The Impact of Gender, Family and Type of School on Smoking in Adolescents in Eyup, Istanbul, Turkey

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ABSTRACT

Objective: *The aim of this study was to determine the influence of smoking habits and education of family, parents, the type of school and gender on smoking in adolescents.*
Methods: *This cross-sectional study was performed on 1062 students from eight high schools in Eyup, Istanbul.*
Results: *Twenty-five per cent of students were current smokers (30.1% of boys [n = 551], 20.9% girls [n=511] 95% CI [26%, 34%] and [17%, 24%]* respectively, *(*$p < 0.05$*). Smoking rate was highest in vocational high schools and lowest in super high schools (33% [n = 406, 95% CI (29%, 38%)] and 11% [n = 127, 95% CI (6%, 17%)]* respectively, $p < 0.05$*). Smoking rate was higher in mothers (31.6% [n = 174, 95% CI (25%, 39%)] vs 15.5% [n = 336, 95%CI (12%, 19%)] and siblings (27.7% [n = 141, 95%CI (20%, 35%)] vs 18% [n = 350, 95%CI (14%, 22%)] of the female students who smoke than of those who did not smoke (*$p < 0.05$*). The rate of smoking in the siblings of 'smoker' boys was higher than that of 'non-smoker' boys (44.6% [n = 130, 95% CI (36%, 53%)] and 26.1% [n = 402, 95% CI (22%, 30%)]* respectively; $p < 0.05$*). The education level of 28%, [n=82, 95%CI (19%, 39%)] of the mothers of 'smoker' girls, and of 19.6% [n=429, 95% CI (16%, 23%)] of 'non-smoker' girls was high school and above (*$p < 0.05$*). The rate of high school and above education was higher in parents of male students who smoke than that in nonsmokers [45.1% and 27.9%, 95%CI (33%, 55%)] and (24%, 32%), respectively,* $p < 0.05$*. Number of smokers saying "Yes" in support of controlling smoking was less than non-smokers (*$p < 0.05$*).*
Conclusion*: Smoking rate was higher in boys, in vocational high schools and seems to be influenced by smoking habits and higher educational levels of their family members. This influence differs according to gender. Anti-tobacco messages should target family, friends and schools of adolescents.*

Impacto del Género, la Familia y el Tipo de Escuela Sobre el Hábito de Fumar en los Adolescentes en Eyup, Estambul, Turquía

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RESUMEN

Objetivo: *El objetivo de este estudio fue determinar la influencia del hábito de fumar y la educación de familia, los padres, el tipo de escuela y el género en el tabaquismo de los adolescentes.*
Métodos: *Este estudio transversal se realizó en 1062 estudiantes de ocho escuelas secundarias en Eyup, Estambul.*
Resultados: *Veinticinco por ciento de los estudiantes eran fumadores regulares (30.1% muchachos [n = 551], 20.9% muchachas [n = 511] (95% CI (26%, 34%) y (17%, 24%)* respectivamente**,** $p < 0.05$**).** *La tasa del hábito de fumar fue más alta en las escuelas secundarias vocacionales y más baja en las escuelas secundarias preuniversitarias (33% [n = 406, 95% CI (29%, 38%)] y 11% [n = 127, 95% CI (6%, 17%)]* respectivamente, $p < 0.05$*). La tasa del hábito de fumar fue más alta en las madres (31.6% [n = 174, 95% CI (25%, 39%)] frente a 15.5% [n = 336, 95% CI (12%, 19%]) y hermanos y hermanas (27.7% [n = 141, 95% CI (20%, 35%)] frente a 18% [n = 350, 95% CI (14%, 22%)] de las estudiantes*

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hembras que fuman, que la de aquellas que no fumaban. (p < 0.05). La tasa del hábito de fumar en los hermanos y hermanas de muchachos fumadores fue más alta que la de los muchachos que no fumaban (44.6% [n = 130, 95% CI (36%, 53%)] y 26.1% [n = 402, 95% CI (22%, 30%)] respectivamente; *p < 0.05). El nivel de educación de 28%, [n=82, 95% CI (19%, 39%)] de las madres de muchachas fumadoras, y de 19.6% [n=429, 95% CI (16%, 23%)] de muchachas no fumadoras fue escuela secundaria y por encima (p < 0.05). La tasa de educación de escuela secundaria y por encima, fue más alta en los padres de estudiantes varones que fuman que en aquellos de los no fumadores ([45.1% y 27.9%, 95% CI (33%, 55%) y (24%, 32%),* respectivamente) (*p < 0.05). El número de fumadores que dijo "Sí" en apoyo a ejercer control sobre el hábito de fumar fue menor que el de los no fumadores (p < 0.05).*

Conclusión: *La tasa del hábito de fumar fue más alta en los muchachos, en las escuelas secundarias vocacionales, y parece estar influenciado por el hábito de fumar y el nivel educacional más alto de los miembros de sus familias. Esta influencia difiere según el género. Los anuncios contra el consumo de tabaco deben ser dirigidos a la familia, los amigos y las escuelas de los adolescentes.*

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INTRODUCTION

Most smokers begin before 18 years of age (1). Several studies have investigated the factors that influence the smoking behaviour of adolescents (2–8). The influence of family members who smoke and their educational levels on female and male adolescents may show regional and cultural differences.

Cigarette smoking is an important health problem in Turkey (9). In the last 30 years, socio-economical and cultural change, and increased immigration to cities have occurred in Turkey. Parallel to this, an increase in tobacco smoking has been observed. In 1988, in a study that involved the whole Turkish population, smoking in the population over 15 years of age was found to be 44.5% [62.8% in males and 24.0% in females] (10). Tobacco smoking primarily affects adolescents in Turkey and adolescents who begin smoking become faithful smoking addicts. Prevention and a decrease of smoking among adolescents are important. For this reason, it is important to determine how adolescents approach cigarette smoking and to know the factors that influence their smoking habits.

In this study, the objectives were to determine the smoking habits, perceptions or attitudes about controlling smoking and to investigate the influence of family members who smoke and families' educational levels on the smoking habits of students; and also to determine the importance of gender on this influence in high school grade 10 students.

METHODS

Study Population

The study population was high school students in the Eyup district of Istanbul, Turkey. The Eyup district has 300 000 inhabitants. This study was performed in 8 of the 10 high schools in the district. Four of the eight high schools included in the study were regular high schools, 3 were vocational high schools and one was a commerce high school. In regular high schools, classes of students were divided into two groups. In the first group there were "regular high school" students and in the second group there were students of "super high schools"; the students in 'super high schools' are selected from students whose grades in primary and secondary schools are higher, and are educated for one more year than the regular high schools in foreign language. The total population of the high schools that were included in the study was 10 183. Tenth grade classes were selected as the target group. The total number of students in 10^{th} grade was 3224. One-third of these students were selected to be involved in the study. The total and sampled numbers of all 10^{th} grade students and branches of the schools were calculated. Classes were selected through cluster randomization method. By the assumption that overall prevalence will be high, we thought inclusion of a third of students from each type of school, would suffice. In the power analysis carried out after the study, power values were found to be 73%, 93% and 99%, respectively. After necessary permissions had been obtained from authorities, directors of schools were visited, and the aim and method of the study were explained. While the questionnaires were being given out, no teachers or directors were present in the classes to avoid undue influence; questionnaires were filled out anonymously. Twenty-four students who filled the questionnaire incompletely were excluded from the study. The distribution of students excluded from the study was as follows**:** 9 from vocational high school, 8 from regular high school, 4 from commerce high school, and 3 from super high school. The number of students who left the study showed an even distribution among school types. The final number of sampled students was 1062 [511 girls (48.1%), 551 boys (51.9%)] (Table 1). The Ethical Committee of Yedikule Training and Research Hospital for Chest Disease and Thoracic Surgery, Istanbul, Turkey, approved this study.

Questionnaire

The self-administered questionnaire had 25 questions in total. The first part comprised questions about demographical features of all students, educational levels, marital status and

Table 1: The total and studied numbers of 10th grade students and classes in all schools

	Vocational high school (3 school)	Commerce high school (1 school)	Regular high school (4 school)	Super high school (4 school)	Total
Total student number	1219	481	1142	382	3224
Sample student number	406	161	368	127	1062
Total class number	33	11	26	12	82
Sample class number	11	4	9	4	28

occupations of their mothers and fathers, their smoking status their knowledge about diseases related to smoking, their thoughts about legal precautions related to smoking and their attitudes toward smoking. To assess the knowledge of students about diseases related to cigarette smoking the question "Is cigarette smoking a major cause of these diseases" was asked. "Lung cancer, chronic bronchitis, oral cancer, laryngeal cancer, coronary disease, peripheral vascular disease, neonatal death and all" were given as answer choices. The students were asked to mark one or more of these choices. To test the students about prohibition of smoking, questions such as "There must be a health warning on cigarette packs" and "Cigarette advertisements should be prohibited" were asked. They answered the questions as "yes" or "no". To evaluate their smoking status, the students were asked: "Do you smoke?" (Yes, regularly/Yes, occasionally/tried a few times, smoked but quit/never smoked). The students who gave the answer 'smoked, but quit' were asked when they quit, how many cigarettes they were smoking daily and if they smoked regularly or occasionally. The smoking status of the students was defined as follows: a daily smoker smokes at least one cigarette daily; an "occasional smoker" smokes less than one cigarette daily; a "former smoker" smoked daily for at least six months prior to present time and who is a "non-smoker" at the time, a non-smoker never smoked, and students who smoked a few cigarettes with the aim of trying were described as "tried".

Questions in the second part applied to students who tried smoking, quit smoking or who smoke intermittently or regularly. Questions in this part comprised the reasons for trying or beginning to smoke, the age when they started smoking, the number of cigarettes smoked per day, brand of cigarettes, the complaints of students, whether they intended giving up smoking or not and whether they tried to give up smoking or not.

Statistical analysis

The study had a 99.7% power to detect a crude odds ratio of 2.04 for smoking in male students versus female students. Logistic regression was used to investigate the association of two or more independent or predictor variables with a two-category (binary) outcome variable. Pearson's Chi-square was used to determine independence between paired variables, with significance set at $p < 0.05$ and CI calculated. The data were analyzed using SPSS for Windows version 10.0.

RESULTS

The mean age of students was 16.24 years and standard deviation *(SD)* was ± 0.80; 25.7% of the students (30.1% of the boys and 20.9% of the girls; $p < 0.001$) were current smokers. The ratio of male students who were daily smokers was higher than female students and male students smoked more cigarettes daily (Table 2). According to types of high schools, the highest smoker rate was in vocational high schools with the percentage of 33% and the lowest smoker rate was 11% in students of super high school [$p < 0.001$] (Table 3). In female students who smoked compared to those who did not, the smoking ratios of mothers ($p < 0.001$) and siblings ($p < 0.05$) were found to be higher. In the male students who smoked compared to the male non-smokers, the smoking habit of their siblings was found to be higher [$p < 0.001$] (Table 4).

Table 2: Smoking status and daily cigarette consumption according to gender

	Boys	Girls	Total
Smoking status			
Daily smoker[1]	123 (22.3%)	59 (11.5%)	182 (17.1%)
Occasionally smoker	43 (7.8%)	48 (9.4%)	92 (8.7%)
Ex-smoker	14 (2.5%)	14 (2.7%)	28 (2.6%)
Tried	125 (22.7%)	123 (24.1%)	247 (23.3%)
Never smoked	246 (44.6%)	267 (52.3%)	513 (48.3%)
Number of cigarette			
1–10 number	61 (49.6%)	46 (78.0%)	108 (58.4%)
> 11 number[1]	62 (50.4%)	13 (22.0%)	77 (41.6%)

[1]$p < 0.001$

Table 3: The effect of gender and school type by odds ratio (OR) on smoking prevalence

	n (%)	OR (95% CI)
Gender		
Female	107 (20.9%)	1.0[1]
Male	166 (30.1%)	1.63 (1.2–2.1)
Type of school		
Super high school	14 (11.0%)	1.0[2]
Regular high school	79 (21.5%)	1.9 (1.1–3.1)
Commerce high school	45 (28.0%)	3.1 (1.6–6.0)
Vocational high school	135 (33.3%)	4.0 (2.2–7.3)

[1]$p < 0.001$, compare to males; [2]$p < 0.001$, compare to other schools

In both the mothers and fathers of male students who smoked, there was a higher proportion with exposure to high

Table 4: Family relation and smoking adolescents

	Boys		Girls	
	%	OR (95% CI)	%	OR (95% CI)
Father smoking				
No	27.7	1.0	19.4	1.0
Yes	32.4	1.3 (0.9–1.8)	22.2	1.2 (0.8–1.8)
Mother smoking				
No	29.1	1.0	15.5	1.0
Yes	32.8	1.2 (0.8–1.8)	31.6	2.5 (1.6–3.9)[2]
Sibling(s) smoking				
No	18.0	1.0	18.0	1.0
Yes	27.7	2.8 (1.5–3.4)[2]	27.7	1.7 (1.0–2.8)[1]
Father' education				
Less than high school education	27.0	1.0	21.5	1.0
High school graduate and more	36.7	1.6 (1.1–2.4)[1]	19.6	0.9 (0.5–1.4)
Mother's education				
Less than high school education	28.4	1.0	19.6	1.0
High school graduate and more	39.8	1.7 (1.0–2.7)[1]	28.0	1.7 (1.0–2.9)[1]

[1]$p < 0.05$, [2]$p < 0.001$

school and more formal education compared to non-smokers. Mothers of female students who smoked had a higher proportion of exposure to high school and more levels of formal education compared to mothers of non-smokers (Table 4).

The starting age of smoking was 12.81 and SD was ± 1.54 (5–17) for students and the duration time of smoking was 3.21 years and SD was ± 2.23. "Yes" answers to questions related to control of smoking were significantly lower in students who smoked compared to non-smokers [$p < 0.001$] (Table 5).

Table 5: Attitudes of adolescents about the control of smoking (percentage of 'yes')

	Smoker (%)	Non-smoker (%)	Total (%)	*P* value
There must be health warning on cigarette packs	76.6	89.1	85.9	$p < 0.001$
Cigarette advertisements should be prohibited	74.7	91.5	87.2	$p < 0.001$
Sale of cigarette to children prohibited	57.9	92.8	83.8	$p < 0.001$
Smoking in public places must be restricted	63.7	93.3	85.7	$p < 0.001$
Price of cigarette should be increased	27.8	74.3	62.3	$p < 0.001$
Smokers could stop smoking if they wanted	65.6	86.6	81.2	$p < 0.001$
It is annoying to be near a person who is smoking	69.6	93.7	87.5	$p < 0.001$
Adults should set a good example by not smoking	89	96.6	94.6	$p < 0.001$

For students who tried smoking, the most important reason was curiosity (71.7%) and current and former smokers, it was the desire to imitate friends (41.4%). Of the students who smoked, 58.2% had tried to quit smoking and 66.9% said that they thought they should quit.

DISCUSSION

In this study, current smoking prevalence among high school students (grade 10) was found to be 25.7%. Prevalence studies carried out in Turkey on middle school and high school students have revealed the following smoking rates: 10–43% in middle and high school students and 21.2–48.2% in university students (11). In a study conducted in 15 provincial capitals, current smoking rate among adolescents aged 16–17 years was 22.8% in students and 42.9% in adolescents who do not go to school but work (12). The high rate of smoking in high school students and the rising rate of university students reaching the smoking rates belonging to people above the age of 20 years, indicate that most of the smokers begin smoking before university. While studies conducted in Turkey in 2000 showed an 11% decrease in the prevalence of smoking in males, an increase was reported in young females (11). In Turkey, smoking rates of females, particularly women with high educational level belonging to vocational groups such as teachers (13) or physicians (14), have reached the same level as that of men. These data indicate that the 'smoke status' of Turkey is consistent with the 3rd stage of the tobacco epidemic. The authors believe that the high rate of smoking among high school students and adults, and the persistently increasing rates of smoking among women, occur due to the rapid transition of people from a traditional life-style to a consumer-based modern community. The eastern European region to which our country belongs has accounted for 25% deaths per year from tobacco smoking. The adult men of this region are predicted to be the group which will manifest the highest early mortality rate by 2020. In our country, 70 000 – 100 000 people are estimated to die each year due to diseases developing as a result of causes associated with smoking, and this number accounts for 14% of overall deaths occurring each year. The economic price of smoking to our country is estimated to be about 10 billion dollars per year (11). If the high frequency of smoking continues in Turkey, morbidity and mortality rates could increase due to diseases associated with smoking. Moreover, smoking will have significant negative influence on the country's economy, as well.

In this study, it was established that male students smoke more than female students and their daily number of cigarettes was also higher. In previous studies conducted in Turkey (12, 15–16), it was found that male students in high school and in the 1st year of university smoked at higher frequencies than female students. In the research that The Global Youth Tobacco Survey Collaborating Group performed around young people between ages 13–15 years in 6 regions, 76 countries, the male/female ratio in cigarette

smoking was found as 1.2:1 in America and Europe; 1.7:1 in the Western Pacific; 2.2:1 in Africa; 4.2:1 in Southeast Asia; 4.3:1 in the Eastern Mediterranean (17). Soyibo *et al* reported 16.6% smoking among high school students in Jamaica (18). In our study the male/female ratio in cigarette smoking was 1.4:1. Our study's male/female ratio in cigarette smoking was between the results found in America, Europe and the Western Pacific. Turkey is a country in a transition stage. This situation may be related to the decreasing positive role of traditional culture which does not favour cigarette smoking by women and children in developing countries (19).

According to types of high schools, the highest smoker-rate was in vocational high schools while the lowest smoker-rate was in super high schools. Wen *et al* found that students of vocational high schools smoked at higher rates than the students of regular high schools (3). Shamsuddin *et al* found that academic performance of smoker students was lower than that of non-smoker students (20). In the present study, as academic performance of high school students increased, smoking habits decreased.

In this study, there was correlation between smoking habits of family members and their educational levels and the smoking habits of high school students was different for female and male students. In previous studies, investigators found that having a 'smoker' father, (1, 20, 21) 'smoker' mother, (1, 22) 'smoker' mother and father, (23, 24) and a 'smoker' sibling (4, 8, 20, 21, 24) increased the risk of smoking in adolescents. In their studies Wen *et al* (3), Rasmussen *et al* (25) and Parna *et al* (23) found that smoking habits of mothers and fathers increased the risk of smoking for all students, especially for females. Burchfiel *et al* (8) determined that fathers' smoking habits increased the risk of smoking for male students while mothers' smoking habits increased the risk of smoking for female students. Burchfiel *et al* (8) and Simons-Morton B *et al* (6) found that having a mother who had a high educational level decreased the risk of smoking for students. In Turkey, Erbaydar *et al* (12) established that having mothers who had high educational levels increased the rate of smoking in female students. In developed countries, smoking rates decrease as educational levels of women increase. Contrary to this, studies carried out in Turkey showed that while smoking rates of men did not change with the increase of educational levels, this rate increased in women with the higher educational levels (9). In Turkish society, cigarette smoking by women and children is considered unusual but cigarette smoking of men and women who have high educational levels and economical independence is acceped. In the family, mothers constitute a role model especially for their daughters and they influence their daughters most. Thus, mothers' smoking habits may facilitate smoking in girls. In the family, boys have more common shares with their siblings (especially with their brothers) and they take them as role models frequently. In Turkey, mothers' and fathers' graduation from high school or university are accepted as good educational levels. In these types of families, they may get acquainted with cigarette smoking more easily.

Students who smoked compared to non-smokers gave less "yes" answers to questions related to control of smoking. The reason for this may be that they feel that smoking is appropriate for them and limitations will be to their disadvantage.

It must be noted that this study has the limitations of a cross-sectional study. This study consists of only one region. It did not comprise the whole country or all parts of the city. This study did not represent working adolescents who did not continue school in this district.

In conclusion, for the benefits of current and future public health, it is important to prevent young people from smoking and to encourage smokers to give up cigarette smoking. Parental smoking and educational levels of mothers and fathers influenced the smoking habits of adolescents. This influence was different for female and male adolescents. If smoking in adolescents and adults continues at a high rate, there will be negative effects on public health and the country's economy in the near future. The authors believe that anti-tobacco messages should be designed according to the local culture of every community and must target family, friends and schools and the gender difference in adolescents should be taken into consideration.

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