Nicotine Use Frequency and Addiction among Medical Students

Zeynep Meva Altaş[1] iD, Jehan Al-Shubaki[2] iD, Sawsan Qawasmi[2] iD, Amer Salameh[2] iD, Nebras Balkhi[2] iD, Dania N.Abouarra[2] iD, Thanaa Al-Tareb[2] iD, Seyhan Hıdıroğlu[1] iD

[1] Marmara University, Faculty of Medicine, Department of Public Health İstanbul, Türkiye.
[2] Marmara University, Faculty of Medicine, Medical Student İstanbul, Türkiye.

Correspondence Author: Zeynep Meva Altaş
E-mail: zeynep.meva@hotmail.com

ABSTRACT

Objective: Evaluating the rate of smoking and factors associated with nicotine addiction in university students will provide target-oriented interventions for students. For this reason, this study aims to measure the frequency of nicotine use and nicotine dependence and related factors among medical students.

Methods: In this cross-sectional study, an online questionnaire about nicotine use frequency and dependence was sent to a state university's medical students via mobile phones. No sample size was calculated, instead, the study aimed to reach a total of 1522 medical students. The Fagerström Nicotine Dependence Test was used to measure nicotine dependence levels. $p < .05$ was considered as statistically significance level.

Results: Of the students, 79.3% (n=306) were non-smokers, 14.7% (n=57) were smokers and 6.0% (n=23) of the students were ex-smokers. Male students, students not living with their families, students with a higher income, and those having at least one smoking parent had statistically significantly higher smoking rates $(p < .05)$. According to the Fagerström Test, of the smoking students, 63.2% (n=36) had low nicotine dependency, 33.3% (n=19) had moderate nicotine dependency, and 3.5% (n=2) showed high nicotine dependency.

Conclusion: Smoking rates were high in medical students, despite the medical knowledge related the negative health outcomes. And students had high level of nicotine dependence. Further studies are needed about the strategies on the prevention of smoking among medical students.

Keywords: Medical students, smokers, nicotine use, nicotine dependence, The Fagerström Nicotine Dependence Test

1. INTRODUCTION

Nicotine dependence which is one of the major addiction problems, is experienced worldwide. It is important to study and understand the frequency of nicotine usage and addiction as according to Benowitz (2010) smoking is the leading cause of preventable death (1). Tobacco use causes more than 7 million deaths per year and the chance that a lifelong smoker will die prematurely from a complication of smoking is approximately 50% (1).

According to the World Health Organization (WHO), the tobacco epidemic is one of the biggest public health threats the world has ever faced (2). Investigation of the smoking prevalence is important to fight the epidemic of smoking. Special populations like students should be also concerned in epidemiological studies. Because it is important to know the challenges before taking action against tobacco usage.

According to the results of the National Household Health Survey 2017 study, the percentage of tobacco use in Turkey was found to be 43.6% for males, and 19.7% for females, and 31.6% for the whole population (3). In the same study, the percentage of current smokers between ages 15-29 years was 44.6% for males, 15.9% for females, and 30.6% for both sexes (3). A study conducted on university students of two different faculties in Turkey (social sciences and health sciences) states that 20.6 % of the students are smoking. In the same study students of health sciences faculties smoke less than social sciences' students (4).

Nicotine dependence can be associated with many factors. A cross-sectional study conducted in Jordan among university students from 3 public and 3 private Jordanian universities states that of the 892 participants, 51.2% were nicotine dependent. Students who started smoking before 18 years of age, had a smoking family member and were studying at governmental universities had higher nicotine dependence levels (5). Another study, a study regarding socio-demographic factors that affect the use of tobacco in 13 low

and middle-income countries, including Turkey, found that a positive association between the prevalence of tobacco use and education level in Turkey exists (6). According to a recent study conducted on university students in Turkey, 31.4% of the students were moderately and 13.4% were highly dependent on nicotine (7).

Even though nicotine usage has harmful effects on health and well-being, it is still commonly seen among university students. Evaluating the rate of smoking and factors associated with nicotine addiction in university students will provide target-oriented interventions for students. For this reason, this study aims to measure the frequency of nicotine use and nicotine dependence and related factors among medical students.

2. METHODS

2.1. Study Design and Students

The study was conducted from February to May 2021. In this cross-sectional type of study, an online questionnaire prepared using Google Docs about nicotine use frequency and dependence was sent to medical students via WhatsApp application. The study population for this study was a state university's medical students of the academic year 2020-2021. Total number of medical students in this university was 1552 for the 2020-2021 academic year. No sample size was calculated; instead, the study aimed to reach a total of 1522 medical students: 290 1st year students, 255 2nd year students, 236 3rd year students, 265 4th year, 261 5th year, and 216 6th year. Before the students were given access to the questions, informed consent was taken. Students checked the "I have read and agree to the terms of this questionnaire" button. No identity information was requested from the students and the questionnaires were filled anonymously.

2.2. Instruments

The questionnaire consisted of 21 questions: 6 demographic questions, 6 questions from the Fagerström test for nicotine dependence, and 9 questions related to smoking prevalence among students.

The Fagerström Nicotine Dependence Test (FTND) is a standard international tool used to assess the intensity of physical nicotine dependence. It is reliable and validated for the Turkish population (8). FTND provides a measure that evaluates cigarette consumption and nicotine dependence. Each item of the six-item scale is scored between 0 and 3 points, and the range of points that can be obtained from the scale varies between 0 and 10. According to the total scores obtained from the scale, nicotine dependence is graded in three groups low (0-3 points), moderate (4-6 points), and high (7-10 points) (9).

2.3. Statistical Methods

The analysis of the data was done with SPSS (Statistical Package for Social Sciences) for Windows 25.0 program. Descriptive

data were presented with median, interquartile range (IQR), number (n) and frequency (%). In the analysis of the data, the Chi-square test was used for categorical variables. The Mann-Whitney U test was used for comparison of continuous variables that did not fit the normal distribution. $p < .05$ was considered as statistically significance level.

2.4. Ethical Concerns

In order to conduct the research, institutional permission was obtained from the university where the study was conducted. In addition, ethics committee approval was obtained from the ethics committee of the studied university (Date: 05.02.2021, decision number= 09.2021.213). After providing information about the study, informed consent was obtained from the students.

3. RESULTS

The total number of students was 386. The median age of the students was 21 years (IQR=2). The median age of onset of smoking was 17 years (IQR=2).

Of the students, 60.9% (n=235) were females, 39.1% (n=151) were males. The majority of students who answered the questionnaire were in the preclinical phase. Most of the students were 2nd year students 28.5% (n=110). Of the students, 67.4% (n=260) lived with their families. Most of the students, 58.0% (n=224), had a monthly income of more than 1000 TL (Table 1).

Table 1. Sociodemographic features of the students

Characteristic	n	%
Total	386	100.0
Gender		
Male	151	39.1
Female	235	60.9
Year of education		
1st	86	22.3
2nd	110	28.5
3rd	88	22.8
4th	36	9.3
5th	28	7.3
6th	38	9.8
Place of living		
With family	260	67.4
At a dormitory	26	6.7
Apartment with friends	46	11.9
Apartment alone	54	14.0
Monthly Income		
More than 500 TL	27	7.0
500-1000 TL	135	35.0
More than 1000 TL	224	58.0

Of the students, 79.3% (n=306) were nonsmokers, 14.7% (n=57) were smokers and 6.0% (n=23) of the students were ex-smokers. 64.5% (n=249) of the students' parents were

both non-smokers. 22.3% (n=86) of students indicated that only their father smokes, and 5.2% (n=20) indicated that only their mother smokes. 8.0% (n=31) of the students' parents were both smokers (Table 2). Of the smokers, 59.6% (n=34) smoke less than 10 cigarettes a day, 28.1% (n=16) 11-20 cigarettes per day, 12.3% (n=7) 21-30 cigarettes per day.

Table 2. Smoking frequency and parental smoking

Characteristic	n	%
Smoking Status		
Yes	57	14.7
No	306	79.3
Ex-Smoker	23	6.0
Parental Smoking Status		
Both Parents Smoke	31	8.0
Only Mother Smokes	20	5.2
Only Father Smokes	86	22.3
Neither Parent Smokes	249	64.5

Male students, students not living with their families, students with a higher income and having at least one smoking parent had statistically significantly higher smoking rates. There was no significant relationship between smoking and the class of students (p= .760). While 23.8% (n=36) of male students were smoking, 8.9% (n=21) of female students were smokers (p< .001). While 11.5% (n=30) of those living with their family were smoking, 21.4% (n=27) of those not living with their family were smokers (p= .010). 18.8% (n=42) of those with high incomes and 9.3% (n=15) of those with low income were smokers (p= .009). Smoking percentage was 20.4% (n=28) among students having smoking parents and 11.6% (n=29) among students whose parents were not smoking (p= .020) (Table 3).

Table 3. Smoking and related factors

	Smoking			
	Yes n (%)	No-Quitted n (%)	Total n (%)	p value
Gender				
Male	36 (23.8)	115 (76.2)	151 (100.0)	< .001
Female	21 (8.9)	214 (91.1)	235 (100.0)	
Class				
1-2-3	41 (14.4)	243 (85.6)	284 (100.0)	.760
4-5-6	16 (15.7)	86 (84.3)	102 (100.0)	
Living With Family				
With Family	30 (11.5)	230 (88.5)	260 (100.0)	.010
Other	27 (21.4)	99 (78.6)	126 (100.0)	
Income				
Low (<1000 TL)	15 (9.3)	147 (90.7)	162 (100.0)	.009
High (>1000 TL)	42 (18.8)	182 (81.3)	224 (100.0)	
Parental Smoking				
At least one of them smokes	28 (20.4)	109 (79.6)	137 (100.0)	.020
Neither of them smokes	29 (11.6)	220 (88.4)	249 (100.0)	

Of the smoking students %63.2 (n=36) were in the low-dependency group, 33.3% (n=19) were in moderate-dependency group, and 3.5% (n=2) were in high dependency group on smoking. When the effect of gender on nicotine dependence was examined, 66.7% (n=24) of males showed low nicotine dependence, whereas 57.1% (n=12) of females showed low nicotine dependence. No statistically significant relationship was found between gender and nicotine dependency levels (p= .472). Of the clinical phase students 68.8% (n=11) showed moderate-high dependence on nicotine, whereas this percentage was lower in preclinical phase students as 24.4% (n=10). Clinical phase students had a significantly higher percentage of moderate-high dependence on nicotine when compared with the preclinical phase students (p= .002). Of the students living with their families 76.7% (n=23) showed low nicotine dependence, whereas other smoking students who didn't live with a family 49.1% (n=13) showed low dependence. Low dependence levels were statistically higher in students living with their families (p=0.026). The percentage of moderate-high dependence levels of the students with lower income was 13.3% (n=2), whereas 36.8% (n=19) of the students with higher income had moderate-high dependence levels. Moderate-high dependence was significantly higher in students with high income (p= .028). Of the students having at least one smoking parent, 50.0% (n=14) of them had moderate-high dependence. On the other hand, 24.1% (n=7) of the students whose parents did not smoke showed moderate-high dependence. Moderate-high dependence was significantly higher in students with smoking parents (p= .043) (Table 4).

Table 4. Dependency levels and related factors

	Dependency Level		Total n (%)	p value
	Low n (%)	Moderate-High n (%)		
Gender				
Male	24 (66.7)	12 (33.3)	36 (100.0)	.472
Female	12 (57.1)	9 (42.9)	21 (100.0)	
Class				
1-2-3	31 (75.6)	10 (24.4)	41 (100.0)	.002
4-5-6	5 (31.3)	11 (68.8)	16 (100.0)	
Living With Family				
With Family	23 (76.7)	7 (23.3)	30 (100.0)	.026
Other	13 (49.1)	14 (51.9)	27 (100.0)	
Income				
Low (<1000 TL)	13 (86.7)	2 (13.3)	15 (100.0)	.028
High (>1000 TL)	23 (63.2)	19 (36.8)	42 (100.0)	
Parental Smoking				
At least one of them smokes	14 (50.0)	14 (50.0)	28 (100.0)	.043
Neither of them smokes	22 (63.2)	7 (24.1)	29 (100.0)	

The median age of low-dependency smokers was calculated to be 21.0 (3.0) and for moderate-high dependency levels 22.0 (4.5). The relationship between age and dependency

levels does not appear to be statistically significant (p= .172). The median age was 18.0 (2.0) for low-dependency smokers to start smoking and 17.0 (2.0) for moderate to high-dependency smokers. There was no statistically significant relationship between the beginning age of smoking and dependency levels (*p*= .917).

Of the students who were smokers 73.7% (n=42) had tried to quit smoking previously. 26.3% (n=15) never tried to quit smoking. Of the smoking students 87.7% (n=50) were thinking about quitting in the future. On the other hand, 12.3% (n=7) of smokers were not thinking about quitting.

4. DISCUSSION

Smoking remains the leading cause of preventable death worldwide. For this reason, investigating the prevalence and dependency levels and the relationship between nicotine dependence and social factors is important to understand how to implement effective smoking-cessation methods.

It is assumed that smoking rates will decrease if awareness regarding the dangers of consuming nicotine can be increased in society. The medical faculty students act as role models as they are a scientifically literate part of the public, in the sense that they are educated on the dangers of smoking tobacco. According to a recent study with 8045 respondents, the rate of tobacco consumption in Turkey is approximately 33.0% (10). Approximately 15.0% of medical students were smokers in our study. This percentage is similar to other studies conducted among university students of health science-related faculties (17.0%-20.0%) (11-14). However, according to a recent study, smoking rates are higher among university students of arts, social sciences, business administration, engineering, and agriculture faculties (smoking rates are between 19.6%-45.0%) (15). These results could be explained by the fact that medical students are expected to have increased awareness regarding the risk of smoking and nicotine consumption, hence smoking prevalence is lower among medical students relative to other university students.

The percentage of male and female smokers in our study was 23.8% and 8.9%, respectively. These findings were mirrored in other medical faculties in Turkey according to Cooper et al. (13) and health profession students in Europe and the Americas as per Sreeramareddy et al. (14). Bozkurt et al. conducted a study about the pattern of smoking behavior and associated factors affecting smoking use in the South-East Anatolian region of Turkey. The findings of the study, concerning gender, indicated that smoking is almost five times more frequent in males compared to females (16). The differences in the frequency between male and female cigarette smoking could stem from cultural and behavioral differences (17).

Although male smoking rates exceed those of females, 42.9% of female smokers exhibited a moderate to high dependency level, in contrast to males, where the moderate to high dependency level was 33.3%. This could be explained by the fact that females experience more stress than males, as is shown in the studies (18, 19). Higher stress levels

could explain the increased dependence on nicotine which is seen in females. Dependency levels according to which phase the students were in (preclinical vs. clinical) showed a statistically significant relationship. Moderate-high level of dependency rate of clinical phase students was significantly higher than preclinical students (68.8% vs 24.4%). According to the literature, psychosocial stress is a significant risk factor for cigarette smoking (20). It is reasonable to draw the same conclusion about dependency levels and the increased perceived stress of clinical years of medical school. As indicated in a similar study, medical students may have anxiety due to challenges in clinical practice and lack of experience in performing academic tasks which is associated with the transition to the clinical phase (21).

Our study shows a statistically significant relationship between higher income levels and higher dependency levels, as the percentage of those with higher income who had moderate to high nicotine dependency was 36.8% compared to 13.3% of people with lower income. These results were not consistent with the results of the Chen et al. study, which suggests an association of higher scores on the Fagerström Test for Nicotine Dependence with lower income and job status (22). The possible reason behind these findings could be that higher income means that the students can financially support the smoking habit, as higher cigarette prices were inversely proportional to adult smoking levels in low – and middle-income countries as was shown by the Kostova et al. study that included Turkey as one of the participating countries (23).

The results of our study also show that smokers who had smoking parents were more likely (50.0% vs 24.1%) to show moderate-high dependence levels. It is suggested that parental smoking is a strong predictor that a child will become a smoker in the future (24). Moreover, these smokers likely picked up the habit from social circles such as having smoker family members or friends, since a strong driver to initiation of smoking is close friends and siblings or vulnerability to peer pressure, especially during the ages of 13-17 years as suggested by the studies (25, 26). The low nicotine dependence scores for students who had non-smoker parents also suggest that they are likely capable of dropping the habit more easily compared to those with smoker parents, as they are not as exposed to the habit or second-hand smoke in their home environments, as is concluded by a study (27).

4.1. Limitations and the Strengths of the Study

This study had several limitations. First, since the questionnaire was administered online, participation must have been affected. This is particularly seen in clinical students' return rate which was lower than that of preclinical students. Students who do not have smartphones or who do not use WhatsApp could not be reached. This can cause a biased sampling of our study. Moreover, reporting bias is also possible since the questionnaire was self-administered. Furthermore, while the honesty of the participant could

be called into question, the fact that it was submitted anonymously means there was no fear of reprisal and thus may be no reason to hide the truth. Since our participation rate was not very high, the cross-sectional nature of the study is limited in terms of representing the population.

The study contributes to the literature, giving data on the frequency of smoking and evaluating nicotine dependence with the Fagerström Nicotine Dependence Test, which is a valid measurement tool. The results of the study provide additional data on the frequency of smoking among medical students in Turkey.

5. CONCLUSION

Smoking rates were high among medical students, despite the medical knowledge related to the negative health outcomes. And students had high levels of nicotine dependence. Further studies are needed about the strategies for the prevention of smoking among university students. Prevention programs and campaigns targeting university students should be arranged and available to the students. Provided with the right guidance and tools, medical students can be equipped to permanently quit and aid in the quitting of their patients in the future.

There is a need for qualitative studies to be conducted in this area in order to understand the reasons that lead medical school students to smoke, the factors that may be related to nicotine addiction, and the barriers to quitting. There is a need for educational updates in the curriculum of the students that will draw attention to the harmful effects of smoking. Students should be informed about the practices that support smoking cessation, such as smoking cessation polyclinics. Implementing practices that prevent smoking, such as restricting smoking areas within the faculty, are among the practices that can reduce smoking rates among students. In faculties, psychological counselling should be planned especially for students with high nicotine dependence. In summary, we think that effective smoking-cessation methods among medical students can be implemented with the help of ongoing psychological, environmental, and educational support.

REFERENCES

[1] Benowitz NL. Nicotine addiction. N Engl J Med. 2010; 362 (24): 2295–2303. doi: 10.1056/NEJMra0809890.

[2] Tobacco. World Health Organization. Accessed [01September 2022] https://www.who.int/news-room/fact-sheets/detail/tobacco

[3] National Household Health Survey In Turkey Prevalence of noncommunicable disease risk factors, 2017. Accessed [01 September 2022] https://apps.who.int/iris/bitstream/handle/10665/342200/978.928.9053136-eng.pdf?sequence=1&isAllowed=y

[4] Oğuz S, Çamcı G, Kazan M. The Prevalence of cigarette smoking and knowing status for diseases caused by smoking among university students Van Tıp Derg. 2018; 25(3): 332-337. DOI: 10.5505/vtd.2018.02411.

[5] Khader YS, Alsadi AA. Smoking habits among university students in Jordan: Prevalence and associated factors. East. Mediterr. Health J. 2008; 14 (4): 897-904.

[6] Palipudi KM, Gupta PC, Sinha DN, Andes LJ, Asma S, McAfee T; GATS Collaborative Group. Social determinants of health and tobacco use in thirteen low and middle income countries: Evidence from Global Adult Tobacco Survey. PLoS One. 2012;7(3):e33466. DOI: 10.1371/journal.pone.0033466.

[7] Terzi O, Kumcagiz H, Terzi M, Dundar C. Cigarette smoking and determination of nicotine dependence levels in university students. ADDICTA: The Turkish Journal on Addictions. 2019; 6(S4): 168-182. DOI: 10.5152/addicta.2020.19134.

[8] Uysal A, Kadakal F, Karşıdağ C, Bayram NG, Uysal O, Yılmaz V. Fagerstrom nikotin bağımlılık testinin türkçe versiyonunun güvenirliği ve faktör analizi. Tuberk Toraks. 2004;52:115-21. (Turkish).

[9] Fagerstrom K, Shneider NG. Measuring nicotine dependence: A review of the Fagerstrom Tolerance Questionnaire. J Behav Med. 1989;12:159-81. DOI: 10.1007/BF00846549.

[10] Ilhan MN, Arikan Z, Kotan Z, Tunçoğlu T, Pinarci M, Taşdemir A, Ay B, Koçak N. prevalence and socio-demographic determinants of tobacco, alcohol, substance use and drug misuse in general population in Turkey. Noro Psikiyatr Ars. 2016;53(3):205-212. DOI: 10.5152/npa.2015.10050.

[11] Tarı Selçuk K, Avcı D, Mercan Y. Smoking addiction among university students and the willingness and self-efficacy to quit smoking. Clin Exp Health Sci. 2018; 8: 36-43. DOI: 10.5152/clinexphealthsci.2017.420.

[12] Alotaibi SA, Alsuliman MA, Durgampudi PK. Smoking tobacco prevalence among college students in the Kingdom of Saudi Arabia: Systematic review and meta-analysis. Tob. Induc. Dis. 2019; 17. DOI: 10.18332/tid/105843.

[13] Cooper R. Görceğiz P. Aktürk N, Akyol SE, Pocari E. Smoking habits of medical school students in Turkey: Has anything changed? Turk J Cancer. 2004; 34: 146-149.

[14] Sreeramareddy CT, Ramakrishnareddy N, Rahman M, Mir IA. Prevalence of tobacco use and perceptions of student health professionals about cessation training: Results from Global Health Professions Students Survey. BMJ Open. 2018; 8(5): e017477. DOI: 10.1136/bmjopen-2017-017477.

[15] Hassan MS, Hossain MK, Khan HT. Prevalence and predictors of tobacco smoking among university students in Sylhet

Division, Bangladesh. International Health 2019; 11(4): 306-313. DOI:10.1093/inthealth/ihy091.

[16] Bozkurt AI, Sahinöz S, Özçırpıcı B, Özgür S, Sahinöz T, Acemoglu H, Saka G, Ceylan A, Palancı Y, Ilçln E, Akkafa F. Patterns of active and passive smoking, and associated factors, in the South-east Anatolian Project (SEAP) region in Turkey. BMC Public Health. 2006; 6(1): 1-8. DOI:10.1186/1471-2458-6-15.

[17] Sieminska A, Jassem E. The many faces of tobacco use among women. Med Sci Monit. 2014; 20:153–162. DOI: 10.12659/MSM.889796.

[18] Holden C. Sex and the suffering brain. Science. 2005; 308(5728): 1574. DOI: 10.1126/science.308.5728.1574.

[19] Kudielka BM, Kirschbaum C. Sex differences in HPA axis responses to stress: A review. Biol Psychol. 2005; 69(1): 113–132. DOI: 10.1016/j.biopsycho.2004.11.009.

[20] Lawless MH, Harrison KA, Grandits GA, Eberly LE, Allen SS. Perceived stress and smoking-related behaviors and symptomatology in male and female smokers. Addict Behav. 2015; 51: 80–83. DOI: 10.1016/j.addbeh.2015.07.011.

[21] Mohd Sıdık S, Rampal L, Kaneson,N. Prevalence of emotional disorders among medical students in a Malaysian university. Asia Pacific Family Medicine. 2003;2(4): 213-217. DOI: 10.1111/j.1444-1683.2003.00089.x.

[22] Chen A, Machiorlatti M, Krebs NM, Muscat JE. Socioeconomic differences in nicotine exposure and dependence in adult daily smokers. BMC Public Health. 2019; 19(1):375. DOI:10.1186/s12889.019.6694-4.

[23] Kostova D, Tesche J, Perucic AM, Yürekli A, Asma S, GATS Collaborative Group. Exploring the relationship between cigarette prices and smoking among adults: a cross-country study of low – and middle-income nations. Nicotine Tob Res. 2014; 16 Suppl 1:10–15. DOI: 10.1093/ntr/ntt170.

[24] Bauman KE, Fisher LA, Bryan ES, Chenoweth RL. Antecedents, subjective expected utility, and behavior: A panel study of adolescent cigarette smoking. Addic Behav. 1984; 9(2): 121–136. DOI: 10.1016/0306-4603(84)90050-9.

[25] Saari AJ, Kentala, J, Mattila KJ. The smoking habit of a close friend or family member—how deep is the impact? A cross-sectional study. BMJ Open. 2014; 4(2): e003218. DOI: 10.1136/bmjopen-2013-003218.

[26] McGee CE, Trigwell J, Fairclough SJ, Murphy RC, Porcellato L, Ussher M, Foweather L. Influence of family and friend smoking on intentions to smoke and smoking-related attitudes and refusal self-efficacy among 9-10 year old children from deprived neighbourhoods: a cross-sectional study. BMC Public Health. 2015; 15(1): 1-11. DOI: 10.1186/s12889.015.1513-z.

[27] Erbaydar T, Lawrence S, Dagli E, Hayran O, Collishaw NE. Influence of social environment in smoking among adolescents in Turkey. Eur J Public Health. 2005; 15(4): 404–410. DOI:10.1093/eurpub/cki040.