Trends of smoking prevalence among Albanian adolescents during 2011-2015: Results of ESPAD surveys

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Abstract

Aim: The aim of this study was to assess the prevalence of last month smoking (current smoking) prevalence among secondary and high school students in Albania during 2011-2015.
Methods: Prevalence of current smoking in 2011 and 2015 was based on the findings of the European School Survey Project on Alcohol and Other Drugs (ESPAD), carried out in Albania in two consecutive waves in these years. The target of ESPAD survey is students who turn 16 years old at the year of survey. In both waves, a representative national sample of 9th and 10th grades was retrieved through a three-stage stratified random sampling strategy. The standardized ESPAD questionnaire was used to retrieve information about smoking as well as demographic and other factors. Binary logistic regression was used to assess the correlates of current smoking in both years.
Results: The prevalence of current smoking declined significantly from 13.3% in 2011 to 11.2% in 2015 (P=0.018). In both waves, significant correlates of current smoking were male gender, studying in private schools, skipping classes, worse school performance, parents' unawareness about what kids do in weekend nights and finding cigarettes easily.
Conclusions: Cigarette smoking rates in Albania are declining but there is need to investigate whether such decline is compensated through increasing use of other tobacco products.

Keywords: Albania, ESPAD, high school, prevalence, secondary school, smoking.

Introduction

Smoking in adolescence is associated with a considerable range of harmful health effects. According to the World Health Organization (WHO), smoking during childhood and adolescence is associated with short-term respiratory and non-respiratory effects as well as long-term consequences, including decreased lung function and growth rate, reduced physical fitness, reduced life expectancy, faster heart beat rate, increased lung cancer risk, higher rate of shortness of breath and increased contacts with medical services (1). Furthermore, early life smoking behavior could increase the risk of using and misusing of other psychoactive substances, such as alcohol, cannabis, cocaine and other illegal drugs, through the "gateway" theory (1-4).

Monitoring smoking rates among adolescents is therefore of paramount importance in order to prevent and/or counteract such adverse effects during the later life. Smoking prevalence has been declining over the past decade all over the world. The World Health Organization's Report on the Global Tobacco Epidemic, 2015 suggested that, globally, current adult tobacco smoking (smoking during the last 30 days) has declined from 23% in 2007 to 21% in 2013, and similar declining trends were observed among males (from 38% to 36%) and females (from 8% to 7%) as well (5). Such declining tobacco smoking trends have been detected across all sorts of levels of economic development: in high income countries, middle-income countries and low-income countries, with the gender gap in favor of males more pronounced in middle- and low-income countries, which also exhibit lower general adult smoking prevalence, compared to high-income countries during the same time-period (5).

Similar decline has been reported among adolescents as well. The European School Survey Project on Alcohol and Other Drugs (ESPAD), which surveys school children aged 15-16 years old in more than 30 European countries, reported that, after an increase during 1995-1999, there has been a steady decline of lifetime and current (last month) tobacco smoking prevalence starting from 1999 and onwards in virtually all the surveyed countries (6). The United States Centers for Disease Control and Prevention (CDC) reported that during 2011-2015 current cigarette smoking among middle (grades 6-8) students declined from 4.3% in 2011 to 2.3% in 2015 whereas among high school students (grades 9-12) it declined from 15.8% to 9.3%, respectively (7). This figures come from the National Youth Tobacco Surveys. However, there was noted an increase in the current use prevalence of other forms of tobacco, including electronic cigarettes and hookahs (7). Other surveys observing smoking trends among adolescents have reported similar declining smoking trends, including Australia, Iceland, and elsewhere (8-11). However, some other studies, mainly from developing countries, reported an increase of smoking rates among adolescents in time (12,13).

In Albania, after two consecutive waves of ESPAD surveys carried out in 2011 (14) and 2015 (6), it is now created a solid base for assessing the time trends of smoking prevalence among adolescents, in order to inform health policy and decision making processes on future steps to address youth tobacco problem. In this context, the aim of this study was to describe the last 30 days smoking (current smoking) prevalence among school children during 2011-2015.

Methods

Type of study

This study exploits the data collected during two waves of ESPAD surveys in Albania: ESPAD 2011 and ESPAD 2015. ESPAD survey implies a cross-sectional design.

Sampling strategy

The detailed methodology employed by ESPAD survey has been described elsewhere (6,14). In brief, ESPAD survey aims to collect internationally comparable and reliable data on alcohol, tobacco

and other legal and illegal psychoactive substances use among school children aged 15-16 years old.
In Albania, in both waves of ESPAD surveys, there was employed a three-stage stratified random sample of 9th and 10th school grades (3), to produce a nationally representative sample of students turning 16 at the year of the survey, the target group of ESPAD survey. For this purpose, the sampling frame was retrieved from the Ministry of Education, comprising of all 9th classes (last year of secondary school) and 10th classes (first year of high school), because the overwhelming proportion of students turning 16 at the year of the survey in Albania is found in these classes, as explained elsewhere (3). Therefore, in the 2011 ESPAD survey the target group was students born in 1995 whereas in the 2015 survey the target group were students born in 1999. This analysis is based on 3189 students surveyed in 2011 and 2554 students surveyed in 2015.
All types of schools were included, despite their location (urban and rural), type (general, artistic, religious, vocational, etc.) and ownership (public and private). All schools agreed to participate.

Data collection and procedures

The international ESPAD questionnaire, validated in Albanian language (3) was used to collect data on alcohol and other psychoactive substances among school children.
Data collection process typically occurred during spring 2011 and 2015. The in-class data collection procedure fulfilled the general requirements of an exam. All children were assured of the confidentiality of the data and were encouraged to participate and give frank responses to respective questions (3,15).

Measures

The last month prevalence of tobacco smoking (current smoking) assessment was based on the question: "*How frequently have you smoked cigarettes during the last 30 days?*" Those reporting "0 times" were classified as non-current smokers whereas all other reporting at least one episode of smoking during this time were regarded as current smokers.
Information was also retrieved regarding sex of respondents, the type of school (secondary school vs. high school), school ownership (public vs. private), school location (urban vs. rural), school skipping, difficulty in finding cigarettes, average grade at school and parents level of knowledge about where the kids spend their Fridays/Saturdays nights.

Statistical analysis

Absolute numbers and respective percentages were calculated and reported. Chi square test was used to compare categorical variables. Binary logistic regression was used to determine correlates of current smoking in 2015 versus current smoking in 2011. Two models of binary logistic regression were employed: in Model 1, crude Odds Ratios (ORs) were calculated whereas in Model 2 we adjusted for all the independent variables included in the study. The Hosmer-Lemeshow test was used to check the appropriateness of binary logistic regression models. Associations were regarded as statistically significant if $P<0.05$.
All statistical analyses were computed through Statistical Package for Social Sciences (SPSS), version 15.

Results

General characteristics of study participants, by year of survey, are displayed in Table 1. In both surveys, more than half of participants were females and the overwhelming majority of students were studying in public and urban schools, whereas about two-thirds were in the high school system (Table 1).
We also collected information about classes' skipping, for reasons other than medical ones, average grade during the last semester, difficulty getting cigarettes and the level of parents'

knowledge regarding the whereabouts of their children during Fridays/Saturdays night. In both surveys, about one in five students had skipped classes for one or more lessons during the last month (21.9% in 2011 and 21.5% in 2015). In both survey more than half of students had the majority of grades 6s-8s but in 2015 it was noticed an increase of the proportion of students with average grades 9s and 10s compared to 2011 (43.5% vs. 35.2%, respectively) [Table 1]. Regarding the difficulty of finding cigarettes, in 2015 there is a sharp increase of the proportion of students finding it fairly or very easy to find cigarettes compared to 2011 data (50.7% vs. 26.5%, respectively) and a sharp decline in the proportion of students finding it impossible, very or fairly difficult to find cigarettes. Lastly, less than one in ten students declared that their parents know their whereabouts on Fridays/Saturdays night only sometimes or usually the don't (Table 1).

Table 1.General characteristics of study population

Variable	ESPAD study wave	
	2011	2015
Total	*3189*	*2554*
Gender		
Male	1436 (45.0)	1217 (47.7)
Female	1753 (55.0)	1337 (52.3)
School ownership		
Public	2833 (88.8)	2214 (86.7)
Private	356 (11.2)	340 (13.3)
School system		
Secondary school	1302 (40.8)	996 (39.0)
High school	1887 (59.2)	1558 (61.0)
School location		
Urban	2284 (71.6)	1838 (72.0)
Rural	905 (28.4)	716 (28.0)
Skipped classes		
No	2372 (78.1)	1899 (78.5)
Yes	666 (21.9)	520 (21.5)
Average grade		
Majority 4s-5s	191 (6.1)	107 (4.3)
Majority 6s-8s	1854 (58.7)	1295 (52.2)
Majority 9s-10s	1111 (35.2)	1079 (43.5)
Difficult get cigarettes		
Impossible, very/fairly difficult	1488 (47.3)	499 (20.0)
Fairly/very easy	832 (26.5)	1266 (50.7)
Don't know	825 (26.2)	734 (29.4)
Parents know whereabouts Fridays/Saturdays night		
Always/quite often	2814 (90.4)	2308 (93.3)
Sometimes/usually no	299 (9.6)	166 (6.7)

The prevalence of current smoking in 2011 was 13.3% whereas in 2015 it was 11.2%. Thus, in 2015 the prevalence of current smoking reduced by 2.1 percentage points compared to 2011 data and this change was statistically significant (P=0.018) [Table 2].

Table 2. Prevalence of current smoking in 2001 and 2015

Variable	ESPAD study wave		P-value
	2011	2015	
Current smoking			
No	2763 (86.7)*	2258 (88.8)	0.018†
Yes	423 (13.3)	285 (11.2)	

* Absolute number and column percentage (in parenthesis).
† P-value according to chi square test.

The prevalence of current smoking by year of survey and independent variables included in the study is presented in Table 3. It can be noted that, in both surveys, the prevalence of current smoking is higher among males, private schools, high schools, urban schools, and among those skipping classes, among students with lower average grades, those finding it fairly or very easy to get cigarettes and those whose parents rarely know their whereabouts during weekends (Table 3). Comparing 2011 to 2015 data, it can be noticed that in general, the prevalence of current smoking has declined among all groups of students, except for students in private schools and those whose parents rarely know their

Table 3.Current smoking prevalence in 2011 and 2015 by independent variables

Variable	Current smoking prevalence	
	2011	2015
Gender		
Male	21.8 %	17.6 %
Female	6.3 %	5.3 %
School ownership		
Public	13.3 %	10.4 %
Private	13.5 %	16.2 %
School system		
Secondary school	11.9 %	8.9 %
High school	14.2 %	12.7 %
School location		
Urban	14.1 %	12.2 %
Rural	11.2 %	8.7 %
Skipped classes		
No	7.8 %	5.8 %
Yes	33.4 %	31.3 %
Average grade		
Majority 4s-5s	36.8 %	26.4 %
Majority 6s-8s	14.7 %	13.2 %
Majority 9s-10s	7.0 %	6.7 %
Difficult get cigarettes		
Impossible, very/fairly difficult	8.2 %	5.6 %
Fairly easy	25.9 %	18.2 %
Don't know	10.4 %	3.6 %
Parents know whereabouts Fridays/Saturdays night		
Always/quite often	10.3 %	8.8 %
Sometimes/usually no	39.3 %	39.4 %

whereabouts during weekend nights where the current smoking prevalence increased during this period (Table 3).

On the other hand, the prevalence of current smoking declined more among males (from 21.8% to 17.6%, a decline of 4.2 percentage points) than females (from 6.3% to 5.3%, a decline of 1 percentage point), implying the narrowing of gender gap. Other marked declines of current smoking prevalence between 2011-2015 were noticed for lowest average grade students (10.4 percentage points decline), students finding cigarettes easily (7.7 percentage points), secondary school students (3 percentage points) and public schools students (2.9 percentage points) [Table 3].

The association of current smoking with independent variables, for both surveys, is displayed in Table 4. In unadjusted analysis, in both survey years, the variables most strongly associated with a significantly higher likelihood of current smoking were male gender, skipping classes, worst averaged grades during last semester, easily getting cigarettes and parents' unawareness about whereabouts of kids in weekends (Table 4).

The association of current smoking with school ownership, school system and school location were weak and significant only in the 2015 survey (with except for school location).

After simultaneously controlling for all the independent variables presented in Table 4, it was noticed a further weakening of strong correlations that appeared in univariate analysis but however they retained the statistical significance. After controlling for confounding effects, the strongest significant predictors of current smoking in 2011 and 2015 were: skipping classes (OR=3.3 and OR=4.7, respectively), parents' unawareness about whereabouts of kids in weekends

Table 4. Association of current smoking with independent variables. Univariate and multivariable adjusted ORs from binary logistic regression

Variable	Current smoking 2011		Current smoking 2015		Current smoking 2011		Current smoking 2015	
	UNIVARIATE ANALYSIS *				MULTIVARIATE ANALYSIS †			
	OR	P-value	OR	P-value	OR	P-value	OR	P-value
Gender								
Female	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001
Male	4.1		3.8		2.1		2.2	
School ownership								
Public	Ref.	0.903	Ref.	0.002	Ref.	0.527	Ref.	<0.001
Private	1.0		1.7		1.1		2.2	
School system								
Secondary school	Ref.	0.062	Ref.	0.003	Ref.	0.174	Ref.	0.088
High school	1.2		1.5		1.2		1.3	
School location								
Urban	1.3	0.029	1.5	0.012	1.1	0.376	0.9	0.409
Rural	Ref.		Ref.		Ref.		Ref.	
Skipped classes								
No	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001
Yes	5.9		7.4		3.3		4.7	
Average grade								
Majority 9s-10s	Ref.	-	Ref.	-	Ref.	-	Ref.	-
Majority 6s-8s	2.3	<0.001	2.1	<0.001	1.7	<0.001	1.7	0.046
Majority 4s-5s	7.7	<0.001	5.0	<0.001	4.5	<0.001	1.9	0.003
Difficult get cigarettes								
Impossible, very/fairly difficult				-				
Fairly easy	Ref.	-	Ref.	<0.001	Ref.	-	Ref.	-
Don't know	3.9	<0.001	3.7	0.087	3.0	<0.001	2.6	<0.001
	1.3	0.074	0.6		1.1	0.631	0.6	0.079
Parents know whereabouts Fridays/Saturdays night								
Always/quite often								
Sometimes/usually no	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001	Ref.	<0.001
	5.6		6.7		3.0		3.1	

* Univariate analysis; not controlled for any confounding effects;crude ORs.

† Multivariable-adjusted analysis; simultaneously controlled for all independent variables presented in the table; multivariable adjusted ORs.

(OR=3.0 and OR=3.1, respectively), easily finding cigarettes (OR=3.0 and OR=2.6, respectively) and worst average grades during last semester (OR=4.5 and OR=1.9, respectively). Male gender is significantly associated with a 2 fold higher likelihood of current smoking in both surveys (Table 4).

Discussion

ESPAD survey in Albania represents one of the most detailed studies on tobacco, alcohol and other psychoactive substances among youngsters. The present study is one of the few reports assessing the prevalence of smoking among adolescents by using the same methodology in two different points of time in Albania.

The current study explored the trends of current smoking prevalence among 15-16 years old school students during 2011-2015 as well as the factors associated with it, revealing some interesting findings. Current smoking prevalence among youngsters in Albania showed a significant decrease between 2011 and 2015, whereas the factors most strongly and significantly increasing the likelihood of current smoking in both surveys were skipping classes, parents' unawareness about whereabouts of kids in weekends, easily finding cigarettes, lowest average grades and male gender.

Besides ESPAD, the only other consecutive survey among school adolescents in Albania is Youth Risky Behavior Survey (YRBS) carried out in 2005 (16) and 2009 (17), among high school students aged 15-19 years old. However, these surveys did not use exactly the same questions regarding smoking (the 2005 survey didn't ask for last month smoking) and therefore it is impossible to evaluate the trends of this indicator during this time. Regarding lifetime smoking, it was 54.6% in 2005 and 59.1% in 2009, showing increasing trends, whereas the prevalence of current smoking in 2009 was 30.3% (17), thus being very much higher compared to the prevalence of current smoking in 2011 and 2015 ESPAD surveys (13.3% and 11.2%, respectively) among 15-16 year old students. Such difference is unlikely to be explained by increasing of smoking rate on older high school students alone. On the other hand, both YRBS and ESPAD reported that males are more likely to be current smokers compared to females. Despite slightly different target groups and methodologies employed by YRBS and ESPAD surveys, data suggest that the prevalence of current smoking among youngsters during the last decade is in decline in Albania. This finding is supported indirectly by studying the trends of smoking among adults in Albania in different points of time. A study assessing the prevalence of smoking among adults aged 18 years or older in Albania reported an increase of lifetime smoking prevalence from 48.2% in 2007 to 54.6% in 2009 (18). But, the 2014 Survey of Substance use among General Population aged 15-64 years old in Albania reported a lifetime and last month smoking prevalence of 41% and 28%, respectively (19). These data suggest that smoking prevalence has declined in Albania during the last decade amongst adults as well.

The observed decline in smoking prevalence amongst youngsters in Albania could be dedicated to several factors. The enforcement of anti-tobacco Law Nr. 9636, date 6.11.2006 "*For the protection of health from tobacco products*" began in 2007 but only since 2013 real progress has been made towards ensuring smoke-free public places throughout the country. On the other hand, the effects of such law enforcement take some time to reflect in population smoking rates and this is why the 2008 study concluded that despite law enforcement in 2007, no decrease in smoking prevalence was observed in 2009 (18).

Additionally, recently in Albania policies regarding the display of health warnings on tobacco packages and other requirements are relatively well implemented, whereas there is total ban for tobacco products in all media (except internet and other direct bans) and the taxes of tobacco products have been gradually increased through the years, reaching the level of 64% in 2014 (20).Tax increase is the single most effective strategy for significantly reducing

smoking behavior (5). This could have contributed to lowering of smoking prevalence in our country. On the other hand, despite the lack of implementation of at least three-weeks campaigns against tobacco in mass media between 2012-2014 (20), anti-tobacco messages are routinely disseminated throughout the country in separate events by the Institute of Public Health, Ministry of Education and other stakeholders, contributing further to reducing smoking rates in Albanian population, including adolescents. Since media has a considerable effect in influencing youth culture, then banning of tobacco advertisement from all media could have played an important role in considering smoking as non-fashionable (21), thus partly contributing to reduce smoking prevalence.

Last decade declining prevalence of smoking has been observed in international arena as well, as explored in the introduction section. Some reasons for this decline include increasing taxes for tobacco products, enforcement of anti-tobacco law and comprehensive smoke-free legislation, as well as education media campaigns (7). However, because young people turned to other tobacco products, such as e-cigarettes or hookahs, the overall rate of tobacco use hasn't change, a finding rather concerning (7). In Albania the information about the use of tobacco products other than cigarettes is rather scarce and therefore we are not able to judge whether the decline in current cigarette smoking prevalence among secondary and high school students in Albania is compensated by increased use of other forms of tobacco.

The association of increased smoking likelihood with male gender, poorer school performance, studying in private schools, skipping classes, parental unawareness about what kids do during weekends evidenced in our study mimics results of international research (7,22,23).

In conclusion, the prevalence of cigarette smoking among secondary and high school students in Albania is showing signs of declines. However, there is need to investigate whether such decline is due to increased use of other tobacco products.

Conflicts of interest: None declared.

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