

Smoking Habits Among Sixth-Year Medical Students in Spain

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OBJECTIVE: To describe and analyze the smoking habits of sixth-year Spanish medical students.

MATERIAL AND METHODS: The target population of this descriptive cross-sectional study was students completing their sixth year in Spanish medical schools. An anonymous, self-administered questionnaire was sent to the students' homes by ordinary mail. The relationships between the variables were analyzed using contingency tables, the χ^2 test, the Student *t* test, and analysis of variance with a significance level of $P < .05$. The software package was SPSS.

RESULTS: A total of 3840 questionnaires were distributed to students, and 1340 were returned completed (34.9%). Of the respondents, 27% were smokers (8.7% smoked only on weekends, and 18.3% were daily smokers). The mean (SD) number of cigarettes smoked per day was 10.54 (7.89). Consumption was significantly higher among men than among women. The mean age of initiation was 17.20 years. Of the students who were smokers, 32.54% stated that they had started smoking during their medical studies. The percentage of smokers who stated that they wanted to quit was 76.3%, and 56.6% said that they had already made at least one quit attempt.

CONCLUSIONS: It is cause for concern that a large number of students start smoking after they enter medical school. One of the reasons for this is the lack of concern about smoking as a health problem within medical schools. The smoking habits of medical students are affected by the same phenomena that affect those of the general public, such as the increase in the number of women smokers, the influence of sociocultural factors, and the increasingly broader age range of initiation. The lower prevalence of smoking among medical students with respect to other populations is probably due to the fact that, in general, these students have better health habits than the general public, and/or the reasons that led them to study medicine also make them disinclined to smoke.

Key words: *Medical students. Smoking addiction. Prevalence. Medical education.*

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Consumo de tabaco en estudiantes de sexto curso de medicina de España

OBJETIVO: Realizar un análisis descriptivo en los estudiantes de sexto curso de medicina españoles respecto al consumo de tabaco.

MATERIAL Y MÉTODOS: Estudio descriptivo transversal cuya población objetivo son los estudiantes de sexto curso de las facultades de medicina de España. Se utilizó un cuestionario de autocontestación, anónimo, que se envió a los domicilios personales de los alumnos por correo ordinario. Para el análisis de las variables y sus relaciones se utilizaron tablas de contingencias, la prueba de la χ^2 , la prueba de la *t* de Student y el análisis de la varianza con un valor de $p < 0,05$ y el paquete estadístico SPSS.

RESULTADOS: Se consultó a 3.840 alumnos y se recibieron 1.340 cuestionarios (34,9%). El 27% de los alumnos son fumadores (el 8,7% fuma los fines de semana y el 18,3% a diario). El consumo medio de cigarrillos es de $10,54 \pm 7,89$ cigarrillos/día, aunque es significativamente más alto en los estudiantes varones que en las mujeres. La edad media de inicio en el consumo de tabaco fue de 17,20 años. El 32,54% de los alumnos que fuma en la actualidad ha iniciado su consumo durante la licenciatura de medicina. El 76,3% de los estudiantes fumadores quiere dejar de serlo y el 56,6% refiere haberlo intentado alguna vez.

CONCLUSIONES: Resulta preocupante el elevado número de alumnos que comienzan a fumar en las facultades de medicina, entre otras causas, por la falta de sensibilidad de estos centros frente a este problema de salud. Los fenómenos que ocurren en la población general respecto al tabaquismo aparecen también en los estudiantes de medicina, como la incorporación de la mujer al consumo de tabaco, la influencia de factores socioculturales o la ampliación en la edad de inicio. Probablemente, la menor prevalencia de fumadores entre estos alumnos respecto a otras poblaciones se debe a que, en general, tienen mejores hábitos de salud que la población general y no fuman por la misma motivación por la que eligieron cursar la licenciatura de medicina.

Palabras clave: *Estudiantes de medicina. Tabaquismo. Prevalencia. Educación médica.*

Introduction

Prestigious health institutions, such as the World Health Organization,¹ the International Union Against Cancer,² the office of the Surgeon General of the United States of America,³ and the Royal College of Physicians in London,⁴ have stated clearly that health professionals, and physicians in particular, can have a significant influence (positive or negative) on the smoking habits of a community. Doctors who take their professional role seriously have the opportunity and responsibility to act on various levels to combat smoking, acting as role models, educators, therapists, and anti-smoking advocates.^{5,6} It has been observed that doctors who smoke tend to be more permissive, are less inclined to advise their patients against tobacco use, and adopt a passive attitude towards smoking.⁷ A comprehensive education for doctors on the subject of smoking dependence is imperative, and the best possible time for this training is when they are students.⁸

One of the many reasons why the subject of smoking should be addressed by medical schools is to avail of the opportunity to reach students during their undergraduate years. This is an ideal time to raise the consciousness of future doctors given that it is easier to influence the attitudes and judgment of people who are in training.^{8,9} Another crucial reason is the effectiveness of interventions carried out in medical schools. It has been demonstrated that seminars on smoking addiction improve students' understanding of the problem and, to a lesser degree, also affect their attitude towards smoking.⁸⁻¹⁰ These findings are all the more important in light of the fact that anti-smoking seminars targeting working health professionals have not achieved the expected results.¹⁰

The smoking habits of medical students have only rarely been the object of studies and interventions in Spain, and the focus of the published literature is generally narrow. A review of the results of these Spanish studies and others published elsewhere reveals certain trends in the evolution of the smoking habits of this population. The prevalence of smoking among medical students declined between 1970 and 1990. The earliest studies reviewed¹¹⁻¹⁴ report that medical students smoked more than either doctors or the population in general (the prevalence among students being 40%-79%). The reverse is true in the most recent studies,^{10,15} in which medical students were found to smoke less than doctors and the general population (the prevalence among students being 23%-33%). In some cases, however, female medical students started smoking earlier than women in the general population.^{11,12,14} An increase over the course of medical studies has been observed in the number of smokers, the daily consumption of cigarettes, and the number of students who became regular smokers.^{10,12,13,15}

For all these reasons, we decided to carry out a nationwide survey of medical students in order to describe and analyze the smoking habits of this population.

Material and Methods

In order to achieve the stated objective we designed a descriptive cross-sectional study targeting sixth-year medical students in Spain. There are 26 universities in Spain accredited to impart fourth through sixth-year medical studies. A request was sent from the University of Zaragoza School of Medicine to all the other Spanish medical schools asking for a list of the names and addresses of their sixth-year students. The following 7 schools refused to take part in the study on the grounds that providing the requested information on their students might infringe the Spanish Data Protection Act: the Complutense University in Madrid, and the universities of Granada, Murcia, the Basque Country, Rovira y Virgili, Valencia, and Valladolid. Similarly, another 4 schools (the Autonomous University of Madrid, and the universities of Navarra, Cadiz, and La Laguna) insisted on distributing the study documentation to their students themselves rather than providing the lists requested. Their decision was also based on the need to respect the confidential nature of the personal data involved.

An anonymous, self-administered questionnaire was used for the study; it comprised 16 questions, coded and grouped into 2 subsections. The first section comprised questions concerning the name of the university, the student's age and sex, and whether he or she had ever smoked. The second section dealt with smoking habits, age at onset, and quitting. The questions asked are shown in Table 1. The design of the questionnaire was guided by the experience gained in recent years by the Smoking Addiction Unit of the University of Zaragoza's Medical School from research into the smoking habits of medical students and was based on data from the current literature. The questionnaire was designed to be read optically, and the results were processed by the University of Salamanca's Data Processing Center.

The first batch of questionnaires was sent out by ordinary mail in May 2000. This date was chosen because the students were still in class but most of the term's work had already been completed. They were mailed to the addresses provided by the schools, except in the case of students attending the

TABLE 1
Questions Asked, Divided Into 2 Sections

First section

1. University
2. Age
3. Sex
4. Have you ever smoked? If your answer to this question is no, you need not answer any more questions

Second section

5. Do you currently smoke?
6. What age were you when you started smoking?
7. How many cigarettes do you or did you smoke a day?
8. How many pipes do you or did you smoke a day?
9. How many cigars do you or did you smoke a day?
10. Have you smoked or did you smoke for 6 months or more?
11. Did you start to smoke after you entered medical school?
12. Do you want to stop smoking?
13. Have you ever made a serious attempt to stop smoking?
14. Why did you stop smoking?
15. If you failed to quit, what do you think was the reason for this failure?
16. If you are not a current smoker, how many months have passed since you last smoked?

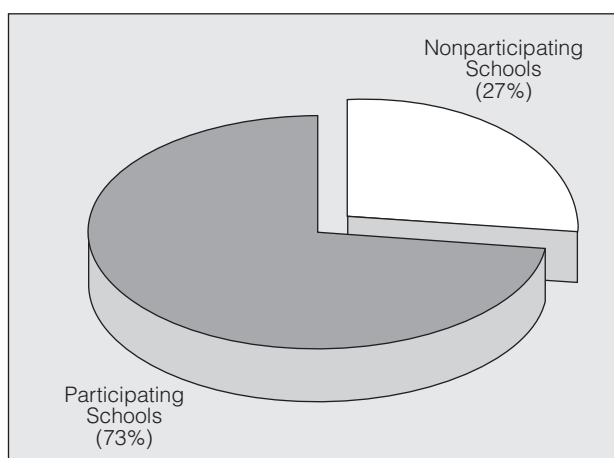


Figure 1. Participation of Spanish medical schools in the study.

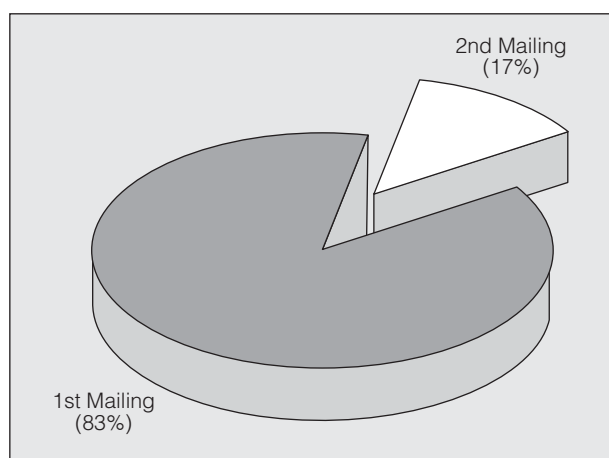


Figure 2. Percentage of valid responses obtained from each mailing.

schools that chose to distribute the documentation themselves to each student. A second batch of questionnaires was mailed in November of the same year in order to improve the response rate; in this second mailing, we did not include the schools that insisted on delivering our questionnaires directly to their own students because it was decided that this method could not be adequately monitored by the research team. Students attending the University of Badajoz were also excluded owing to errors in data collection that could not be corrected.

The data used to evaluate how representative the sample was with respect to the target population were the response

rates obtained from different schools and the distribution by sex of the students who responded in each school. Since variations and discrepancies were found in these values, we looked for a way to analyze the extent and direction of any possible bias between the sample and the target population. To this end, the results returned by the population that responded to the first mailing were compared to those obtained from the second mailing.

Qualitative variables were analyzed using absolute and relative frequency distributions. Mean and standard deviation were calculated for each quantitative variable. Relationships between qualitative variables were analyzed using contingency tables, and the χ^2 test was applied. The Student *t* test was used to analyze comparisons between 2 groups, and analysis of variance was used for comparison of more than 2 groups, once it had been established that the data met the conditions for applying these tests. The significance level used was $P < .05$, and the statistical analysis was carried out using version 7.5 of the SPSS statistical software package.

TABLE 2
Number of Students Studying Medicine, by Sex and School;
Number of Students Who Completed Questionnaires,
by Sex and School, and Overall Percentage of Responses

School	Questionnaires Mailed		Questionnaires Completed		
	Men	Women	Men	Women	Total (%)
Alcalá de Henares	28	71	8	34	42.42
U. Autónoma de Barcelona	49	123	23	61	48.84
U. Autónoma de Madrid	70	126	11	14	12.76
Barcelona (Central)	43	94	15	53	49.64
Cádiz	42	61	8	6	13.59
Cantabria	26	42	13	22	51.47
Córdoba	190	157	28	47	21.61
Extremadura	58	99	9	8	10.83
La Laguna	198	50	4	6	4.03
Las Palmas de Gran Canaria	38	64	18	26	43.14
Lleida	32	66	10	37	47.96
Málaga	154	203	57	89	40.9
U. Miguel Hernández (Elche)	57	88	25	40	44.83
Navarra	72	124	20	54	37.76
Oviedo	29	53	15	28	52.44
Salamanca	100	132	23	55	33.62
Santiago de Compostela	79	193	29	81	40.44
Sevilla	144	246	53	112	42.31
Zaragoza	154	285	54	140	44.19
Total	1563	2277	423	913	34.79
	(40.7%)	(59.3%)	(31.7%)	(68.3%)	

Results

A total of 19 medical schools took part in the study, representing 73% of the national medical student population (Figure 1). In the initial mailing, 3840 letters were sent out, and 1115 correctly completed questionnaires were received, representing a 29% rate of response. In the second mailing, 3097 questionnaires were mailed and 225 students responded, a 7.7% rate of response. Overall, 1340 valid completed questionnaires were received, representing a response rate of 34.9%. The percentage received from each mailing is shown in Figure 2. The response rate for the 4 medical schools which distributed the questionnaires directly to their students was under 40%, while the response from the group of students who received the documentation by mail was over 40% in most schools (80%).

Whereas 40.9% of the study population were men and 59.1% women, 31.7% of valid responses were received from men and 68.3% from women. The mean (SD) age of the participants returning valid questionnaires was 24.97 (3.14) years (range, 21-59). A difference was

observed in the distribution by sex between the group of students who received questionnaires and those who responded. Differences in sex distribution were also observed between schools (Table 2).

Overall, 42.5% of the participants answered yes to the question, "Have you ever smoked?" Of the 27% of students who stated that they were current smokers, 8.7% said they smoked only on weekends, and 18.3% admitted being daily smokers. The mean number of cigarettes smoked per day was 10.54 (7.89). Consumption was significantly higher ($P<.001$) among men (13.19 [9.24] cigarettes/day) than among women (9.43 [6.97] cigarettes/day). The mean age of smoking onset was 17.20 (2.55) years.

More of the students who responded to the second mailing had smoked (53.3%) than those who responded to the first mailing (40.3%), and more of them were also current smokers. If we consider that the difference between the responses to the first and second mailings indicates that there was a difference between those who responded to the first mailing and those who did not, this would point to a bias toward underestimating smoking prevalence by a little over 10%. The results obtained by comparing the responses of these 2 populations to 2 of the questions asked are shown in Tables 3 and 4.

Of the current smokers 32.54% said that they started smoking after they entered medical school. Some 59.5% of the students had smoked for 6 months or more, but 17.68% of this group were ex-smokers at the time of the study. Of those who had quit, 72.4% said that they had stopped smoking to protect their health, and 20.6% indicated that they had quit for other reasons including pressure from colleagues and family members and the desire to set a good example.

Finally, 76.3% of the current smokers stated that they would like to stop smoking, and 56.6% reported that they had made at least 1 serious attempt to quit. Of this group, 47.3% failed to quit; 31.1% attributed this failure to the symptoms of addiction and withdrawal, 28.5% to pressure from their environment, and 40.62% to other causes.

Discussion

Nineteen of the 26 medical schools in Spain took part in this study. At first glance, the rate of participation may seem high. The result is perhaps less positive when it is considered in the context of the effort made by the research team to promote awareness of the issue and to motivate these institutions to provide a list of students' names and addresses. Some schools cited the Data Protection Act as their reason for refusing to provide this list.¹⁶ The reasons for the existence of this legislation are most probably unrelated to scientific research, but its provisions do further complicate the problem of confidentiality in scientific research and must therefore be taken into account in the design of future studies.

TABLE 3
Differences Between the Smoking Habits of the 2 Mailing Populations

Question	Mailing		Total
	First Mailing	Second Mailing	
Have you ever smoked?			
Yes	449 (40.3%)	20 (53.3%)	569 (42.5%)
No	665 (59.7%)	105 (46.7%)	770 (57.5%)
Total	1114 (100%)	225 (100%)	1339 (100%)

TABLE 4
Differences in Current Smoking Habits Between the 2 Mailing Populations

Question	Mailing		Total
	First Mailing	Second Mailing	
Do you currently smoke?			
Never	153 (35.40%)	34 (29.30%)	187 (34.10%)
Only on weekends	95 (22.00%)	21 (18.10%)	116 (21.20%)
Every day	184 (42.60%)	61 (52.60%)	245 (44.70%)
Total	432 (100%)	116 (100%)	548 (100%)

The response rate achieved was lower than desired. It was, however, comparable to that achieved by other studies of medical school students with a broad focus and with objectives similar to those of the present study.^{17,18} In other countries, studies of medical personnel typically achieve response rates over 50%. In Spain, however, this level is rarely achieved or surpassed although variability is high.^{19,20} In general, the studies that have achieved the highest levels of participation have been affected by serious methodological limitations, such as non-random sample selection, an unspecified population universe, or an unreported response rate. We may, therefore, assume that the response rate achieved in the present study is acceptable.

The low level of participation typical of studies based on mailed questionnaires can in part be explained by factors of a general nature, which include the following: mail delivery problems, incorrect addresses, errors made by the person completing the questionnaire, physical distance, and diminished sense of responsibility. The feeling of personal responsibility to act and the inclination to do so become weaker when more participants are involved.²¹ People feel more obliged to act when they feel more involved in the situation and when it is less likely that others will act in their stead. In an anonymous study based on questionnaires distributed by mail, neither of these 2 factors comes to bear to provide a positive effect. The lack of personal contact could explain the differences in response rates between the schools that distributed the questionnaires directly to students and the institutions that supplied the students' names and addresses so that

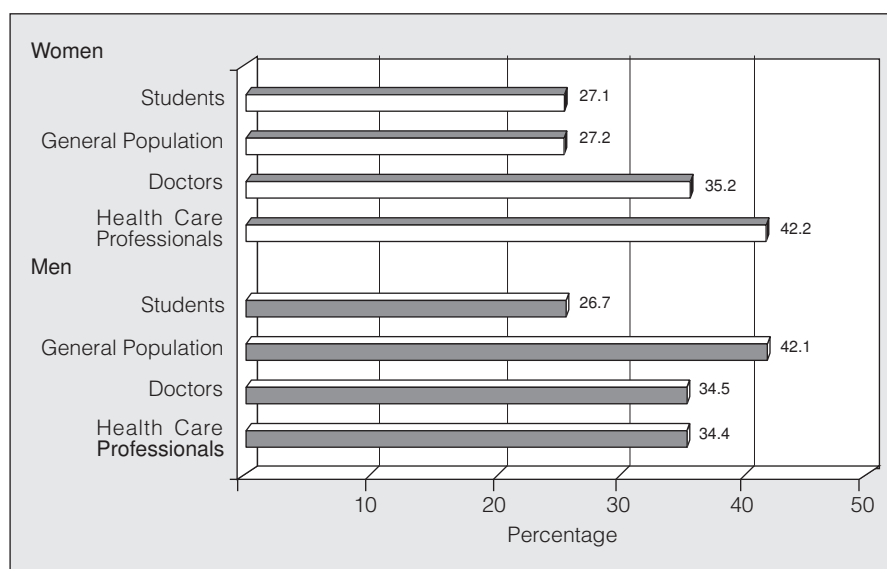


Figure 3. Prevalence of smoking among medical students, the general population, doctors, and health care professionals, by sex.

the research team could mail the questionnaire directly to a student's home; the response rate was higher in the group of students who received the questionnaires directly without the school acting as an intermediary.

Other factors affected the level of participation in the present study, such as the characteristics of the target population and the subject of the study. The student population is made up of people who are young and consequently not closely identified with the health problems of older age groups. Given that they are motivated by short term aims and rewards and must deal with considerable uncertainty about their personal situation and the successful completion of their studies, smoking may not be a very important issue for them.

On the other hand, some studies report high prevalences of tobacco use among teachers, and suggest that this may contribute to the difficulty of raising the consciousness of the student body about the dangers of smoking.¹⁰ This is the case even though the undergraduate years offer an ideal time to raise students' consciousness about the smoking issue.

In line with the trends described in studies with a narrower scope carried out in Spain, the prevalence of smoking found among medical students in our study (27%) is lower than that observed among health care professionals and physicians in the 1998 INSALUD survey⁵ (38.9% and 34.7%, respectively), and also lower than the prevalence reported for the general population in the 2001 National Health Survey²² (35.7%). Analysis by sex (Figure 3) reveals that male students (for whom the prevalence was 26.65%) smoke less than male health care workers and doctors (34.4% and 34.5% respectively) and less than the male general population (42.1%), while female students (27.10% of whom are smokers) smoke less than female health care workers and doctors (42.2% and 35.2% respectively) and about the same as women in the general population (27.2%). The relationship between educational level

and smoking habits, which differs by sex, may explain the difference between doctors and medical students on the one hand and the general population on the other. Among men, the higher the level of education, the lower the prevalence of smoking. The relationship between these 2 variables is, however, reversed in the case of women, such that the lower the level of studies among women, the lower the prevalence of smoking. The similarity between the prevalence of smoking among women in the general population and female medical students cannot be explained by education alone; the better health habits of the medical students as compared to the general population might explain the parity in this case.

Since the mean age in our study was 24.97 years, prevalence values should be compared with those of the 16 to 24 year age group. The difference between medical students and the general population in the prevalence of smoking can be observed in both males (40.8% in the general population versus 26.65% in medical students) and females (42.7% in the general population vs 27.1% in medical students). In both sexes the prevalence was lower among medical students. These data confirm the trend reported in other recent studies, both in Spain and abroad.^{23,24}

An important finding is the high percentage of students who started smoking after they entered medical school (32.54%). This result is very similar to that found in an earlier study carried out in the University of Zaragoza's Medical School (32%).¹⁰ In a study carried out in the 1980s this figure was 22%.¹² The expansion of the age range for risk of smoking onset, the scant information on tobacco addiction given to students in the early years of their medical studies, and possibly the low impact of the students' knowledge on their attitudes, are all factors that favor this phenomenon, which is both paradoxical and a grave cause for concern.

The United States of America, the United Kingdom, and Australia are the countries that stand out for the number and scope of the studies that have been undertaken there in this respect. The results and conclusion of the present study are, in general terms, similar to those reported in the literature.²⁵⁻²⁸ The similarity increases when the sociocultural characteristics are the same, so that the situations most similar to the Spanish experience are found in European studies. The greatest variations in smoking prevalence appear to be related to the sociocultural characteristics of each region including factors such as religion, the presence of women in the labor market, gender equality, and cultural behavior with respect to the use of stimulants.

In Spain, the prevalence of smoking is lower among sixth-year medical students than among doctors and the general population of a similar age. It is, nevertheless, still high. Medical schools in Spain are not, as would be expected, a less likely place than any other for starting smoking since, despite the contradiction this supposes, 1 out of every 3 sixth-year medical students who currently smoke started after entering medical school.

The smoking habits of medical students are subject to the same phenomena that affect those of the general public in their age group. The lower prevalence of smoking among medical students with respect to other populations is probably due to the fact that, in general, these students have better health habits than those found in the population overall, and the reasons that led them to study medicine also make them disinclined to smoke.

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