

A sequential school based smoke prevention program in secondary school adolescents

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ABSTRACT: *A sequential school based smoke prevention program in secondary school adolescents. A. Di Paco, R. Boffi, C. De Marco, N. Ambrosino.*

Background and Aim. The hazardous health effects of smoking and second-hand smoke are well known and have been confirmed in several studies. We wondered whether a school based programme involving media models such as those represented by famous soccer players and TV characters, was effective in prevention of smoking habit in secondary school adolescents.

Methods. Since October 2006 to May 2007 an anonymous survey was submitted to 1382 secondary schools pupils. After completing the questionnaire all students of 42 out of 70 classes selected by the school principals underwent a prevention programme consisting of 1 hour lecture on smoke healthy hazard with educational material (slides, video, leaflets). Furthermore each pupil was given card games with significant

pictures. Since October 2007 to May 2008 and Since October 2008 to May 2009 pupils underwent a 1 hour interactive lesson on smoke related health hazards respectively. On December 2007 pupils in study attended a theatre event with show business characters acting to smoke dissuasion. No intervention was performed on the 568 pupils of the other classes along all the same 2 school- year period (controls).

Results. Among other results at the end of the 2-year program 4% pupils of study group and 14% of controls reported smoking habit ($p = 0.001$) whereas 7% and 27% ($p = 0.001$) of study and control pupils respectively ignored smoking induced dependence.

Conclusion. A school based programme involving media models such as those represented by famous soccer players, TV characters, was effective in prevention of smoking habit in secondary school adolescents.

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The hazardous health effects of smoking and second-hand smoke are well known and have been confirmed in several studies. In industrialised countries, tobacco smoke is the single most common preventable risk factor for many chronic and potentially life-threatening conditions, such as respiratory, cardiovascular and malignant disease [1-5]. The World Health Organization (WHO) has estimated that, annually, some 5 million deaths worldwide can be attributed to cigarette smoking [6]. Despite these facts, the number of smoking people, especially among children and adolescents, remains high or is even increasing in recent years in most countries [7, 8]. As the majority of smokers become addicted during adolescence, behavioural and community strategies have often aimed at preventing the initiation of smoking among children and youth [9, 10]. Traditionally, school-based prevention programmes have been used as a way to reach as many children and adolescents as possible [11-14]. There is limited evidence that school-based programmes are effective for most tobacco use related outcomes, at least in the short term [15]. Pro-tobacco marketing and media stimulate tobacco use

among youth and a ban on all tobacco promotions has been suggested with the aim to protect children [16].

We wondered whether a school based programme involving media models such as those represented by famous soccer players and TV characters, was effective in the prevention of smoking habit in secondary school (11 to 14 years old) adolescents.

Methods

Our school based programme involved 3 Phases.

Survey

Since October 2006 to May 2007 a written survey was submitted to 1382 pupils of 72 first classes (10 to 12 years old) of secondary schools of Italian towns of Livorno and Pisa (Livorno, 667 54% male, Pisa 715, 49% male). The anonymous 21 item questionnaire explored anagraphic characteristics, personal and family smoke habit, pupils' knowledge about healthy effects of smoke. The survey is depicted in Appendix.

Intervention (figure 1)

After completing the questionnaire all students (study group) of 42 out of 72 classes (814 pupils, 400 male) selected by the school principal, not involved in the scientific study, underwent a prevention programme consisting of a 1 hour lecture on smoke hazard supported by educational material (slides, video, leaflets). Each pupil was also given card games (UNO, Mattel, Inc. 333 Continental Boulevard El Segundo, CA 90245) modified with smoke-related significant images with the recommendation to play with parents.

Since October 2007 to May 2008 a study group underwent also a 1 hour interactive lesson on smoke related health hazards. Additional educational materials was given (card games: Memory, Robert-Bosch-Str 1, Ravensburg, 88188, Germany).

Furthermore on December 2007 pupils of study group also attended a theatre event with known showbusiness characters acting to smoke dissuasion. No intervention was performed on other 568 (273 male) pupils (control group) along all 2 year period.

Final Survey

On September to December 2008 the questionnaire was administered again to both groups.

Statistical Analysis

All calculations were performed with the programme 'Sigmastat release 3.5'. Data is shown as absolute numbers and percentages. The Mann-Whitney Rank Sum Test was used to evaluate baseline differences between study and control group. The chi-square test with Yates correction factor was used to evaluate after intervention changes in answers. A *p* value < 0.05 was considered as statistically significant.

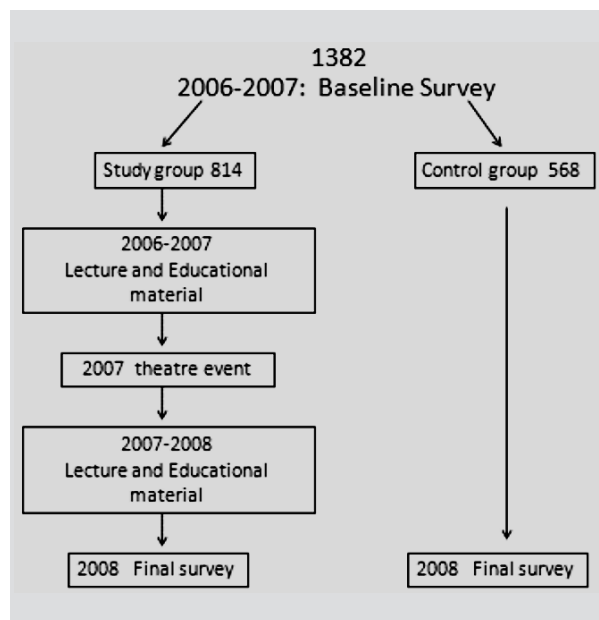


Fig. 1. - Flow chart of intervention along the 3-year period of secondary school.

Results

Baseline Survey

Study and Control Groups did not differ for sex and geographic location. As shown in table 1 only 5 out of 1382 (0.4%) pupils were current smokers of at least one cigarette/day, whereas 75 (5.4%) pupils had smoked at least one cigarette in their life, without any significant difference between study and control group.

Fifty-two % of pupils had no smokers in their family, whereas 48% had at least one smoker, the father being the most represented (17%), whereas 60% of pupils claimed to have at least a smoker among friends, without any significant difference between groups.

The vast majority of pupils claimed to know the potential harm of active, and passive smoke, although majority of pupils (74%) were unaware of the chemical compound in tobacco, again without any difference between groups.

Post Intervention Survey

After intervention 4% pupils of study group were actual smokers as compared to 14% of control group *p* = 0.002. Pupils smoking more than 10 cigarettes per day were by far more represented in control than in study group (11% vs 4% respectively, Chi-square = 8.02; *p* = 0.0046).

As expected the study group reported a greater influence of school (50%) as compared to other sources (media, parents, paper) in their education on smoke, whereas control group reported a school influence only in 19%.

Intervention resulted also in: Better knowledge on second hand smoking hazard (98% and 93% of pupils in study and control group respectively), knowledge of chemical compounds of cigarette smoke (98% vs 92% *p* = 0.005), awareness of dependence risk of smoking habit (93% vs 73% *p* = 0.001)

Discussion

This study based on a large population shows that a school based programme involving media models, was effective in the prevention of smoking habit in secondary school adolescents. The prevalence and amount of smoking habit was significantly less, in pupils undergoing the intervention compared to control pupils. These positive results were associated with better knowledge of adverse effects of smoking habits. This study supports the effectiveness of school based programmes. Müller-Riemenschneider *et al* [17] evaluated the long-term effectiveness of behavioural interventions in the prevention of cigarette use among children and youth and compared the effectiveness of different school-based, community-based and multisectorial intervention strategies in adolescents up to 18 years. Differing from our study this review on a follow-up duration ranging from 12 months to 120 months, indicated that the evidence for the effectiveness of current school-based smoking prevention strategies alone was inconclu-

Table 1. - Have you ever tried to smoke?

	Tot	Study	Control	p
Never	1302/1382 (94.2%)	761/814 (93.4%)	541/568 (95.2)	ns
Yes and I liked it	5/1382 (0.4%)	2/814 (0.24%)	3/568 (0.53%)	ns
Yes but I didn't like	75/1382 (5.4%)	51/814 (6.3%)	24/568 (4.2%)	ns

sive and that there was more conclusive evidence for the effectiveness of community-based and multi-sectorial smoking prevention strategies [17].

To the best of our knowledge this is the first report of smoking habit in a secondary school population. Before the survey the prevalence of smoke habit in our sample of teenagers was negligible (0.4%), increasing to 4% and 14% in study and control population respectively after 2 years. Data on smoking habit is available for Italian high school student (> 14 years old). Such data shows a smoke habit prevalence ranging from 9.5% to 29.5% in male students [18]. Audrey *et al* (19) in more than 10000 12 to 13 year old adolescents, reported that a 12 month intervention was associated with a significant reduction in smoking habit prevalence in smokers (18.8% vs 23.0% in intervention and control respectively) but not in non smokers at baseline (2.4% vs 3.1).

On the basis of our best knowledge this is also the first report on a large adolescent population of the effectiveness of a programme based on media models like famous soccer players and TV characters. Our study indicates a significant reduction in the risk of those pupils who followed the programme becoming smokers.

This study also shows the level of knowledge of these pupils on the adverse effects of smoking habits. The lower prevalence of smoking of the subjects involved in the programme was associated with a better understanding of the harmful effects of smoking. Even though this is outside the scope of the study it is possible that the increased knowledge of the smoking damage might be involved in reducing smoking habit prevalence.

The use of characters of the popular TV shows and sports indicates the need to communicate through the media positive behaviours. Attributable risk estimates suggest that movies scenes including people smoking account for one-third to one-half of adolescent smoking onset [20-22], raising the possibility that trends in movie smoking could influence trends in adolescent smoking.

Limitation of study

The present study was neither randomised or blind. Nevertheless the choice of allocation to study or control group was performed by principals of schools, not involved in the scientific study on a classroom basis. Therefore we are confident that this choice has not influenced our results.

The study did not check for long-term effects and should also be included in the revised version of the paper.

In conclusion, a school based programme involving media models such as those represented by

famous soccer players and TV characters, was effective in the prevention of smoking habit in secondary school adolescents. Whether these results can be maintained in the long term has to be evaluated.

Appendix

We propose this questionnaire to get information on your consciousness about tobacco, its use and your attitude in front of your habit to smoke. This questionnaire is anonymous and there isn't any valuation. We thank you for your collaboration.

- 1) Sex F - M
- 2) Age
 - a) 8-10
 - b) 11-13
 - c) 14-16
- 3) Have you ever tried to smoke?
 - a) never
 - b) yes, but I didn't like
 - c) yes and I liked it
- 4) Do you smoke?
 - a) yes
 - b) no
- 5) If you smoke, Who gave you your first cigarettes?
 - a) you took it from your parent's packet
 - b) a friend
 - c) you bought it
- 6) If you smoke, how many cigarettes do you smoke a day?
 - a) almost one
 - b) more than one
 - c) more than ten
- 7) If you smoke, what age did you begin?
 - a) 5/7
 - b) 8/10
 - c) 11/13
 - d) 14/16
- 8) In your family smokes:
 - a) nobody
 - b) my father
 - c) my mother
 - d) my brother/sister
- 9) Among your schoolfriends and your teachers is there anyone who smokes?
 - a) yes
 - b) no
- 10) In your opinion, what age is normal to begin smoking?
 - a) never
 - b) before 18
 - c) between 18 and 30
 - d) I don't know
- 11) As for you, why people begin to smoke?

- a) for curiosity
- b) to feel adult
- c) to copy our parents
- d) for boredom
- 12) Do you believe smoking is dangerous for your health?
 - a) yes
 - b) no
- 13) Someone told you about the damage that provoke smoking?
 - a) yes
 - b) no
- 14) How did you know about the damages that smoke provokes?
 - a) trough TV
 - b) trough newspaper
 - c) trough school
 - d) trough your parents
 - e) trough your general practitionnaire
- 15) Do you believe passive smoking (that of cigarettes smoked by others) is dangerous for your health
 - a) yes
 - b) no
- 16) Do you believe a sportive smoker can have the same results of a non smoker?
 - a) yes
 - b) no
- 17) Do you know which chemical substance more known contained in tobaccos leaves?
 - a) cocaine
 - b) nicotine
 - c) heroine
- 18) Do you believe that smoking tobaccos gives a “physical dependence” as drugs
 - a) yes
 - b) no
- 19) Do you believe stopping smoking is:
 - a) very difficult
 - b) easy (I can stop when I want)
 - c) difficult but we can do it if someone helps you
 - d) difficult but possible if you really want it
- 20) Do you know is possible to receive help when you want to stop smoking?
 - a) yes
 - b) no
- 21) Do you think industries who produce cigarettes know well about the damage smoke provokes?
 - a) yes
 - b) no

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