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ORIGINAL ARTICLE

Smoking prevalence in Portuguese school-aged adolescents by gender: Can we be optimistic?☆

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KEYWORDS
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Abstract
Introduction: According to the MPOWER approach adopted in 2008 by the WHO, monitoring smoking epidemics is necessary in order to assess the effectiveness of the preventive measures used in smoking control in adolescents and adults.
Objectives: To determine the prevalence of smoking in Portuguese school-aged adolescents by region.
Material and methods: The sample is made up of 8764 students, 4060 boys and 4704 girls, and is representative of the Portuguese students in regular public education. The data was collected in the 2008/2009 academic year, through a quantitative self-report questionnaire.
Results: In the total sample, 10.2% of boys and 9.1% of girls are regular smokers. Smoking increases with age. At 15 years old 12.3% of the boys and 8.6% of the girls are regular smokers and 6.1% of the boys and 4.0% of the girls are occasional smokers. Looking at prevalence by region, the highest prevalence of regular smoking is found in Alentejo (14.7%), followed by Azores (11.8%) and the lowest is found in Algarve (4.1%).
Conclusions: The prevalence of smokers among Portuguese school-aged adolescents varies within the several regions of the country, similar to what happens in the adult Portuguese population.

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PALAVRAS-CHAVE
Consumo de tabaco;
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Adolescente

Prevalência do consumo de tabaco em adolescentes escolarizados portugueses por sexo: podemos estar otimistas?

Resumo
Introdução: De acordo com a abordagem MPOWER, adotada em 2008 pela OMS, a monitorização da epidemia tabágica é necessária como forma de avaliar a eficácia das medidas preventivas desenvolvidas no controlo do consumo de tabaco em adolescentes e adultos.
Objetivo: Determinar a prevalência do consumo de tabaco em adolescentes escolarizados portugueses, por regiões.
Material e métodos: A amostra é constituída por 8764 alunos, 4060 do sexo masculino e 4704 do sexo feminino, e é representativa dos alunos do ensino regular público português. Os dados foram recolhidos no ano letivo de 2008/2009 através de um questionário de auto-relato.
Resultados: Na amostra total, 10,2% dos rapazes e 9,1% das raparigas são consumidores regulares de tabaco. O consumo aumenta com a idade, sendo que, aos 15 anos, 12,3% dos rapazes e 8,6% das raparigas consomem tabaco regularmente e 6,1% dos rapazes e 4,0% das raparigas consomem tabaco ocasionalmente. Relativamente à prevalência por região, a mais elevada prevalência de consumo regular de tabaco regista-se no Alentejo (14,7%), seguindo-se os Açores (11,8%), e a mais baixa regista-se no Algarve (4,1%).
Conclusão: A prevalência do consumo de tabaco em adolescentes escolarizados portugueses varia de acordo com a região do país e de forma similar ao que acontece na população adulta portuguesa.

Introduction

Smoking has short-term negative consequences on young people's health.[1]

However, the greater risk of starting to smoke is the dependence and the later associated pathologies.[2] In spite of the seriousness of this behavior for human's health, the results of the Health Behavior in School-aged Children (HBSC) revealed that in Portugal, in 2006, 9% of the 15-year-old boys and 12% of the 15-year-old girls were regular smokers (smoke at least one cigarette a week).[3] Although the prevalence of regular smokers in Portuguese school-aged youngsters is one of the lowest in Europe,[3] it is nevertheless worrying to learn that approximately one in each ten 15-year-old students is a regular smoker.

The evolution of smoking in the 1997–2006 period shows that the prevalence of 15-year-old daily smokers has decreased from 10% to 8% in girls and from 13% to 5% in boys.[3,4] This downward trend is also found in the ESPAD, The European School Survey Project on Alcohol and Other Drugs, study.[5] In order to evaluate the effectiveness of the preventive interventions, the MPOWER approach, adopted in 2008 by the WHO to control the smoking epidemics, highlights the need to (M)onitor smoking in young people and adults.[6] Therefore, it is necessary to continue to monitor tobacco use in young people and study the associated risk factors for better prevention.

Objectives

To determine the prevalence of smoking in Portuguese school-aged adolescents by region.

Materials and methods

Participants

A sample of 8764 students (4060 boys and 4704 girls), from 57 schools from 5th to 12th grades, in the academic year of 2008/2009 was used. It is a representative sample of the Portuguese adolescents in regular public education from the 5th to the 12th grades (including the islands of Açores and Madeira). A stratified sampling design (dividing the country according to the seven administrative regions in Portugal – NUTS) was used. Taking into account the population, a proportional sample size was defined, so that the sampled students in each NUT were representative of that region and mainly proportional to the population distribution. Then a clusters sampling was used to ensure that there was an equal proportion of country schools vs. city schools in each NUT. Finally, there was a cluster multi-stage sampling, each cluster composed of a class. Two classes per grade were randomly selected in each school, which included all the students from those classes whose parents/carers had signed the consent form.

No school refused to participate, but some had low participation rates, the region of Lisboa and Vale do Tejo is a little underrepresented in the national sample.

The total average age is 14.26 ($SD = 2.42$) (14.42 years old [$SD = 2.43$] among boys and 14.10 years old [$SD = 2.41$] among girls). The mothers of the female students had attended school up to the 9th grade (58.8%), as had most fathers (64.7%). This trend is the same among males, the mothers having studied up to the 9th grade (56.0%), as well as the fathers (61.6%).

Most participants live in a city, both girls (44.3%) and boys (46.7%).

Table 1 Smoking prevalence in Portugal school-aged children, by gender ($n = 8371$).

	Smoking pattern		
	Regular, *n* (%)	Occasional, *n* (%)	Non smoker, *n* (%)
Boys ($n = 3796$)	388 (10.2)	123 (3.3)	3285 (86.5)
Girls ($n = 4463$)	406 (9.1)	116 (2.6)	3941 (88.3)
Total	805 (9.6)	245 (2.9)	7321 (87.5)

Materials

An anonymous self-report questionnaire was used, ''Smoking habits in children and adolescents''. It was purpose-built, based on the validated questionnaires: ''Questionnaire for the evaluation of smoking behaviour''[7] and the ''Research Protocol for the 1997–98 study''.[8] It is a multi-item questionnaire, with 83 items and an 18-item scale, and evaluates seven dimensions: socio-demographic data, smoking pattern, cigarette trial and individual, environmental, micro and macro social risk factors for smoking. Content validity was assessed through specialist revisal and a pilot scheme in two classes from each of the following grades: 5th, 7th, 9th and 12th. From this process changes in the number of questions and the formulation were made.

The smoking pattern was evaluated through the answer to the question ''Do you smoke at present?'' Four categories were defined, according to WHO proposal[9] and HBSC categories[3,10]: daily smokers (those who smoke ''everyday''); weekly smokers (smoke ''at least one cigarette per week, but not one per day''); occasional smokers (smoke ''less than one cigarette per week'') and non-smokers (those who do not smoke, though they might have tried ''a puff''). According to this metrics, daily and weekly smokers can be grouped as regular smokers (those who smoke ''at least one cigarette per week'').

Procedure

This is a cross-sectional study. Ethical approval was obtained by the Direcção Geral de Inovação de Desenvolvimento Curricular (DGIDC).

Selected schools were contacted by phone and then an email requesting permission was sent to all the directors of the selected schools. Informed consent was given to children and should be signed by the parents/caregivers of the students who were younger than 18 years old. Only those who had permission to participate were included.

The questionnaires were delivered to the schools and distributed in the classroom by the teachers who were given written instructions.

Data analysis

The data were analyzed through Statistical Package for Social Sciences Statistics (version 17.0 for Windows). Frequency distributions and the Qui-Square Test were used.

Results

Overall prevalence

Of the total sample, 9.6% of students are regular (daily or weekly) smokers and 2.9% are occasional smokers (Table 1). 10.2% of the boys and 9.1% of the girls are regular smokers and 3.3% of the boys and 2.6% of the girls are occasional smokers. The prevalence of regular smokers in the total sample is higher in boys than in girls, the difference was statistically significant ($\chi_{(1)} = 3.343$; $p < 0.05$), as well as with occasional smoking ($\chi_{(1)} = 3.361$; $p < 0.05$).

Prevalence by region

Regarding prevalence by region (Table 2), the highest prevalence of regular smoking is found in Alentejo (14.7%), followed by Açores (11.8%) and the lowest is found in Algarve (4.1%). Also occasional smoking is most prevalent in Alentejo (3.9%), followed by the Center (3.4%).

In the regions of North, Center, Algarve, Açores and Madeira, regular smoking is higher in boys than in girls, the contrary being true for Lisboa and Alentejo. The highest prevalence of regular smoking among boys is recorded in Alentejo (12.3%) and Açores (12.4%) and the lowest in Algarve (5.1%) and Madeira (6.1%). The highest prevalence of regular smoking among girls occurs in Alentejo (16.9%) e em Lisboa e Vale do Tejo (11.8%).

The prevalence of regular and occasional smokers increases with age in both genders (Figs. 1 and 2). The prevalence of 15-year-old regular smokers is 12.3% in boys and 8.6% in girls.

The average age of the first trial cigarette is 12.7 years old ($SD = 2.52$) in the total sample (12.3 [$SD = 2.71$] among boys and 13.0 years old [$SD = 2.27$] among girls). This was most frequently at school (25.4%) and at friends' houses (18.6%) for both boys and girls. The majority of them (72%) were offered the first cigarette by a friend and curiosity was the main identified reason for the first trial (77.9%).

Discussion and conclusions

In this study, 9.6% of the students are regular smokers (daily or weekly) and 2.9% are occasional smokers. Both our study and HBSC 2006[3] results reveal that the prevalence of smokers in Portuguese school-aged children/adolescents of 15 year old is lower than the average prevalence of the total of HBSC countries (18% in boys and 19% in girls).[3]

The highest prevalence of regular smokers boys is recorded in Alentejo (12.3%) and Açores island (12.4%) and

Table 2 Smoking prevalence by region and gender.

Region	Smoking pattern								
	Regular			Occasional			Non smoker		
	Boys *n* (%)	Girls *n* (%)	Total *n* (%)	Boys *n* (%)	Girls *n* (%)	Total *n* (%)	Boys *n* (%)	Girls *n* (%)	Total *n* (%)
North	194 (10.6)	167 (7.9)	369 (9.2)	62 (3.4)	61 (2.9)	126 (3.2)	1572 (86.0)	1889 (89.2)	3505 (87.6)
Center	48 (10.1)	45 (7.3)	94 (8.5)	22 (4.7)	14 (2.3)	38 (3.4)	403 (85.2)	559 (90.4)	974 (88.1)
Lisbon	44 (9.5)	63 (11.8)	107 (10.6)	12 (2.6)	13 (2.4)	25 (2.5)	408 (87.9)	459 (85.8)	882 (86.9)
Alentejo	50 (12.3)	81 (16.9)	132 (14.7)	14 (3.4)	20 (4.2)	35 (3.9)	343 (84.3)	379 (78.9)	731 (81.4)
Algarve	7 (5.1)	6 (3.4)	13 (4.1)	5 (3.6)	2 (1.1)	7 (2.3)	125 (91.3)	168 (95.5)	294 (93.6)
Azores	30 (12.4)	31 (11.5)	61 (11.8)	6 (2.5)	4 (1.5)	10 (1.9)	206 (85.1)	234 (87.0)	447(86.3)
Madeira	15 (6.1)	13 (4.9)	29 (5.6)	2 (0.8)	2 (0.7)	4 (0.8)	228 (93.1)	253 (94.4)	488 (93.6)

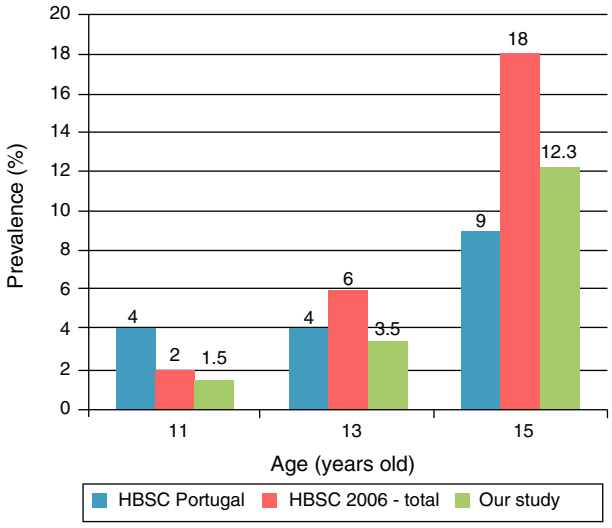

Figure 1 Prevalence of regular smoking in school-aged boys by age.

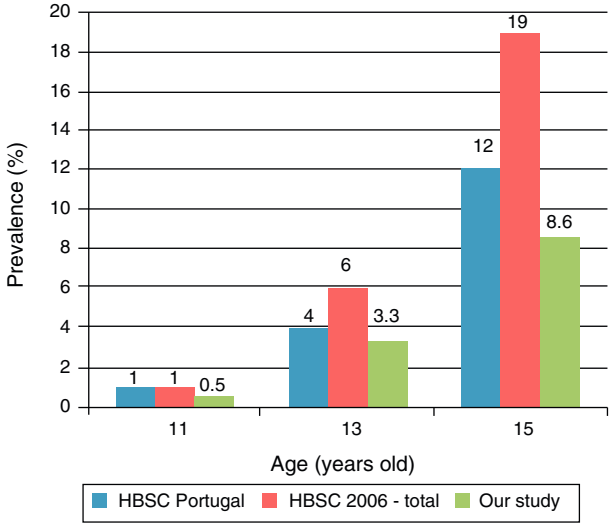

Figure 2 Prevalence of regular smoking in school-aged girls by age.

the lowest in Algarve (5.1%) and Madeira (6.1%). Among girls the highest prevalence is registered in the region of Alentejo (16.9%) and Lisboa and Vale do Tejo (11.8%).

Comparing these data with other gathered in the Portuguese adult population,[10] it seems that there is a similar trend by region. In that study,[10] the highest prevalence of men who smoked daily was observed in the Açores (31.0%), followed by Alentejo (29.9%). Among women, the highest prevalence of daily consumption of tobacco occurred in the region of Lisboa and Vale do Tejo (15.4%), followed by Algarve (12.8%). These data may confirm the importance of family and social influences on tobacco use. Several studies support the thesis that the students who grow up in a social environment (family, group of friends) in which there are smokers and/or in which smoking is not disapproved of, run a greater risk of becoming smokers than those who grow up in an environment in which there is less consumption.[11,12]

Regarding gender, the prevalence of 15-year-old regular smokers is higher in boys (12.3%) than in girls (8.6%), unlike what was verifiable through the HBSC-Portugal study, in which the prevalence of regular smokers at this age was higher in girls (12%) than in boys (9%),[3] which may be the result of different sampling methods. In our study, the region of Lisboa and Vale do Tejo is a little underrepresented, due to a lower rate of participation. This is a limitation of our study which might have contributed to reducing the prevalence of smoking in girls in the overall prevalence, since Lisbon registers a higher prevalence of regular smoking in girls than in boys.

This study as well as data from the HBSC 2006[3] revealed that the prevalence of smoking among Portuguese school-aged children is one of the lowest among European countries. A longitudinal analysis, from 1997[4] to 2006,[3] shows that the current tendency is for a decrease in the prevalence in both genders.

The smoking use tendency in population older than 15 years old is different from those observed in the younger one. From 1987 until 2006, the prevalence of smoking in Continental Portugal among men who are at least 15 years old revealed a slight decrease of 2.7% (from 33.3% to 30.6%). It was the opposite with women, with an increase of 6.8% (from 4.8% to 11.6%) in all age groups, being higher in the groups of 35–44 years old (increasing from 6.3% to 21.2%) and of 45–54 years old (increasing from 2.4% to 12.6%).[13]

These data seem to show that according to the smoking epidemic stages,[14] the Portuguese situation seems to be classified in the transition from phase II to phase III, which is characterized by a stabilization in men and an increase in women smoking. The increase in tobacco use in adult women in almost all age groups is an indicator that preventive efforts should be maintained in school and lifelong and should be focused – at the moment – on women. It is important to continue the preventive interventions in school and to increase the investment in community preventive actions to decrease of the smoking epidemic in women, as has happened in other countries.

The data on the prevalence according to age shows that many children are already smokers by the time they are 12 and 13 years old, so it is recommended that prevention in schools start before this age, in the 5th, 6th and 7th grades, and should be continued throughout the school years. It is known that the countries that implemented health education programmes in general and smoking prevention programmes in particular, have achieved positive results in the reduction of the prevalence.[15] This proves that the smoking problem is vulnerable and can be modified with a systematic and organized action.[16] The prevalence of smoking use among adolescents (and other risk behaviors such as alcohol and illicit drugs abuse) makes school and its staff – among which the role of teachers can be highlighted – a privileged place to: (1) detect; (2) warn and (3) guide. It is important that approximately at 14–15 years old, the age when a considerable percentage of the students become regular smokers, specific secondary prevention programmes be implemented for students at this specific stage of smoking.[17] This intervention is decisive in order to reduce the prevalence of smoking for two reasons: firstly, because it promotes quitting and, secondly, because smokers are a ''focus of infection'' for those who do not smoke or quitted. Quitters become protagonists of the non-smoking behavior and positive models for their schoolmates. In Portugal, the Ministry of Education has ordered the compulsory inclusion of several Health Education themes in school Educational Projects, from the 1st to the 12th grade, among which the prevention of psychoactive substance, alcohol, cigarette and drug abuse can be found.[18] It is important that those recommendations are implemented in order to reduce the prevalence of smokers among school-aged youth. The continuity of the primary preventive efforts in adolescence smoking is an indispensable tool for the reduction of smoking. Secondary and tertiary preventive programmes (like smoking cessation programmes specially designed for adolescents) should be part of a strategy to reduce prevalence or at least to prevent its increase.

Pediatricians and family doctors have a very important role in the prevention of smoking, by helping parents quit smoking which will have a very important impact on the present and future health of their child and on their behavior regarding smoking.

The family doctor can play a determinant role in the treatment and prevention of smoking, if one intends to avoid children being infected by the influence of adults, prevention should start with the treatment of those closest to the child (parents, friends and other reference adults).

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Conflicts of interest

The authors have no conflicts of interest to declare.

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