

Attendance at Narcotics Anonymous and Alcoholics Anonymous meetings, frequency of attendance and substance use outcomes after residential treatment for drug dependence: a 5-year follow-up study

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ABSTRACT

Aims This study investigates the relationship between frequency of attendance at Narcotics Anonymous and Alcoholics Anonymous (NA/AA) meetings and substance use outcomes after residential treatment of drug dependence. It was predicted that post-treatment NA/AA attendance would be related to improved substance use outcomes. **Methods** Using a longitudinal, prospective cohort design, interviews were conducted with drug-dependent clients ($n = 142$) at intake to residential treatment, and at 1 year, 2 years and 4–5 years follow-up. Data were collected by structured interviews. All follow-up interviews were carried out by independent professional interviewers. **Findings** Abstinence from opiates was increased throughout the 5-year follow-up period compared to pre-treatment levels. Clients who attended NA/AA after treatment were more likely to be abstinent from opiates at follow-up. Abstinence from stimulants increased at follow-up but (except at 1-year follow-up) no additional benefit was found for NA/AA attendance. There was no overall change in alcohol abstinence after treatment but clients who attended NA/AA were more likely to be abstinent from alcohol at all follow-up points. More frequent NA/AA attenders were more likely to be abstinent from opiates and alcohol when compared both to non-attenders and to infrequent (less than weekly) attenders. **Conclusions** NA/AA can support and supplement residential addiction treatment as an aftercare resource. In view of the generally poor alcohol use outcomes achieved by drug-dependent patients after treatment, the improved alcohol outcomes of NA/AA attenders suggests that the effectiveness of existing treatment services may be improved by initiatives that lead to increased involvement and engagement with such groups.

Keywords Aftercare, alcohol, heroin, Narcotics Anonymous, treatment outcome, 12 steps.

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INTRODUCTION

Improved substance use and other outcomes have been found after treatment in residential addiction treatment programmes [1–4]. However, the relatively high rate of relapse which often occurs after leaving treatment gives rise to concern. In this respect, the time after leaving treatment has been described as a 'critical period' [5]. For many years, it has been recognized that aftercare services can help to maintain the gains achieved during treatment and to reduce the risk of relapse after leaving the protected treatment environment [6,7]. Unfortunately, most treatment systems continue to suffer from a marked lack of adequate aftercare services.

Narcotics Anonymous and Alcoholics Anonymous (NA/AA) programmes are an important part of addiction treatment systems in many countries throughout the world [8,9]. However, despite the important role played by NA and AA, and compared to many other addiction treatments, relatively little controlled research has been conducted into the effectiveness of these mutual-support groups. Of the available empirical research, most has been concerned with AA, and has been conducted mainly in the United States. Studies of AA have shown that it is associated with increased abstinence from alcohol [10–12] and lower rates of relapse [13–15] among those who attended AA meetings after treatment. In Project Match, the results for 12-Step facilitation were

comparable to those for motivational enhancement therapy or cognitive-behavioural therapy. Indeed, for patients who were more severely dependent upon alcohol, the 12-Step approach led to greater improvement in drinking behaviour than cognitive-behavioural treatments [16]. Other studies of 12-Step self-help groups (both NA and AA) also showed that attendance at 12-Step groups is associated with increased rates of abstinence, improved substance use and psychological health outcomes [9,17–20].

AA can serve as a supplementary intervention rather than as an alternative to hospital care [21,22]. Treatment services can make use of NA/AA as an aftercare resource merely by recommending participation and encouraging their clients to attend meetings. A study of post-treatment attendance at AA after in-patient treatment for alcoholism found that frequent AA attenders had superior drinking outcomes to non-AA attenders and infrequent attenders [23]. From a service management perspective, AA offers a readily accessible and freely available form of aftercare [24]. The importance of AA is likely to increase if professional substance abuse treatment services become less readily available and of shorter duration [9].

Less is known about the impact of Narcotics Anonymous. Although it is a more recent development and is less well established than AA, NA has grown from fewer than 200 groups in three countries in 1978, to more than 21 500 groups in 116 countries in 2005 (<http://www.ukna.org>, accessed 25 June 2007). In the United Kingdom, more than 800 regularly scheduled meetings were taking place in 2003 (T. Leighton, personal communication, 2007). NA may have a larger population of drug abusers involved in its programmes than any other drug recovery initiative [25]. In the United Kingdom, more than three-quarters of substance misuse patients in a health service treatment facility had previously attended either NA or AA meetings [26].

Studies that looked specifically at NA have found an association between group attendance and improved drug-using outcomes [27], and length of time in NA has been found to be related to abstinence from illicit drugs [28]. Involvement with NA after treatment has been found to be associated with social networks that are more supportive of abstinence [29]. It has been suggested that key areas for further research include longitudinal evaluation of participation in NA and AA, and better specification of the aspects of 12-Step participation that are related to outcome [30].

The present study reports the substance use outcomes over a 5-year follow-up period of a cohort of patients who had received treatment for drug dependence in UK residential addiction treatment services. More specifically, the study investigates the relationship between atten-

dance at NA (and AA) meetings prior to and after leaving treatment, frequency of attendance, and changes in substance use outcomes. It was predicted that post-treatment NA/AA attendance would be related to improved substance use outcomes.

METHOD

Sample and treatment agencies

The study uses a longitudinal, prospective cohort design. The study sample was drawn from drug-dependent patients recruited to the National Treatment Outcome Research Study (NTORS). Data are presented for drug misusers seeking treatment in residential agencies for drug dependence problems: the main inclusion criterion was presenting with a drug dependence disorder (this could be in addition to an alcohol use disorder, but those with an alcohol use disorder alone were not eligible for inclusion). Participants were recruited from 23 agencies (eight in-patient drug dependence units and 15 residential rehabilitation programmes) that were selected purposely, not randomly. Criteria for agency participation were: location of the service (agencies to be located throughout England and in areas in which drug problems were prevalent) and capacity to recruit a sufficient number of cases to the project.

The residential treatment programmes varied in many respects [31–32]. The eight in-patient drug dependence units were based mainly within psychiatric hospitals and provided medically supervised detoxification usually with psychosocial, rehabilitative interventions. The planned duration of these programmes was between 2 and 5 weeks. The rehabilitation services included 12-Step programmes, Therapeutic Communities, Christian houses and general houses. Four rehabilitation programmes had a planned treatment regimen of between 6 and 12 weeks. The other 11 programmes offered longer treatments with planned durations of between 13 and 52 weeks. Support for NA/AA services after treatment also varied. Referral to NA/AA services after treatment was encouraged actively at six of the eight in-patient programmes and seven of the 15 residential rehabilitation programmes.

The study sample was drawn from an eligible follow-up sample of 255 patients. At 2 years, 202 residential patients (79%) were interviewed, and at 4–5 years 178 were interviewed (70%). Almost all (91%) of the sample of residential patients were interviewed at either the 2- or 4–5-year follow-up point. This report presents data for 142 subjects for whom data were available from interviews conducted on four occasions: at intake, after 1 year, after 2 years and after 4–5 years. The study sample was constructed to have the same participants at

all follow-up points for the purposes of statistical analysis. The purpose and methods of the project were explained, and all participants gave informed consent.

Measures

Data were collected by structured interviews at intake and at follow-up, 1 year, 2 years and 4–5 years after intake to treatment. Intake interviews were conducted by specially trained clinical staff at the agencies. All follow-up interviews were carried out by independent professional interviewers from the Office for National Statistics (ONS). The mean times to follow-up were 1.2 years [standard deviation (SD) 0.15], 2.2 years (SD 0.24) and 4.4 years (SD 0.24).

Measures of substance use behaviours and problems were taken for the previous 90 days. Urine screening was conducted on patients from programmes selected randomly on a one-in-two basis, at intake and at 1-year follow-up. The results of urine screening provided evidence of the validity of self-reported drug use [33] with a concordance rate of 93% between urinalysis results and self-reported use of heroin, cocaine and amphetamines. Contact with NA and AA and frequency of attendance at NA and AA meetings were assessed for the 2 years prior to treatment entry and for the 90 days prior to each follow-up interview. Because of the use of 90-day measurement windows, the data do not provide a fully continuous coverage of the follow-up period.

In NA/AA, members are encouraged to comply with complete abstinence from all drugs, including alcohol. For this reason, abstinence from drugs and alcohol was chosen as the most appropriate outcome measure for the evaluation of outcomes in the present study. The specific substances for which outcomes are reported are: illicit opiates (heroin and non-prescribed methadone), stimulants (crack cocaine, cocaine powder and amphetamines) and alcohol.

RESULTS

Attrition analysis

The intake characteristics and problems of the follow-up sample and the remainder of clients from the eligible sample ($n = 113$) were compared using logistic regression analysis. Variables included in the analysis were: age, sex, ethnicity, relationship status, frequency of use of heroin, non-prescribed methadone, crack cocaine, cocaine powder, amphetamines, frequency of drinking, addiction treatment contact (residential or substitute prescribing) during the previous 2 years and whether clients had participated in self-help groups during the previous 2 years. The regression model was not statistically significant ($\chi^2_{13} = 12.13$; $P = 0.517$) and none of the variables

entered into the model were associated significantly with follow-up status. The results show that the study sample was similar to those who were not followed-up in terms of pre-admission characteristics and problems.

Demographics and substance use problems at intake

The mean age of the sample at intake was 29.7 years (SD 6.4); 78% were men; 94% described their ethnicity as 'white-UK'; 50% were either married or living with a partner; and 19% were either homeless or without stable accommodation at intake to treatment. Heroin use was reported by 77% during the 3 months prior to intake; the mean duration of heroin use was 9.7 years (SD 5.6). A third (35%) used non-prescribed methadone, 51% used cocaine and 35% used amphetamines during the 3 months before intake.

Attendance at NA or AA

During the 2 years prior to treatment, 35% (50/142) of the sample attended at least one NA/AA meeting. Among those who attended NA/AA, the mean number of meetings attended was 26.6 (SD 46.6). NA attendance was more common than AA attendance (28% versus 16%).

At all follow-up interviews, contact with NA/AA was assessed for the previous 3 months. The rates and frequencies of post-treatment contact with NA/AA are shown in Table 1. Between one-quarter and one-fifth of the sample had attended at least one NA/AA group prior to each follow-up; during the period prior to treatment, attendance at NA was more common than AA attendance. Attendance at both groups was not uncommon: about one in 10 of the sample attended both NA and AA.

Clients who attended NA/AA groups prior to intake were significantly more likely than the remainder of the follow-up cohort to have also attended NA/AA prior to the 1-year follow-up (32% versus 8%; $\chi^2 = 32.33$, $P < 0.001$), the 2-year follow-up (29% versus 8%; $\chi^2 = 29.50$, $P < 0.001$) and the 4–5-year follow-up (32% versus 5%; $\chi^2 = 48.98$, $P < 0.001$).

Substance use outcomes at 4–5-year follow-up

Statistically significant increases in drug abstinence after treatment were found for use of illicit opiates and for stimulants (crack cocaine, powder cocaine and amphetamines). Abstinence from opiates increased from 19% at intake to treatment to 47% at 4–5-year follow-up ($\chi^2 = 30.72$; $P < 0.001$). Abstinence from stimulants increased from 30% at intake to treatment to 61% at 4–5-year follow-up ($\chi^2 = 27.27$; $P < 0.001$). There was no statistically significant change in alcohol abstinence: this was 36% at intake to treatment and 34% at 4–5-year follow-up ($\chi^2 = 0.08$; $P = 0.78$).

Table 1 Contact with self-help groups at 1, 2 and 4–5 years follow-up.

Self-help contact	1 year	2 years	4–5 years
% Any self-help	25	20	20
% NA	21	17	17
% AA	17	10	11
% NA only	8	10	9
% AA only	4	3	3
% NA + AA	13	7	8
Mean (SD) NA meetings*	26.3 (28.9)	14.2 (16.1)	18.5 (19.1)
Mean (SD) AA meetings*	12.0 (14.4)	11.8 (12.8)	9.1 (12.6)
Mean (SD) combined NA + AA meetings*	30.7 (31.5)	18.0 (20.7)	20.7 (22.7)

*Number of meetings shown for patients attending meetings during 90 days prior to each follow-up point.

NA/AA attendance and substance use outcomes

Logistic regression analyses were used to compare substance use outcomes at the 1-year, 2-year and 4–5-year follow-up points for those who attended NA/AA after treatment and those who did not (see Table 2). The following variables were entered as covariates: age, sex, ethnicity, pre-intake contact with NA/AA and pre-intake severity of dependence (SDS scores). Severity of drug dependence was used as a covariate in the analysis of drug use outcomes, and severity of alcohol dependence was used as a covariate in the analysis of alcohol outcomes.

Clients who attended NA/AA prior to follow-up were significantly more likely to be abstinent from opiates and alcohol. This effect was found at all follow-up points. NA/AA attenders were about three to four times more likely to be abstinent from opiates and four to five times more likely to be abstinent from alcohol than those who had not been to any meetings. Clients who had been to NA/AA were significantly more likely to be abstinent from stimulants at 1-year follow-up but not at 2 years or 4–5 years.

Pre-intake severity of drug dependence was associated with significantly reduced odds of abstinence from opiates at 1 year [odds ratio (OR) = 0.88, 95% confidence interval (CI) 0.78, 0.99] and reduced odds of abstinence from stimulants at 1 year (OR = 0.83, 95% CI 0.72, 0.95) and 2 years (OR = 0.88, 95% CI 0.78, 0.99). Pre-intake severity of alcohol dependence was not associated significantly with any of the alcohol outcomes.

A more detailed analysis of the results was conducted to investigate the association between the most frequent level of NA/AA attendance at any time during the follow-up period and substance use outcomes at 4–5 years. Three attendance groups were constructed: no NA/AA attendance after treatment, infrequent (less than weekly) attendance and frequent (weekly or more than weekly) attendance. Comparisons between the drug and alcohol use outcomes of these groups were made by

logistic regression analysis. Age, sex, ethnicity, pre-intake severity of dependence (SDS scores for both drug and alcohol) and pre-intake contact with NA/AA were entered as covariates. None of these covariates was a statistically significant predictor of substance use outcomes.

After leaving residential treatment, and during the follow-up period, those who had attended NA/AA on a weekly or more frequent basis at some point during the follow-up period were more likely to be abstinent from opiates and alcohol at 4–5 years (Table 3). A higher percentage of those who were more frequent attenders of NA/AA were abstinent from stimulants at 4–5 years, but due to the multivariate analysis this effect failed to reach the 5% level of statistical significance ($P = 0.080$).

DISCUSSION

Abstinence from opiates was increased throughout the 5-year follow-up period compared to pre-treatment levels. Clients who attended NA or AA meetings after treatment were more likely than non-attenders to be abstinent from opiates at follow-up. About one-third of the sample reported attending either NA or AA during the 2 years prior to treatment, but although those who had previously attended NA/AA were more likely to also attend 12-Step meetings after treatment, only post-treatment attendance was related to improved substance use outcomes.

The results differed for different substance use outcomes. For stimulants, although abstinence rates were increased at all follow-up points after treatment, no additional benefit was found for attendance at NA/AA meetings (with the exception of an effect at the 1-year follow-up only). For alcohol, there was no overall change in rates of abstinence after treatment, but clients who attended NA/AA were more likely to be abstinent from alcohol at all follow-up points than were non-attenders.

Although increased rates of abstinence from opiates and alcohol were associated with post-treatment atten-

Table 2 Self-help attendance and abstinence (%) from opiates, stimulants and alcohol at 1, 2 and 4–5 years follow-up.

	1 year			2 years			4–5 years		
	No self-help (n = 107)	Self-help (n = 35)	Adjusted OR (95% CI)	No self-help (n = 114)	Self-help (n = 28)	Adjusted OR (95% CI)	No self-help (n = 114)	Self-help (n = 28)	Adjusted OR (95% CI)
Opiates	37	69	2.72* (1.12, 6.56)	42	71	2.73* (1.03, 7.25)	40	71	3.37* (1.26, 8.90)
Stimulants	60	86	3.22* (1.04, 10.04)	57	75	2.35 (0.82, 6.71)	58	75	2.33 (0.84, 6.44)
Alcohol	34	63	4.26* (1.74, 10.43)	31	57	3.66* (1.35, 9.88)	27	61	5.44*** (1.98, 14.95)

Odds ratios (OR) are adjusted for age, sex, ethnicity, pre-intake severity of dependence and pre-intake contact with NA and/or AA. None of these covariates was a statistically significant predictor of outcome. Odds are calculated with the no self-help group as the reference category. Levels of statistical significance are shown as: * $P < 0.05$; *** $P < 0.001$.

dance at NA/AA meetings, frequency of attendance was a better predictor of outcomes. Frequent attenders at NA/AA meetings were more likely to be abstinent from opiates and alcohol compared to both non-attenders and to infrequent attenders.

These results are consistent with the findings of other studies [27,34,35]. While weekly or more regular NA/AA attendance has been found to be associated with favourable substance use outcomes, less than weekly NA/AA attendance appears to be no more effective than non-attendance [15,23,36]. Other studies have shown that affiliation with AA is an important variable [37]. Substance abusers with attitudes that are congruent with the 12-Step philosophy were more likely to participate in 12-Step activities during treatment [38], and less likely to drop out or to attend fewer meetings [13]. It is not known why our results for opiate and alcohol outcomes differ from those for stimulant outcomes. In other studies, participation in 12-Step groups has been found to be predictive of reduced drug use among cocaine-dependent patients [39].

The benefits associated with NA/AA attendance were limited to a relatively small proportion of patients. At each follow-up point, only about one-quarter to one-fifth of the sample reported having attended NA/AA meetings. It is widely believed that 12-Step programmes are not acceptable to all drug users. However, many drug misusers in addiction treatment services have been found to hold positive views about NA/AA [26]. Also, attitudes towards NA/AA and 12-Step treatment have been found to change during treatment, often becoming more positive, especially when there is an opportunity to attend NA/AA meetings. The treatment agencies in our study varied in their attitudes towards and support of NA and AA. Clinicians are in a position to actively encourage NA/AA attendance [40]. Other strategies might involve developing closer liaison between health service treatment units and local NA/AA groups, promoting sponsor visits to the treatment service and identifying liaison members from local groups for patients leaving treatment. Intensive referral interventions during treatment have been found to lead to increased attendance of 12-Step programmes [41].

Although the outcomes reported in this paper relate to attendance at both NA and AA, the study sample was dependent primarily upon heroin (or other illicit drugs). The sample was found to be more likely to attend NA than AA and also attended more NA than AA meetings. For this reason, the results have particular relevance for the less well-researched issue of NA attendance and outcomes for clients with primary drug dependence disorders.

The present study has a number of limitations. The use of a naturalistic design and the lack of random allocation to NA/AA may have allowed confounding of results due to

Table 3 Abstinence from opiates, stimulants and alcohol at 4–5 years follow-up by frequency of self-help attendance.

	% No self-help attendance (n = 89)	% Less than weekly self-help attendance (n = 27)	Adjusted OR (95% CI)	% Weekly or more frequent self-help attendance (n = 26)	Adjusted OR (95% CI)
Opiates	38	41	1.06 (0.42, 2.66)	81	6.20** (1.93, 19.88)
Stimulants	58	52	0.76 (0.31, 1.87)	80	2.83 (0.88, 9.05)
Alcohol	25	33	1.82 (0.68, 4.88)	65	9.64*** (3.05, 30.47)

Odds ratios (OR) are adjusted for age, sex, ethnicity, pre-intake severity of dependence and pre-intake contact with NA and/or AA. None of these covariates was a statistically significant predictor of outcome. Odds are calculated with the no self-help group as the reference category. Levels of statistical significance are shown as: ** $P < 0.01$; *** $P < 0.001$.

a selection bias in the characteristics of those who attended NA/AA. However, no relationship was found between pre-treatment attendance at NA/AA meetings and substance use outcomes. Also, the possible influence of possible confounding factors was controlled by covariate adjustment during the analyses. Further research should make a more detailed investigation of factors related to attendance and engagement with NA/AA, the temporal relationship between meeting attendance, lapses, and other treatment attendance, and an exploration of the mechanisms through which NA/AA attendance supports or enhances substance use outcomes.

Despite these limitations, the results are interesting and are presented for a substantial follow-up period. The findings suggest that NA/AA can provide a useful after-care resource, can supplement other forms of treatment and that regular contact may help to maintain the benefits accrued initially from drug dependence treatment programmes. Case-mix issues are important here, because residential programmes often accept the most chronic and severely problematic cases [42]. Post-treatment attendance at NA/AA may be especially useful after residential treatment. However, it is acknowledged that NA/AA will not appeal to, or be a feasible option for, all patients [26].

The findings for alcohol are of particular importance because of the generally poor alcohol use outcomes achieved by drug-dependent patients after treatment [43]. Many drug-dependent patients make little change to their pre-treatment drinking behaviour after treatment [44]. The finding that regular NA/AA attendance is associated with improved alcohol use outcomes suggests that this is one area in which the effectiveness of existing treatment services may be improved significantly by initiatives that lead to increased involvement and engagement with such groups.

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