

Smoking Prevention Intervention Among Secondary School Students in the Spanish Province of Malaga

M.C. Soria-Esojo, J.L. Velasco-Garrido, M.V. Hidalgo-Sanjuán, G. de Luiz-Martínez, C. Fernández-Aguirre, and M. Rosales-Jaldo

Servicio de Neumología, Hospital Clínico Virgen de la Victoria, Málaga, Spain.

OBJECTIVE: To assess the prevalence of smoking among 13- to 18-year-old students, analyze smoking-related factors in this population, and design an intervention program to reduce smoking.

POPULATION AND METHODS: A 6-month smoking prevention intervention was designed for students at a public secondary school in the Spanish province of Malaga. The objective of the intervention was to inform students of the gravity of smoking and its deleterious effects on health. The efficacy of the intervention was subsequently assessed.

RESULTS: Of the 337 students who completed the questionnaire, 27% declared they were smokers. Smoking prevalence was significantly higher among girls (36.1%) than boys (18.1%) ($P < .001$) and progressively increased with age. Initiation occurred at 13 to 14 years of age. The most common reason for starting was to try something new (52.2% of students). The greatest risk factor in the family environment was having a smoking sibling.

After the program, 78% of smokers admitted that the intervention had not affected their smoking but had made them more aware of its detrimental effects, and 66.8% planned to quit in the future.

CONCLUSIONS: The study shows the high prevalence of smoking among adolescents, particularly among girls. It also shows that health education increases understanding of the problems related to smoking, causing changes of attitude with regard to whether they will smoke in the future.

Key words: Tobacco use. Student. Prevention.

Intervención sobre tabaquismo en estudiantes de enseñanza secundaria de la provincia de Málaga

OBJETIVO: Conocer el consumo de tabaco en jóvenes de entre 13 y 18 años, analizar los factores asociados con el tabaquismo en esta población y desarrollar un programa de intervención para reducir su consumo.

POBLACIÓN Y MÉTODOS: Se ha diseñado un programa de intervención sobre tabaquismo de 6 meses de duración, dirigido a estudiantes de Enseñanza Secundaria Obligatoria de un instituto de la provincia de Málaga, orientado a informarles sobre la magnitud del problema del tabaquismo y sus efectos patológicos. Posteriormente se ha evaluado la eficacia de dicha intervención.

RESULTADOS: De los 337 alumnos que cumplimentaron la encuesta, el 27% se declaraba fumador. El consumo era significativamente ($p < 0,001$) mayor en las mujeres (36,1%) que en los varones (18,1%) y se incrementaba de forma progresiva con la edad. La edad de comienzo se situaba entre los 13 y 14 años. El motivo más frecuente por el que iniciaban al consumo era probar algo nuevo (un 52,2% de los alumnos). En el entorno familiar el mayor factor de riesgo para el adolescente era tener un hermano fumador.

Una vez finalizado el programa, aunque el 78% reconocía que éste no había influido directamente sobre su consumo, tenía más conciencia de los efectos perjudiciales del tabaco y el 66,8% de los fumadores se planteaba dejarlo en el futuro.

CONCLUSIONES: El estudio pone de manifiesto el elevado consumo de tabaco en los adolescentes, fundamentalmente en las chicas. Además, demuestra que la educación sanitaria es útil para mejorar el conocimiento sobre el problema del tabaquismo, ya que provoca un cambio de actitud en los adolescentes fumadores respecto a su futuro consumo.

Palabras clave: Tabaquismo. Estudiantes. Prevención.

Introduction

In western countries, smoking is a major problem for public health, not only among adults but also among children and adolescents.¹ Despite scientific evidence

that smoking causes death and incurable illness, prevalence is increasing among the young as a consequence of aggressive advertising on the part of the tobacco industry which promotes its products among the new generations of potential smokers.²

According to the survey carried out for the Spanish national drug plan in 2000, tobacco is second to alcohol as the most used drug among secondary-school students, as shown by the fact that 34.4% have smoked on some occasion.³ Smoking is more prevalent among girls and

Correspondence: Dra M.C. Soria-Esojo.
Colombia, 20, 29640 Fuengirola, Málaga, España.
E-mail: mcsoriaesojo@terra.es

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the difference between the sexes increases with age. Age is clearly related to smoking, with prevalence increasing from 14 to 18 years of age. Adolescents are an easy target, a fact the tobacco industry well knows, and advertising campaigns are directed to this population. Over recent years cigarette advertising has been aimed at the young and, particularly, at women, who will soon equal men in smoking prevalence.⁴

Smoking at an early age is a risk factor for nicotine dependence at older ages. If an adolescent manages to avoid smoking, he or she is unlikely to smoke as an adult.⁵ Habits like smoking adopted at this stage of life are difficult to modify once established and are sustained in adulthood.⁶

Smoking prevention among the young must be tackled on 2 fronts: by limiting advertising as recommended in Spanish Royal Decree 192/1988 and by educating, through health education programs.⁷

Health education forms part of the general education children and adolescents should receive to encourage healthy lifestyles and to prevent nicotine or any other drug dependency.⁸ In Spain, the national drug plan has achieved the reduction of some drug use among adolescents but not of smoking.³ The inclusion of health education in the government regulation of the educative system (Ley de Ordenación General del Sistema Educativo) (LOGSE) has tried to introduce programs that have been successful in other countries.⁹⁻¹¹

The efficacy of smoking prevention programs in schools has been demonstrated by authors such as Barrueco et al,¹ de la Cruz Amorós et al,² and Ellickson et al¹²; interventions aimed at the young are widely regarded as more profitable than those that target other age groups.

The objective of this study was to discover the characteristics of smoking among the young in Spain and, at the same time, to try and design an informative program on the detrimental effects of smoking and the benefits of healthy lifestyles in order to reduce smoking prevalence in this population.

Population and Methods

A 6-month intervention program was carried out on secondary-school students at a public secondary school in Malaga, Spain, as well as an observational, transversal study with information collected on 2 occasions. The program was carried out during the 2002-2003 academic year and with the cooperation of the teachers of the school. Before starting the informative sessions, a questionnaire was distributed which consisted of 13 closed questions (similar to the European questionnaire on cancer prevention) and examined the following variables: sex, age, attitude to smoking, practice of sports, smoking habits of family, and awareness of the detrimental effects of smoking (Table 1). Students answered the questionnaire anonymously just before beginning the informative program on smoking.

The target population consisted of 647 teenagers, 13 to 18 years old, who were studying the second, third, fourth, and fifth year of secondary school education.

TABLE 1
Questionnaire Given to Students Before the Smoking
Intervention Program*

Age
Sex
Boy
Girl
Do you smoke?
Yes
No
Have you ever tried smoking?
Yes
No
What were your reasons for not continuing?
Concern for health
Practicing a sport
Smoking tastes bad
Smoking is absurd.
Because of your parents
For other reasons
If you are a smoker how often do you smoke?
Occasionally
At weekends
Every day
At what age did you start smoking?
What was the reason you started smoking:
Friends
To try something new
Adolescence
Other reasons
Does anyone in your family smoke?
Nobody
Father
Mother
Brother or sister
Do your friends smoke?
Yes
No
Do you practice a sport?
Yes
No
Do you know what diseases smoking causes?
Cancer
Bronchitis
Cardiovascular diseases
Others

*Translation of the original Spanish questionnaire, for information purposes.

The content of the intervention was designed to provide information on the magnitude of the problem of smoking and its pathological components and effects and to analyze the publicity of large tobacco companies. Sessions were given in an audiovisually equipped classroom with 50 students per session. Material was created specifically for the program, based on the smoking prevention program of the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR), and consisted of slides, questionnaires, and transparencies. Informative posters were put up around the school with the reminder that smoking was forbidden.

When the sessions had finished, discussions were organized and moderated by the teachers to assess whether the students had found the intervention useful and students answered a further questionnaire to assess the efficacy of the sessions (Table 2).

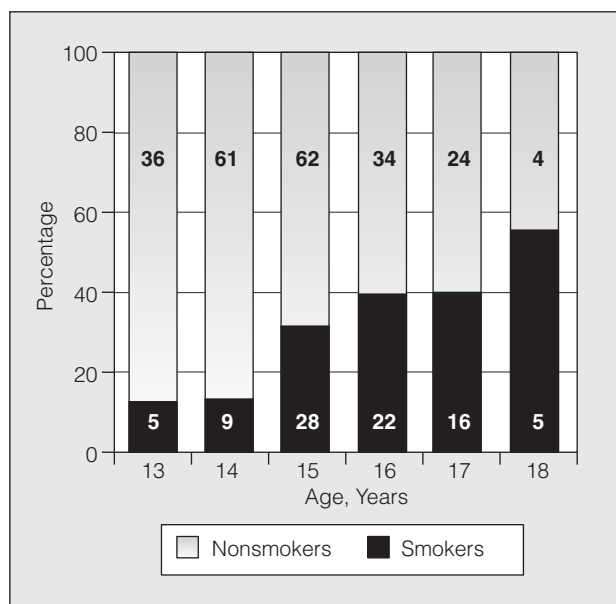


Figure 1. Distribution of smoking by age

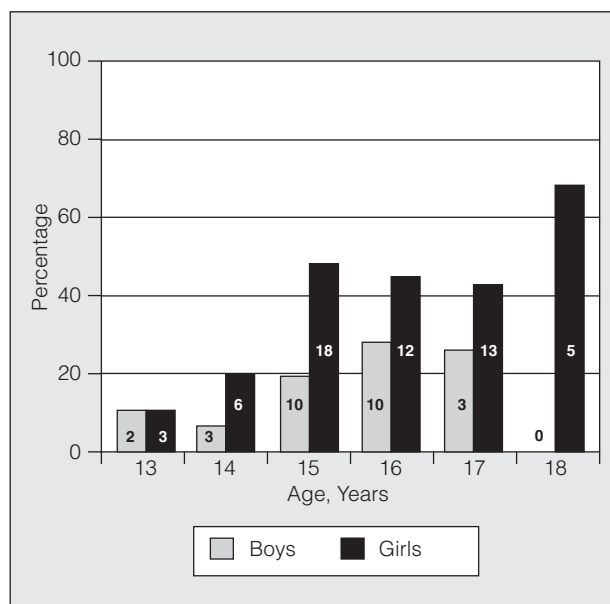


Figure 2. Distribution of smoking by age and sex.

The answers to the first and second questionnaires were stored in a data base and analyzed with the statistical program SPSS for Windows. The χ^2 test was used to assess the significance of differences observed.

Results

A total of 647 students participated in the study, 337 (52.09%) of whom completed the questionnaires. Of the final sample, 171 (50.7%) were boys and 166 (49.3%) were girls. Overall, 27% declared themselves to be smokers and 73% nonsmokers. Smoking prevalence was significantly higher among girls (36.1%) than boys (18.1%) ($P < .001$).

Smoking prevalence increased with age: only 12.2% of 13-year-olds declared themselves to be smokers, whereas 55.6% of 18-year-olds did (Figure 1). Prevalence increased progressively with age, particularly among girls. At 18 years of age, the difference between the sexes was marked: 21.4% of boys smoked compared with 71.4% of girls (Figure 2).

The frequency of smoking among student smokers was the following: 66.3% smoked daily, 32.6% smoked occasionally, and 1.1% smoked only at weekends.

Initiation tended to be at 13 (21.6%) or 14 (41.6%) years. Motives for initiation were to try something new (52.5%), having friends who smoked (33.9%), adolescence (1.7%), and other reasons (11.9%).

Among the self-declared nonsmokers, 36.5% stated they had tried smoking at least once and this percentage increased with age, reaching 68% for 18-year-olds. More girls had tried smoking (60%) than boys (42.6%) ($P < .001$).

When nonsmokers who had tried smoking were asked what had motivated them against continuing, they

answered the following: that smoking was not good for their health, 36.2%; smoking tasted bad, 34.5%; they practiced some kind of sport, 6.9%; they found it absurd to smoke, 7.8%; they did not smoke in consideration of their parents, 4.3%; and reasons not specified, 10.3%.

Prevalence of smoking among family members was the following: no family member smoked, 32.4%; the father smoked, 19.3%; the mother smoked, 13.1%; a sibling smoked, 12.5%; both the mother and father smoked, 16.6%; and the whole family smoked, 5.9%.

TABLE 2
Questionnaire Given Students After the Intervention on Smoking*

Age
Sex
Boy
Girl
Are you a smoker?
Yes
No
Have our discussions had an influence on your smoking behavior?
Yes
No
Are you more aware now of the effects smoking has on your health?
Yes
No
After learning about the detrimental effects of smoking, do you plan to be a nonsmoker in the future?
Yes
No
Do you think there should be more discussions on smoking for the young?
Yes
No

*Translation of the original Spanish questionnaire, for information purposes.

TABLE 3
Relation Between Student Smoking Behavior and Smokers in the Family

	No Family Member Smoked	Father Smoked	Mother Smoked	Sibling Smoked	Both Parents Smoked	The Whole Family Smoked	Total
Student smoker	16 (17.6%)	16 (17.6%)	11 (12.1%)	22 (24.2%)	17 (18.75%)	9 (9.9%)	91 (100%)
Student nonsmoker	93 (38%)	49 (20%)	33 (13.5%)	20 (8.2%)	39 (15.9%)	11 (4.5%)	245 (100%)

The relation between student smoking behavior and family members who smoked is shown in Table 3.

Of the students who answered the questionnaire, 74.8% had friends who smoked—the percentage was higher if the students themselves smoked (Table 4).

Some kind of sport was practiced by 64.7% of the students: by 83.6% of boys but by only 45.5% of girls ($P < .001$).

Before the informative sessions, 77.2% related smoking to cancer, 12.8% to respiratory diseases and cancer, 0.9% to respiratory diseases, 2.1% to cardiovascular disease, and 7.1% did not relate smoking to any disease.

At the end of the program, the influence our intervention had had was assessed and the following results were obtained: 313 students completed the questionnaire (156 boys and 157 girls), 87 of whom said they were smokers (27.8%); by sex, 28 boys (17.9%) smoked and 59 girls (37.5%) did. In response to questions on the effect of the intervention, 78% said the program had not directly influenced their smoking, 84.3% said they had become more conscious of the detrimental effects of tobacco, 66.8% planned on not smoking in the future, and 91% gave the opinion that more discussions on smoking should be given and that the program had been quite interesting.

Discussion

Our study reveals a smoking prevalence of 18.1% for boys and 36.1% of girls between the ages of 13 and 18. The higher prevalence among girls had already been observed in the Spanish national survey on drugs in 2000³ and in the studies carried out by Muñoz et al¹³ in Fuenlabrada and Abu-Shams et al⁴ in Navarra. Age was associated with smoking, which increased progressively from 13 to 18 years of age and reached maximum levels at 18 in girls, while in boys smoking increased until 16, after which it remained constant and then started to decrease.

The main reasons for initiation declared by our subjects (to try something new and the fact that friends smoked) are similar to the results published by Barrueco et al¹ in a study carried out in Salamanca. Our study showed a particularly high number of students who had tried smoking at some time but declared themselves nonsmokers, a percentage which was higher among girls (60%) than boys (42%) and increased with age. In the study by Barrueco et al, fewer girls than boys had tried smoking.

The most common reasons given for not continuing to smoke were fear of diseases smoking could cause

TABLE 4
Relation Between Student Smoking Behavior and Friends Who Smoked*

	Friends Who Smoked	Friends Who Did Not Smoke	Total
Smoker	90 (98.9%)	1 (1.1%)	91 (100%)
Nonsmoker	162 (65.9%)	84 (34.1%)	246 (100%)

* $P < .01$.

(36.2%), a result which agrees with those reported recently by Sánchez Agudo,¹⁴ and that smoking tasted bad (34.5%). Cancer was the most common disease students associated with smoking, without specifying the type, (77.2%) followed by respiratory diseases and cancer (12.8%). Other authors, such as Barrueco et al,¹ however, have described heart failure as the most common association described.

Several studies on secondary-school students have associated smoking with drinking alcohol and having friends or family who smoked.^{1,15,16} Our study found that 90% of the friends of smokers also smoked whereas 65.9% of friends of nonsmokers smoked, a result that has been confirmed in other studies.^{14,17} The association was similar with respect to families: more students smoked if members of their family smoked, and having a sibling who smoked represented a greater risk than the father, mother or both parents. A possible explanation for this influence is that adolescents aspire more to the model of older siblings than to that of their parents.² In our study sample, only 8.2% of student nonsmokers had a sibling who smoked while 24.2% of student smokers lived with a sibling smoker.

Two interesting results were that there are twice as many girl smokers as boy smokers and that 83.6% of boys practiced some kind of sport while only 45.5% of girls did. Other studies have found similar results^{15,18} and that programs designed to increase physical activity could be effective in reducing smoking rates.^{19,20} Programs organized to encourage sports among the young would be beneficial, particularly those aimed at girls, as would the introduction of sports in smoking cessation programs aimed at women.²⁰

Several studies have shown that schools are an ideal environment for the prevention of smoking among the young^{21,22} and demonstrate the benefits of health education for adolescents.^{2,23} While our study did not have a direct effect on smoking among students, it clearly increased awareness of the detrimental effects of smoking and the desire to quit in the future (66.8%).

This result justifies efforts to raise awareness that could provoke a change in adolescents' attitudes on their first encounters with smoking.

The study of smoking habits in school populations contributes to knowledge of the problem of nicotine addiction in Spain and allows more effective prevention strategies to be planned. Prevention should target this population group in particular, and schools are the ideal setting for the study of this behavior. Despite disparate results found in various studies, these programs should be systematically included in the educative content of schools¹ and not be relegated, as they are today, to scarce, isolated initiatives. We believe that the present study demonstrates once again that health education is effective in reducing smoking initiation among the young.

REFERENCES

1. Barrueco M, Vicente M, Garavís JL, Blanco A, Rodríguez MC. Prevención del tabaquismo en la escuela: resultado de un programa realizado durante tres años. *Arch Bronconeumol.* 1998;34:323-8.
2. de la Cruz Amorós E, Tuells Hernández JV, Monferrer Fábrega R, and grupo SEDET. Educación sanitaria como instrumento útil en la disminución del consumo de tabaco en los adolescentes. *Prev Tab.* 2001;3:5-12.
3. Informe del Observatorio Español sobre Droga. Madrid: Delegación del Gobierno para el Plan Nacional sobre Drogas; 2000.
4. Abu-Shams K, de Carlos Izquierdo M, Tiberio López G, Sebastián Ariño A. Prevalencia del tabaquismo en la población escolar adolescente de Navarra. *Arch Bronconeumol.* 1998;34:59-63.
5. Marín Tuya D. Tabaco y adolescentes. Más vale prevenir. *Med Clin (Barc).* 1993;100:497-500.
6. Pérez Trullén A, Herrero Labarga I. El tabaquismo, una enfermedad desde la adolescencia. *Prev Tab.* 2002;4:1-2.
7. Real Decreto 192/1988 sobre limitaciones de venta y uso de tabaco para la protección de la salud de la población. *BOE* de 9 marzo de 1988; p. 7499-501.
8. Educación para la salud. Cuadernos de Pedagogía. 1993;214:7.
9. de Vries H, Dijkstra M. Non-smoking: your choice. A Dutch smoking prevention programme: a case study. In: James C, Balding J, Harris D, editors. *World yearbook of education 1989.* Health education. New York: Kogan Page; 1990. p. 20-30.
10. Perry C, Killen J, Telch M, Slinkard LA, Danaher BG. Modifying smoking behavior of teenagers: a school-based intervention. *Am J Public Health.* 1980;70:722-5.
11. de Vries H, Weijts W, Dijkstra M, Kok GG. The utilization of qualitative and quantitative data for health education program planning, implementation and evaluation: a spiral approach. *Health Ed Q.* 1992;19:101-15.
12. Ellickson PL, Bell RM, McGuigan MS. Preventing adolescent drug use: long-term results of a junior high program. *Am J Public Health.* 1989;83:856-61.
13. Muñoz MT, Plaza I, Madero R, Otero J, Hidalgo I, Baeza J, et al. Estudio Fuenlabrada: hábito tabáquico en los niños y adolescentes, influencia sobre las variables de riesgo cardiovascular. *An Esp Pediatr.* 1989;31:331-5.
14. Sánchez Agudo L. Tabaquismo en la infancia. *Arch Bronconeumol.* 2004;40:1-4.
15. García V, Ramos M, Hernán M, Gea T. Consumo de tabaco y hábitos de salud en los adolescentes de Institutos de Enseñanza Secundaria pública en Granada. *Prev Tab.* 2001;3:215-23.
16. Alcalá Cornide M, Azañas Ruiz S, Moreno Torres C, Gálvez Alcaraz L. Consumo de alcohol, tabaco y otras drogas en adolescentes, estudio de dos cortes. *Medicina de Familia (And).* 2002;2:81-7.
17. Ariza C, Nebot M. Predictores de la iniciación al consumo de tabaco en escolares de enseñanza secundaria en Barcelona y Lleida. *Rev Salud Pública.* 2002;76:227-38.
18. Mendoza R. Situación actual y tendencias en los estilos de vida del alumnado. Primeras Jornadas de la Red Europea de Escuelas Promotoras de la Salud en España; 1995, septiembre 28-30; Granada. Granada: Escuela Andaluza de Salud Pública; 1995.
19. Dishman RK, Buckworth J. Increasing physical activity: a quantitative synthesis. *Med Sci Sports Exerc.* 1996;28:7066-719.
20. Nerín I, Crucelaegui A, Novella P, Ramón y Cajal P, Sobradie N, Gericó R. Encuesta sobre tabaquismo en estudiantes universitarios en relación con la práctica de ejercicio físico. *Arch Bronconeumol.* 2004;40:5-9.
21. Glynn TJ. Essential elements of school-based smoking prevention programs. *J School Health.* 1989;59:181.
22. Walter H, Vaughan R, Wynder E. Primary prevention of cancer among children: changes in cigarette smoking and diet after six years of intervention. *J Natl Cancer Inst.* 1989;81:995-9.
23. Lynch BS, Bonnie RJ, editors. *Growing up tobacco free: preventing nicotine addiction in children and youths.* Washington DC: National Academy Press; 1994.