

The Smoking Status and Attitudes of Medical School Students in a University of Nicosia

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BACKGROUND AND AIMS

The smoking prevalences of physicians and medical students continue to preserve their high levels around the world. This study is the 2018 survey of a broader intervention started in 2017, aiming to monitor the smoking status of medical students in a multinational university of Northern Cyprus.

MATERIAL and METHODS

The universe of this cross-sectional study was all of the 1,461 medical students registered at the medical school for the academic year 2018-2019. The data were collected by a self-administered questionnaire applied under direct observation. Of the students, 1,304 responded to the questionnaire with a response rate of 89.3%. The data were analyzed by Statistical Package for the Social Sciences (SPSS) version 18.0 (IBM SPSS Corp.; Armonk, NY, USA), with $P < .01$ evaluated as significant.

RESULTS

The participants were from 31 counties, the majority being citizens of the European-Central Asian country group. The overall smoking frequency was 33.7%, with 42.1% for males and 26.1% for females. While 26.8% consumed tobacco products other than cigarettes, 50.8% of smokers had starting smoking after registered to medical school. Sub-Saharan African country citizens smoked least by 6.0%, and the European-Central Asian group smoked most by 35.7%. Nonsmokers displayed significantly more positive attitudes for tobacco regulations and doctors being role models, compared to smokers.

CONCLUSION

The results of this survey revealed a high tobacco use frequency in spite of a medical curriculum including a specific tobacco program. Stronger educational and other behavioral interventions are needed to alter the smoking behaviors of medical students, and thus, medical education should be modified accordingly.

Keywords: Smoking, tobacco use frequency, attitudes, medical students, Northern Cyprus

INTRODUCTION

Tobacco use is a major public health problem globally and specifically in developing countries, resulting in more than seven million deaths per year according to the World Health Organization (WHO). More than one billion people of our planet are smokers.¹

Health professionals and particularly doctors are in a position to curb health problems related to tobacco use by community approaches. Attitudes and behaviors of doctors and their role model functions are influential on increasing the willingness of their patients to quit smoking, as well as in affecting other lifestyle behaviors.²⁻⁵ A number of studies conducted during the last decades of the previous century and up to the present time have revealed the efficacy of physician's role in assisting individuals for smoking cessation, and doctors with good lifestyle behaviors have a better chance for this end.³⁻⁵ Yet, smoking among doctors and medical students continues to stay high in many countries, in spite of the WHO and World Medical Association efforts to assist medical doctors globally and to guide national medical associations for effective measures.²

The tobacco use attitudes and behaviors of doctors and medical students are well documented by ample research worldwide.⁵⁻¹⁰ For example, a study of 2008-2012 from Brazil found the level of agreement of the students with the WHO recommendations as high. The prevalence of cigarette smoking was 5.2%, but 43.8% of the students reported experimenting water-pipe,¹¹ whereas a study among medical students of Saudi Arabia reported a 13% smoking frequency among male students.¹² According to an international review of 2007 on tobacco smoking among medical students, the prevalence ranged from 3% in the United States to 58% in Japan.¹³ In general, the attitudes and behaviors of medical students in this respect closely reflect the community they are a part of, just as the medical doctors and other health professionals.

Turkey is one of the countries with a considerable number of studies on the tobacco issue conducted during recent decades. On the average, the frequencies of smoking among medical students were found in the range of 30-40% in Turkey during late 1990s and early 2000s.¹⁴⁻¹⁶

Smoking frequency is consistently higher for male medical students than females, and the smoking rates increase with the advancing years of medical education¹⁴⁻¹⁷ in Turkey. In one study, smoking frequency was 34.5% in the first year rising up to 44.2% in the sixth year of medical school.¹⁷

Comprehensive tobacco control education in the medical curriculum is crucial for preventing the initiation of the smoking habit or lowering the prevalence of smoking among medical students and assisting the students to identify themselves as nonsmoking role models for the community.^{5,13}

This study is part of an intervention study designed to follow-up the students in a medical school of the Turkish Republic of Northern Cyprus (TRNC). The aim is to monitor the students as

to the changes in trends of smoking attitudes and behaviors in relation to the impact of educational interventions.

Objectives

The objective of this study is to determine the tobacco use prevalence and attitudes regarding tobacco use among medical students in a university of Northern Cyprus for the year 2018.

The broader and long-term objectives of this study include monitoring tobacco use prevalence among medical students of the Near East University between 2017 and 2021 and to follow-up the changes in smoking behaviors of the students after integrating comprehensive tobacco education into the NEU medical curriculum.

MATERIAL and METHODS

The university where the study was conducted is located in Nicosia, Northern Cyprus, and accepts citizens of countries from various regions of the world. The current study was designed as a cross-sectional survey with the aim of accessing all the 1,461 medical students registered at the Turkish and English programs of the Medical School in December 2018.

The data were collected by a questionnaire of 12 questions developed by the researchers and applied under direct observation. The questionnaire included four questions on sociodemographic features and eight questions on smoking behaviors and attitudes, which were developed in compliance with WHO adult questionnaires for Global Adult Tobacco Survey.¹⁸⁻²⁰ The questions were revised, so that the best input from the participants would be attained. Besides, some adaptations were performed relevant to the local conditions, i.e., the grouping of number of cigarettes per day. The questionnaire has been attached as Appendix I.

Statistical Analysis

The data collected were analyzed by Statistical Package for the Social Sciences (SPSS) version 18.0 (IBM SPSS Corp; Armonk, NY, USA) program. Chi-square and Fisher's exact tests were used for determining the differences of the groups, and $P < .01$ was evaluated as significant.

Ethics Approval and Consent to Participate

An informed consent of the participants was requested, and anonymity of the responses was guaranteed. Permission from the dean of the Faculty of Medicine and the approval of the Ethics Committee of the university were provided (Report No. YDU/2017/52-482 for the English medical program students and YDU/2018/54-516 for the Turkish medical program students, dated November 22, 2018).

Terms and Definitions

The following terms and definitions based on WHO guidelines were used in accordance with the context of the study²⁰⁻²²:

Current smoker: Percentage of adults who currently smoke tobacco.

Daily smoker: Percentage of adults who currently smoke tobacco daily.

Occasional smoker: Percentage of adults who currently smoke tobacco less than daily.

Main Points

- The smoking status was found higher in this study than most medical student studies, probably related to the high smoking atmosphere in Northern Cyprus; smoking frequency is significantly higher among male students with 42.1% for males and 26.1% for females.
- Exposure to various forms of passive tobacco smoke was stated by %80.7 of the participants in our study, particularly in cafes and restaurants but in the university campus and facilities as well.
- More students have started smoking after registering to the medical school (50.8%) and smoking status increased with advancing years of medical education, revealing the necessity of early and more comprehensive tobacco education throughout the medical curriculum.
- In addition to increasing education on tobacco, it is crucial to fully implement all tobacco control measures in medical school including banning sales of tobacco products in the university campuses.
- All campuses should be smoke-free and the rules and regulations regarding tobacco use should be strictly supported and enforced.

Table I. Some Sociodemographic Characteristics and Smoking Features of the NEU Medical Students (Nicosia, December 2018) (N = 1,304)

Sociodemographic Characteristics	n	%
Age Group (years) (n = 1,292)		
≤17	24	1.9
18–24	1,180	91.3
≥25	88	6.8
	Mean ± SD = 21.3 ± 2.3; minimum = 16; maximum = 39	
Sex (n = 1,304)		
Male	623	47.8
Female	681	52.2
Lifetime Smoking (n = 1,304)		
Never	541	41.5
Only tried	214	16.4
Former smoker	109	8.4
At least one cigarette daily	337	25.8
Less than one cigarette daily	103	7.9
Use of Noncigarette Tobacco Products (n = 1,060)		
Never	776	73.2
Water pipe (Narghile)	249	23.5
Electronic cigarettes	15	1.4
Cigar	11	1.0
Pipe	9	0.9
Male students (n = 503)	194	38.6
Total	284	26.8
Current Cigarette Smoking Status (n = 1,304)		
Nonsmoker	865	66.3
Smoker	439	33.7
Number of Daily Cigarettes Consumed by Smoker Students (n = 435)		
Occasional (less than 1 daily)	70	16.1
1-5	88	20.2
6-10	95	21.9
11-20	128	29.4
Over 20	54	12.4
Duration of Smoking (n = 578)*		
One year or less	136	23.5
2-5 years	317	54.8
6-10 years	109	18.9
More than 10 years	16	2.8
Initiation of Smoking in Relation to Starting Medical School (n = 478)		
Before	235	49.2
After	243	50.8

*Includes exsmokers as well.

Former smoker: Percentage of adults who are ever daily and occasionally tobacco smokers and currently do not smoke tobacco.

Cigarette smoker: Percentage of adults who currently smoke cigarettes.

Current tobacco user: Percentage of adults who currently use tobacco (current daily and less than daily tobacco smokers and/or smokeless tobacco users).

RESULTS

The total number of students studying at the Turkish and English programs of the Medical School was 1,461 in December 2018. The number of students who responded to the questionnaire was 1,304, comprising a response rate of 89.3%. The majority of the Turkish medical program students (97.5%) are citizens of Turkey and TRNC. Most of the English medical program students (75.6%) are from five countries, Turkey, Nigeria, Syria, Jordan, and TRNC, in descending order.

Table I shows some sociodemographic characteristics, and the cigarette and noncigarette tobacco product use features of the participants.

Of the participants, 57.9% are lifetime nonsmokers and 33.7% are current smokers, while 76.4% of the smokers are daily smokers and 12.4% smoke more than 20 cigarettes per day. Of the smokers and former smokers together, 54.8% reported a smoking duration of 2-5 years. Notably, 50.8% of the smokers stated they started smoking after admittance to medical school.

Consumers of noncigarette tobacco products comprise 26.8% of the total participants. 17.7% of the nonsmokers and 44.2% of the smokers consume noncigarette tobacco products. Cigarette smokers consume noncigarette tobacco products at significantly higher levels than nonsmokers ($\chi^2 = 86.0$, $P < .001$). 38.6% of the male students and 16.2% of the females consume noncigarette tobacco products; the difference between the genders being significant as well.

Table 2. Smoking Status of NEU Medical Students in Relation to Some Sociodemographic Features and to Their Countries of Origin Classified as WB Country Groups by Region and by Income Groups* (Nicosia, December 2018) (N = 1,304)

Sociodemographic Feature	Smoking Status						χ^2	P
	Nonsmoker		Smoker		Total			
	n	%	n	%	n	%		
Sex (n = 1,304)							36.9	<.001
Male	361	57.9	262	42.1	623	100		
Female	503	73.9	178	26.1	681	100		
Age Group (n = 1,292)							1.1	.292
<25	805	66.9	399	33.1	1,204	100		
≥25	54	61.4	34	38.6	88	100		
Grade of Medical School (n = 1,304)								
First grade	182	71.1	74	28.9	256	100		
Second grade	176	68.0	83	32.0	259	100		
Third grade	149	62.6	89	37.4	238	100		
Fourth grade	206	65.0	111	35.0	317	100		
Fifth grade	91	64.5	50	35.5	141	100		
Sixth grade	60	64.5	33	35.5	93	100		
Country Group (Region) (n = 1,290)								
Middle East and North Africa	124	66.0	64	34.0	188	100		
Europe and Central Asia	642	64.3	357	35.7	999	100		
Latin America and Caribbeans	–	–	1	100	1	100		
Sub-Saharan Africa	78	94.0	5	6.0	83	100		
South Asia	13	76.5	4	23.5	17	100		
North America	1	50.0	1	50.0	2	100		
WB Income Group (n = 1,282)							31.7	<.001
High income	135	70.7	56	29.3	191	100		
Higher middle income	564	62.6	337	37.4	901	100		
Lower middle income	99	87.6	14	12.4	113	100		
Low income	56	72.7	21	27.3	77	100		

*World Bank Country and Lending Groups. 2019. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>.

On the other hand, 80.7% of the students indicated being exposed to some form of secondhand smoke. Notably, 39.5% of the passive smokers were exposed at cafes and restaurants. Other locations of exposure included homes, polluted either by smoker household members (22.9%) or by visitors (19.3%) and indoor places other than home (34.7%) (not shown in tables).

Table 2 shows the smoking status of the participants in relation to some sociodemographic features and their countries of origin classified as World Bank (WB) country groups by region and by income.

Male students smoke more than females at significantly higher rates ($\chi^2 = 36.9, P < .001$): 42.1% of the male students and 26.1% of the female students smoke. Third-grade students smoke most with 37.4%, followed by fifth- and sixth-grade students with 35.5% each.

Sub-Saharan country citizens smoke least by 6.0%, while European and Central Asian region members smoke most with 35.7%. Smoking is highest among citizens of higher-middle income countries with 37.4%. Smoking frequency among lower-middle income country citizens (12.4%) is significantly lower than citizens of high income, higher-middle income, and low-income countries ($P < .001$) (Table 2).

The comparison of the attitudes of smoker and nonsmoker medical students regarding their attitudes on support of indoor

smoking bans and their opinions on doctors being nonsmoking role models is presented in Table 3.

91.9% of the nonsmokers as compared to 73.9% of smokers are in support of smoking bans indoors. Nonsmokers support smoking bans at significantly higher levels than smokers ($\chi^2 = 76.9, P < .001$). Besides, nonsmokers adopt the role model function of doctors at significantly higher levels than smokers at 87.7% for nonsmokers and 54.3% for smokers.

Smoking status of all students according to their nationalities is indicated in Table 4, country by country.

Overall, citizens of Turkey, comprising 63% of the participants, smoke at a higher frequency by 37.5% than the total average of 33.7%.

The analyses of medical students of various country income groups in regard to the use of noncigarette tobacco products revealed that low-income countries of sub-Saharan Africa consume these products at the lowest level with 7.2% (not shown tables). The consumption of these products in all other regions is above 25%. Surprisingly, consumption is highest among students of low-economy countries with 31.3%, while 23.1% for high-income countries and 28.9% for upper middle income countries. The students from lower middle-income countries have the lowest frequency in this respect with 12.5%, which is significantly lower than other country groups.

Table 3. The Comparison of the Attitudes of Smoking and Nonsmoking NEU Medical Students Regarding Support of Indoor Smoking Bans and Doctors Being Nonsmoking Role Models (Nicosia, December 2018) (N = 1,304)

	Attitudes Regarding Indoor Smoking Bans (n = 1,290)						χ^2	P
	Supporting		Not Supporting		Total			
	n	%	n	%	n	%		
Smoking Status							76.9	<.001
Nonsmoker	784	91.9	69	8.1	853	100		
Smoker	323	73.9	114	26.1	437	100		
Total	1,107	85.8	183	14.2	129	100		
	Attitude on doctors being nonsmoking role models (n = 1,291)							
Nonsmoker	751	87.7	105	12.3	856	100	179.5	<.001
Smoker	236	54.3	199	45.7	435	100		
Total	987	76.5	304	23.5	129	100		

Table 4. Smoking Status According to Country of Origin of NEU Medical Students (Nicosia, December 2018) (N = 1,304)

Smoking Status (n = 1,293) Country	Nonsmoker		Smoker		Total	
	n	%*	n	%*	n	%
Turkey	509	62.5	305	37.5	814	63.0
TRNC	125	72.5	48	27.7	173	13.4
Nigeria	62	96.9	2	3.1	64	4.9
Syria	44	68.8	20	31.3	64	4.9
Jordan	31	56.4	24	43.6	55	4.3
Egypt	15	75.0	5	25	20	1.5
Bangladesh	9	75.0	3	25	12	0.9
Iraq	6	54.5	5	45.5	11	0.9
Libya	7	77.8	2	22.2	9	0.7
Palestine	4	50	4	50	8	0.6
Oman	6	85.7	1	14.3	7	0.5
Sudan	5	71.4	2	28.6	7	0.5
Pakistan	4	66.7	2	33.3	6	0.5
Lebanon	4	80	1	20	5	0.4
Yemen	4	100	–	–	4	0.3
Tanzania	3	75	1	25	4	0.3
Germany	2	50	4	50	4	0.3
Kenya	3	100	–	–	3	0.2
Somalia	3	100	–	–	3	0.2
Saudi Arabia	1	33.3	2	66.7	3	0.2
USA	1	50	1	50	2	0.2
Iran	1	50	1	50	2	0.2
Sweden	1	50	1	50	2	0.2
Kosovo	1	50	1	50	2	0.2
Turkmenistan	2	100	–	–	2	0.2
Uganda	2	100	–	–	2	0.2
Other†	4	80	1	20	5	0.4

*Row percentages.
†Algeria, Armenia, Bulgaria, Romania, and Venezuela.

Similar to the cigarette smoking data, 74.8% of noncigarette tobacco users compared to 89.2 of nonconsumers support the ban in indoor public places, the difference being significant ($\chi^2 = 34.0, P < .001$). Similar results are valid for the opinions of the participants about the role model function of the physician.

DISCUSSION

The status of tobacco use among medical students and their attitudes on the tobacco issue were studied in this cross-sectional study. The smoking frequency was 33.7% in general, 37.5% among Turkish citizens, and 27.7% among Northern Cyprus citizens. The smoking prevalences are higher in our

study than most medical student studies in Turkey.^{16,17,23} However, the smoking frequency was much higher (39%) in a study among students of a private medical school in Turkey.²⁴

Recent studies among university students and particularly medical students in the Middle East and African countries have found lower prevalences compared to the results of our study in general. However, two studies in Nigeria found higher frequencies compared to our Nigerian group; lifetime tobacco use was 9.6%²⁵ and 10.5%²⁶ in these surveys. The Nigerian medical students in our study showed a lower frequency as 3.1%.

A 2007 study in Syria on medical students found the cigarette smoking prevalence to be 10.9%,²⁷ much lower than our general result of 33.7% and the Syrian students in particular, who had a smoker rate of 31.3% in our study.

A study in Jordan among medical students found the smoking prevalence as 26% for male and 7% for female students.²⁸ On the contrary, the findings of the Jordanian students in our study showed a much higher frequency as 43.6%. Syrian and Jordanian results in the current study may be a reflection of the social status of our students, as well as the prosmoking atmosphere of Cyprus grounds.

According to an international review, the prevalence of smoking among medical students ranged from 3% in the United States to 58% in Japan, with 29.5% for Italy, 29% for Saudi Arabia, and 10-10.5% for Nigeria.¹³ Medical students are subject to similar impacts of their social environment and present behaviors as other members of their society, in spite of the fact that they are studying medicine. Thus, the higher smoking rates displayed by the present study may be attributed to the high smoking atmosphere of Northern Cyprus.

Smoking frequency was significantly higher among male students than female students in our study as expected. Furthermore, smokers were higher for both sexes among Turkish medical program students with 43.9% for men and 29.1% for women. These results are similar to but higher than the results of some medical schools of Turkey, which show a range of 8.2-17.3% for female students and 25.1-35.0% for males.^{23,24}

The finding that male students smoke more than female students is consistent with other studies' findings.²⁹ The study among medical students in Jordan revealed the prevalences as 26% for male and 7% among female students.²⁸

Contrary to other research, a study from China found that medical students have higher rates of smoking than other students, but most of the smokers were occasional smokers.³⁰ On the other hand, a study in Greece found smoking rates of medical students as 35.3%, while 50.2% for other students.³¹

Smoking frequency is 28.9% among first year students and 35.5% for sixth-grade students in the current study, while it is highest in the third year with 37.4%. Smoking prevalences range from 8 to 18% among first year medical students and 21-39% among 6th year students according to various studies conducted in Turkey.^{16,32}

Our results show higher frequencies for almost all parameters. In a study comparing the students of seven medical schools and the same grades of other schools of science in Turkey, a significant difference between the medical and other students was found in the first grades, with lower frequencies for medical students. However, the difference was not statistically significant for last grade students, although smoking rates were lower for medical students.³²

Of the participants in our study, 26.8% have stated using noncigarette tobacco products, of which water pipe (narghile) is the leading product with 23.5%. According to a 2011 study among medical students in Turkey, 17% of the first-year students and 14% of the sixth-year students were using water pipe.³³

Exposure to various forms of passive tobacco smoke was stated by 80.7% of the participants in our study. Although the law regulating tobacco use has been enforced since 2008 in Northern Cyprus, these results display the noncompliance regarding indoor bans. On the other hand, the students are highly in favor of the indoor bans regardless of their smoking status. Still the rate of supporters is significantly higher among nonsmokers.

The majority of the students are in the opinion that doctors should be nonsmoking role models for the community. Nonsmokers share this view at significantly higher levels than smokers (87.7% of nonsmokers vs 54.3% of smokers). The 1994 study from Turkey had displayed a much lower frequency for this parameter; 44% of the smokers and 70% of the never smokers were in support of the role model function of doctors at that time.³² The difference between the two studies may be evaluated as an indicator of progress of the community and particularly of the medical students on the tobacco control issue during the years in between. Interestingly, 26.1% of smoker students and 8.1% of nonsmokers do not support legal measures for tobacco control in the current study, the difference of the groups being highly significant. In comparison, these rates were 24 and 6%, respectively, in the seven-university study of 1994.³² These results reveal the role of smoking on attitudes of doctors and the importance of non-smoking behaviors.

More students have started smoking after registering to the medical school (50.8%) than those who initiated smoking before their medical education period (49.2%). These findings indicate the importance of early tobacco control education in the medical school for prevention of picking up the habit. The findings of the present study are similar to the results of the first baseline study in our university³⁴ and indicative of inadequate tobacco control interventions, including current content of the medical education.

The role of medical education on the smoking trends of doctors has been a subject of research in recent years. According to global surveys, the tobacco education in medical curricula varies widely among countries and medical schools.^{13,35}

An international study among medical students of 42 countries in Europe, Asia, and Africa found significant deficiencies in medical education on tobacco and recommended urgent changes in the medical curricula.³⁵ The content, program, and methods of the tobacco education curriculum continue to be topics of discussion in the context of medical education.

The Restrictions of the Study

The study was conducted in one medical school of Northern Cyprus. Thus, the results of our study can neither be representative of all the medical schools of Cyprus nor be associated with students studying in other schools of universities.

The questions of the study questionnaire were limited as for a descriptive study to obtain baseline data with the intention of accessing more students and more responses. Therefore, neither in depth and detailed analyses of the data could be performed in this study, nor we could derive a wider variety of results from the data obtained.

CONCLUSION

This study about the smoking status of medical students revealed high smoking frequencies for both male and female students, compared to medical students of other countries, probably related to the high smoking atmosphere of Northern Cyprus. More than half of the smokers started smoking after entering the medical school, and smoking status increased with advancing years of medical education, all showing the necessity of more tobacco control measures in the university and more tobacco education throughout the medical curriculum.

In addition to increasing education on tobacco, it is crucial to fully implement all tobacco control measures in medical schools. University campuses should be smoke-free, and the rules and regulations regarding tobacco use should be strictly supported and enforced. Related educational and other activities about tobacco control should be available for all medical students throughout all the years and content of medical education.

Medical education should be restructured to include the skills for tobacco cessation and other relevant subjects. Tobacco control and cessation techniques education in the curriculum of medical education are one of the intervention methods, which is in the agenda of our medical faculty in the near future.

Ethics Committee Approval: Ethical committee approval was received from the Near East University (Report No. YDU/2017/52-482 for the English medical program students and YDU/2018/54-516 for the Turkish medical program students, dated November 22, 2018).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

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