Effectiveness of a school-program against smoking in Europe: early results from the EU-Dap trial

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INTRODUCTION

School is likely the most appropriate setting for prevention of tobacco smoking. Notwithstanding the evidence of effectiveness of school-based programmes is still weak. Tobler's review (2000) pointed interactive intervention out, whereas Thomas (2002) found inconsistent effects of social influence programmes. Moreover most part of the evaluation studies have been carried out in North America, raising suspects about generalisability.

With the aim to evaluate the effects of an European primary prevention program, EU-Dap (EUropean Drug Addiction Prevention) project has been carried out in 9 centers of 7 European countries, co-funded by the European Commission.

METHODS (1) - STUDY ENROLMENT

EU-Dap is a Cluster Randomized Trial in which schools are the unit of randomization and students the unit of analysis. From the 323 schools randomly selected from the centers involved, and assessed for inclusion, 170 have been randomized to the following arms:
- Basic intervention
- Basic intervention plus parents involvement
- Basic intervention plus peers involvement
- Control (usual curriculum)

After the randomization, but before the first baseline survey, 27 schools dropped out. All in all 7079 students of 345 classes (7th, 8th and 9th grade) have been included in the study (Fig 1).

“UNPLUGGED”: THE PREVENTION PROGRAM

The programme under evaluation is based on a comprehensive social influence approach and includes the following components:
- Social skills
- Personal skills
- Knowledge
- Normative education

It is composed by 12 one-hour units delivered weekly from October 2004 to January 2005 by the class teachers. Each teacher received a 3-days training course. It has been designed by the EU-Dap Intervention Planning Group.
RESULTS (1)

Figure 2 shows changes in prevalence of daily smoking between baseline and follow-up survey. Given that non significant differences were found among intervention arms, in the result tables they are pooled together.

Table 1 shows the main results. Compared to the Unadjusted model, Model 3 (adjusted for cluster effect, centre prevalence and students’ use at baseline) does not show large differences in effect size but it shows wider confidence intervals. The intervention groups show significant reduction in daily use (-30%) and lower and not significant effect on ALO smoking and on Regular smoking.

<table>
<thead>
<tr>
<th></th>
<th>Controls</th>
<th>Interventions</th>
<th>Unadjusted</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>n/N*</td>
<td>n/N*</td>
<td>PR (95%CI)</td>
<td>PR (95%CI)</td>
<td>PR (95%CI)</td>
<td>PR (95%CI)</td>
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<tr>
<td>ALO smoking</td>
<td>642/3059</td>
<td>531/3098</td>
<td>0.82 (0.74-0.91)</td>
<td>0.87 (0.72-1.04)</td>
<td>0.88 (0.72-1.08)</td>
<td>0.88 (0.71-1.08)</td>
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<tr>
<td>Regular smoking</td>
<td>407/3059</td>
<td>315/3098</td>
<td>0.76 (0.67-0.88)</td>
<td>0.84 (0.66-1.06)</td>
<td>0.85 (0.65-1.10)</td>
<td>0.86 (0.67-1.10)</td>
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<tr>
<td>Daily smoking</td>
<td>294/3059</td>
<td>200/3098</td>
<td>0.67 (0.57-0.80)</td>
<td>0.73 (0.56-0.95)</td>
<td>0.74 (0.55-0.99)</td>
<td>0.70 (0.52-0.94)</td>
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* Number of users out of the total number of students answering the question at follow-up (unadjusted model).

PR. Prevalence Ratios (all interventions vs control).
Model 1. Multilevel model (RIGLS bin 1st order MQL) with 3 levels (level 1: centre; level 2: class; level 3: student)
Model 2. Multilevel model (RIGLS bin 1st order MQL) with 3 levels adjusting for centre prevalence of daily smoking
Model 3. Multilevel model (RIGLS bin 1st order MQL) with 3 levels adjusting for centre prevalence of daily smoking and baseline status of the outcome
RESULTS (2)

Table 2 reports Prevalence ratios stratified by gender. UNPLUGGED program have higher effects on boys: Prevalence Odds Ratios for daily smoking and for regular smoking are significantly reduced among intervention groups, compared to controls (POR=0.49 and POR=0.68 respectively). Effect size appears smaller among girls, and not statistically significant.

No significant differences are found among different school grades involved (data not shown).

<table>
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<tr>
<th>Table 2. Prevalence Odds Ratios of effectiveness of interventions, compared to controls (PR=1), stratified by gender</th>
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<tr>
<td><strong>ALO smoking</strong></td>
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<tr>
<td><strong>Regular smoking</strong></td>
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<tr>
<td><strong>Daily smoking</strong></td>
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</tbody>
</table>

1. Number of users out of the total number of students answering the question at follow-up (multilevel adjusted model).

PR. Prevalence Ratios (all interventions vs control) estimated using multilevel model 3 (RIGLS bin 1st order MOL with 3 levels adjusting for centre prevalence of daily smoking and baseline status of the outcome)

DISCUSSION

The prevention program evaluated by EU-Dap resulted effective in reducing the prevalence of smoking habits among students of 7th to 9th grade.

There are some characteristics of this effect deserving a deeper discussion: the Prevalence ratios appear to increase with the increasing of smoking frequency; the program is more effective with daily users than with sporadic users (ALO smoking). Moreover it works better for boys than for girls. These effects could be related to the main features of the program, and require further investigation.

These results are coming from a Cluster Randomized Controlled trial, which is considered the most appropriate study design for evaluating programmes carried out at the group level. Furthermore the large sample size and the heterogeneity of contexts in which the program has been experimented assures a good generalizability.

UNPLUGGED is a comprehensive program, mainly based on the life skills approach. Life skills have been previously shown effective in drug use prevention (Faggiano 2005), but before this study the evidence for tobacco appeared weak (Thomas 2000). Although the evidence presented here cannot strictly be extended to all programmes based on life skills approach, this should be matter of consideration.

In conclusion, UNPLUGGED is the first prevention program effective among 7th-9th graders European students, coming from the effort of a large international collaboration. Its dissemination will be the focus of further European projects.

ACKNOWLEDGMENTS

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