

# Intervention on early-onset conduct problems as indicated prevention for substance use: A seven-year follow up

## *Intervención sobre problemas de conducta tempranos como prevención indicada del consumo de drogas: Siete años de seguimiento*

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### Abstract

The aim of this study is to evaluate the long-term effects of a manualised program which intervenes on children with early-onset conduct problems, their families and teachers. The program evaluation involved 14 primary schools which were randomly assigned to the intervention (45 participating families) and control (30 families) conditions during 2007-2008. After a screening process which identified children with significant conduct problems both at home with their family and at school, the program was implemented in eight schools. Seven years later, 58 families (37 from the intervention group and 21 from the control group), with characteristics equivalent to those of the study's entire initial group, were contacted again. With measures administered to the children and their parents, comparisons through multivariate analyses of variance between intervention and control groups supported the program's efficacy in reducing both conduct problems and relations with antisocial peers. Furthermore, the program fostered social and communication skills. As regards drug use, the intervention group showed less favourable attitudes towards drugs, lower intention of drug use, lower frequency of tobacco use and lower intensity of alcohol use. These results support the usefulness of multicomponent programs for conduct problems as a way to prevent, in the long term, unfavourable developmental trajectories, where drug use is a key element.

*Keywords:* Indicated prevention; Conduct problems; Childhood; Substance use.

### Resumen

Este trabajo tiene como objetivo evaluar los efectos a largo plazo de un programa manualizado que interviene sobre niños con problemas de conducta, sus familias y sus profesores. El programa involucró, durante el curso 2007-08, a 14 escuelas que fueron asignadas aleatoriamente a las condiciones de intervención (45 familias participantes) y control (30 familias). A partir de un screening que identificó niños con problemas significativos de conducta en la familia y en la escuela, el programa fue aplicado en ocho de esos centros. Siete años más tarde, se pudo contactar de nuevo con 58 familias (37 de intervención y 21 control), con características equivalentes al total de participantes en el estudio inicial. Por medio de informes obtenidos de los participantes y de sus padres, y a través de comparaciones con análisis multivariados de la varianza, se apoya la eficacia del programa en la reducción de los problemas de conducta y de la implicación con amigos antisociales. Asimismo, se encuentra que el programa promueve la competencia social y comunicativa de los participantes. En cuanto al consumo de drogas, el grupo de intervención muestra actitudes menos favorables hacia las drogas, menor intención de consumo, menor frecuencia de consumo de tabaco y menor intensidad de consumo de alcohol. Estos resultados apoyan la utilidad de los programas multicomponente de intervención sobre los problemas de conducta como una vía para prevenir, a largo plazo, trayectorias de desarrollo desfavorables, en las que el consumo de drogas es una pieza fundamental.

*Palabras clave:* Prevención indicada; Problemas de conducta; Niñez; Consumo de drogas.

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**D**rug use prevention has been a widely developed field in recent decades (Scheier, 2015). However, despite the enormous volume of efforts invested in what Gordon (1983) called “universal prevention”, “indicated” prevention (specifically targeted at individuals who display indicators that permit predicting a problem; see Foxcroft, 2014) is a less developed field. In recent years, both American (NIDA, 2003) and European (EMCDDA, 2009) agencies have expressed the need for increasing resources for prevention, with special attention to those individuals with an early risk of more severe use patterns. In this regard, research has shifted its focus toward early-onset conduct problems as a key indicator for predicting drug abuse and comorbidity with other problems, such as antisocial behaviour, maladjustment at school and emotional difficulties.

The study of disruptive behaviour disorders (or “externalising” problems) as part of the determinants for drug use has experienced a major boost in recent years (e.g., Martel et al., 2009; Sitnick, Shaw & Hyde, 2014). Developmental psychopathology (Cicchetti & Cohen, 2006) highlights the need for moving beyond immediate indicators to know how the trajectories leading to a high risk of drug abuse develop from childhood. In this regard, theoretical cascade models have been proposed (Dodge et al., 2010; Haller, Handley, Chassin & Bountress, 2010), positioning conduct disorders in the centre of an accumulative process where further difficulties are generated progressively. Therefore, behavioural problems, through reciprocal, influential links with family problems, rejection by peers, maladjustment at school, and limited self-control and emotional processing skills, generate a snowball effect, by which the opportunities for healthy development are increasingly reduced. In this context, conduct disorders become more chronic, and a maladjusted lifestyle becomes increasingly consolidated, resulting in problematic drug use, together with antisocial, impulsive and emotional disorders (Webster-Stratton & Hammond, 1997).

In support of these models, research has proven that behavioural problems are consistently associated with indicators of severity of use, including high rates of polydrug addiction, high involvement in criminal activities, high risk of abandoning treatment, and poor response unto interventions (Hawkins, 2009; Hser, Grella, Collins & Teruya, 2003). Therefore, programs that address early-onset conduct problems are considered necessary tools for preventing problematic drug use since childhood (EMCDDA, 2009; Glantz, 2002).

Given the breadth and complexity of the factors intervening in the aetiology and development of conduct disorders, prior studies have reiterated the need for multicomponent programs that simultaneously act upon different sources of risk (Conduct Problem Prevention Research Group, 2004; Foster, Olchowski & Webster-Stratton, 2007). Though earlier publications include many examples of intervention programs for conduct problems, databases on evidence-ba-

sed prevention programs (e.g., Blueprints for Youth Health Prevention, Centre for Substance Abuse Prevention) identify a very low number of multicomponent programs that both target children with behaviour disorders and have undergone a long-term evaluation to verify their impact on drug use. The programs *Coping Power* (Zonneville-Bender, Matthys, Van De Wiel & Lochman, 2007) or *Linking the Interests of Families and Teachers* (Eddy, Reid, Stoolmiller & Petrow, 2003) are mentioned as exemplary interventions which, acting upon several psychosocial areas and focused on behaviour problems, have proven to be effective in relation to the subsequent behaviour of youth, including drug use prevention.

Likewise, reviews of this issue have highlighted the need for pursuing further research on the preventive effect of the intervention on children with emotional and behavioural problems (Salvo et al., 2012). For all of these reasons, this study evaluates, seven years after its implementation, a multicomponent program that targeted children with early-onset conduct problems. The EmPeCemos program (see Romero, Villar, Luengo & Gómez-Fraguela, 2009; [http://www.emcdda.europa.eu/html.cfm/index52035EN.html?project\\_id=ES\\_03&tab=overview](http://www.emcdda.europa.eu/html.cfm/index52035EN.html?project_id=ES_03&tab=overview)) is based upon cascade models proposed by developmental psychopathology (Dodge et al., 2010; Granic & Patterson, 2006) and offers a manualised and coordinated intervention that involves the family, the teachers and the children themselves. Previous studies on the efficacy of each of its components as well as of the program as a whole showed that the intervention decreases conduct problems (including hyperactivity and rebellious behaviours), with *d* effect sizes between .72 and .78 for global measures of conduct problems, and that these effects were maintained for one year (Robles, 2009; Romero, Villar, Luengo, Gómez-Fraguela & Robles, 2014). Furthermore, the program has significant short-term effects on theoretically mediating variables: parenting practices, children’s socioemotional skills and teachers’ self-efficiency in managing disruptive behaviours (Romero, Villar & Gómez-Fraguela, 2010), in accordance with the program’s immediate goals.

The purpose of this study is to complete a long-term follow-up of this program by examining its effects when the participants are adolescents. Bearing in mind the approach of developmental psychopathology in addition to the role of early-onset conduct problems in drug use, our analysis includes both these youths’ disruptive behaviour patterns and substance use.

## Methods

### Participants

The participants were selected during the 2007-2008 academic year through a screening at 14 randomly selected grade schools in the geographical area near Santiago de Compostela in Galicia. This screening used a 10-item instru-

ment based on the Teacher Report Form (TRF, Achenbach, 1991a), in accordance with the indications given by previous programs aimed at children with conduct problems (Larson & Lochman, 2002). The teachers of grades two to four, who were mentors of the children, completed this instrument. A detailed evaluation was completed of those cases which the screening identified as more suitable for the intervention, taking into account information provided by parents (using the CBCL by Achenbach, 1991b) and teachers (using the full version of the TRF). This evaluation was used to select the families whose children had significant conduct problems (t-scores higher than 70 in the "Externalising" dimension) at home with the family and at school. Criteria for exclusion included a diagnosis of mental retardation or a pervasive developmental disorder. Of the 88 families selected, 75 agreed to participate in the study. Of the 14 participating schools, 8 were randomly assigned to the "intervention" condition (with 45 children with conduct problems; average age: 8.34 years) and 6 to the "control" condition (with 30 children with conduct problems; average age: 8.27 years). No significant differences were found between the groups as to basic sociodemographic variables (age, sex, household composition) or degree of conduct problems.

The multicomponent program was implemented at the 8 schools of the intervention group during the academic years 2007-2008 (basic program) and 2008-2009 (booster modules). The participants were contacted again in 2014 for purposes of this long-term follow-up. Of the 75 families participating in the initial study, 64 were contacted. Changes in telephone number and/or address impeded contacting the other families. Of the 64 families contacted, 58 agreed to participate. Of these families that refrained from participating, four claimed limited availability and/or temporary health problems; another two families declined to participate without offering specific reasons. The attrition rate, therefore, was 22% over seven years; lost cases from the intervention group amounted to 17% (37 of the 45 families participated) while, as is expected, participation from the control group was lower (21 of the 45 families participated; 30% attrition rate). Finally, the sample of participants included in our evaluation was comprised of 58 children (56 boys and 2 girls) with an average age of 15.25 years at the time of the evaluation.

### **Description of the intervention**

The EmPeCemos program is comprised of three components. The 12-session family program trains parents in skills for establishing positive relationships with their children, promoting positive behaviours in them and facing problematic conduct themselves. Furthermore, the program includes training modules on self-control, problem-solving and communication skills as support for the parenting strategies these parents need to learn and, as support, in addition, for the children's cognitive and emotional development. The 12-session children program trains children with conduct

problems in skills for recognising their emotions, self-control, problem-solving, acknowledgment of other viewpoints, and socialization skills (a detailed program description is given in Romero et al., 2009). Last of all, the 8-session teacher program provides training on strategies for managing disruptive behaviours and for promoting collaboration with the family and stimulating suitable conduct at school. The booster modules (two sessions for parents and children and one session for teachers) were implemented six months and one year after this basic program.

The program's three components are implemented in groups (of between 5 and 10 participants) using techniques based on social learning: instructions, discussion, modelling (in vivo and audiovisual), role-playing and, especially, guided practice in a natural setting. With the goal of achieving coherent changes in the children and their environment, previously trained therapists implement the components simultaneously and in coordination.

The multicomponent program was implemented at the schools themselves. The program's participation rates are quite high, especially given the fact that the program participants had a high risk of social maladjustment. The abandonment rate between the start and end of the basic program was 8% for the parents and children component (4 of 45) and somewhat higher for the teacher component (15%; 19 of 125). Participation in the sessions was also high: on the average, parents attended 9.24 sessions, children attended 10.43 (in both cases, with a possible maximum of 12), and teachers attended 5.05 (maximum of 8). On another hand, follow-up of the implementation process showed that an average of 88% (70 of 79) of the proposed activities for families, 76% (59 of 77) of the proposals for children and 73% (30 of 41) of the proposals for teachers were applied. This provides support for the integrity of the program's application which, in addition, was applied with a high degree of fidelity as to the program's rationale and principles, verified through the implementation diaries, the virtual monitoring platform used and the self- and hetero-evaluation questionnaires completed by therapists during each session.

Finally, the abandonment rate between the start of the intervention and end of the support modules was 11% for the parents and children component (5 of 45) and 25% for the teacher component (31 of 125). As regards the booster sessions six months later, on average, 90% of the planned activities for parents (9 of 10), 100% of those for children (9 of 9) and 75% of those for teachers (3 of 4) had been applied. As regards the support modules one year later, on average, 100% of the planned activities for parents (10 of 10), 100% of those for children (10 of 10) and 66% of those for teachers (2 of 3) had been applied.

### **Instruments**

This evaluation included data collected through self-reports and rating scales completed by parents.

### Self-reports as instruments

*Drug use.* The Drug Use Questionnaire (Luengo, Romero, Gómez-Fraguela, Garra & Lence, 1999) includes a broad range of indicators related with substance use, including attitudes, intention of use, age at onset of use, frequency and quantity consumed. The instrument has been used in many previous studies and has proved its efficiency for evaluating drug use patterns amongst youth (e.g., Luengo, Villar, Sobral, Romero & Gómez-Fraguela, 2009; Sobral, Gómez-Fraguela, Romero, Luengo & Villar, 2012).

*Disruptive behaviour problems.* The Antisocial Behaviour Questionnaire (CCA; Luengo, Otero, Romero, Gómez-Fraguela & Tavares, 1999), allowed for evaluating, through 37 items, the implication of youth in antisocial conduct over the last 12 months. A specific evaluation of aggressive conduct patterns was completed using the self-reported Reactive/Proactive Aggression Scale (Dodge & Coie, 1987), a brief 6-item scale that allows for evaluating involvement in premeditated and instrumental conduct (proactive aggression) and aggressive emotional conduct as a reaction to real or perceived provocations (reactive aggression).

*Adaptation at school.* The School Adaptation Scale by Berry, Phinney, Sam & Vedder (2006) includes 8 items for measuring absenteeism, performance and socialization at school.

*Adaptation to the group setting.* To examine the degree of integration and adaptation to the peer group setting, in addition to a direct item that asks about the number of friends, we also used the Trust in Friends Scale (taken from the Inventory of Parent and Peer Attachment (IPPA), Armsden & Greenberg, 1987), that evaluates closeness and caring attitude in one's relationship with peers, and the Involvement with Antisocial Friends Scale (adapted from Thornberry, Lizotte, Krohn, Farnworth & Jang, 1994), with five items evaluating relations with friends having antisocial conduct.

*Empathy.* Given the relevance of empathy and acknowledgment of other viewpoints as ingredients of social competencies required for healthy development, a self-reported empathy indicator was included: the abbreviated version of the Empathy Scale for Children (Del Barrio, Aluja & García, 2004), comprised of 10 items that evaluate children's capacity for feeling affected by others' emotions.

All of the self-reported instruments had been widely used in previous studies in our sociocultural context, with suitable psychometric properties (e.g., López-Romero, Romero & Andershed, 2015).

### Rating scales completed by fathers/mothers

*Conduct problems.* The children's fathers/mothers completed the Child Behaviour Checklist (CBCL; Achenbach, 1991b) that allows for evaluating externalising and internalising problems, the Disruptive Conduct Rating Scale (Barkley, 1997) that allows for obtaining, through 26 items, measures of attentional difficulties, hyperactivity/impulsivi-

ty and oppositional/defiant conduct. Furthermore, to evaluate aggressive conduct patterns, the parent version of the Reactive/Proactive Aggression Scale (Dodge & Coie, 1987) was used.

*Emotional and social competencies.* The Fast Track Social Competency Scale (Conduct Problems Prevention Research Group, 1995) provides, through 12 items, measures on Prosocial/Communication Skills and Emotional Control Skills.

Families were asked to have the parental figure that spends the most time with the child complete the hetero-informed instruments; in 77% of cases, the mother was the source of information.

Again, these instruments had been adapted and widely used in previous studies (López-Romero et al., 2015; Romero, Robles & Lorenzo, 2006), with suitable psychometric properties.

### Procedure

In February 2014, seven years after the program had been applied, the families that had participated previously in the study as part of the intervention or control group were contacted by phone or letter to request their collaboration in this follow-up. The evaluation instruments were applied between April and July, at the places of residence of these families, by specialised personnel without prior involvement in the program's implementation. While no incentives were given for participation in the study during the program's application, each family that participated in this follow-up was awarded 20 euros. All of the procedures were approved by the Bioethics Committee of the University of Santiago de Compostela, and both informed consent of the parents and willingness to participate of children were obtained for participation in the initial study as well as the follow-up.

## Results

### Analysis of attrition

First, we examined the extent to which differential attrition had occurred, depending on variables that, a priori, could be considered relevant for evaluating the program's effects. As to the intervention group, no significant differences were found between the participants and the lost cases in terms of age (participants' initial age of 8.42, compared with 8.38 for the lost cases;  $F = 0.007$ , 1/43 df, ns). As concerns previous conduct problems, the lost cases tended toward higher scores (average global score in disruptive conduct of the Barkley scale of 46.89, compared with 38.49 of the participants), but, even so, these differences were not statistically significant ( $F = 2.05$ , 1/42 df, ns). Differential attrition did occur depending on sex in the intervention group. Though the sample size of girls was already small (5 girls, 11% of the total sample, reflecting the different prevalence of early-onset conduct problems between boys and girls), more girls

than boys were lost during follow-up (chi-squared: 10.18, 1 df,  $p < .01$ ).

As regards the control group, no differential attrition occurred depending on initial age (8.54 in the case of participants, 8.21 in the lost case group,  $F = 1.90$ , 1/28 df, ns), in previous conduct problems (though, once again, the lost case group tends to show more previous problems, though these were not statistically significant: 37.50 vs. 45.23,  $F = 1.90$ , 1/28 df, ns). Neither is there a differential loss of participants depending on sex (chi-squared: 0.12, 1 df, ns).

Finally, when both groups of participants in the follow-up (intervention and control) are compared as regards these basic variables, no significant differences are found for sex (chi-squared: 0.20, 1 df, ns), initial conduct problems (38.19 in the intervention group vs. 37.50 in the control group;  $F = 0.03$ , 1/54 df, ns) nor for current age (15.06 in the intervention group vs. 15.43 in the control group,  $F = 1.25$ , 1/55, ns).

Therefore, the analysis of attrition suggests that the participants of both intervention and control groups who participated in the final follow-up comprise two groups that are equivalent to those that initially participated in the study. This supports the internal validity of the comparisons made in this evaluation.

### **Differential development of conduct problems during the seven-year period**

For purposes of knowing how disruptive conduct problems develop in both groups (as measured using the Disruptive Conduct Rating Scale, Barkley, 1997) in this long-term evaluation, a 2x3 Analysis of Variance was performed with an intrasubject measure, represented by evaluation periods T1 (pretest, before applying the program), T2 (posttest, upon completion of the basic program) and T3 (follow-up, seven years later). The purpose of this is to identify the development trajectories of conduct problems over the seven years of follow-up, taking a suitable measure (the Barkley scale) for use during the three evaluation periods. The results display a significant interaction between the treatment condition (intervention vs. control) and time ( $F$

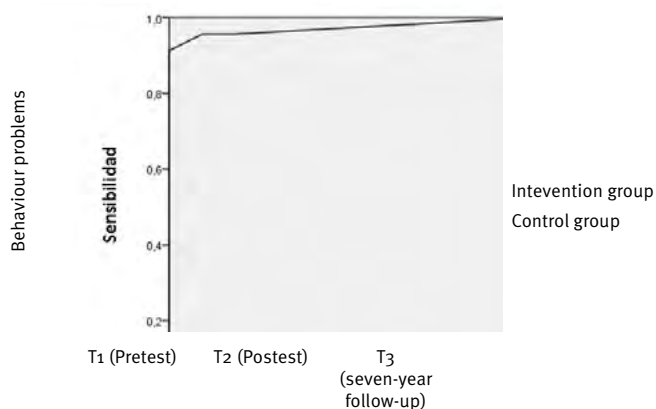


Figure 1. Development of conduct problems between pretest and seven-year follow-up

$= 8.70$ , 2/45 df,  $p < .001$ ), therefore indicating that the conduct problems developed differently in both groups. Figure 1 represents this development.

The figure displays the decrease in conduct problems for the intervention group between pretest and posttest,  $t(35) = 6.58$ ,  $p < .001$ , and that this decrease continues over time, without significant differences between posttest and follow-up,  $t(34) = 0.17$ , ns. The control group, however, maintained high levels of conduct problems in the posttest (without significant differences between both periods;  $t(19) = -.29$ , ns, and, though the seven-year period shows a decreasing trend, the difference between posttest and evaluation is not statistically significant,  $t(20) = 1.19$ , ns, and conduct problems remain high in comparison with the intervention group. No differences were found in intergroup comparisons of the intervention and control groups in the pretest, as already mentioned,  $F(1/54) = .03$ , ns, but the opposite occurred in the posttest,  $F(1/54) = 12.46$ ,  $p < .001$ , and in follow-up,  $F(1/53) = 4.67$ ,  $p < .05$ , with the control group obtaining higher scores in both cases.

### **Comparison of the intervention and control groups in follow-up: Behavioural difficulties, psychosocial functioning and drug use**

Once having compared that 1) the intervention and control groups were comparable with each other, in that they adequately represented the groups comprising the initial study; and that 2) the groups developed differently over time in the basic marker of conduct problems, the next step was to compare both groups in a wide range of variables indicative of the adolescents' psychological adjustment. This allowed us to analyse the extent to which participation in the program relates with markers of wellbeing and social adaptation, including drug use.

In particular, this analysis included three clusters of variables: 1) behavioural problems (externalising and internalising), 2) psychosocial skills and functioning (in family, school and group settings), and 3) drug use. Bearing in mind the multicollinearity of the variables, multivariate analysis of variance (MANOVA) was performed, considering each group of variables jointly; when the multivariate analysis resulted in significant differences, univariate analysis of variance was subsequently performed. In accordance with the multi-informant perspective adopted by this study, each analysis included, as pertinent for those indicators, information given by the parents and by the youth themselves.

The results of the comparison of the intervention and control groups are explained below.

#### *Comparison as regards behavioural problems.*

For comparing behavioural problem measures, we used, on one hand, indicators of general behaviour problems and, on another hand, aggressive conduct (reactive and proactive) as a specific category of behaviour problems.

Table 1 displays the results corresponding to the comparison of the intervention and control groups in diverse global measures of behaviour problems.

The results of the multivariate analysis revealed the existence of significant differences in this group of variables. Specifically, the univariate analysis revealed that the boys that participated in the intervention presented, seven years later, lower levels of externalising and disruptive problems as reported by parents, less impulsivity and less oppositional-defiant conduct. However, no differences were found as regards attentional problems, nor in self-reported antisocial conduct. Neither were there differences as regards internalising problems.

When aggressive conduct was analysed specifically, including measures of proactive (premeditated, instrumental) and reactive (hostile, emotional) aggression, as reported both by parents and the children themselves, the multivariate analysis showed the inexistence of significant differences between both groups ( $F = 0.59, 4/49, ns$ ).

#### *Comparisons of psychosocial skills and functioning.*

The analysis of variables for this area considered, on one hand, psychosocial skills, on another hand functioning at

school, and on another, social functioning amongst the group of friends.

Table 2 displays the results of the comparison of both groups as regards psychosocial skills: emotional control skills, prosocial/communication skills, and empathy (self-reported).

The results of the multivariate analysis revealed the existence of significant differences in this group of variables. The differences occur, specifically, in prosocial/communication skills, where the intervention group obtained higher scores than the control group.

When analysing functioning at school (socialization at school, absenteeism, academic performance), the multivariate comparison was not significant ( $F = 1.77, 3/52, ns$ ), though the univariate comparison did indicate that unjustified absences of the control group were significantly more frequent than those of the intervention group ( $F = 5.01, 1/54, p < .05$ ).

Table 3 displays the results corresponding to the variables of the group of friends.

Table 3 shows that both groups also differ in this group of variables, and that these differences are established, in particular, in the antisocial conduct of one's friends, higher in the control group than in the intervention group.

Table 1. *Multivariate analysis of variance for comparing the intervention and control groups in measures of behaviour problems (seven-year follow-up)*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			0.65	3.64 (6/42)**	0.34
CBCL-Externalising (Parent Inf.)	12.86 (8.36)	21.20 (10.36)		8.91 (1/47)**	0.16
CBCL-Internalising (Parent Inf.)	12.80 (8.36)	9.18 (5.96)		2.46 (1/47)	0.05
Attentional difficulties (Parent Inf.)	12.76 (7.96)	14.00 (7.17)		0.26 (1/47)	0.05
Hyperactivity/Impulsivity (Parent Inf.)	6.69 (4.86)	9.66 (4.46)		4.06 (1/47)*	0.08
Oppositional-defiant conducts (Parent Inf.)	6.11 (5.55)	11.20 (5.10)		9.14 (1/47)**	0.16
Self-reported antisocial conduct	9.09 (9.21)	12.66 (11.48)		1.33 (1/47)	0.02

Note. \*  $p < .05$ ; \*\*  $p < .01$

Table 2. *Multivariate analysis of variance for comparing the intervention and control groups in measures of psychosocial skills (seven-year follow up).*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			0.81	3.83 (3/51)*	0.18
Emotional control skills (Parent Inf.)	10.99 (4.42)	8.85 (3.85)		3.26 (1/53)	0.05
Prosocial/communication skills (Parent Inf.)	15.91 (4.46)	11.45 (5.09)		11.46 (1/53)**	0.17
Empathy (self-reported)	7.26 (2.36)	6.20 (2.23)		2.69 (1/53)	0.04

Note. \*  $p < .05$ ; \*\*  $p < .01$

Table 3. *Multivariate analysis of variance for comparing the intervention and control groups in measures concerning peers (seven-year follow-up)*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			0.22	3.47 (3/41)*	0.22
Number of friends	7.04 (5.79)	8.00 (6.56)		1.00 (1/40)	0.00
Trust in friends	3.82 (0.95)	4.13 (0.68)		0.77 (1/39)	0.02
Antisocial conduct of friends	1.53 (1.52)	3.50 (2.93)		7.79 (1/40)**	0.17

Nota. \*  $p < .05$ ; \*\*  $p < .01$

Table 4. *Multivariate analysis of variance for comparing the intervention and control groups in attitudes and intention of drug use (seven-year follow-up)*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			0.77	3.61 (4/51)*	0.83
Attitude toward drugs	6.46 (3.69)	10.30 (4.08)		12.87 (1/54)**	0.19
Intention tobacco	0.40 (0.87)	1.29 (1.30)		9.47 (1/54)**	0.14
Intention alcohol	0.77 (1.06)	1.48 (1.16)		5.22 (1/54)*	0.08
Intention cannabis	0.26 (0.61)	0.67 (1.01)		3.56 (1/54)	0.06

Note. \*  $p < .05$ ; \*\*  $p < .01$

#### *Drug use comparison.*

For the multivariate analyses, the variables related with drug use were grouped into the following groups for analysis: attitudes and intentions, age at onset of use, frequency and quantity of alcohol consumed.

First, attitudes and intentions as regards drug use were analysed. The Attitudes toward Drugs Scale is part of the Drug Use Questionnaire (CCD; Luengo et al., 1999), and evaluates the degree to which adolescents rate the use of drugs and its effects positively (e.g., "Smoking joints is a pleasant experience that must be experimented", "Drinking alcohol will be prejudicial for my studies", "You can't talk to others about the effects of drugs unless you use them first yourself", "Alcohol makes parties more fun"). The Intentions Scale, specifically, asks about the likelihood that the adolescent thinks he or she will use drugs (tobacco, alcohol, cannabis) next weekend, if given the opportunity ("Surely not", "Probably not", "Probably yes", "Surely yes"; these responses are scored from 0 to 3). The results are presented in Table 4.

The multivariate analysis showed a significant F and, in particular, differences in attitudes (higher in the control group) and in the intention of using tobacco or alcohol (also higher in the control group). When the proportion of adolescents that will "probably yes" use tobacco is analysed, we find that 11% of the intervention group is willing to use,

compared with 42% of the control group (chi-squared: 7.59, 1 df,  $p < .001$ ). As to adolescents that will "probably yes" use alcohol, 11% of the intervention group chose this response, compared with 35% of the control group (chi-squared: 6.23, 1 df,  $p < .01$ ).

No differences are found, however, in age at onset (multivariate  $F = 0.47$ , 2/29 df, ns), which was 13.00 years (intervention) and 13.77 years (control) for tobacco; 14.18 years (intervention) and 13.27 years (control) for alcohol; and 14.63 years (intervention) and 14.40 years (control) for cannabis.

Frequencies of use over the last month and over one's lifetime were also analysed: e.g., "How many times have you smoked cigarettes over the last month?"; "How many times have you drunk more than one sip of alcohol over your lifetime?". The response options range between "Never" (with a value of 0) and "Over 20" (with a value of 5). The comparison of averages did not yield significant differences between the intervention and control groups as to alcohol use (multivariate  $F = 1.09$ , 2/49, ns) or cannabis (multivariate  $F = 1.84$ , 2/38, ns), though in both cases, however, the averages tended to be higher in the control group than in the intervention group. However, there are significant differences in the frequency of tobacco use. The results are presented in Table 5.

Table 5. *Multivariate analysis of variance for comparing the intervention and control groups in frequency of tobacco use (seven-year follow-up).*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			.71	7.94 (2/39)**	0.28
Frequency of tobacco month	0.59 (1.50)	2.67 (2.19)		13.18 (1/40)**	0.24
Frequency of tobacco lifetime	1.44 (1.96)	3.87 (2.03)		14.26 (1/40)**	0.26

Note. \*\*  $p < .01$

Table 6. *Multivariate analysis of variance for comparing the intervention and control groups in intensity of alcohol use (seven-year follow-up)*

	Intervention Group N = 37	Control Group N = 21	$\lambda$	F(df)	$\eta^2$
	Average (SD)	Average (SD)			
			.77	5.53 (2/38)**	0.22
Number of drinks	0.86 (1.08)	1.87 (0.83)		9.87 (1/39)**	0.30
Number of episodes of drunkenness	0.19 (0.40)	0.60 (0.63)		6.39 (1/39)**	0.14

Note. \*\*  $p < .001$

Significant differences were obtained as regards the frequencies of both measures. The control group shows higher frequencies of tobacco use than the intervention group. When this data is analysed from a categorical perspective, 33% of the adolescents from the intervention group affirmed having used tobacco more than once over their lifetime, compared with 75% of the adolescents of the control group (chi-squared = 6.98, 1 df,  $p < .001$ ). Likewise, 11% of the adolescents from the intervention group claimed to have used tobacco over the last month, compared with 56% of the control group (chi-squared = 13.42, 1 df,  $p < .001$ ).

Finally, differences are found in the measures of quantity of alcohol use ("How many drinks do you usually have when you drink alcohol?", "How many times have you gotten drunk over the past year?"). The results are presented in Table 6.

When this data is analysed from a categorical perspective, 26% of the adolescents from the intervention group affirmed that they usually have more than one drink when drinking, compared with 62% of the adolescents of the control group (chi-squared = 5.20, 1 df,  $p < .05$ ). As to the number of times the adolescent got drunk over the last year, 19% of the adolescents from the intervention group claimed to have gotten drunk, compared with 56% of the control group (chi-squared = 6.10, 1 df,  $p < .05$ ).

## Discussion

The need for designing multicomponent indicated prevention programs has been repeatedly highlighted in recent

years (Boxmeyer, Lochman, Powell, & Powe, 2015). The identification of unfavourable developmental trajectories, associated with early-onset conduct problems, has driven the proposal of programs that target children for the purpose of preventing numerous psychological and social dysfunctions, including severe drug use patterns. This study has allowed for verifying the long-term efficacy of a multicomponent program aimed at children with conduct problems, their parents and their teachers.

As shown, the developmental trajectories of conduct problems differ in the intervention and control groups.

The control group continued to have problems over the long term, without significant differences between measures, with a decreasing trend between posttest and follow-up, congruent with the results of other studies that have examined the development of conduct problems since childhood as reported by parents (Anselmi et al., 2008; Hofstra, Van der Ende & Verhulst, 2000). The intervention group, however, shows decreases with the program that are maintained over time. Therefore, seven years after the start of the intervention, it is verified that the multicomponent program reduces disruptive behaviour problems in adolescence, particularly impulsive and oppositional types of conduct. Nevertheless, we must point out that the effects appear more clearly in the parents' reports, and less so when these are reported by the adolescents themselves. It is possible, given the program's prioritisation of intervention within the family context, that the program's positive effects are perceived more clearly within the context of parent-child interactions. On another hand, it is noteworthy that significant effects are



not appreciated in relation to aggressive conduct, despite the fact that coping with anger is one of the most emphasised contents of the component for children. Apparently, the program has a more generalised effect on impulsive conduct and the defiance of rules, but, however, the components aimed specifically at reducing aggression do not have the expected impact in the long term. In relation to the above, it is also worth highlighting that no significant differences were found in emotional control skills or in empathy, which seems to suggest that the specific effects on interpersonal emotions are attenuated over time and, therefore, that these components require reinforcements during the intervention.

In general, significant effects on conduct problems in the long term are coherent with other multicomponent programs that have also demonstrated a long-term preventive effect on externalising problems (Eddy et al., 2003; Hektner, August, Bloomquist, Lee & Kimes-Dougan, 2014; Webster-Stratton, Reid & Hammond, 2001) and delinquency (Conduct Problems Prevention Research Group, 2010; Tremblay, Pagani-Kurtz, Masse, Vitaro & Pihl, 1995).

On another hand, results demonstrate that the program is capable of favourably affecting prosocial and communication skills and of decreasing involvement with antisocial friends during adolescence. Given the relevance of these factors in chronification models of conduct problems (Dodge et al., 2010), this result can also be considered favourable for the prevention of persistent antisocial behaviour problems.

Evidence is also found of significant effects when examining the effects on drug use specifically. Participation in the program is associated with more unfavourable attitudes toward drugs and a lower intention of tobacco and alcohol use. Significant effects are also observed in the prevention of tobacco use, with a lower frequency of use in adolescents that participated in the program, both over their lifetime and over the last month. As regards alcohol, apparently the frequency of use remains unaffected (which, in fact, is high in the general population of adolescents at these ages; Plan Nacional sobre Drogas, 2013), but quantity of use is affected, with fewer drinks consumed and episodes of drunkenness in the intervention group. These results are especially worth emphasising, given that the increase in quantity of alcohol consumption is a parameter of special concern in western societies, according to epidemiological studies carried out over the last decade (ESPAD, 2011; Johnston, O'Malley, Miech, Bachman & Schulenberg, 2015). No significant effects are found as regards use of cannabis; however, given that the consumption of cannabis, in general, has a later onset than tobacco and alcohol use, an evaluation in an even longer term would be required to properly assess the effect on use patterns of this substance. In fact, the use of cannabis has been associated with the use of alcohol and tobacco among youth in Spain (Míguez Varela & Becoña,

2015), wherefore it would be relevant to examine whether, in broader evaluations, effects also arise in relation to cannabis. In general, the results on drug use are coherent with some previous studies (Eddy et al., 2003; Zonneville et al., 2007) which have also provided evidence of the effects on drug use, and specifically on the use of alcohol (Eddy et al., 2003), of multicomponent programs that address externalising conduct problems.

Therefore, this study contributes toward consolidating the usefulness of multicomponent programs based on developmental psychopathology models for exerting effects on attitudes and behaviours of youth when these approach adolescence. The program object of this evaluation, which includes an integral intervention in coordination with parents, teachers and children themselves, has effects on numerous indicators of psychosocial adjustment, including drug use.

In addition to the implications that these results may have for orientating indicated prevention aimed at children, they also provide support for the models that serve as the basis of these programs. As other authors have pointed out (LeMarquand, Tremblay & Vitaro, 2001), verifying the efficacy of the intervention programs allows for validating the basic principles as to the source and maintenance of problems targeted by the intervention. In our case, the effects of the intervention have backed the importance of conduct problems in the development of drug use.

This way, this study contributes new data in support of the efficacy of a type of program whose long-term impact requires systematic examination. Furthermore, the use of several informants strengthens the effects found. The study, as a whole, entails some limitations to be overcome by future research. On one hand, the limited sample size (common in these types of studies with high-risk children; Zonneville-Bender et al., 2007) weakens the statistical power of the analyses carried out. In this regard, the implementation of studies at several sites would allow for broadening the scope of the evaluation of efficacy; furthermore, this would allow for including the study of moderators of efficacy to understand which of the characteristics of the children, their environment or the application conditions would maximise the intervention's positive effects. Variables like sex, socioeconomic status of the family, severity of initial conduct problems, comorbidities, as well as the fidelity and integrity of the implementation are some elements that require study; these factors have been identified in recent decades as factors affecting the success of parent training programs (Maughan, Christiansen, Jenson, Olympia & Clark, 2005; Robles & Romero, 2011) and could also be analysed as moderators of these types of programs. Particularly, the role of contextual conditions as moderating variables deserves a systematic analysis, given the relevance in studies on addictive behaviours of factors related with the macrosocial (Buil, Solé Moratilla & García Ruiz, 2015) and family environments

(Hernández-Serrano, Font-Mayolas & Gras, 2015). Increasing the sample size will also allow for breaking down the mechanisms of influence on the program and for evaluating which of the program components are critical for its positive impact.

Given the costs associated with this type of program, another aspect worthy of analysis is its efficiency in terms of costs and benefits. Some previous reviews have provided support for the efficiency of multicomponent programs (Foster et al., 2007), though this aspect should be analysed systematically as long-term studies are implemented.

For the time being, evidence from this study provides support for including early-onset conduct problem reduction programs as drug abuse prevention programs (Glantz, 2002). It has been claimed, in this regard, that a multicomponent intervention could have a cascade effect, generating a chain of positive changes between the individual and the environment (Patterson, Forgatch & Desarmo, 2010), capable of substantially altering the individual's development path and, in particular, the risk of involvement in drug abuse. Intervention at early ages, on another hand, is compatible with neuroscientific research that provides support for the importance in development programs of the cognitive functions of self-management and self-control when the corresponding neural systems still have high plasticity and are responsive to environmental inputs (see Fishbein & Tarter, 2009). In fact, evidence that is now being generated on the relevance of conduct problems have affirmed that conduct problems could offer "the greatest" opportunity for prevention in the field of mental health (Harley, Murtagh & Cannon, 2008).

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## Conflict of interests

The authors declare the inexistence of conflicts of interest.

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