

EFFECT OF INCENTIVES ON RETENTION IN AN OUTPATIENT TREATMENT PROGRAMME FOR COCAINE ADDICTS

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The high drop-out rate in treatment programmes is one of the most important problems in the area of drug addictions. This study assessed the effect of the use of incentives on retention in an outpatient programme for cocaine addicts. The effect of individual variables on programme drop-out was also analyzed. Participants were 66 patients randomly assigned to one of three treatment groups: standard treatment, treatment with incentives (vouchers) I, and treatment with incentives II. The patients in the latter two groups received incentives contingent upon cocaine abstinence with two different magnitudes. Retention rate at six months was 35% in the standard treatment, 78.6% in the treatment with incentives I, and 53.3% in the treatment with incentives II. Global prognostic capacity of the individual variables (sociodemographic, history and pattern of use, psychopathological state, and EuropASI scores) was 85.7%, with the psychopathological variables being more closely related to retention. These results suggest that the use of incentives may be an effective strategy for improving retention in outpatient treatments for cocaine addiction.

Keywords: Cocaine addicts, retention, vouchers, contingency management.

La alta tasa de abandonos en los programas de tratamiento es uno de los problemas más graves en el ámbito de las drogodependencias. En este estudio se analiza el efecto del uso de incentivos sobre la retención en un programa ambulatorio para adictos a la cocaína. También se analiza el efecto de determinadas variables individuales sobre el abandono del programa. Participaron 66 sujetos que fueron distribuidos aleatoriamente a tres grupos de tratamiento: tratamiento estándar, tratamiento con incentivos I y tratamiento con incentivos II. Los pacientes de estos dos grupos recibían incentivos contingentes a la abstinencia de cocaína con dos magnitudes diferentes. La tasa de retención a los seis meses de tratamiento fue del 35% en el tratamiento estándar, del 78,6% en el tratamiento con incentivos I y del 53,3% en el tratamiento con incentivos II. La capacidad pronóstica global de las variables individuales (sociodemográficas, historia y patrón de consumo, psicopatológicas y puntuaciones del EuropASI) fue del 85,7%, siendo las psicopatológicas las más relacionadas con la retención. Estos resultados sugieren que el uso de incentivos puede ser una estrategia eficaz para mejorar la retención en los tratamientos ambulatorios para la adicción a la cocaína.

Palabras clave: Adictos a la cocaína, retención, incentivos, manejo de contingencias.

Lack of treatment compliance is an extremely common phenomenon in the field of drug-dependence. Indeed, its prevalence is far superior to that of many disorders (Swett & Noones, 1989; MacNair & Corazzini, 1994; Wierzbicki & Pekarik, 1993). Patients with antecedents of drug use also present lower rates of compliance with other types of therapy (Ladero, Orejudo & Carrobes, 2005). Furthermore, rates of drop-out from treatment for cocaine addiction are higher than those for treatment in relation to other substances (Fishman, Reynolds & Riedel, 1999;

Veach, Remley, Kippers & Sorg, 2000).

Efficacy of treatments for drug-dependence is highly correlated with retention, since premature drop-out from the treatment is related to greater likelihood of relapse, and its maintenance to better prognosis. This relationship has been confirmed in the treatment of various types of addiction, including addiction to cocaine (Wells, Peterson, Gainey, Hawkins & Catalano, 1994).

Studies on the factors related to retention on treatment programmes for cocaine addiction are scarce. In general, they tend to include two types of variable: those related to patients and those related to the treatment itself. The majority of work focuses on the analysis of patient variables, such as their personality characteristics (Aharonovich, Nunes & Hasin, 2003;

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López & Becona, 2006; Moeller et al., 2001; Patkar et al., 2004), psychopathological aspects (Agosti, Nunes, Stewart & Quitkin, 1991; Rowan-Szal, Joe & Simpson, 2000; Sayre et al., 2002), sociodemographic variables (Agosti et al., 1991; Agosti, Nunes & Ocepeck-Welikson, 1996; Kleinman, Kang, Lipton, Woody, Kemp & Millman, 1992; Rowan-Szal, Joe & Simpson, 2000; Sayre et al., 2002; Siqueland et al., 2002), legal aspects (Rowan-Szal, Joe & Simpson, 2000), history and patterns of use (Agosti, Nunes & Ocepeck-Welikson, 1996; Siqueland et al., 2002; Wells, Peterson, Gainey, Hawkins & Catalano, 1994) and motivation for treatment (Rowan-Szal, Joe & Simpson, 2000). In general, these types of variable have shown scarce relation to retention, with the possible exception of “being white” (in North-American samples), and having higher educational level and lower severity of addiction. Other “dynamic” variables, such as impulsiveness or sensation-seeking, appear to be positively related to drop-out (Moller et al., 2001; Patkar et al., 2004).

As regards treatment-related variables, the use of certain therapeutic strategies which, in general, tend to increase the intensity of the programme (Roberts & Nishimoto, 1996) –through the inclusion of individual and group sessions (Hoffman et al., 1994), family activities (Lewis & Petry, 2005) or «homework» (González, Schmitz & DeLaune, 2006)– reduces the

probability of drop-out. However, there are very few studies that have analyzed the influence of these types of variable, so that the results should be treated with caution.

The strategy most widely used for increasing retention rates (and therefore abstinence) on cocaine programmes has been contingency management (Higgins et al., 1994). This procedure has also been used successfully in patients who abused cocaine while they were in treatment with substitutes for opiate dependence (Poling et al., 2006).

Contingency management programmes use a wide variety of reinforcers. In programmes with incentives (vouchers), patients earn points contingent upon abstaining from cocaine use or attendance at sessions. These points can be exchanged for a range of goods and services. The use of incentives has also been tried as an effective strategy for the treatment of addiction to other drugs, such as alcohol, cannabis, tobacco or heroin (Higgins, Alessi & Dantona, 2002; Lussier, Heil, Mongeon, Badger & Higgins, 2006). However, the majority of studies published to date have been carried out with North-American populations, and many of them in experimental contexts.

The main objective of the present study is to analyze the effect of incentives on retention after six months of treatment in an outpatient programme for cocaine addiction. It also sets out to measure retention/drop-out rates in these types of programme, and finally, to determine whether certain individual variables influence retention or drop-out.

METHOD

Participants

The study sample was taken at random from the total of patients attending two *Proyecto Hombre* centres (Asturias and Madrid) for help with their problems of cocaine addiction. Inclusion criteria were as follows: meeting DSM-IV (APA, 2002) diagnostic criteria for cocaine dependence, aged over 18, and living near the clinic. Presenting serious psychopathological disorders (such as psychosis or dementia) was an exclusion criterion.

Total number of patients selected was 66 (91% men and 9% women), with a mean age of 29 years (range 19–43). Table 1 shows the main characteristics of the sample.

Instruments

During the intake process patients were administered

Table 1
Participant characteristics

Characteristics	CRA + vouchers I (N= 15)	CRA + vouchers II (N= 14)	Standard treatment (N= 37)	Total (N= 66)
Demographics				
Mean age	28.6	31.2	28.2	29
Male (%)	78.6	100	92	91
Average years of education	10.1	11.1	9.2	10
Never married (%)	57.1	61.5	82.8	71.4
Employed full time (%)	71.4	86.7	78.6	81.8
Ever in prison (%)	14.3	13.3	17.2	12.5
Cocaine use				
Intranasal (%)	85.7	87	100	92.5
Average years of use	8.6	8.3	8.3	
Average grams/week	3.7	4.3	5.4	
Michigan Alcoholism Screening Test				
Mean score	5.7	5.7	5.7	6.1
Beck Depression Inventory				
Mean score	15.07	15.07	20.1	17.3
Addiction Severity Index Composite Scores (mean scores)				
Medical	.20	.15	.15	.21
Employment	.51	.22	.52	.31
Alcohol	.28	.29	.27	.18
Drugs	.20	.22	.18	.08
Legal	.14	.05	.18	.21
Family/social	.33	.49	.41	.21
Psychiatric	.23	.20	.19	.21

the following instruments: DSM-IV-TR criteria for cocaine dependence (American Psychiatric Association, 2002), Michigan Alcoholism Screening Test (MAST) (Selzer, 1971), Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock & Erbaugh, 1961), Symptom Check List (SCL-90-R) (Derogatis, Lipman & Cobi, 1973) and EuropASI (Kokkevi & Hartgers, 1995). Additionally, patients were given a full medical examination.

Detection of cocaine in urine was carried out using Eve Layper's Quickscreen Test reagents, which work rapidly. Cut-off points for these tests are those recommended by the *Substance Abuse and Mental Health Services Administration* (SAMHSA).

The dependent variable was retention, assessed through two criteria: patient retention or drop-out after 6 months of treatment; and average number of weeks patients remained on the programme.

Procedure

Patients were assigned at random to one of three treatment groups: standard treatment (N= 37), treatment with incentives (vouchers) I (N= 15), and treatment with incentives (vouchers) II (N= 14).

Standard treatment

This is an outpatient, drug-free, cognitive-behavioural type programme, with a duration of 18 months. The programme is structured in three phases of unequal length. Patients attend group sessions twice a week, arranging individual sessions with the therapist where necessary in order to deal with specific problems. The basic components of the group sessions are: information on drugs, increased awareness of the addiction problem, expression of emotions, problem-solving and prevention of relapses. In addition to these components there are others, such as psychoeducational groups on health and drugs, training-vocational workshops and support groups for patients' families.

The urine tests take place on the same days as the patients attend the group sessions. Patients in this group received no type of incentive in exchange for remaining abstinent.

CRA plus vouchers I

CRA (*Community Reinforcement Approach*) Plus Vouchers is an outpatient programme lasting approximately 12 months, whose basic objective is abstinence from cocaine. The therapy has six components: incentives therapy (vouchers), coping

skills for drug use, lifestyle changes, relationships counselling, other substance abuse and treatment of other psychiatric disorders.

The protocol was applied in accordance with the original version by Budney and Higgins (1998), with just one difference: in our case most of the modules were applied in group format. Patients attended two group sessions per week, with individual sessions arranged where necessary to resolve particular problems.

The incentives therapy subcomponent is a contingency management procedure through which abstinence from cocaine is systematically reinforced. In exchange for negative results in the urine analyses, patients earn vouchers that can be swapped for certain incentives (goods or services) that help them to achieve the therapeutic goals and improve their lifestyle (leisure activities, transport, training courses, etc.). The incentives programme was financed primarily through donations from companies and institutions from the community. In no case was money used as a method of reinforcing abstinence. Urine tests took place three times a week for the first three months of the programme, twice a week in the following three months and randomly in the final six months. All the negative samples collected in the first three months were reinforced with incentives. Each point was worth 0.25€. For the following negative samples, their value increased by 5 points. For every three consecutive negative samples the patient obtained a bonus of 40 points. A positive test or skipping a test meant that the value of the samples returned to the initial value of 10 points. Five consecutive negative tests after a positive one brought the level back to what had been obtained previously.

From months 3 to 6 a random system was introduced whereby only half the negative samples were reinforced.

The average amount obtained via the incentives was 1,237.57€.

CRA plus vouchers II

Participants in this group received the same programme as those in the previous group, with just one difference: in the incentives programme, each point earned by patients was worth half the value of the previous group's points: that is, each point had a value of 0.125€. In all other respects, the incentives programme protocol was the same in the two groups.

The average amount obtained via the incentives was 401.62€.

Data analysis

Various descriptive and frequency analyses were carried out in relation to the participants' characteristics. Bivariate analyses (chi-squared for the dichotomic

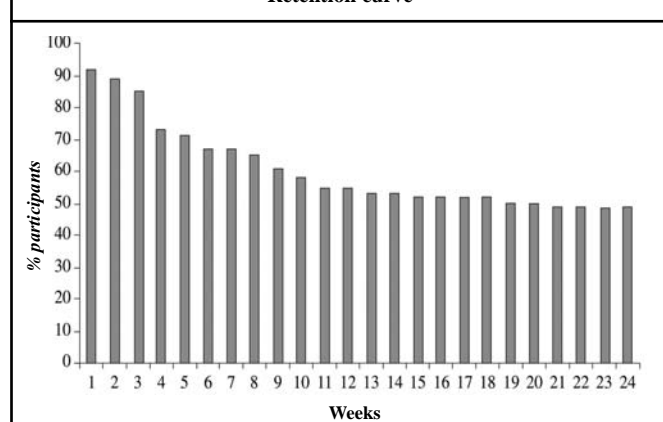
Table 2
Predictive capacity of individual variables
(discriminant analyses)

Variables	% cases correctly classified
Sociodemographic	65
History and pattern of use	62
Psychopathological state	72.5
Composite ASI scores	65.5

Table 3
Structure matrices (discriminant analyses)

Sociodemographic	Function
Years of education	,769
Sex	,386
Employment record	,371
Age	-,145
History and pattern of use	
MAST score	,854
Cannabis use	,593
Years of cocaine use	,182
Grams per week	,079
Alcohol use	-,061
Longest period of abstinence	,032
Psychopathological state	
BDI score	-,153
SCL-90 Global Severity Index Centile	,133
Composite EuropASI scores	
Medical	-,522
Alcohol	,481
Drugs	,333
Family/social	,248
Legal situation	,135
Employment	,101
Psychiatric	,093

Figure 1
Retention curve



variables and Student *t* for the continuous variables) were performed for comparing those in the two treatment groups at baseline and for analyzing differences in treatment retention. Various discriminant analyses were carried out for analyzing the predictive capacity of the individual variables (sociodemographic, history and pattern of use, psychopathological state and EuropASI scores) in relation to the participants' situation after six months of treatment (drop-out or retention).

Confidence level was 95%, and the statistical package used was the SPSS-12.

RESULTS

There were no statistically significant differences between the groups ($p < .05$) in the most important characteristics of the sample prior to the treatment (see Table 1).

Global retention rate for the three groups was 48.5% (i.e., 32 of the 66 patients in the sample). Mean stay was 15 weeks. The majority of drop-outs (64.5%) occurred during the first six weeks of treatment, and the figure decreased as time passed and patients continued on the programme (in the final three weeks only four patients dropped out) (Figure 1).

A total of 78.6% of the patients from the CRA plus vouchers I group completed six months of treatment, compared to 53.3% from the CRA plus vouchers II group and 35% from the standard treatment. These differences were statistically significant only in the CRA plus vouchers I group (the larger one) and the standard treatment group ($p < .005$).

Mean number of weeks of treatment was 20 in the CRA plus vouchers I group, 15 in the CRA plus vouchers II group, and 12 in the standard treatment group. Statistically significant differences were found between the CRA plus vouchers I and standard treatment groups ($p < .05$).

Global prognostic capacity of the individual variables was 85.7%. The results of the discriminant analyses carried out by groups of variables (sociodemographic, history and pattern of use, psychopathological state and EuropASI scores) are shown in Tables 2 and 3.

DISCUSSION AND CONCLUSIONS

The main objective of the present study was to analyze the effect of the use of incentives on retention in an outpatient programme for the treatment of cocaine addicts. We also set out to determine retention/drop-out rates in this type of programme and to assess whether

certain individual variables influenced retention or drop-out of patients on the programme.

Global drop-out rate after 6 months of treatment was 51.5%. This figure is significantly lower than the mean found in other studies carried out in relation to similar programmes. As also found in previous studies, the majority of drop-outs occurred in the first weeks of treatment. It is well known that these types of drop-out are the most serious (those with the poorest prognosis), and that the likelihood of continuing on the programme increases considerably after the initial months. Thus, the graphic representation of the retention curves gives a characteristic hyperbolic pattern, which is the same for all the programmes (especially drug-free ones), even if they differ in absolute retention rates.

The relationship between patients' individual characteristics and retention after 6 months of treatment is weak, with the exception of the psychopathological variables. Of the sociodemographic variables, the only one that appears to have some weight is educational level (number of years studied). Similar results have been found in previous studies (Agosti, Nunes & Ocepeck-Welikson, 1996; Rowan-Szal, Joe & Simpson, 2000; Sayre et al., 2002). The variables related to history and pattern of use had scarce predictive capacity for retention; the rather homogeneous profile of the majority of participants (high severity of addiction) may have influenced the fact that the analyses did not reflect the possible effect of such characteristics. Among the individual variables, scores on the BDI and SCL-90 are those that best predicted drop-out, even though this prognostic capacity cannot be considered high. However, perhaps the best summary of these results can be found in the data contributed by the EuropASI. It should be borne in mind that this instrument assesses the patient's state in seven different areas (medical situation, drug use, alcohol use, employment, legal situation, family-social situation and psychopathological state), so that it can be considered as a scale providing information on the participant's global situation. But it emerged, at least in the present study, that EuropASI scores did not predict treatment retention. It can be concluded, then, that patient-related characteristics (both static and dynamic) are only weakly associated with retention.

The results related to the effect of the incentives give a very different picture. All three groups achieved considerable retention rates, but in fact, a dose-response effect was found between incentives and retention. As the magnitude of the reinforcers (that is, the value of the

incentives) increased, the results improved. However, the differences were only statistically significant in the comparisons between the two extreme groups (standard treatment without incentives and the treatment with the highest incentives), which appears to indicate that programmes of contingency management through incentives can be effective as long as they attain a given magnitude and intensity. Indeed, one of the parameters deserving of greater attention from research is precisely that of the variability of intensity of incentives and its effect on treatment results.

Some methodological limitations hinder the generalization of these results. On the one hand, the small sample size, especially in the incentives (vouchers) groups, made it difficult to find significant differences between the groups. And secondly, the design employed means that we cannot be totally sure that the higher retention rates in the incentives groups are due exclusively to the effects of those incentives, since in these groups we also applied CRA, a component not present in the standard treatment group. Nevertheless, the fact that the retention rates are directly related to the magnitude of the incentives suggests a positive effect of this procedure on retention.

Notwithstanding these limitations, the results reported here suggest that the use of incentives can be an effective strategy for improving retention in outpatient treatment programmes for cocaine addiction. Finally, the data from this study also show how the use of incentives can be adapted to the natural conditions imposed by a real community care context in our country.

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