

Trends in tobacco use among adolescents in Spain (2002-2018)

Tendencias en el consumo de tabaco adolescente en España (2002-2018)

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Abstract

Smoking is the single greatest preventable cause of death in the world today. Adolescence is the developmental period during which smoking is most commonly initiated and addiction is likely to happen. The aim of this study is to examine trends in tobacco use among school-aged adolescents in Spain from 2002 to 2018 by sex and age. The sample is composed of 51,046 adolescents aged 15 to 18. Data is representative of the adolescent school population in Spain in 2002, 2006, 2010, 2014 and 2018. The smoking questionnaire provided by the international team of the study Health Behavior in School-aged Children (HBSC) was used. Odds Ratios and 95% confidence intervals were estimated using logistic regression. Data show a decrease in daily tobacco use between 2002 (26.5%) and 2018 (8.7%), but no change was found between 2006 (17.9%) and 2010 (17.4%). This decreasing pattern is stronger in girls than boys to the extent that no differences by sex were found in 2018. Similarly, the decrease was greater in older adolescents, but in this case, the differences by age remained. Daily smoking prevalence among Spanish adolescents aged 15 to 18 in 2018 is 8.7%. Results confirm the need to maintain tobacco prevention and control policies. Measures are presented in order to fight this public health problem.

Key Words: Tobacco; Adolescence; Trends; Monitoring; Epidemiology.

Resumen

El tabaco es la principal causa de muerte prevenible en todo el mundo. La adolescencia es una etapa clave en la iniciación al hábito tabáquico y en la proclividad a desarrollar adicción a esta sustancia. El objetivo de este trabajo es analizar cómo ha evolucionado el consumo de tabaco de los chicos y chicas adolescentes escolarizados en España desde 2002 a 2018 y si hay diferencias en las tendencias por sexo y por edad. La muestra está conformada por 51.046 participantes de 15 a 18 años, representativos de la población adolescente escolarizada en España en los años 2002, 2006, 2010, 2014 y 2018. Se utilizó el cuestionario de consumo de tabaco consensuado por el equipo internacional del estudio Health Behaviour in School-aged Children (HBSC). Se estimaron las Odds Ratio y los intervalos de confianza del 95% mediante regresiones logísticas. Los resultados muestran una disminución en el consumo diario de tabaco adolescente entre 2002 (26,5%) y 2018 (8,7%) aunque con un periodo de estabilidad entre 2006 (17,9%) y 2010 (17,4%). Esta tendencia de descenso es mayor en las chicas (21,9 puntos) que en los chicos (13,1 puntos) hasta el punto de que en 2018 no hay diferencias en función del sexo. También es mayor en el grupo de 17-18 años (20,2 puntos) que en el de 15-16 años (15,8 puntos), aunque en este caso, permanecen las diferencias en función de la edad. La prevalencia de consumo de tabaco diario en adolescentes de 15 a 18 años es del 8,7% en 2018. Se concluye la conveniencia de no suprimir ni disminuir las políticas de prevención y control del tabaquismo y se proponen nuevas medidas para hacer frente al problema de salud pública que está suponiendo el consumo de tabaco en España.

Palabras clave: Tabaco; Adolescencia; Análisis de tendencias; Monitorización; Epidemiología.

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Each year, tobacco kills around 7 million people worldwide (World Health Organization, 2017), and it is estimated that this mortality rate will rise to 8.3 million by 2030, accounting for 10% of all deaths (Mathers & Loncar, 2006). In Spain, more than a quarter of a million deaths were attributable to smoking between 2010 and 2014, at an estimated average rate of almost 52,000 per year. This figure represents 13% of all deaths of people over 35 in Spain (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2016).

Adolescence is a crucial period for experimentation with drugs and the onset of addictive disorders. Brain development during this time includes changes in functionality and organization which result in greater activity in the areas related to the search for new experiences while the inhibitory control system is still growing. This predisposes boys and girls at these ages to carry out a greater number of impulsive actions and risky behaviors including the use of drugs (Chambers, Taylor & Potenza, 2003).

With respect to smoking, both national (ESTUDES, EDADES) and international (ESPAD, Eurobarometer) surveys place the age of onset in adolescence and early youth (European Commission, 2017; European Monitoring Centre for Drugs and Drug Addiction, 2016; Moreno et al., 2016; Plan Nacional sobre Drogas, 2018a; Plan Nacional sobre Drogas, 2018b). Adolescent girls and boys who start smoking believe that they will be able to stop soon and easily, but the addictive nature of nicotine causes most of them to develop a dependence on this substance and to continue smoking for many years (Gruber, 2001). In addition to the problems of tobacco addiction, smoking in adolescence has immediate consequences on physical health (US Department of Health and Human Services, 2012), is linked with depressive symptoms (Espada, Sussman, Huedo & Alfonso, 2011), suicidal ideation (Bousoño et al., 2017) and with other addictive behaviors such as intensive alcohol consumption (Golpe, Isorna, Barreiro, Braña & Rial, 2017), cannabis use or gambling (Míguez & Becoña, 2015). Faced with this reality, international institutions and national governments have taken measures to fight this problem (European Parliament and Council, 2014; WHO, 2003). The most important of these in Spain was the approval in 2005 of the law on measures against smoking (Law 28, 2005) and its subsequent amendment in 2010 (Law 42, 2010), as well as the implementation of research projects and prevention campaigns (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2017, Plan Nacional sobre Drogas, 2017).

Measures aimed at controlling tobacco use seem to have had an effect on the prevalence of smoking in the global adolescent population (European Monitoring Centre for Drugs and Drug Adiction, 2016; Hublet et al., 2015; Organisation for Economic Cooperation and Development, 2017;) and in Spain (Plan Nacional sobre Drogas, 2018b;

Villalbi et al., 2012), leading to a general decline in use, in line with a similar trend among the general population (European Commission, 2017; Instituto Nacional de Estadística, 2013; Instituto Nacional de Estadística, 2017; Plan Nacional sobre Drogas, 2018a). Nevertheless, this decrease is not continuous; a more in-depth analysis of the data of recent years reveals instability and variation.

Analyzing the ESTUDES survey between the years 2002 and 2016 (Plan Nacional sobre Drogas, 2018b) shows certain fluctuations in all types of smoking (daily, last 30 days, last 12 months and lifetime). For example, in the data for daily use we found periods of slight increases (2002-2004 and 2010-2012), stability (2006-2008 and 2014-2016) and decrease (2004-2006, 2008-2010 and 2012-2014), with 8.8% smoking daily in 2016. Differences between the sexes have almost disappeared (8.6% in boys and 9.0% in girls) compared to 2002, when the difference was 6.5 points (17.7% in boys and 24.2% in girls). Other studies confirm these irregularities in Spanish adolescent smoking trends for the same period (Villalbi et al., 2012).

At the international level, the ESPAD survey (European Monitoring Center for Drugs and Drug Addiction, 2016) also finds this generalized downward trend in all European countries between 2002 and 2010. The percentage of adolescents who smoke daily in 2015 was 10%, with the highest values (20% or more) found in Bulgaria, Croatia, Italy and Romania, while the lowest values (5% or less) were observed in Albania, Iceland, Moldova and Norway. The differences between boys and girls have been decreasing over time to the point in 2015 where they no longer exist or are minimal. Similarly, the international study HBSC (Hublet et al., 2015) indicates a global decrease in smoking between 2002 and 2010, although different trends depending on the region were found. Thus, while a decrease was observed in Southern European and Anglo-Saxon countries, smoking in Northern and Central European countries remained stable, and Eastern European countries and North America saw an increase in adolescent smoking. These fluctuations have also been reflected in the latest Eurobarometer, where an increase in consumption has been detected in the youngest group (15-24 years), rising from 24% in 2014 to 29% in 2017 (European Commission, 2017).

Given these examples of instability observed in reports on smoking, it is essential to perform more comprehensive analyses to determine how adolescent smoking has actually evolved in Spain so far this century and whether this trend is developing simultaneously across both sexes and the different stages of adolescence, or whether, conversely, there are groups with different patterns of use. Only in this way can political decisions be taken which are adjusted to the reality of the data. The objective of this paper is thus to examine the trends in tobacco use in a sample of adolescents representative of the school population in Spain from 2002 to 2018, analyzing them by sex and age.

Methods

Study design and sample

Our research draws on the data of the Health Behavior in School-aged Children (HBSC) study, the aim of which is to obtain a global vision of the lifestyles of the adolescent school population, thereby facilitating evidence-based health promotion.

The sample was selected following multistage random cluster sampling stratified by age, geographical area, habitat and school type. The sample units were classrooms, chosen at random from the census provided by the Ministry of Education. The item response rates for each of the versions accessed by this study were 98.52% in 2002, 98.50% in 2006, 96.57% in 2010, 97.6% in 2014 and 95.73% in 2018.

In all the analyses we used sampling weights by age, geographical area and school ownership to adjust for imbalances in the sample, thereby adjusting the data to the population parameters. Given the low level of tobacco use shown by girls and boys under 15 years of age, the analysis of this study focuses on adolescents aged 15 to 18. The total sample amounted to 51,046 adolescents, with an estimated sampling error of approximately 1.1% in each version. The data are representative of schoolchildren in Spain aged between 15 and 18. For more technical information, see the reports of the HBSC study for the different versions of the study (Moreno, Muñoz, Pérez & Sánchez-Queija, 2005; Moreno et al., 2008; Moreno et al., 2012; Moreno et al., 2016; Moreno et al., in press).

Procedure and instrument

Data collection was via questionnaires completed by the pupils during school hours and with total guarantees of anonymity, in accordance with international study protocol guidelines (Roberts et al., 2009). From this questionnaire, approved by the Coordinating Ethics Committee of Biomedical Research of Andalusia, the variables sex (boy / girl), age (15-16 years / 17-18 years), version (2002 / 2006 / 2010 / 2014 / 2018) and smoking frequency were selected. The latter was assessed with the question: How often do you currently smoke tobacco? The response categories were: every day / at least once a week, but not every day / less than once a week / I do not smoke.

Statistical analysis

Results are shown disaggregated by sex and age. For age, they are divided into two groups: 15-16 year olds, who are still in compulsory education, and 17-18 year olds, continuing their education voluntarily. The data were analyzed with logistic regression, a method also used in other studies of national and international trends (Hublet, et al., 2006; Looze, et al., 2013; Sánchez-Queija, García-Moya & Moreno, 2017; Sánchez-Queija, Moreno, Rivera & Ramos, 2015; Schnohr et al., 2015; Zaborskis, Sumskas, Maser & Pudule, 2006). Odds Ratios (OR) and 95% confidence intervals (95% CI) were calculated. First, logistic regression equations were performed to show the differences by sex and age group in each of the versions covered (2002, 2006, 2010, 2014 and 2018). Second, trend analyses were carried out to show global tendencies across the entire period, that is, between 2002 and 2018, as well as at four-year intervals to learn more about the general trend. For this purpose, 2002 will be the reference year for changes between 2002 and 2006, 2006 will be the reference for changes up to 2010, 2010 for changes to 2014, and finally, 2014 is the reference for changes up to 2018. Both trend analyses took sex and age variables into account in order to illustrate whether the development of adolescent smoking patterns is similar or different for boys and girls, and for the 15-16 and 17-18 age groups. SPSS v.21 was used for the statistical analyses.

Results

Table 1 shows the sample data of this study.

Table 2 shows the different types of smoking prevalences by sex and age, except those for daily use, which are presented in more detail in Table 3 and Figure 1. The data reflect a decrease in general terms in schoolchildren smoking weekly and also less than once a week, as well as an increase between 2002 and 2018 in teenagers who do not smoke at all. However, there are some moments when smoking peaked, especially in the 2006 and 2010 versions of the study.

To analyze daily tobacco use in depth, this variable was dichotomized into daily smoking (codified 1) versus other frequencies and non-smoking (coded 0). Table 3 shows the results of the logistic regression between the daily smoking

Table 1. Description of the sample of the five study versions by age and sex.

		2002 n	2006 n	2010 n	2014 n	2018 n	Total n
15-16 years	Boys	1374	2032	1237	2949	3655	11247
	Girls	1531	2231	1350	3082	3619	11813
17-18 years	Boys	1454	2356	1007	3909	4824	13550
	Girls	1643	3115	975	3800	4903	14436
Total		6002	9734	4569	13740	17001	51046

Table 2. Tobacco use prevalence: weekly, less than once a week, and no-smoking in the adolescent school population in Spain in 2002, 2006, 2010, 2014 and 2018.

Smoking frequency	Age (years)	Sex	2002		2006		2010		2014		2018	
			%	CI	%	CI	%	CI	%	CI	%	CI
Weekly	15-16	Boys	7.1	6.4-7.7	4.6	4.1-5.0	3.7	3.1-4.2	4.1	3.7-4.4	3.9	3.6-4.1
		Girls	8.3	7.6-8.9	7.3	6.7-7.8	6.1	5.4-6.7	5.6	5.2-5.9	5.0	4.6-5.3
	17-18	Boys	7.3	6.6-7.9	5.1	4.6-5.5	7.6	6.8-8.3	6.2	5.7-6.6	6.1	5.7-6.4
		Girls	6.9	6.2-7.5	7.1	6.5-7.6	7.7	6.9-8.4	6.5	6.0-6.9	7.2	6.8-7.5
Less than once a week	15-16	Boys	7.7	7.0-8.3	5.1	4.6-5.5	4.9	4.2-5.5	3.8	3.4-4.1	5.2	4.8-5.5
		Girls	5.6	5.0-6.1	7.6	7.0-8.1	6.7	5.9-7.4	4.8	4.4-5.1	6.8	6.4-7.1
	17-18	Boys	6.2	5.5-6.8	5.5	5.0-5.9	5.6	4.9-6.2	6.7	6.2-7.1	5.2	4.8-5.5
		Girls	6.0	5.3-6.6	6.2	5.7-6.6	6.6	5.8-7.3	5.5	5.1-5.8	6.8	6.4-7.1
No smoking	15-16	Boys	66.8	65.6-67.9	79.6	78.7-80.4	79.7	78.5-80.8	85.9	85.3-86.4	85.6	85.0-86.1
		Girls	62.1	60.8-63.3	69.8	68.8-70.7	70.0	68.6-71.3	82.8	82.1-83.4	82.4	81.8-82.9
	17-18	Boys	61.3	60.0-62.5	71.5	70.6-72.3	66.2	64.8-67.5	75.1	74.3-75.8	77.2	76.5-77.8
		Girls	50.5	49.2-51.7	62.5	61.5-63.4	64.3	62.9-65.6	73.5	72.7-74.2	75.2	74.5-75.8

variable and the variables sex, age and sex-age combined in each of the versions analyzed in this study. The percentage of adolescents who smoke daily is shown to have fallen from 26.5% in 2002 to 8.7% in 2018. As to sex, girls in both age groups smoked daily to a greater extent than boys in 2002 and 2006. However, in 2010 and 2014 these differences decreased, remaining significant only in one of the two

age groups (15-16 year olds in 2010 and 17-18 year olds in 2014), while in 2018 no significant differences were found in any of the age groups. Regarding age, the 17-18 group presents greater tobacco use than the 15-16 year olds in all versions of the study and in both sexes. Figure 1 shows how smoking has evolved in each specific group across the 16 years.

Table 3. Percentage of daily smoking, OR and 95% CI in the adolescent school population in Spain in 2002, 2006, 2010, 2014 and 2018.

	2002	2006	2010	2014	2018
% total	26.5	17.9	17.4	10.3	8.7
Sex					
Boys (%)	21.9	14.6	15.7	9.5	8.8
Girls (%)	30.5	20.6	19.0	11.1	8.6
OR (95% CI)	1.560 (1.387-1.754)***	1.511 (1.357-1.683)***	1.260 (1.080-1.469)**	1.190 (1.064-1.331)**	0.973 (0.873-1.085)
Age					
15-16 (%)	21.3	13.2	14.6	6.5	5.5
17-18 (%)	31.3	21.5	21.1	13.3	11.1
OR (95% CI)	1.679 (1.493-1.888)***	1.805 (1.615-2.016)***	1.566 (1.343-1.827)***	2.187 (1.934-2.473)***	2.155 (1.908-2.433)***
By groups					
Boys 15-16 (%)	18.4	10.8	11.7	6.2	5.3
Girls 15-16 (%)	23.9	15.4	17.2	6.8	5.7
OR (95% CI)	1.390 (1.160-1.666)***	1.505 (1.254-1.807)***	1.579 (1.262-1.976)***	1.107 (0.900-1.362)	1.089 (0.886-1.338)
Boys 17-18 (%)	25.2	17.9	20.7	12.0	11.5
Girls 17-18 (%)	36.6	24.2	21.5	14.6	10.8
OR (95% CI)	1.711 (1.464-1.999)***	1.464 (1.280-1.675)***	1.047 (0.843-1.299)	1.256 (1.009-1.435)**	0.927 (0.815-1.055)

Note. *p < .05; ** p < .01; *** p < .001

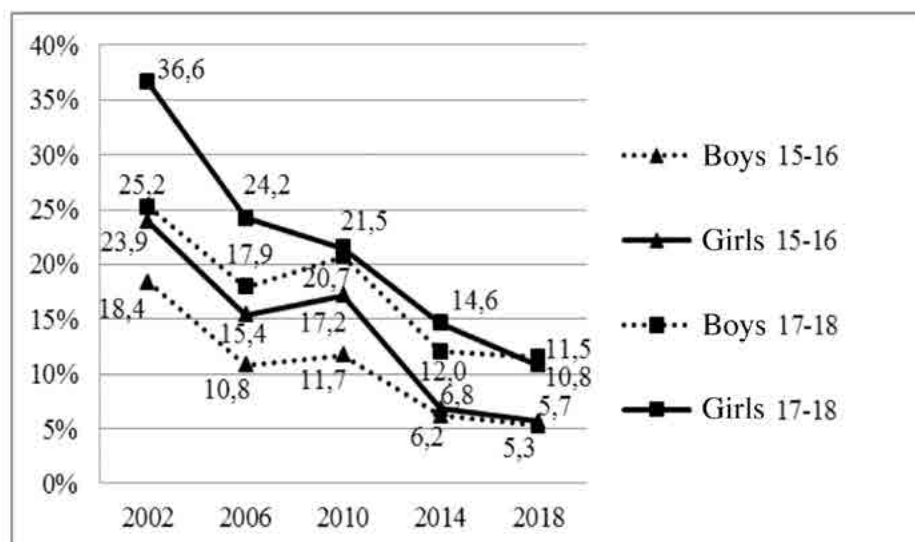


Figure 1. Daily smoking by sex and age

Table 4 shows the trend analysis for both the full period comparison (2002 vs 2018), as well as the four-year comparisons (2002 vs 2006, 2006 vs 2010, 2010 vs 2014 and 2014 vs 2018). In global terms, the decrease in adolescents smoking daily is confirmed, falling from 26.5% at the beginning of the period studied to 8.7% at the end (OR = 0.22; 95% CI = 0.20-0.25). On analyzing the change in each specific group, a strong decrease is detected in both groups of girls, especially the older ones (25.1 points) (OR = 0.21; 95% CI = 0.18-0.24). However, a comparison of each version to the previous yields a period of stability between 2006 and 2010 for both sexes and all ages.

To analyze whether there are statistically significant differences in daily smoking trends among boys and girls,

the interaction between sex and study version was analyzed (Table 4). The data show that there is a statistically significant interaction between version and sex in the entire period from 2002 to 2018 (OR = 1.61; 95% CI = 1.37-1.90), with the decrease among girls (21.9 points) being more pronounced than in boys (13.1 points). Similarly, the interaction between age and study version was analyzed to investigate whether the drop in smoking over the years was greater in one age group than the other. The results show that smoking fell more sharply among 17-18 year group (20.2 points) than the group of 15-16 year olds (15.8 points) (OR = 0.78; 95% CI = 0.66-0.93).

Table 4. Daily smoking among the adolescent school population in Spain: OR (95% CI) of the study version, sex, age, sex-version and age-version interactions, as well as of each specific group for the comparison of the entire period (2002 vs 2018) and the comparisons between versions (2002 vs 2006, 2006 vs 2010, 2010 vs 2014 and 2014 vs 2018).

	OR (CI 95%)				
	2002 vs 2018	2002 vs 2006	2006 vs 2010	2010 vs 2014	2014 vs 2018
Version	0.222 (0.196-0.252)***	0.578 (0.512-0.651)***	0.937 (0.806-1.091)	0.557 (0.477-0.651)***	0.736 (0.653-0.830)***
Sex	1.567 (1.393-1.764)***	1.567 (1.393-1.764)***	1.479 (1.327-1.648)***	1.279 (1.095-1.492)**	1.210 (1.082-1.354)**
Age	1.686 (1.499-1.897)***	1.686 (1.499-1.897)***	1.777 (1.591-1.986)***	1.579 (1.354-1.842)***	2.197 (1.942-2.484)***
Sex-version	1.615 (1.375-1.897)**	1.060 (0.903-1.244)	1.156 (0.957-1.397)	1.056 (0.873-1.279)	1.248 (1.067-1.459)**
Age-version	0.782 (0.661-0.927)**	0.949 (0.807-1.116)	1.126 (0.931-1.361)	0.719 (0.590-0.875)**	1.019 (0.857-1.212)
Boys 15-16	0.247 (0.202-0.302)***	0.536 (0.440-0.652)***	1.090 (0.872-1.364)	0.503 (0.399-0.633)***	0.841 (0.680-1.040)
Girls 15-16	0.193 (0.161-0.233)***	0.580 (0.492-0.684)***	1.144 (0.953-1.374)	0.352 (0.289-0.430)***	0.827 (0.677-1.012)
Boys 17-18	0.386 (0.333-0.448)***	0.648 (0.522-0.760)***	1.194 (0.992-1.438)	0.521 (0.435-0.625)***	0.958 (0.839-1.094)
Girls 17-18	0.209 (0.183-0.240)***	0.555 (0.487-0.632)***	0.854 (0.717-1.016)	0.625 (0.523-0.747)***	0.707 (0.621-0.805)***

Note. The reference categories for the study version variable are: 2002 for the 2002 vs 2018 comparison; 2002 for the 2002 vs 2006 comparison; 2006 for the 2006 vs 2010 comparison; 2010 for the 2010 vs 2014 comparison; 2014 for the 2014 vs 2018 comparison. For the sex variable, the reference category is 'boy' and for the age variable '15-16 years'.

*p < .05; ** p < .01; *** p < .001

Discussion

This study focuses on the analysis of adolescent smoking trends to date in this century. The results indicate a decrease in absolute terms between 2002 and 2018 in both sexes and in all ages, which coincides with other national (Plan Nacional sobre Drogas, 2018b; Villalbi et al., 2012) and international studies (European Monitoring Centre for Drugs and Drug Addiction, 2016; Hublet et al., 2015; Organization for Economic Cooperation and Development, 2017). However, the data indicate that this trend is not continuous, but alternates with a period in which smoking remained stable (2006-2010). In fact, in three of the four groups analyzed, the percentage of adolescents who smoke daily increased between 2006 and 2010, although such differences do not reach the level of statistical significance. This instability in smoking trends reflects that detected by the ESTUDES survey (Plan Nacional sobre Drogas, 2018b) and by Villalbi et al. (2012).

In terms of smoking patterns by sex and age, the results of this study show that the downward trend in girls is greater than in boys, leading to the disappearance of gender differences in 2018. There has thus been a reversal of the previously observed upward trend in which girls, especially the older ones, smoked much more than boys (Mendoza, López & Sagrera, 2007). Similarly, the fall in daily tobacco use is more pronounced among the older pupils compared to the younger age group, although in this case, the differences remain stable. These data confirm and complement the trends observed in other national and international studies on adolescent smoking (Díaz Geada, Busto Miramontes & Caamaño Isorna, 2018; European Monitoring Centre for Drugs and Drug Addiction, 2016; Hublet et al., 2015; Plan Nacional sobre Drogas, 2018b).

Although daily smoking has decreased significantly in Spain, with values in 2015 (the last year for which we have international comparisons) similar to the European average, it should also be noted that the prevalence of boys and girls smoking every day (8.7%) is still higher than desirable and higher than in other countries (European Monitoring Centre for Drugs and Drug Addiction, 2016). Thus, the data show that in 2018 5.5% of 15-16 year olds smoke daily, rising to 11.1% for 17-18 year olds. In the latter case, it should be noted that these are only adolescents who still remain in the educational system, so this percentage could be even higher when taking into account the population no longer at school at this age.

Since adolescence is a key stage for initiation and maintenance of the smoking habit (Chambers et al., 2003; European Commission, 2017; European Monitoring Centre for Drugs and Drug Addiction, 2016; Gruber, 2001; Moreno et al., 2016; Plan Nacional sobre Drogas, 2018a; Plan Nacional sobre Drogas, 2018b), it is essential and of the utmost priority to develop smoking prevention and control policies that focus on these ages - even more so when

taking into account the latest data from the Survey on Alcohol and Drugs in Spain (EDADES, Encuesta sobre Alcohol y otras Drogas en España) recently presented in Spain, which reports that the percentage of daily tobacco use in the population aged 15-64 years increased between 2015 and 2017 (Plan Nacional sobre Drogas, 2018a). Preventing those who have not yet started smoking from doing so, and getting those who smoke in adolescence to stop would prevent more than 90% of lung cancer mortality attributable to smoking and reduce public spending on tobacco-related diseases, which ranges from 6% to 15% in developing countries (Jha, 2011). However, at the national level, efforts to fight this public health problem do not currently appear to be sufficiently effective: the anti-tobacco law failed to have the expected impact (Grupo de trabajo sobre tabaquismo de la Sociedad Española de Epidemiología, 2017), tobacco research projects funded by the National Plan on Drugs (Plan Nacional sobre Drogas, 2017) have ceased, tobacco-specific national prevention campaigns have been suppressed (Ministerio de Sanidad, Servicios Sociales e Igualdad, 2017; Plan Nacional sobre Drogas, 2017), the Tobacco Observatory was phased out (Law No. 15, 2014) and the transposition of the new European Directive was not completed in the way proposed by the expert groups working on the subject (Comité Nacional de Prevención del Tabaquismo, 2017).

The problem of adolescent smoking continues to be a current one, but awareness of the issue and actions to tackle it have diminished over time. We are at a key moment in Spain, since Law 28/2005 has recently been modified to complete the transposition of European Directive 2014/40/EU, yet the modifications made have been minimal and focused entirely on equating certain restrictions on tobacco products to electronic cigarettes and refill containers. A great opportunity has been missed to resume the fight against an epidemic that causes thousands of deaths per year in our country and to launch a series of measures necessary to improve the health of our teenage boys and girls and the population in general, as several working groups specialized in the subject have been proposing (Grupo de trabajo sobre tabaquismo de la Sociedad Española de Epidemiología, 2017; Comité Nacional de Prevención del Tabaquismo, 2017). The measures proposed by these groups include those related to neutral packaging; control over tobacco advertising, promotion and sponsorship; the expansion of smoke-free spaces; the imposition of taxes on all tobacco products; the implementation of smoking prevention, sensitization, research and training programs; as well as the appropriate help for smokers. Moreover, such measures cannot merely take the form of a declaration of intent. Implementation requires considerable effort on the part of the government, not only in terms of funding and the provision of resources but also in the firmness of application in the face of pressure from the tobacco industry.

This study is not without limitations. Chief among them is the cross-sectional nature of the study, in which the data are collected at a single moment in time and through anonymous self-reports; this involves certain risks such as social desirability or underestimation of problematic behaviors. However, this is the type of methodology most frequently applied in studies of this type (Villalbí, Suelves, Saltó & Cabezas, 2011). The second limitation is that the sample is limited to schoolchildren, thus excluding young people aged 17-18 who have left school, a fact which may bias the data, most likely by underestimating the level of adolescent smoking. However, the study has important strengths. The large number of participants in the sample brings undeniable descriptive power to the study and provides a fairly accurate reflection of smoking at these ages. Likewise, the possibility of carrying out pertinent statistical analysis at five specific moments in time to examine trends in smoking allows the changes over these 16 years to be revealed quite accurately and makes it possible to take political decisions based on scientific evidence. In conclusion, the results of this study constitute a valuable contribution to the literature on adolescent smoking trends in the 21st century in Spain, as well as to smoking prevention and control policies.

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Conflicts of interest

The authors of this study declare that they have no conflicts of interest.

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