

# Tobacco use among working adolescents and high school students in Turkey: evaluating the effect of the national tobacco control policy

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## ABSTRACT

**Background.** In our previous published study conducted in 2006 before the national tobacco control program (NTCP), we found that working adolescents (WA) more frequently consumed cigarettes than high school students (HSS). The objective of the present study was to compare the smoking status of WA and HSS before and after the NTCP.

**Methods.** A questionnaire including questions about the participant's socio-economic level and smoking status was administered.

**Results.** There were 668 subjects in the 2006 study and 869 subjects in the 2015 study. When we compared the 2015 results with the 2006 study, while there was a significant decline in the ever smokers ( $p < 0.001$ ), there was no difference in current smokers in both the female and male WA groups. In the HSS group, there was a significant decline in ever smokers ( $p < 0.01$ ), for both females and males. While there was a significant decline in current female smokers ( $p = 0.002$ ), no significant decrease was found in current male smokers ( $p > 0.05$ ) in the HSS group.

**Conclusions.** After the initiation of the NTCP, we have not seen a reduction in the smoking rates of both female and male WA and male HSS. The NTCP should particularly focus on the adolescent group in Turkey.

**Key words:** tobacco, adolescents, tobacco control.

Tobacco smoking is the most important avoidable public health problem in the world. Smoking causes pulmonary and cardiovascular complications.<sup>1</sup> With public awareness of hazardous toxic effects of tobacco consumption, smoking has declined, especially in high income countries, but low and middle income countries remain the targets of the tobacco industry. Turkey is one of the leading tobacco consumer countries in the world.<sup>2</sup> In

2006, the Turkish Government implemented a smoke-free legislation (Law No: 4207/5727) and a comprehensive tobacco control plan that banned smoking in closed public areas, a ban on smoking advertising through any media and or communication platform, pictorial health warnings about smoking, and prohibition of the sale of tobacco products to individuals under 18 years of age. This campaign has been in force continuously since then. It is estimated that there has been a 13% decline in smoking consumption nationwide following the implementation of these regulations and the resulting heightened public awareness of the harmful health effects of tobacco smoking.<sup>1</sup>

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It is well known that smoking addiction starts at an early age.<sup>3</sup> The young population are at risk for a longer exposure to the toxic effects of tobacco smoking. There is limited data, regarding both the smoking status of adolescents and the effect of the tobacco control policy on smoking consumption. In our previous published study conducted in 2006 before the national tobacco control program was instituted, we found that working adolescents (WA) more frequently consume cigarettes and were exposed to second-hand (cigarette) smoking at home more frequently than non-worker high school students (HSS).<sup>4</sup> The objective of the present study was to compare the smoking status of WA and HSS and to evaluate the effect of the national tobacco control policy on these groups.

## Material and Methods

Both studies, in 2006 and 2015, were conducted in a district of Istanbul, which is populated with low to middle income people. The same target population and area were chosen from WA and HSS in both the earlier and later study. The WA group were students at a Vocational Training Center which offers apprenticeship training. The apprentices study at school once a week while they work during the rest of the week. Their training areas at the center include hairdressing, lathe-finishing, motor repair and textile manufacture. The HSS group was from a high school, which is located in the same district.

The study was approved by the local ethics committee of the Bezmialem Vakif University (Number: 36/12, date: 08.04.2013). Additionally, permissions were obtained from the Kartal Province National Educational Directorate, the management of the high school, and the parents of the participants. All study participants were informed about the study and its objectives and signed written consent forms before inclusion in the study. It was explained to the participants that the questionnaire results would be kept according to the principle of confidentiality. The questionnaires in the current study were

designed in the same manner as the 2006 study.<sup>4</sup> A questionnaire included questions about the participant's socio-economic and smoking status. All questionnaires were carried out face-to-face by the same researcher. Participants who had 100 or more cigarettes in their lifetime and currently smoked cigarettes were considered current smokers. Adolescents who had tried at least one cigarette in their lifetime were considered ever smokers.<sup>5</sup> Smoking at home was defined as existence of an adult who was a current smoker at home.

In this study, we first compared the smoking status of the WA and HSS groups in the 2015 study. Then, we compared the 2006 and 2015 data for the WA and HSS groups with each other.

## Statistical analysis

During the assessment of the study data, we described our numerical parameters with mean and standard deviation values while we investigated the distribution of the categorical measurements by frequency and percentages. An independent samples t-test was used for the evaluation of numerical parameters with normal distribution, and the Mann-Whitney U-test was used for the evaluation of parameters without normal distribution. A chi-square test was used in the univariate assessment of our parameters, also performed classifying numerical parameters. The Pearson chi-square, Fisher's exact chi-square, the Fisher Freeman Hatlon exact chi-square, and Yates correction chi-square tests were used for comparison of qualitative data. The results were evaluated at a 95% confidence interval and at a significance level of  $p < 0.05$ . The SPSS for Windows 13.0 and NCSS (Number Cruncher Statistical System) programs were used for the statistical analysis.

## Results

There were 554 participants in the WA group and 244 subjects in the HSS group in the 2015 study versus 353 subjects in the WA group and 315 subjects in the HSS group in the 2006

study. Table I summarizes the demographic characteristics and smoking status of the participants of the 2015 study. Those who had ever smoked (ever smokers) ( $p < 0.001$ ), current smokers ( $p < 0.001$ ), and smoking exposure at home ( $p < 0.005$ ) were significantly higher in the WA group than HSS group.

Comparison of demographic characteristics and the smoking status of WA in 2006 and in 2015 is shown in Table II. There was no significant difference regarding the median age and gender between the WA groups. While there was a significant decline in the ever smokers ( $p < 0.001$ ), there was no difference in current smokers for both females and males.

Comparison of demographic characteristics and smoking status of HSS in 2006 and 2015 is shown in Table III. There was a significant decline in ever smokers ( $p < 0.01$ ), for both females and males. While there was a significant decline in current female smokers ( $p = 0.002$ ), no significant decrease was found in current male smokers ( $p > 0.05$ ).

There was no significant difference according to smoking exposure at home between 2006 and 2015 in both groups.

We also evaluated attitudes and behaviors of WA and HSS in 2015 about the smoking bans (Table IV). There were similar views in the two groups.

**Table I.** Demographic characteristics and smoking status of the participants in 2015.

		Working adolescents (n=554)		High school students (n=244)		p
Mean age		17.67±1.34		16.54±0.93		>0.05
Gender	Female	90	16.2	114	46.7	<0.001
	Male	464	83.8	130	53.7	
Ever smoker	Female	52	57.8	24	21.1	<0.001
	Male	282	60.8	43	33.1	<0.001
	Total	334	60.3	67	27.5	<0.001
Current smoker	Female	35	38.9	3	3.6	<0.001
	Male	203	43.8	17	13.1	<0.001
	Total	238	43.0	20	8.2	<0.001
Smoking at home		382	69.0	143	58.6	0.005

**Table II.** Comparison of demographic characteristics and the smoking status of the working adolescents in 2006 and 2015.

		Working adolescents, 2006 (n=353)		Working adolescents, 2015 (n=554)		P
Median age (year)		17 (14-20)		17 (14-19)		>0.05
Gender	Female	54	15.3	90	16.2	>0.05
	Male	299	84.7	464	83.8	
Ever smoker	Female	38	70.3	52	57.8	0.001
	Male	236	78.9	282	60.8	0.001
	Total	274	77.6	334	60.3	0.001
Current smoker	Female	19	35.1	35	38.9	>0.05
	Male	130	43.4	203	43.8	>0.05
	Total	149	42.2	238	43.0	>0.05
Smoking at home		266	75.4	382	69	>0.05

**Table III.** Comparison of demographic characteristics and the smoking status of the high school students in 2006 and 2015.

		High school students, 2006 (n=315)		High school students, 2015 (n=244)		P
		17 (14-19)		17 (14-19)		
		n	%	n	%	
Median age (year)		17 (14-19)		17 (14-19)		>0.05
Gender	Female	62	19.7	114	46.7	<0.001
	Male	253	80.3	130	53.3	
Ever smoker	Female	33	53.2	24	21.1	<0.001
	Male	136	53.8	43	33.1	<0.001
	Total	169	53.7	67	27.5	<0.001
Current smoker	Female	10	16.1	3	2.6	0.002
	Male	50	19.8	17	13.1	>0.05
	Total	60	19	20	8.2	<0.001
Smoking at home		195	61.9	143	58.6	>0.05

**Table IV.** Knowledge and behavior of students concerning the smoking ban.

		Working adolescents	High school students	p
		%	%	
Has anyone quitted smoking in your family after the ban?	Yes	23	30	>0.05
Do you support the ban	Yes	90	91	>0.05
Should the government take action against smoking?	Yes	89	88	>0.05
Is passive smoking harmful?	Yes	89	89	>0.05
Are smoking bans enough?	No	57	52	>0.05
Do you know that there are penalties for businesses that allow smoking?	Yes	99	93	>0.05
Do you know that if a person sells cigarettes to someone under 18 they can be imprisoned?	Yes	56	54	>0.05
Do you know that tobacco companies cannot advertise?	Yes	80	80	>0.05
Do you know that waste such as cigarette butts cannot be thrown?	Yes	54	47	>0.05

**Discussion**

In this study, the smoking behavior of WA and HSS were evaluated after the national tobacco control policy went into effect. There was no decline in the current smoker ratios of the WA before and after the national smoking policy was initiated. In the HSS, the current smoker ratio declined in girls but not in boys. As in 2006, the WA smoking ratio was higher than that for HSS in 2015.

Smoking most often starts in adolescence; thus, to prevent smoking, interventions should be

done in this period. It is estimated that smoking varies between 13.8% and 28% for the HSS group in different parts of the world. According to the Global Youth Tobacco Survey (GYTS) study that was conducted between 2013-2014 and included forty-five countries, the ratio of current smokers of high school age varies between 1.7% to 28.9% (Kazakhstan 1.7% and Timor-Leste 28.9%).<sup>6</sup>

In 2006 in Turkey, a school-based survey of 15,957 students between the ages of 13 and 15 years was conducted, and it was established

that around one third of students had already tried smoking, and 10% were current smokers.<sup>7</sup> In most studies, current smokers were predominantly male. However, a study from the Turkish city of Izmir showed that females were slightly higher current smokers, but that was not statistically significant ( F/M: 23.7% & 22.7%).<sup>8</sup>

There are a few studies regarding the smoking status of WA in the literature. The frequency of smoking of WA was found to be significantly higher than that of HSS in Turkey (ranging between 21.7% and 50.5%) as in our study.<sup>4,9,10,11</sup> Similar ratios were seen in a few studies in other countries.<sup>12,13</sup>

The National Tobacco Law is the leading regulation along with other comprehensive smoke-free environmental campaigns in Turkey. There are not enough studies that compare the smoking status before and after National Tobacco Policy was instituted. In our study, we compared the smoking status of both WA students and HSS students before and after the National Tobacco Law was initiated. While there was a significant reduction in the ever and current smoker ratios in the high school girl group, there was no reduction in current smoker ratios in high school boys and both female and male working adolescents. Our study is the only study in Turkey that compares the smoking ratios in the same population before and after the smoking ban. In the literature, we found two studies that evaluated the smoking ratios before and after the smoking ban in Turkey, but the study design and the groups were different from our study. The study population of these two studies were 10th grade high school students but not in the same area. Ever smoker ratios were evaluated in these studies. There was a significant decrease in the ever smoker ratio (the 2005 study, 37% and the 2013 study, 24.4%). Current smokers were not evaluated in these studies.<sup>14,15</sup> A study of adults that evaluated tobacco control activities in Turkey found a 13% reduction in current smokers from 2006 to 2013 (31.7% and 27.1%).<sup>16</sup>

There are a few studies in the literature from around the world that compare the smoking ratio in HSS. In a study from Argentina, after the implementation of anti-smoking regulations in 2011, the overall proportion of youths aged approximately 13-15 years who reported ever smoking a cigarette declined from 52% in 2007 to 41.9% in 2012.<sup>17</sup>

To the best of our knowledge, there is no study comparing WA before and after smoking bans either in Turkey and the world at large; thus, our study may be the first one.

We also evaluated smoking exposure in both groups, comparing 2006 and 2015. Smoking exposure at home was reduced from 2006 to 2015, but it was not statistically significant. Bilir et al.<sup>16</sup> assessed second hand smoke in various places before and after the ban. In Bilir's study, after the National Tobacco Policy was instituted, exposure to second hand smoke reduced in restaurants (55.9% and 12.9%), homes (56.3% and 38.3%), workplaces (37.3% and 15.6%), public transportation (16.5% and 10.4%), and government buildings (11.3% and 6.5%).

In this study, we also evaluated the knowledge and behavior of adolescents in terms of the smoking ban in 2015. Both the WA and HSS groups had similar views about the smoking ban, and most of the adolescents supported the ban.

In conclusion, after the National Tobacco Control Program was instituted, we did not see a reduction in the smoking ratios of working adolescents and high school boys. Therefore, the National Tobacco Control program was found to be less effective than expected, especially in the adolescent group. New studies encompassing a large area evaluating smoking status after the ban are needed. New policies against smoking are also needed to reduce the smoking ratios, especially in adolescents.

#### Author contribution

The authors confirm contribution to the paper as follows: study conception and design: EÇ,

FK, RE, BK, ED; data collection: BNK, AHG; analysis interpretation of results: EÇ, AÖ, HY, NV; draft manuscript preparation: EÇ, AÖ, HY. All authors reviewed the results and approved the final version of the manuscript.

### Ethical approval

The study was approved by the local ethics committee of the Bezmialem Vakif University (Number: 36/12, date: 08.04.2013).

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### Conflict of interest

The authors declare no conflict of interest.

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