

RESEARCH ARTICLE

Trends in Smoking among University Students between 2005-2012 in Sakarya, Turkey

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Abstract

Turkey protects its entire population of 75 million people with all the MPOWER measures at the highest level. The aim of this study is to make a comparison of smoking and addiction data obtained from Sakarya University students in 2005-6 and 2012-13. A total of 4,200 (2,500 and 1,700 for each academic year) students at Sakarya University in Sakarya, Turkey, were randomly selected for sampling purposes. The selected participants represented Sakarya University students. Data were collected using a pretested anonymous and confidential, self-completed questionnaire which took 15-20 minutes to complete and Fagerstrom Test for nicotine dependence. Chi-squared, Spearman correlation, and binary logistic regression tests were used to define associations, if any. The level of significance was kept at $\alpha=0.05$. Smoking prevalence dropped by 8.5% (from 26.9% to 18.5%). Male gender, older age, high family smoking index, low self-rated school success, and high peer smoker proportion were common variables that have correlation with smoking status. In the binary logistic regression test the highest contributor to "being a smoker" was found to be the rate of peer smokers. Having all friends smoking puts the student a 47.5 and 58.0 times higher risk for smoking for males and females, respectively. Our results suggest an admirable diminution of smoking prevalence among Sakarya University students, which can be attributed to MPOWER protection.

Keywords: Students - smoking - universities - peer smoking - MPOWER protection - Turkey

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Introduction

The five leading global risks for mortality in the world are high blood pressure, tobacco use, high blood glucose, physical inactivity, and overweight-obesity. These are responsible for raising the risk of chronic diseases, such as heart disease and cancers and affect countries across all income groups. Worldwide smoking prevalence is 26% (males 54%, females 10%) and attributable mortality by smoking in the world is estimated to be 8.7% (males 11.5%, females 5.5%). According to the classification in July 2012 on the basis of 2011 gross national income (GNI) per capita by the World Bank, Turkey stands in "upper middle income" group among European countries (The World Bank, 2014). The prevalence of regular tobacco smoking (the main component of tobacco use) in the European Region of the World Health Organization (WHO) among the population aged 15 years and over has reached 27% on average according to the data reported from 37 countries around 2008 (World Health Organization, 2013).

The WHO Framework Convention on Tobacco

Control (FCTC), which was adopted by the World Health Assembly on 21 May 2003 and entered into force on 27 February 2005 is the first international treaty negotiated under the auspices of WHO and has since become one of the most rapidly and widely-embraced treaties in United Nations history. After its adoption by the 56th World Health Assembly in May 2003, WHO FCTC remained open for signature until 29 June 2004. Among the 168 states, which signed the WHO FCTC during this period expressing their willingness to become a party to the convention, Turkey has signed the convention on 28 April 2004 that entered into force on 31 March 2005 (World Health Organization, 2012). In 2008, WHO identified six evidence-based tobacco control measures that are most effective in reducing tobacco use known as "MPOWER". The measures, which correspond to one or more of the demand reduction provisions included in the WHO FCTC are as follows: *i*) Monitor tobacco use and prevention policies; *ii*) Protect people from tobacco smoke; *iii*) Offer help to quit tobacco use; *iv*) Warn people about the dangers of tobacco; *v*) Enforce bans on tobacco advertising, promotion and sponsorship; *vi*) Raise taxes

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on tobacco

Three countries with 278 million people have put in place four measures at the highest level. Today, one country, Turkey, protects its entire population of 75 million people with all MPOWER measures at the highest level.

In Turkey the 1996 Law No. 4207 on "Prevention and Control of Hazards of Tobacco Products", as amended in 2012 (Law 4207 as amended and consolidated in 2012) is the main source of law regulating the advertising of tobacco products. The law sets a general ban on tobacco products advertising, promotion and sponsorship. The Regulation on Procedure and Principles of Sales and Presentations of Tobacco Products and Alcoholic Beverages, adopted in 2011 expressly prohibits promotional discounts.

Turkey was the first country to complete data collection for the Global Adult Tobacco Survey (GATS) in 2008, and was one of the two countries to repeat GATS in 2012. According to these surveys, the smoking prevalence significantly decreased among adults from 31.2% (16.0 million) in 2008 to 27.1% (14.8 million) in 2012 which represents a 13.4% relative decline of the smoking prevalence (World Health Organization, 2013).

In this study, we aimed to design a survey to make a comparison of smoking and dependence data obtained from Sakarya University students in 2005 and 2012.

Materials and Methods

Study sample and sampling

In academic years 2005-2006 and 2012-2013, the total number of Sakarya University Campus students was 17,541 and 14,942, respectively. A total of 4,200 (2,500 and 1,700 for each academic year) students of Sakarya University in Sakarya, Turkey, were randomly selected for a proper representation of Sakarya University students. Of the 4,500 students selected, 3,749 responded (2,249 and 1,500, respectively), yielding an overall response rate of 89.3%. The study was carried out during the fall periods of each academic year. Students were informed of their selection and asked to attend the study at their classrooms. Informed verbal consent was obtained from the participating students. They were asked to answer all questions honestly, and were reassured about the anonymity and confidentiality of the information. Data were collected using a pretested anonymous and confidential, self-completed questionnaire, which was administered by one of the investigators and took 15-20 minutes to complete.

Questionnaire

Participants were asked to classify themselves as "non-smoker", "current smoker", and "ex-smoker". The demographic characteristics were age (in years), grade (1-4), and gender. Parental education level was asked in five items: illiterate, literate (no graduation), primary school, secondary/high school, college/faculty. Age was grouped into two as "20 years and younger" and "older than 20 years". Students self-rated their school success as "bad", "passable", and "good/very good". The "family members smoking index" ranged from 0 to 4, based on four items: having a smoker father, having a smoker mother, having

a smoker sibling, and having a smoker relative living in the same household. Students were grouped into three (1=dormitory; 2=family or relative home; 3=student lodging) based on their accommodation status. They were asked to classify their family income as lower most segment (=0), middle segment (=1), and upper/uppermost segment (=2). To gather information on "peer smoking", participants were asked how many of their friends smoke cigarettes (0=none, 1=few, 2=almost half, 3=almost all, 4=all). "Intention to quit" was a measure of the student's intention to quit smoking cigarettes ("No, I do not plan to quit smoking", "Yes, within 30 days", "Yes, within one year", "Yes, in five years / I'm not sure when") and if they believe in themselves about their intentions (either "Yes" or "No"). Students were asked if they ever had attempt to quit. The "self-rated dependence" was inquired ("No, I'm not dependent", "Yes, I'm dependent") and all students who smoke one or more cigarettes daily were asked to fill in Turkish version of "Fagerstrom Test for Nicotine Dependence" (FTND) (Uysal et al., 2004). The scores were categorized into five groups as very low dependence, low dependence, medium dependence, high dependence, and very high dependence .

Statistical analysis

Data were coded, entered and analyzed using SPSS for Windows 11.5 (SPSS Inc, Chicago, Illinois, USA). Results are given as frequency and in percent. Bivariate analysis was completed using chi-squared tests of significance. All statistically-significant independent variables from the correlation tests (Pearson's) were entered into a binary logistic regression model. They were regressed on the smoking status (with smokers=1) as the outcome variable. Based on this binary logistic regression model, the strength of association between the independent and outcome variables was determined by the odds ratio [with 95% confidence interval (CI)]. The level of significance was kept at alpha=0.05.

Results

Academic Year 2005-2006

Among 2,249 students, 606 (26.9%) reported smoking cigarettes. The rest of the students claimed had never smoked (n=1,521; 67.6%) or had quit smoking (n=122; 5.4%). The mean age was 20.9±2.2 years and males comprised 50.1% (n=1,126) of the sample (Table 1). Among smokers, males were more than females (n=394, 35.0% vs n=212, 19%; p<0.001). The odds of being smoker for a male student was found to be 2.31 times as high as female students (95%CI: 1.91 to 2.81). Fathers (n=991; 44.1%) were more prevalent smokers than mothers (n=458; 20.4%) of the students and sibling smoking rate was 25.4% (n=572). Our chi-square test with Yates' continuity correction revealed that the percentage of having a smoker father did not differ by the student's smoking status ($\chi^2(1, N=2249)=1.66, p=0.197, \Phi=0.28$, the odds ratio is 1.14 with 95%CI of 0.94 to 1.37) but that was not the same as having a smoker mother ($\chi^2(1, N=2249)=6.95, p=0.013, \Phi=0.054$, the odds ratio is 1.34 with 95%CI of 1.07 to 1.67) or a smoker sibling ($\chi^2(1,$

Table 1. Descriptive Statistics for the Students Classified as Non-Smokers, Occasional Smokers and Daily Smokers

Characteristic	Non-smokers (n, %)		Smokers (n, %)		Total (n, %)	
	2005-2006	2012-2013	2005-2006	2012-2013	2005-2006	2012-2013
Gender						
Female	911 (55.4)	718 (58.8)	212 (35.0)	116 (41.7)	1123 (49.9)	797 (53.1)
Male	732 (44.6)	504 (41.2)	394 (65.0)	162 (58.3)	1126 (50.1)	703 (46.9)
Age groups						
<21	856 (52.1)	538 (44.0)	193 (31.8)	96 (34.5)	1049 (46.6)	634 (42.3)
≥21	787 (47.9)	684 (56.0)	413 (68.2)	182 (65.5)	1200 (53.4)	866 (57.7)
Class						
1	691 (42.1)	340 (27.8)	171 (28.2)	71 (25.5)	862 (38.3)	411 (27.4)
2	445 (27.1)	286 (23.4)	177 (29.2)	59 (21.2)	622 (27.7)	345 (23.0)
3	272 (16.6)	270 (22.1)	124 (20.5)	71 (25.5)	396 (17.6)	341 (22.7)
4	235 (14.3)	326 (26.7)	134 (22.1)	77 (27.7)	369 (16.4)	403 (26.9)
School success						
Bad	111 (6.8)	47 (3.9)	99 (16.4)	31 (11.2)	210 (9.4)	78 (5.3)
Passable	798 (49.1)	549 (45.4)	301 (49.1)	136 (49.1)	1099 (49.3)	685 (46.1)
Good	608 (37.4)	503 (41.6)	163 (27.0)	81 (29.2)	771 (34.6)	584 (39.3)
Very good	108 (6.6)	109 (9.0)	41 (6.8)	29 (10.5)	149 (6.6)	138 (9.3)
Family member smoking index score						
0	630 (38.3)	548 (44.8)	175 (28.9)	95 (34.2)	805 (35.8)	643 (42.9)
1	660 (40.2)	489 (40.0)	260 (42.9)	107 (38.5)	920 (40.9)	596 (39.7)
2	302 (18.4)	151 (12.4)	121 (20.0)	58 (20.9)	423 (18.8)	209 (13.9)
3	50 (3.0)	32 (2.6)	46 (7.6)	16 (5.8)	96 (4.3)	48 (3.2)
4	1 (1.0)	2 (0.2)	4 (0.7)	2 (0.7)	5 (0.2)	4 (0.3)
Family income						
Low most segment	1048 (64.5)	66 (5.5)	344 (57.2)	16 (5.9)	1392 (62.5)	82 (5.6)
Middle segment	577 (35.5)	726 (60.7)	257 (42.8)	161 (59)	834 (37.5)	887 (60.4)
Upper/upper most segment	0 (0)	404 (33.8)	0 (0)	96 (35.2)	0 (0)	500 (34.0)
Peer smoker proportion						
None	151 (9.3)	281 (23.5)	3 (0.5)	4 (1.4)	154 (6.9)	285 (19.3)
Few	728 (44.9)	558 (46.7)	85 (14.1)	45 (16.2)	813 (36.5)	603 (40.9)
Almost half	424 (26.1)	233 (19.5)	205 (34.0)	90 (32.4)	629 (28.3)	323 (21.9)
Almost all	297 (18.3)	112 (9.4)	274 (45.4)	122 (43.9)	571 (25.7)	234 (15.9)
All	23 (1.4)	11 (0.9)	36 (6.0)	17 (6.1)	59 (2.7)	28 (1.9)
Accommodation						
Dormitory	808 (49.7)	647 (53.3)	195 (32.6)	82 (29.6)	1003 (45.1)	729 (48.9)
With family / relatives	272 (16.7)	220 (18.1)	107 (17.9)	68 (24.5)	379 (17.0)	288 (19.3)
Student lodging	510 (31.4)	314 (25.9)	265 (44.2)	119 (43.0)	775 (34.8)	433 (29.0)
Other	36 (2.2)	33 (2.7)	32 (5.3)	8 (2.9)	68 (3.1)	41 (2.7)
When do you consume maximum amount of cigarette?						
Study time	-	-	148 (26.4)	69 (25.7)	148 (26.4)	69 (25.7)
With friends –social reunion	-	-	145 (25.9)	85 (31.6)	145 (25.9)	85 (31.6)
When upset or uptight	-	-	205 (36.6)	80 (29.7)	205 (36.6)	80 (29.7)
Other	-	-	62 (11.1)	35 (13.0)	62 (11.1)	35 (13.0)
Intention to quit						
No, I do not plan to quit smoking	-	-	73 (13.5)	47 (19.0)	73 (13.5)	47 (19.0)
Yes, within 30 days	-	-	95 (17.5)	50 (20.2)	95 (17.5)	48 (19.4)
Yes, within one year	-	-	68 (12.5)	42 (16.9)	67 (12.4)	41 (16.5)
Yes, in five years/ I'm not sure when	-	-	306 (56.5)	108 (43.5)	307 (56.6)	112 (45.2)
Quit attempt						
No	-	-	233 (43.0)	96 (39.0)	233 (43.0)	96 (39.0)
Yes	-	-	309 (57.0)	150 (61.0)	309 (57.0)	150 (61.0)
Level of addiction (Fagerstrom Question-ire)*						
Very low dependence	-	-	274 (47.6)	134 (50.8)	274 (47.6)	134 (50.8)
Low dependence	-	-	139 (24.1)	72 (27.3)	139 (24.1)	72 (27.3)
Medium dependence	-	-	66 (11.5)	19 (7.2)	66 (11.5)	19 (7.2)
High dependence	-	-	76 (13.2)	30 (11.4)	76 (13.2)	30 (11.4)
Very high dependence	-	-	21 (3.6)	9 (3.4)	21 (3.6)	9 (3.4)

N=2249)=32.67, $p<0.001$, $\Phi=0.122$, the odds ratio is 1.82 with 95%CI of 1.48 to 2.23). Response rate to "Do you want to quit smoking?" was 89.4% (542/606). The majority [469 (86.5%)] of the students claimed that they wanted to quit smoking, and 75.5% (n=354) of them

believed they could manage to quit. Three hundred and nine (57.0%) students with the intention to quit had at least one previous attempt. There was a negative and weak correlation with school success and intention to quit ($r=-0.132$, $p=0.038$). Most of the students who want to quit

(n=306, 65.2%) were planning to quit in five years or they were not sure about timing. Longest cigarette smoking periods were stated as “when I am upset or uptight” (n=205; 36.6%), “at social reunions” (n=145; 25.9%), “during examination weeks” (n=108; 19.3%). FTND scores of male smokers was higher than those of the female smokers (3.20±2.49 vs 2.45±2.13; p<0.001). Self-rated dependence (“Are you dependent?”) was affirmative with 65.0% (n=331/509) and according to FTND scores 30.1% (n=153/508) students’ dependence may be classified as medium to very high (Table 1). Among these 153 students 127 (83.0%) declared “I am dependent”. In chi-square test with Yates’ continuity correction, the percentage of self rated dependence significantly differed with FTND group (0=very low and low dependence; 1=medium through very high dependence) ($\chi^2(1, N=508) = 30.20, p < 0.001, \Phi = 0.248$, the odds ratio is 3.66 with 95%CI of 2.28 to 5.86).

Academic Year 2012-2013

In this academic year we obtained 1,700 questionnaires, among which 1,500 had been completed (88.2%) and current smoking were reported in 278 (18.5%). The rest of the students claimed have never smoked (n=1,185; 79.0%) or had quit smoking (n=37; 2.5%). The mean age was 21.0±2.2 years and females compromised 71.1% (n=1066) of the sample (Table 1). Overall 39.4% (n=591) of students had a smoking father, 16.1% (n=241) had a smoking mother, 19.9% (n=299) had a smoking sister or brother, and 2.9% (n=43) had a smoking relative living in the same household. The analysis of the data by using chi-square test with Yates’ continuity correction significant differences in terms of having a smoker mother ($\chi^2(1, N=1500) = 10.42, p = 0.001, \Phi = 0.086$, the odds ratio is 1.72 with 95%CI of 1.25 to 2.37) or a smoker sibling ($\chi^2(1, N=1500) = 23.40, p < 0.001, \Phi = 0.127$, the odds ratio is 2.07 with 95%CI of 1.55 to 2.79) by student’s smoking status but this difference was not found for having a smoker father ($\chi^2(1, N=1500) = 0.66, p = 0.417, \Phi = 0.023$, the odds ratio is 1.13 with 95%CI of 0.86 to 1.47). Response rate

to “do you want to quit smoking” was 89.2% (248/278) and 201 (81.0%) claimed that they want to quit smoking, and 69.7% (n=140) of them believed they could manage to quit. Ten percent (n=150) of these students had at least one quit attempt. Analysis revealed that there is no independent variable correlated with “intention to quit”. Most of the students who want to quit (n=108, 53.7%) were planning to quit in five years or they were not sure about timing. Longest cigarette smoking periods were stated as “at social reunions” (n=85; 31.6%), “when I am upset or uptight” (n=80; 29.7%), “during examination weeks” (n=51; 19.0%). FTND scores of male smokers was higher than the female smokers (3.17±2.38 vs 2.20±2.22; p=0.001). Self-declared addiction (“Are you dependent?”) rate among the smokers was 58.1% (n=147/253) and according to FTND scores 57/253 students’ dependence categorized as medium to very high (Table 1); among them 48 (84.2%) claimed dependence. Our chi-square test with Yates’ continuity correction the percentage of self rated dependence significantly differed with FTND group (0=very low and low dependence; 1=medium through very high dependence) ($\chi^2(1, N=253) = 19.24, p < 0.001, \Phi = 0.285$, the odds ratio is 5.23 with 95%CI of 2.43 to

Table 2. Correlation Coefficients for Variables by Education Year

	Correlation coefficient	
	2005-2006	2012-2013
Peer smoker proportion	0.386**	0.443**
Gender	0.182**	0.309**
Age	0.197**	0.134**
Siblings’ smoking status’	0.122**	0.127**
Accommodation	0.162**	0.070**
Family smoking index	0.102**	0.117**
Self declared economic status (family)	0.57**	0.008 (Not correlated)
Relatives’ smoking status	0.058**	0.072**
Mothers’ education level	0.058**	0.051 (Not correlated)
Mothers’ smoking status	0.054*	0.086**
Fathers’ education level	0.040 (Not correlated)	0.068**
Self rated school success	-0.128**	-0.107**

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed)

Table 3. Student Characteristics Differentiating Non-Smokers and Smokers in 2005-2006 Educational Year

	B	S.E.	Wald	df	P	Odds ratio	95% CI for Odds ratio		
							Lower	Upper	
Age	0.154	0.025	39,014	1	<0.001	1,166	1,111	1,224	
Male vs Female	0.428	0.114	14,015	1	<0.001	1,534	1,226	1,920	
School success			17,428	2	<0.001				
School success	Passable vs Bad	0.744	0.179	17,215	1	<0.001	2,104	1,480	2,989
	Good-Very Good vs Bad	0.239	0.117	4,163	1	.041	1,270	1,009	1,597
Family smoking index		0.219	0.062	12,487	1	<0.001	1,245	1,102	1,405
Ratio of peer smokers				181,192	4	<0.001			
Ratio of peer smokers	None	1,608	0.596	7,270	1	.007	4,994	1,551	16,072
	Few vs None	2,869	0.592	23,454	1	<0.001	17,612	5,516	56,233
	Half vs None	3,402	0.593	32,939	1	<0.001	30,034	9,397	95,988
	All vs None	3,860	0.651	35,176	1	<0.001	47,450	13,253	169,894
Family income				14,645	2	0.001			
Family income	Lower most segment vs Upper/upper most segment	-0.005	0.243	0.000	1	0.983	.995	0.618	1,602
	Middle segment vs Upper/upper most segment	0.426	0.249	2,935	1	0.087	1,531	0.940	2,494
Constant		-7,662	0.820	87,268	1	<0.001	0.001		

Table 4. Student Characteristics Differentiating Non-Smokers and Smokers in 2012-2013 Educational Year

	B	S.E.	Wald	df	P	Odds ratio	95% CI for Odds ratio	
							Lower	Upper
Age	0.069	0.034	4,263	1	0.039	1,072	1,004	1,145
Male vs Female	0.610	0.171	12,743	1	<0.001	1,840	1,317	2,573
Family smoking index	0.210	0.091	5,378	1	0.020	1,234	1,033	1,475
Ratio of peer smokers			144,997	4	<0.001			
Ratio of smoker friends								
None	1,590	0.530	8,987	1	0.003	4,904	1,734	13,869
Few vs None	3,003	.526	32,659	1	<0.001	20,150	7,194	56,441
Half vs None	3,865	.5310	52,951	1	<0.001	47,713	16,846	135,135
All vs None	4,061	0.653	38,724	1	<0.001	58,016	16,147	208,446
Accommodation			19,196	2	<0.001			
Accommodation								
Family/ relative home vs Dormitory	-0.835	0.210	15,742	1	<0.001	0.434	0.287	0.655
Student lodging vs Dormitory	-0.190	0.210	0.814	1	0.367	0.827	0.548	1,249
Constant	-5,465	0.882	38,400	1	<0.001	0.004		

11.23).

Determinants of smoking

For both education years' data analysis; age/age group, gender, mothers and fathers' education level, family smoking index, mothers' smoking status, siblings' smoking status, relatives' smoking status, school success (self-rated), and accommodation were found to be correlated with smoking (Table 2). Self-declared economic status (family) and mothers' education level were not correlated with smoking in academic year 2012-2013. In the binary logistic regression (stepwise forward likelihood ratio) smoking was taken as the dependent variable and for academic year 2005-2006; age, gender, parental education level, self-declared economic status and school success, family smoking index, accommodation during academic year, and peer smoking were taken as independent variables. Among these independent variables age, gender, school success, family index, peer smoking, and self-declared economic status were the terms left in the equation (Table 3). The most remarkable contributor of the equation was peer smoking ratio; the odds of being classified as a smoker increased positively with having smoker friends (all) (OR= 47.45; 95%CI= 13.25 to 167.89).

Analysis of 2012 data with binary logistic regression age, gender, accommodation, and peer smoking were the terms left in the equation (Table 4). The results reveal that peer smoking has a positive effect on student smoking; to have all peers smoking is found to increase the probability of student smoking by 58.02 times (95%CI= 16.15 to 208.45) (significant at the level 0.1%).

Discussion

Smoking ban in Turkey has inevitably carried and sustained anti-tobacco activities in public agenda. Thus these activities should be taken as a whole with the new legislation while measuring the effects of the legislation per se. Sakarya University has started an outpatient clinic for students with the intention to quit smoking in 2006. At this outpatient clinic a pulmonary diseases specialist and a nurse served at weekdays, free of charge. In addition to

this service, there were some social and cultural activities; "knowledge contest"s, conferences, "Don't be dependent, be free" project, concerts etc. These were under the supervision of "Sakarya University Tobacco Coordination Committee", which was comprised of representatives (a faculty and a civil servant) from each academic unit. This study's first step took place in 2005-2006 educational years which was the very first year of "anti-tobacco" activities at Sakarya University Campus. About a quarter of the students were smokers with male gender dominance. Overall prevalence was higher than Çukurova but significantly lower than Sivas, Eskişehir students' smoking prevalence during those years (Metintaş et al., 1998; Saatci, et al., 2004; Demirel et al., 2005). Significant difference between genders have been found in previous studies and mainly attributed to traditional gender roles in Turkish culture which still has influence despite changing social and economic status (Saatci et al., 2004; Erbaydar et al., 2005). In the 2012-2013 educational year there was significant decrease of smoking prevalence; from 26.9% to 18.5%. The Global Adult Tobacco Survey (GATS) is a global standard protocol for systematically monitoring adult (persons 15 years of age and older) tobacco use and tracking key tobacco control indicators. In Turkey, GATS was first conducted in 2008 and repeated in 2012. The smoking prevalence significantly decreased among adults from 31.2% in 2008 to 27.1% in 2012. This represents a 13.4% relative decline of the smoking prevalence (13.5% decline for males; 13.7% decline for females). Sangthong et al. study (2011) in Thailand revealed that susceptibility to smoking in newer cohorts is lower than that in earlier cohorts at the same age. In the same study prevalence of smoking increases from 11-15 to 26-30 years old which implies that most people begin to smoke in their teens. In Kerala a specially designed tobacco control program reduced tobacco use among school children (Philip et al., 2013). In Korea family status was highlighted (Kang et al., 2013). In Turkish teen studies smoking prevalences are between 18.1% and 38% (Arbak et al., 2000; Karlıkaya, 2002; Golbasi et al., 2011). Most of this decline in Turkey is basically due to the implementation of a comprehensive set of tobacco control policies and a national action plan. In 2007 no country protected its population with all five or

even four of the measures known as MPOWER. By 2013 only Turkey protects its entire population of 75 million people with all MPOWER measures at the highest level. Following ratification of WHO FCTC on 30/11/2004, Ministry of Health (MoH) formed a National Tobacco Control Committee for preparation and implementation of a tobacco control programme. In 2010 the government established a national quit line service, and began to cover costs of nicotine replacement therapy. In 2005 Tobacco and Alcohol Market Regulatory Authority (TAPDK), required larger text warning covering (30-40% of the front and back of packages), prohibited misleading and deceptive terms (mild or light). In 2013 taxes on tobacco was about 81,6% of the retail price (World Health Organization, 2013). Although relative decline in smoking among our sample is not as much as the decline in GATS, it still implies the effect of MPOWER protection on the population (World Health Organization, 2013).

Smoking determinants among Turkish adolescents have been studied and male gender, parental smoking, parents' age, mother's education, smoking of sibling, birth rank, employment of father were reported as independent variables increasing the odds of being smoker (Metintaş et al., 1998; Ozge et al., 2006; Ertas, 2007). In our study population, the odds of being smoker were high if a student was male, had smoker mother/ sibling/peer, had low school success, was of low familial income, or lived at places except for dormitories although these correlates of being smoker are not peculiar to Turkish university students. All around the world tobacco consumption studies revealed these associates of smoking (Kabir, 2007; Binu et al., 2010; Cai et al., 2012; Reda et al., 2012; Hussain et al., 2013; Kaleta et al., 2013; Karimy et al., 2013).

Self-rated dependence question was dichotomous and was highly correlated with moderate/high nicotine dependence score of FTND but for this group approximately 20% of the students rated themselves as not dependent. The assessment of nicotine dependence is indispensable in epidemiological studies. The major methods to determine nicotine dependence can be divided into four types based on their central constructs: (1) generic definitions of substance dependence and their derivatives (American Psychiatric Association, 2010), (2) Fagerstrom tests and their derivatives (Fagerström, 1978; Heatherton, et al., 1991), (3) consumption, and (4) self-rated dependence (Eiser et al., 1986). FTND is a measure of nicotine dependence that is subjective in nature. In some studies it is indicated that men tend to be more dependent than women, and in some others no difference was reported (Berlin et al., 2003; Bohadana et al., 2003; Targowski, et al., 2004; Gallus et al., 2005; John et al. 2005). In this study there was inter-gender difference in terms of mean FTND scores, i.e. men were more "dependent" than women. In some research it is suggested that men smoke primarily for pharmacological reinforcement provided by nicotine, whereas women smoke primarily for psychological reinforcement obtained through social interaction and tension reduction (Berlin et al., 2003). Evidence suggests that women are less likely to quit smoking than are men. Women tend to have a more difficult time in smoking cessation depending on the phase of menstrual cycle:

greater craving and dysphoria during the luteal phase than during the follicular phase of the cycle (Carpenter, et al., 2006). Although several sex differences in nicotine dependence have been identified, the mechanisms underlying these sex differences are not clear.

In conclusion, the 2013 World Health Assembly called on governments to reduce the prevalence of smoking by about a third by 2025 (World Health Organization, 2013). Price was presented as the key determinant of smoking uptake and cessation. WHO Framework Convention on Tobacco Control and MPOWER initiative are other ways of consumption reduction. Our Sakarya sample is a cross-sectional example of the university students' smoking and these results cannot be generalized to whole nation but we can speculate that all measures taken against smoking contributes to diminution of smoking prevalence. As Turkey protects its entire population with all MPOWER measures we do not have the opportunity to compare our results with university students who are not under MPOWER protection. .

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