Smoking trends in adolescence: report on a Greek school-based, peer-led intervention aimed at prevention

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SUMMARY

This article presents a school-based, peer-led programme aiming at smoking prevention among Greek adolescents. The intervention was based on the social influence approach, and utilized 28 students' personal sensitization for the development of audio-visual material, which was presented to the remaining students of the two experimental schools (n = 440). The effectiveness of the intervention was assessed by means of experimental and control (n = 217) students' completion of a questionnaire prior to, immediately after and 3 months after the intervention. The Repeated Measures Analysis of Variance (MANOVAR) showed declines in the experimental group's smoking behaviour and intention to smoke immediately after, but not 3 months after the intervention, and more lasting changes in this group's knowledge of addiction and anti-smoking attitude. These effects were not observed for the control group. Programme evaluation and the implementation of health education programmes in the Greek school curriculum are discussed in the light of these findings.

Key words: adolescent smoking; peer-led intervention; smoking prevention in schools

BACKGROUND

As adolescent smoking has increased worldwide (Gilpin et al., 1999), health education programmes have focused on prevention. Experiential interventions with a primarily social reinforcement/influence orientation, and a secondary developmental/social norms orientation seem to have been quite effective in preventing adolescent smoking in schools (Bruvald, 1993). Social influence curricula can even decrease the rate of smoking among adolescents who have already started to smoke (Ary et al., 1990). Interventions have included peer-led activities, training of social skills to resist peer pressure, social learning with successful non-smoking peers acting as models, role-playing and discussion, group problem solving, or a combination of the above (Bruvald, 1993).

However, researchers have been critical of social influence programmes, considering long-term effectiveness (Flay, 1985), developmental trends when teaching social skills (Del Greco et al., 1986), and the different needs of specific target groups, for example of students at the point of transition from primary to secondary education (Murray et al., 1984).

Peer-led interventions in the social influence approach seem to be more effective than adult-led interventions (Bell et al., 1993). In Santi et al.'s study, students showed increased knowledge of health and social influence, and improvement in resistance skills (Santi et al., 1994). The programme was delivered by eleventh and twelfth graders as peer-leaders to younger students, and included oral and videotaped presentations and discussions on health and social parameters.
relating to smoking, role-playing in refusal techniques and contracts not to use tobacco.

Telch et al.’s work with seventh graders showed peer-leader involvement as a crucial factor in the ability to resist social pressure among both ‘experimenting’ and ‘regular’ smokers (Telch et al., 1990). Finally, Elder et al.’s intervention, using a behavioural indication of smoking (refusal of audiotape offers), showed similar results for the effectiveness of peer training (Elder et al., 1994).

**The Greek scene**

Greece has the highest percentage of smoking among adults in Europe and the third highest percentage worldwide (Tountas, 1997). Both Kokkevi and Davou report high percentages of smoking youth in studies conducted with 15–24 year olds (41%) and 11–13 year olds (18.6%), respectively (Davou, 1992; Kokkevi, 1997).

Only recently has the Ministry of Education started planning the implementation of health education programmes in Greek schools. Few school-based interventions have been reported with reference to smoking prevention (Ministry of Education, 1998). Macri and Tsiantis found that a school-based peer-led intervention, in which adolescents developed and used audio-visual material in educating their peers, was effective in withholding the onset of smoking and decreasing the intention to smoke in an experimental but not a control group (Macri and Tsiantis, 1998). No change was found in attitudes and knowledge of the experimental group.

**Aims of the present study**

The study reported here follows the work of Macri and Tsiantis (Macri and Tsiantis, 1998). There was a more structured intervention and examination of its effect on the additional parameter of students’ self-esteem, as self-esteem seems to be crucial in both the onset and sustainance or elimination of smoking among youth (Ary et al., 1990).

The theoretical (research) and action (intervention) aims are, respectively: (i) to assess the effectiveness of the intervention by measuring changes in the variables of smoking behaviour, anti-smoking attitudes, intent to smoke, knowledge concerning smoking-related illnesses, knowledge concerning addiction and self-esteem; and (ii) to develop a school-based intervention for the prevention of smoking by involving group leaders who would work on psychosocial parameters such as anti-smoking attitudes, intent to smoke and self-esteem, and would prepare related material. The team’s aim would be to present produced material to the whole school population, the target group.

**METHODS**

**Sample**

Participants were 657 students from three secondary schools (experimental group of 440 students, control group of 217 students, attrition estimated; mean age was 13 years and 4 months). The schools are located in Athens city centre (area of Ambelokipi). The sample was considered to be representative of students attending city centre schools (mostly middle-class families).

Socio-demographic comparisons were made in terms of the father’s occupation along the Hollingshead Occupational Categories Scale, which has been used with Greek samples [e.g. (Motti-Stefanidi et al., 1993)]. Hollingshead scores can range from 90 (higher executives/proprietors of large business/major professionals) to 10 (laborers/merial service workers). No significant difference was observed \[\chi^2 = 3.452 (8), p = 0.902\]. In both groups, the most frequently observed professions were clerical and sales workers, and small business owners.

Two of the schools were located in the same building and were more willing for the implementation of the intervention. It was decided to treat these two as the experimental group and the third school as the control group. Girls and boys were almost equally represented (50.7 and 49.3%, respectively) in the total sample \[\chi^2 = 0.99 (1), p = 0.318\].

**Description of the intervention**

Two working groups of students were formed in the experimental schools for the production of audio-visual material with anti-smoking messages, specifically a videotape (20 students) and drawings (eight students). Participant students had completed voluntary participation forms. Members of school councils were also encouraged to participate, as they might more easily influence the change of peer attitudes. As the goal was to strengthen peer resistance even among non-assertive but willing students, sociometric
techniques were not used [e.g. (Robinson et al., 1997)].

Each group held 12 weekly 2 h meetings, for a period of 3 months. The meetings took place in one of the classrooms. Four child mental health professionals acted as group facilitators, following 8 weeks of training on group dynamics, enhancement of student self-esteem and social skills, and group activities for health education. The training was delivered by three senior child mental health professionals with relevant experience.

The aims of the group meetings were: (i) the expression of thoughts and feelings in relation to smoking and shaping of related attitudes, intention to smoke, social skills and self-esteem, as these parameters were the focus of our intervention; and (ii) the production of audio-visual material with anti-smoking messages, discussion and role-playing on how peers would think and feel about the messages. The themes were inspired by students themselves (from now on called ‘peer-leaders’). This applied both to the scenarios written and played for the filming of the videotape, and the drawings (available upon request).

The three scenarios were stories of adolescents (both males and females) who experiment with smoking as a solution to problems like lack of communication with parents, wishing to impress and giving in to peer pressure. In all three cases, the stories end with self-questioning the overall benefits of smoking. The drawings’ themes were related to health issues (e.g. respiratory and heart problems that might lead to death) and addiction. When complete, the material was presented to the target group. Although there were practical difficulties, due to teachers’ strikes, there were presentations/discussions in each separate class (25 students maximum).

**Questionnaire assessing the intervention**

The questionnaire was based on international evidence of parameters related to smoking behaviour (see above), on the work by Macri and Tsiantis (Macri and Tsiantis, 1998) and on the European collaboration (Koumi and Tsiantis, 1997), and is available upon request. It was administered before the start of intervention (15–20 days), immediately after the start of intervention (counting 16 weeks from the start) and in a 3-month follow-up (28 weeks after the start of intervention). There was a difference of ~3 weeks at the pre-test assessment between the administration to the experimental and the control group, for practical reasons.

The following dimensions were examined:

- smoking behaviour of the student in the past and at the moment of assessment, (two items);
- parents’ smoking behaviour (two items);
- intention to smoke (six items);
- knowledge on smoking-related illnesses (11 true–false items);
- knowledge on addiction (six items); and
- anti-smoking attitude (15 items).

The total set of 42 items was piloted with a sample of 93 students. Test–retest reliability indices for a 2-week interval ranged from 0.60 to 0.78. The Cronbach α values were 0.9314 for ‘intention to smoke’ and 0.7435 for ‘anti-smoking attitude’. In addition, students were asked to complete the Rosenberg Self-Esteem Scale (Rosenberg, 1979), which consists of 10 four-point ordinal items (e.g. ‘I wish I could have more respect for myself’) and has been used in Greece with very good psychometric results (Koumi, 1994). The Cronbach α value achieved for the present study was 0.6815, which is rather low.

**Hypotheses**

It was expected that the intervention would cause significant changes in the smoking behaviour, intention to smoke, anti-smoking attitude, knowledge on smoking-related illnesses, knowledge on addiction and self-esteem in the experimental group; no such changes would be observed in the control group.

**Statistical analyses**

The Repeated Measures Analysis of Variance (MANOVA) was used to assess the effect of the intervention. ‘Group’, ‘grade’, ‘sex’, ‘smoking behaviour of parents at baseline’ (both of them smoke/one of them smokes/neither of them smoke) and ‘smoking behaviour of student at baseline’ (smokes daily/does not smoke/smokes less than once a week/smokes at least once a week) constituted the independent variables, whose effect was estimated for the dependent variables of ‘smoking behaviour’, ‘intention to smoke’, ‘knowledge of illnesses’, knowledge of addiction,’anti-smoking attitude’ and ‘self-esteem’. The analysis followed the UNIQUE technique.
RESUL TS

Differences at baseline
The smoking behaviour of the two groups differed significantly at baseline \([M \text{ (mean)} = 1.89 \text{ for the control;} \ M = 1.43 \text{ for the experimental group; } t = -2.75; \ p < 0.05]\). The implications of this difference are discussed later. Throughout the study, girls had a significantly higher intention to smoke than boys \([M = 2.39 \text{ and } M = 2.15, \text{ respectively}], \ [F(1, 620) = 7.72; \ p < 0.05]\).

Effects on smoking behaviour
Immediately after intervention, there is a decline from 4.5 to 4.1\% in the experimental group, whereas in the control group this percentage increases from 12.4 to 13.8\%. Three months later, there is 5\% smoking in the experimental group and 20.3\% in the control group, as shown in Figure 1 \([F(2, 1248) = 21.98; \ p < 0.001]\).

An effect of parental smoking on smoking behaviour was detected at the 3-month follow-up: in total, the percentage of smokers increased more among those students whose parents both smoked, compared with students where one or no parent smoked. The percentage for the first group increased from 9.18\% at baseline to 9.69\% immediately after the intervention, and to 15.31\% at the 3-month follow-up \([F(4, 1248) = 6.61; \ p < 0.001]\). Moreover, in the control group, students with parents who both smoked at baseline showed an increase in smoking behaviour from 14.49\% at baseline to 15.94\% immediately after the intervention, and to 30.43\% 3 months after intervention \([F(4, 1248) = 6.04; \ p < 0.001]\).

Effects on intention to smoke
In the experimental group, there is a decline in the intention to smoke immediately after intervention and an increase at the 3-month follow-up. In the control group, there is an increase both immediately after and at 3 months after the intervention, as shown in Figure 2 \([F(2, 1240) = 55.51; \ p < 0.001]\).

Students who smoked at baseline showed a significant decrease in the intention to smoke immediately after the intervention \(M = 3.56 \text{ to } M = 3.40 \text{ to } M = 3.60 \text{ before, immediately after and 3 months after intervention, respectively)]\) compared with non-smokers \(M = 2.21 \text{ to } M = 2.14 \text{ to } M = 2.18 \text{ before, immediately after and 3 months after intervention, respectively}]\) \([F(2, 1240) = 9.43; \ p < 0.001]\).

Effects on anti-smoking attitude
In the experimental group, there was a significant increase in anti-smoking attitude, especially immediately after intervention, whereas in the control group there was a decrease, as shown in Figure 3 \([F(2, 1344) = 41.81; \ p < 0.001]\).

 Immediately after the intervention, anti-smoking attitude increased significantly among smokers in both groups \(M = 3.30 \text{ to } M = 3.40 \text{ to }
M = 3.30), but not among non-smokers (M = 3.93 to M = 3.97) \[ F(2, 1244) = 12.72; \ p < 0.001 \].

**Effects on knowledge of addiction**

In the experimental group, there is an increase in the knowledge of addiction, whereas in the control group there is a slight decrease, as shown in Figure 4 \[ F(2, 1242) = 14.33; \ p < 0.001 \].

There was a significant increase of knowledge of addiction among smokers of the experimental group compared with non-smokers of the same group \[ F(2, 1242) = 11.08; \ p < 0.001 \], especially immediately after intervention (M = 3.18 to M = 3.52 to M = 3.27 for smokers; M = 3.57 to M = 3.59 to M = 3.63 for non-smokers).

**Effects on knowledge of smoking-related illnesses and self-esteem**

In both groups, there is an increase of the knowledge of smoking-related illnesses immediately after intervention, but on average it remains higher in the experimental group (from M = 7.03 to M = 7.14 to M = 7.12) than in the control group (from M = 7.05 to M = 7.12 to M = 7.10), \[ F(2, 1242) = 3.64; \ p < 0.05 \].

Finally, immediately after intervention, there is a significant increase in the self-esteem of both experimental and control groups, whereas 3 months after intervention there is a slight increase in the experimental group, but a decrease in the control group (M = 3.09 to M = 3.11 to M = 3.12 for the experimental group, M = 3.13 to M = 3.15 to M = 3.13 for the control group) \[ F(2, 1212) = 15.65; \ p < 0.001 \].

**DISCUSSION**

**The effects of intervention**

The intervention seems to have contributed to temporary changes in the experimental students’ smoking behaviour and intention to smoke, and to more lasting changes in their knowledge of addiction and anti-smoking attitude. Questions about their intention to smoke might appear threatening to students, who might then be more ready to provide negative answers immediately after the intervention, but not some time later.

The intervention had not directly addressed the parameter of knowledge of addiction, but seems to have had an indirect effect, perhaps because of the contents of audio-visual material presented to the target population (references to the dangers of addiction).

Both groups showed an increase in self-esteem, which may be due to several factors such as timing (the pre-intervention assessment coincided with the beginning of the school year, the immediate post-intervention assessment with the end of the school year), feelings of pride in the experimental schools, other confounding factors, etc.
parameters in the control group, social desirability or cultural effects (Koumi, 1994) in both groups. Moreover, sleeper (delayed) effects may be responsible for a further increase in the self-esteem of students in the experimental group (Bell et al., 1989). Specifically relating to changes among first graders, it is worth mentioning developmental findings on the decrease of self-esteem and increase of self-consciousness during pre-adolescence coinciding with transference to secondary school (Rosenberg, 1979).

These findings also indicate adolescent students’ need of maintaining a personal risk-taking, even charming, lifestyle, which is not easily affected by school-based attempts. Students seem to be particularly sensitive as they pass from the first to the second grade, when the social environment of secondary school possibly suggests smoking as part of an expected pattern of behaviour.

The effect of parental smoking on student smoking behaviour, especially in the control group, points to the need for intervention within the family. Foshee and Bauman (Foshee and Bauman, 1992) and Morgan and Grube (Morgan and Grube, 1994) suggest that smoking constitutes, for adolescents, a conventional acceptance of social rules, through their interactions with others who smoke. Recently, Charlton et al. have stressed the significance of self-efficacy perceptions in refusing cigarette offers from one’s best friend (Charlton et al., 1999).

Students’ initial smoking behaviour seems to influence subsequent intentions, knowledge of addiction and anti-smoking attitudes. It is interesting to note changes in the expected direction immediately after the intervention, but in the opposite direction 3 months later. Similar conclusions can be drawn from the baseline analyses, where second and third graders showed significantly higher smoking behaviour. Apart from suggesting social desirability phenomena (Coolican, 1994), this finding indicates the necessity to intervene as early as possible, perhaps in primary school. Pfau and Van Bockern stress the need to ‘inoculate’ children with anti-smoking attitudes before entry into secondary school (Pfau and Van Bockern, 1994).

Finally, girls had a significantly greater intention of smoking than boys (Robinson et al., 1997). It could be that girls, more than boys, consider smoking as a risky, self-assertive behaviour. Also, Crisp et al. suggest a link between smoking and fears of gaining weight among adolescent girls (Crisp et al., 1999).

The Cronbach α values for the variables of ‘anti-smoking attitude’ and ‘self-esteem’ were relatively low (0.7435 and 0.6815, respectively). This might be due to several situational factors, such as difficulties in answering a rather lengthy questionnaire in a limited period of time (45 min or a school hour). The possibility of high instability in adolescent student self-reports seems unlikely for ‘self-esteem’, considering psychometric results of other uses of the Rosenberg Self-Esteem Scale with Greek adolescents. These issues must be addressed in the future, by allowing more time for questionnaire completion or by other psychometric examinations. It might prove wiser to concentrate on the parameters of specific health self-perceptions, rather than global self-esteem.

### Issues on the evaluation of the procedure: limitations and facilitators

It is not certain whether the changes in anti-smoking attitude and knowledge of addiction have been brought about by the intervention per se. This claim is based on our impression that the shaping of attitudes in peer-leaders has possibly not directly influenced the attitudes of the target group, since there has been no use of qualitative assessment to prove this (use of focus groups, for instance). Combining qualitative and quantitative means of assessment should give more efficient evaluations of prevention programmes (De Vries et al., 1992).

Also, unofficial information provided to target students by the peer-leaders might have contributed to the observed differences in the desired directory in this experimental group, especially immediately after the intervention. Such effects, along with the influences of social desirability, should be examined and ruled out in future interventions.

Considering recommendations for process evaluations by various researchers (Rolf, 1989; Flannery, 1998), and based specifically on Rolf’s suggested dimensions for evaluation (Rolf, 1989), one can mention content validity problems. One of them was the difference in smoking behaviour of experimental and control students at baseline, even though the two groups did not differ significantly in terms of demographic characteristics. We estimate that there are at least three possible reasons for this. First, there was a time delay in the administration of the pre-intervention questionnaires to the control group
(approximately 3 weeks), which, given the speed of smoking onset in adolescence, may have contributed to the difference. Secondly, the experimental schools were selected on the basis of their willingness to implement the intervention. Thirdly, it appeared in the process that the experimental schools had experienced co-operation with mental health professionals previously. On the other hand, the data analysis has taken student smoking behaviour at baseline into account (see above). However, it is recommended that there should be a similar risk status of the experimental and control groups at baseline in future work.

Also, the post-intervention administration of questionnaires coincided with teachers’ strikes and an overall confusion in the school timetable (Van Teijlingen et al., 1995). The presentation of audio-visual material to the target group faced similar problems of time and location, so the discussion was rather more superficial than required, even though teachers were not present. The above parameters have acted as procedural barriers, and should be considered in the planning and implementation of future interventions. Concerning external validity, one can only generalize the results in populations with similar demographic characteristics (Greek inner-city schools, urban middle-class families).

With reference to procedural facilitators (Rolf, 1989), secondary data (students’ diaries and facilitators’ notes) point towards the need of the participating leaders to work in a team on an extracurricular topic which is for them of primary interest. The transference of enthusiasm to the target group, the two experimental schools’ competitive feelings with respect to the production of important audio-visual material, and the working groups’ cohesiveness are all important factors.

**CONCLUSIONS**

It would be worthwhile repeating the assessment of the effects of intervention, as it is known that changes (‘sleeper effects’) may appear sometime after intervention (Bell et al., 1989). It is usual to examine the sustained effects of changes at least 1 year after the end of the intervention, and possibly thereafter. One might also consider applying ‘booster’ intervention programmes to have more lasting effects (Bell et al., 1989). If results are not sustained, more careful planning of intervention phases and assessment, and on the basis of permanent co-operation with the school, should facilitate procedures.

The Ministry of Education is working towards the inclusion of health education in the curriculum of secondary schools, and has funded the implementation of our programme in three more schools. Further decision making should consider international evidence on the effectiveness of several models of health education programmes, but also cultural parameters in issues such as the development of material and the training of teachers or other personnel.

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