The impact of anti-smoking laws on high school students in Ankara, Turkey

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ABSTRACT

Objective: To determine the factors affecting the smoking habits of high school students, their thoughts about changes resulting from anti-smoking laws, and how they are affected by those laws. **Methods:** In this cross-sectional study, 11th-grade students at eight high schools in Ankara, Turkey, were invited to complete a questionnaire. **Results:** A total of 1,199 students completed the questionnaire satisfactorily. The mean age of the respondents was 17.0 ± 0.6 years; 56.1% were female, of whom 15.3% were smokers; and 43.9% were male, of whom 43.7% were smokers (p < 0.001). The independent risk factors for smoking were male gender, attending a vocational school, having a sibling who smokes, having a friend who smokes, and poor academic performance. Of the respondents, 74.7% were aware of the content of anti-smoking laws; 81.8% approved of the restrictions and fines; and 8.1% had quit smoking because of those laws. According to the respondents, the interventions that were most effective were the (television) broadcast of films about the hazards of smoking and the ban on cigarette sales to minors. The prevalence of smoking was highest (31.5%) among students attending vocational high schools but lowest (7.5%) among those attending medical vocational high schools. Although 57.1% of the smokers were aware of the existence of a smoking cessation helpline, only 3.7% had called, none of whom had made any attempt to quit smoking. **Conclusions:** Although most of the students evaluated were aware of the harmful effects of smoking and approved of the anti-smoking laws, only a minority of those who smoked sought professional help to quit.

Keywords: Smoking/prevention & control; Smoking/trends; Smoking/psychology; Students/statistics & numerical data; Adolescent; Young Adult.

INTRODUCTION

Smoking is a major health problem threatening the lives of people of all ages. Worldwide, there are 1.3 billion smokers, 84% of whom live in developing countries.[1] Every year, 5.4 million people die from tobacco-related diseases, and this number is expected to exceed 8 million by 2030.[2] Smoking-related diseases and deaths are preventable. This knowledge has increased the importance of smoking control and cessation programs, and many countries have therefore implemented such programs.

In Turkey, the comprehensive fight against cigarette smoking began on November 26, 1996. In 2008, the list of smoke-free areas was expanded to include the corridors of public buildings; the outdoor areas of schools and training centers; shopping malls; hotels; and taxis. On July 19, 2009, a ban on smoking in the enclosed spaces of businesses within the catering sector, such as restaurants and coffeehouses, went into effect.[3] Businesses that allow smoking in the workplace or sell cigarettes to minors (individuals < 18 years of age) are fined. Businesses that continue to do so after the first two infractions are not only fined but are also subject to closure. In the first four years after the enactment of the anti-smoking laws (2008-2012), 2.2 million people quit smoking.[3] Although smoking in the home was not banned, the number of smokers smoking in their own homes decreased. In addition, the prevalence of smoking in the segment of the population comprising individuals over 15 years of age declined from 33.4% to 27.1% between 2006 and 2012.[3] On the basis of the criteria established by the World Health Organization,[2,4] Turkey now ranks sixth in the world and fourth among European countries in terms of the measures taken to control smoking.

Many studies have demonstrated that people usually start smoking before the age of 18.[2,5] One of the main ways in which tobacco control programs attempt to reduce smoking among the adult population is smoking prevention. Another focus of such programs is smoking cessation. Recent studies conducted in Turkey have examined the effects of tobacco control programs on university students and public employees.[6,7] However, there has been only one such study involving high school students and that was limited to examining the deterrent effects of the pictures appearing on cigarette packs.[8]

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In this study, we attempted to determine the factors affecting the smoking habits of high school students in Turkey, their level of knowledge about the smoking control measures taken in the country, and how they are affected by anti-smoking regulations.

METHODS

Subjects and procedures

This was a cross-sectional study involving students attending high schools in Keçiören, one of the districts of Ankara, the capital of Turkey. The Regional Ethics Board and the Provincial Directorate of National Education approved the study. In the Keçiören district, there are twenty-nine high schools, with a collective total of 16,175 11th-grade students. The study sample was drawn from among 11th-grade students at eight high schools that were randomly selected from among those twenty-nine. Each of the selected high schools was either a (regular) public high school, a non-medical vocational high school, a medical vocational high school, a public Anatolian[1] high school, or a private Anatolian high school.

Using a 30-item questionnaire prepared for the purposes of this study, we obtained data related to various aspects of the lives of the students evaluated: demographic characteristics; personal smoking habits; social environment; and knowledge of/thoughts about anti-smoking laws and regulations. These students completed the questionnaires anonymously, under the supervision of their teachers. The questionnaires were subsequently divided into three groups on the basis of the smoking status of the respondents: current smokers, defined as individuals who have smoked at least 100 cigarettes in their lifetime and still smoked on a regular basis, daily or otherwise, or had quit smoking recently (within the last 12 months); former smokers, defined as individuals who had quit smoking at least 12 months ago; and never smokers, defined as individuals who had never smoked or had smoked fewer than 100 cigarettes in their lifetime.[9]

Via the questionnaires, students provided data regarding their gender; the smoking status of their first-degree relatives and friends; the type of school they attended; and their level of academic success. Schools were broadly categorized as belonging to one of three groups: public high schools; Anatolian high schools (public or private); and vocational high schools (medical or other).

Statistical analysis

We compared continuous variables analysis using t-tests or the Mann-Whitney U test. The chi-square test was used in order to compare categorical variables. We identified the risk factors for smoking by comparing the smoking students with the nonsmoking students. We then performed multivariate analysis using a variable-dependent forward stepwise logistic regression model. The level of statistical significance was defined as $p < 0.05$.

RESULTS

Collectively, there were 1,308 11th-grade students enrolled in the eight high schools selected. However, on the day the questionnaires were administered, 42 students were absent. Consequently, the questionnaires were distributed to 1,266 students, 22 of whom were excluded from the study because they did not complete the survey. Therefore, the study sample comprised 1,244 students. The mean age of the respondents was 17.1 ± 0.6 years (range, 15-20 years). Of the 1,244 respondents, 697 (56%) were female. The demographic characteristics of the respondents are shown in Table 1. There were 45 students who did not complete the questionnaire satisfactorily. Therefore, the final sample comprised 1,199 students, Of those students, 238 (19.8%) were classified as smokers, 97 (8.1%) were classified as former smokers, and 864 (72.1%) were classified as never smokers. All of the students classified as former smokers stated that they had quit smoking because of the anti-smoking laws. Of the 238 students classified as smokers, 173 (72.6%) were male. Male gender was found to correlate significantly with smoking ($p < 0.001$).

Among the various types of schools, the prevalence of smoking was highest (31.5%) at the vocational high schools, although students enrolled in non-medical vocational high schools accounted for 24% of that prevalence, whereas those enrolled in medical vocational high schools accounted for only 7.5%. The students classified as current or former smokers (n = 335 collectively) had started smoking at a mean age of 14.1 ± 2.0 years (range, 9-17 years), 107 (32%) having started at 15 years of age and 67 (20%) having started at 16 years of age. Of the current smokers, 30% reported smoking 11-15 cigarettes/day, 24% reported smoking 16-20 cigarettes/day, and 5% reported smoking > 20 cigarettes/day. The most common reason given for starting smoking was to find a source of comfort following a stressful event, which was the answer given by 19% of the current smokers, followed by envying a friend, reported by 16%; seeking pleasure, reported by 15%; peer pressure, reported by 9%; curiosity, reported by 7%; and as a weight loss strategy, reported by 4%. In addition, 6% of the current smokers reported that, when they started smoking, they were unaware of its harmful effects.

The prevalence of smoking was significantly lower among the students whose academic performance was classified as successful than among those in whom it was classified as poor ($p < 0.001$), whereas it was significantly higher among the students who had a sibling or friend who smoked than among those who did not ($p < 0.001$ for both). The prevalence of smoking among the people close to the respondents was highest (50.4%) for their fathers, followed by 32.9% for their friends, 27.1% for their siblings, and 21.9% for their mothers.

When the students were asked who the first person they remember smoking around them was, 38.8%

Table 1. Sociodemographic profile of the high school students evaluated.

Characteristic	(N = 1,244)
Gender, n (%)	
Male	547 (43.9)
Female	697 (56.1)
Type of high school, n (%)	
Regular	251 (20.2)
Non-medical vocational	682 (54.8)
Medical vocational	67 (5.4)
Public Anatolian[a]	184 (14.8)
Private Anatolian[a]	60 (4.8)
Maternal level of education, n (%)	
Illiterate	34 (2.7)
Literate	591 (47.5)
Secondary school graduate	259 (20.8)
High school graduate	226 (18.2)
University graduate	108 (8.7)
No response	26 (2.1)
Paternal level of education, n (%)	
Illiterate	6 (0.5)
Literate	327 (26.3)
Secondary school graduate	293 (23.5)
High school graduate	344 (27.6)
University graduate	259 (20.8)
No response	15 (1.3)
Occupation of parents, n (%)	
Educator	58 (4.7)
Health care worker	21 (1.7)
Other	1,165 (93.6)
Monthly income of parents, n (%)	
≤ 250 USD	74 (5.9)
251-500 USD	454 (36.5)
501-1,000 USD	420 (33.8)
> 1,000 USD	226 (18.2)
No response	70 (5.6)
Academic performance, n (%)	
Excellent	176 (14.1)
Good	335 (27.0)
Mediocre	344 (27.6)
Poor	364 (29.2)
No response	25 (2.1)

[a]Refers to high schools in Turkey that admit only students with high scores on the nationwide standardized test known as the Transition from Primary to Secondary Education exam.

first listed one or both of their parents. The difference between parents and the other groups was statistically significant (p < 0.001). We found that the smoking habits of the students did not correlate with their level of mathematical or verbal education, nor with level of education or income of their parents.

Using logistic regression analysis to evaluate the smokers and former smokers collectively (Table 2), we determined that the independent risk factors for smoking were male gender (p < 0.001), attending a non-medical vocational high school (p = 0.002), having a sibling who smokes (p < 0.001), having a friend who smokes (p < 0.001), and poor academic performance (p = 0.0013). We found that 58.7% of the students classified as current smokers had tried to quit smoking at least once in their lives, with varying rates of success—53.6% had quit for less than a week, 18.4% had quit for 1-4 weeks, and 28.0% had quit for 5-12 weeks. When asked "Are you thinking about quitting smoking?", 54.9% of the smokers answered in the affirmative. Of the quitters (former smokers plus smokers who had quit and subsequently started smoking again), only 8.1% had quit smoking simply because they wanted to, the other reasons for quitting including "for my own health", cited by 42.9%, and "to set a good example for others", cited by 18.5%. Of the students classified as current smokers, 29.1% reported that they were not thinking about quitting. Although there was no predominant reason given for taking that position, 23.6% of those students stated that they loved smoking. We also found that 91.4% of never smokers, 55% of current smokers, and 78% of former smokers thought that cigarettes were harmful. When asked to name the most common smoking-related diseases, 492 students (42.4%) answered "lung cancer", whereas 472 (40.7%) answered "cardiovascular diseases".

In our assessment of student awareness of smoking cessation resources, we found that 61.6% of the students were aware of the existence of the smoking cessation helpline. Of the 238 students classified as current smokers, 136 (57.1%) were aware of the smoking cessation helpline. Of those 136 smokers, 5 (3.7%) had called the helpline but had not made any attempt to quit smoking. The majority of students (74.7%) were aware of the legislation pertaining to the tobacco control program. That rate was 77.0% among the never smokers, 69.9% among the smokers, and 66.7% among the former smokers.

We found that 81.8% of the students agreed with the restrictions and punishments imposed by the anti-smoking laws. The rate of approval among smokers was 69.9%. The comparison between smokers, never smokers, and former smokers is shown in Table 3. In the opinion of the respondents, the legislation-related interventions that were most effective in reducing the prevalence of smoking were the ban on sales of cigarettes to individuals under 18 years of age (p = 0.003) and the (television) broadcast of short films about the hazards of smoking (p < 0.001).

DISCUSSION

In this study, we evaluated high school students in terms of their smoking status, as well as their knowledge of and agreement with anti-smoking laws. We found that approximately 20% of the high school students smoked, current and former smokers collectively accounting for approximately 30% of the study sample. On average, the students had started smoking at approximately 14 years of age. The primary risk factors for smoking

Table 2 - Independent and dependent variables affecting student smoking.

Variable[a]	n	Smoking[b] %	OR (95% CI)	Adjusted OR (95% CI)
Gender (N = 1,199)				
Female	666	15.3	1	1
Male	533	43.7	4.29 (3.27-5.63)**	2.79 (2.02-3.85)**
Type of high school (N = 1,199)				
Regular	239	20.9	1	1
Anatolian[c]	234	23.9	2.07 (1.17-3.66)*	1.19 (0.77-1.83)
Vocational	726	31.5	1.92 (1.25-2.93)*	1.74 (1.23-2.47)*
Academic performance (N = 1,177)				
Good	496	16.9	1	1
Poor	681	36.1	2.77 (2.09-3.68)**	1.85 (1.28-2.68)*
Maternal smoking (N = 1,179)				
No	858	25.3	1	1
Yes	321	34.6	1.56 (1.18-2.06)	1.27 (0.89-1.79)
Paternal smoking (N = 1,171)				
No	438	25.1	1	1
Yes	733	29.6	1.25 (0.96-1.63)	0.97 (0.70-1.35)
Has a sibling who smokes (N = 1,199)				
No	868	21.4	1	1
Yes	331	45.0	3.00 (2.29-3-93)**	2.61 (1.88-3.62)**
Has a friend who smokes (N = 1,199)				
No	769	13.9	1	1
Yes	430	53.7	7.42 (5.61-9.82)**	5.08 (3.72-6.92)**

[a]The N differs among the variables, because some students did not answer all of the questions. [b]Current and former smokers were evaluated collectively. [c]Refers to high schools in Turkey that admit only students with high scores on the nationwide standardized test known as the Transition from Primary to Secondary Education exam. *p < 0.01. **p < 0.001.

Table 3. The opinions of high school students regarding the changes associated with anti-smoking laws in Turkey.

Opinion	Smoking status			p[a]	p[b]
	Never (%)	Current (%)	Former (%)		
I know the anti-smoking laws.	66.2	57.1	64.6	0.012	0.268
The restrictions and the punishments imposed by the laws are just.	75.9	69.9	78.3	< 0.001	0.004
Cigarette should not be sold to minors (individuals under the age of 18).	77.8	35.2	53.1	< 0.001	0.003
Cautionary photographs on cigarette packages are effective.	66.2	73.8	66.3	0.026	0.179
The television broadcast of videos about the harms of smoking is effective.	71.2	43.7	67.4	< 0.001	< 0.001
Recommendations on the subject are more effective if made by a nonsmoking role model.	71.1	49.6	60.6	< 0.001	0.086
Courses teaching the harmful effects of smoking should be implemented in schools.	76.9	50.9	58.7	< 0.001	0.217

[a]Never-smokers vs. current smokers. [b]Current smokers vs. former smokers.

were male gender, attending a non-medical vocational high school, and poor academic performance, as well as having a sibling or friend who smoked. Our findings also indicate that, although the majority of students who smoked thought that smoking was harmful and were aware of the resources provided via the tobacco control program, only a small proportion (8%) had made an effort to quit.

Various studies conducted in Turkey before the implementation of the tobacco control program showed that the prevalence of smoking among secondary and high school students ranged from 13.3% to 29.0%, and that the mean age at which those students started smoking was 13.2 ± 2.7 years.[10,11] In a study conducted in the United States, researchers found that the prevalence of smoking among middle and high school students

declined from 65.5% to 40.5% within the first nine years after the implementation of a tobacco control program.[12] In Turkey, the prevalence of smoking among adults decreased from 31.2% to 27.0% within the first four years after the implementation of the tobacco control program.[13] However, to date, there have been no studies evaluating the impact of the program on adolescents. Although our study was conducted after the implementation of the tobacco control program, we found the prevalence of smoking among adolescents to be similar to that reported before the control program was implemented. Possible explanations for this finding include the fact that individual adolescents have inaccurate perceptions of smoking-related health problems or ignore those future problems due to the immediate pleasure derived from smoking. Therefore, we believe that using understandable language and accessible media to explain the harmful effects of smoking on human health to the students, in their schools and homes, reduces the rate of the initiation of the smoking habit.

In the present study, we identified the following independent risk factors for smoking: male gender, attending a non-medical vocational high school, having a sibling who smokes, having a friend who smokes, and poor academic performance. Similar to what has been reported in other studies, the prevalence of smoking was higher in males than females (male/female ratio, 3.3:1).[14,15] This higher rate might be due to the fact that smoking among males is seen as a symbol or confirmation of masculinity. Peer pressure is a common cause of the initiation of smoking in adolescents. The likelihood that adolescents will start smoking increases 3 to 4 times when they have peers who smoke.[16] In the present study, most of the siblings who smoked were older and were likely perceived as role models. The implementation of anti-smoking laws in recreational areas where adolescents spend time with their friends, such as cafes, playing fields, and cinemas, can be an effective deterrent to the initiation of the smoking habit.

Poor academic performance and attending a low-tier school were identified as risk factors for smoking in our study and in the study conducted by Morin et al.[17] In addition, we found that the prevalence of smoking was lowest in medical vocational high schools. This demonstrates that increasing awareness about the adverse effects of smoking is an important deterrent. It seems that giving space to health-related courses in the education system beginning in the lower grades is an effective means of increasing awareness and raising a smoke-free generation.

To our knowledge, there have been no previous studies comparing students attending medical vocational high schools with those attending other types of high schools, in terms of the prevalence of smoking. However, there have been studies showing that the prevalence of smoking is lower among college students in the medical field than among those in any other field.[7,18]

Researchers have suggested that teacher attitudes toward smoking affect those of their adolescent students.[19] In the present study, approximately 70% of the students stated that recommendations from nonsmoking teachers and doctors could be effective. In addition, the students were in favor of school courses on the harmful effects of smoking. Furthermore, various studies conducted in schools have shown that anti-smoking campaigns have positive effects on students.[13,20]

In previous studies, researchers showed that adolescents might start smoking due to envy[21] or curiosity, and that many adolescents are unaware of the harmful effects of smoking.[22] In our study population, the most common reason given for starting smoking was as a source of comfort following a stressful event.

Studies conducted in the years prior to the implementation of the tobacco control program in Turkey showed that 42% of high school students had the desire to quit smoking, 3.1% having already achieved that goal.[23] In a study conducted in the United States, it was reported that although 67% of high school seniors wanted to quit smoking, only 3% had done so,[24] compared with 8.1% in the present study. In addition, we observed that none of those who wanted to quit smoking sought help from a professional. We found that the majority of the students classified as current smokers were aware of the smoking cessation helpline. However, only a few of those students had called the helpline and received information, and none of those had made any attempt to quit smoking. Therefore, we concluded that those young people had not yet reached the ideal level of awareness. Nevertheless, it can be said that tobacco control programs have increased the smoking cessation rate among adolescents, as has been reported for the adult population.[13] Another study conducted in Turkey examined the effects of anti-smoking laws on university students.[25] To our knowledge, ours is the first study examining the effects of such laws on high school students in Turkey.

In the present study, we found that 74.7% of the high school students evaluated knew the content of the anti-smoking laws and that approximately 81.8% considered the penalties to be appropriate. Approximately 60% of the students stated that the informative short films about the harms of smoking, broadcast on television, were impressive and approved of the blurring of depictions of smoking in movies and television series. The students classified as former smokers or never smokers approved of the limitations imposed by the anti-smoking laws in greater proportions than did those classified as current smokers. We found that, in the opinion of the students evaluated, the interventions that were most effective in reducing the prevalence of smoking were the ban on cigarette sales to persons under 18 years old and the (television) broadcast of short informative films about the harms of smoking. Lazuras et al.[26] and Chaaya et al.[14] reported similar results in studies of secondary school students in Greece and university students in Lebanon, respectively. The

increased awareness brought about by the anti-smoking laws is a highly positive development.

The authors of another study conducted in Turkey found that 22.5% of high school students who quit smoking were influenced by the warnings about the harms of smoking on cigarette packages.[27] Prior to the enactment of anti-smoking legislation in Turkey, the proportion of people who found warnings on cigarette packages effective was approximately 20%.[28] After the enactment of the legislation, that proportion increased to 80%.[29] In our study, we found a similar proportion (approximately 70%). Anti-smoking campaigns employing visual media have been shown to be effective in reducing the number of people who start smoking, reducing the number of cigarettes smoked, and increasing the smoking cessation rate.[30]

One of the limitations of our study is that it focused on a single district and our findings therefore might not accurately represent the thinking of all high school students in Turkey. Another limitation was that, because of the large number of participants, the questionnaires were administered under the supervision of each classroom teacher, rather than in individual, face-to-face interviews. Nevertheless, we believe that our findings are relevant and indicative of general trends in the country.

In conclusion, we can state that smoking is quite common among high school students in Turkey. Although the rate of the seeking professional help is low, we found that such adolescents are aware of the anti-smoking laws. Significant measures to increase awareness about the hazards of smoking among students in Turkey include more decisive implementation of the anti-smoking laws, implementation of better quality educational programs in schools, improving academic performance, and providing comprehensive information on the harmful effects of smoking. We believe that establishing health centers for students to receive guidance and professional help in schools might also be useful in order to assist students who want to quit smoking rather than waiting for those students to seek help at health care facilities. Family support and professional help will help decrease the prevalence of smoking and increase the rate of smoking cessation among adolescents. We also believe that, in order to be successful, anti-smoking campaigns should take into consideration the opinions of the adolescent population before outlining action plans for tobacco control.

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