclusion P -value of 0.15. Homer and Lemeshow goodness-of-fit test indicated a good fit for the final model with $P = 0.41$. The covariates history of mental illness, gender, race (black vs. other), education (high school graduate or GED), all four age quartiles, income ($> \$5000$ last year) and having-a-sponsor dropped out of the multivariate logistic regression runs for the outcome current heroin or opium use with an inclusion P -value of 0.15. Homer and Lemeshow goodness-of-fit test indicated a good fit for the final model with $P = 0.50$.

The literature is replete with examples of the importance of personal and social support in sustaining abstinence (Hawkins and Catalano, 1985). However, the focus of this investigation, NA/AA sponsorship, varies distinctly from other personal and social relationships, such as family and friends, in that a sponsor has this definitive task to assist the sponsored person in initiating and maintaining abstinence. The sponsor draws from her or his own life experiences for insights into this process, and works in the framework of 12-step philosophy. Typically, NA/AA sponsorship is an intimate, supportive and directive relationship that often lasts for years and decades (personal communications with NA/AA participants, 1997–1998).

Previous studies have examined the association between social/personal relationships and drug-use in this inner-city Baltimore injection drug use community. Personal network densities, size of drug sub-networks and having a partner have been shown to be associated with drug injection patterns (Latkin et al., 1995). The present investigation of NA/AA sponsorship extended this exploration of socio-personal support to include an examination of the associations that exist specifically between NA/AA sponsorship and abstinence.

Over the 1-year study period, having a sponsor in NA/AA was *not* associated with sustained abstinence. There was no statistical nor substantial difference in sustained abstinence rates between those NA/AA members without a sponsor and those with a sponsor. This is striking, because the receiving of support and direction by a sponsor seems ineffectual. The higher rates of methadone treatment among those without a sponsor, crossovers (i.e. those without a sponsor at baseline acquire a sponsor during the study period and vice versa), and the short time period of the study may have contributed some to making the sustained abstinence rates similar between these two groups. However, the preponderance of the evidence indicated that the independent effect of having-a-sponsor contributed little or nothing to the success of sustained abstinence for those being sponsored. It is entirely possible that the contributions of support and direction provided by the NA/AA members in general may have supplanted any impact by the individual sponsor.

A total of 93% of the Sponsors group reported not currently using at baseline. Over the year 75% of the Sponsors maintained abstinence. In multivariate logistic regression analysis, being-a-sponsor was very strongly associated with sustained abstinence with an odds ratio of 3.2, when controlling for community involvement not drug-related, marital status, drug and alcohol treatment, NA/AA attendance, employment and HIV status. Being-a-sponsor was even more strongly associated with not currently using at baseline with an odds ratio of nearly 7, when controlling for community involvement not drug-related, NA/AA attendance, drug

and alcohol treatment, HIV status, employment and older age (>44 years). Being-a-sponsor was more strongly associated with abstinence over the year study period than with not currently using at baseline; arguably, over the 1-year study period cross-overs and temporary relapses may have depressed the odds ratio for sustained abstinence.

Being-a-Sponsor may both be a surrogate measure for degree of involvement in NA/AA as well as a lifestyle-change factor itself, either or both of which may have contributed to sustained abstinence (personal communications with NA/AA participants, 1997–1998; Narcotics Anonymous, 1993; Chappel, 1994). It is noteworthy that the observed association of being-a-sponsor with sustained abstinence and not currently using at baseline was independent of NA/AA attendance. This indicates that being-a-sponsor was associated with improved abstinence rates above and beyond the contributions of NA/AA meetings alone.

All 29 NA/AA sponsors included in this investigation were sponsored. Only three NA/AA sponsors, excluded from this investigation because of small sample size, had never been sponsored. A full 91% (29/32) of all NA/AA sponsors were sponsored. It is uncommon in NA/AA to find a sponsor that is not sponsored and has not been sponsored in the past (NA/AA participants, 1997–1998). Even though having-a-sponsor in NA/AA was not independently associated with any improvement in abstinence rates, it is possible that having-a-sponsor may have acted as a 'gateway' to becoming a sponsor.

In previous NA/AA studies, regular meeting attendance was shown to be associated with sustained abstinence; the results in this investigation support those previous findings. However, an interesting comparison in the logistic regression results was that drug and alcohol treatment centers, which used pharmacological treatments as well as integrated 12-step philosophies (Rawson et al., 1991; Weddington, 1993), were no more important to abstinence and not currently using at baseline than NA/AA attendance alone. When the importance of being-a-sponsor was included with that of NA/AA meeting attendance, the combined 12-step factors were much more strongly associated with abstinence rates and not currently using at baseline than drug and alcohol treatment alone. This suggests the importance of active ongoing social structures in abstaining from illicit drug use, especially in an NA/AA framework.

The substantially higher rates of HIV among the Sponsors group was not unexpected. Studies of HIV testing and counseling have shown that seroconverters will seek out lower-risk healthier lifestyles (Weinhardt et al., 1999). The Sponsors group has the highest rate of sustained abstinence and lifestyle change of any of the sponsorship groups.

Community involvement not drug-related was strongly associated with sustained abstinence. The odds ratio was 2.3 when controlling for being-a-sponsor, marital status, drug and alcohol treatment program participation, NA/AA attendance, employment and HIV status. Most importantly, this contribution of community involvement not drug-related was independent of the NA/AA factors and treatment centers. By far the most commonly reported community activity was church functions. Of all those who reported participating in at least one community organization not drug-related, 56% reported attending church activities. The role of spirituality, integral to both church and NA/AA meetings, in sustaining abstinence has recently become an active area of research (Ellis and Schoenfeld, 1990). Our results suggest that these community-led community-based institutional supports, such as church and NA/AA, play an important role in sustaining abstinence.

Other community social institutions, in particular employment and marriage, were also positively associated with sustained abstinence. The prominence of employment and marriage, possibly both are surrogates for degree of successful social integration, confirms the findings of previously published studies (Vaillant, 1983).

Many of the limitations in the study were related to the original purpose of SAIL, which was to examine psycho-social factors in an injection drug-using cohort impacted by high HIV rates. This study's primary purpose was to specifically examine the impact of community-based NA/AA sponsorship on sustained abstinence rates. Drug-use information was collected at all three visits in this prospective study; this allowed the tracking of changes in drug use patterns over the year study period. However, we were constrained to information on NA/AA participation and sponsorship status only at baseline. There was no information available in the follow-up questionnaires on changes in NA/AA sponsorship status that may have occurred during the study period. Fortunately, such cross-overs would not have been likely to have exaggerated relative rates, but to make sustained abstinence rates more similar. Unfortunately, neither was information available on other features of NA/AA meetings such as home groups, working the steps, speaking, etc., so interactions between these factors could not be examined. Likewise, we did not have the benefit of scales used in studies of AA (Humphreys et al., 1998a; Tonigan et al., 1996a). Some predictors of AA affiliation previously identified in the literature were not available to us.

How truthfully injection drug users respond to self-report survey questions about illegal and stigmatized drug-use is a major concern in substance abuse research. However, previous validation studies were con-

ducted to determine the accuracy of the responses to drug questions in the ALIVE study, from which the SAIL participants were recruited. Within the context of this long-term confidential interview environment, the ALIVE cohort proved to be quite accurate in reported drug use and drug use patterns (Vlahov, 1994; Anthony et al., 1991). Other validation studies examining self-reported drug use in similar populations and settings also found adequate accuracy for research purposes (Sobell et al., 1995; Darke et al., 1991). These validation studies provided confidence that this investigation was based on sufficiently valid responses from the SAIL surveys. Moreover, in the SAW study there was no benefit to participants in either under or over-reporting drug use. Given the years of trust that has developed between the participants and ALIVE (and now SAIL) researchers, especially given the extensive validation of the instruments in this population, it is felt that further testing such as drug urine analysis might threaten that trust. A substantial limitation in examining the association of sponsorship with abstinence was the 1-year study period. Studies of much longer duration, preferably years, could examine changes in abstinence rates not observed in this study.

This study population of former and current cocaine and heroin injection drug users from inner-city Baltimore is at high risk for alcoholism, comorbid mental illness, unemployment, and frequent homelessness. Most live in or near open-air drug markets and many of their friends and family members are drug users. Affordable drug and alcohol treatment slots are limited and demand far outstrips the supply (Washton and Stone-Washton, 1991; Zweben and Payte, 1990). The alternatives are the non-profit self-help group. The most prominent of these are the independent community-based NA/AA organizations. Study results indicated that having-a-sponsor was *not* associated with improved likelihood of sustained abstinence, while being-a-sponsor was strongly associated with such success. Community involvement not drug-related, especially involvement with church activities, was strongly and independently associated with sustaining abstinence. The significance in this study of community involvement and participation in NA/AA, particularly in those roles of responsibility and leadership, suggests that social and institutional integration is important for successful sustain abstinence in inner-city injection drug-using populations.

For the professional in the clinical and therapeutic setting, this study provides further evidence that directing inner-city injection drug-using clients to community-based NA/AA meetings may improve their likelihood of successfully sustaining abstinence. Being-a-sponsor was strongly and independently associated with improved likelihood of sustained abstinence. However, having-a-sponsor had no association with im-

provements in abstinence rates when compared to NA/AA members who were without sponsors. These results together suggest that the professional may do well to support clients in taking on roles of responsibility and leadership in NA/AA and community organizations to build a more secure foundation for long-term abstinence.

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