



Original Article

The Prevalence of Tobacco Product Use Among Students in the Faculty of Medicine at Pamukkale University and Their Views on the Smoke-Free Campus Implementation

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Abstract

OBJECTIVE: Tobacco use is an important risk factor for more than 20 types of cancer, especially cardiovascular and respiratory diseases, and many other health problems. Cigarettes are one of the most commonly used tobacco products in the world, and they can cause both physical and mental addiction. Adolescence is known to be the highest-risk period in terms of addiction among all age groups. As a result, smoke-free campus practices have become even more important in universities. This study investigates the prevalence of smoking among Pamukkale Medical School students and their views and behaviors regarding smoke-free campus practices.

MATERIAL AND METHODS: This cross-sectional study was conducted with 548 medical students at Pamukkale University Faculty of Medicine during the academic year 2021-2022, between April 1-29, 2022. A face-to-face interview was conducted. Students' smoking status and their views about a smoke-free campus were assessed. In the questionnaire, the independent variables were socio-demographic characteristics, duration of staying in a smoke-free environment, smoking status in the place of residence, areas where smoking is most common, Fagerström nicotine dependence level, knowledge about smoke-free campus applications and campuses with the smoke-free application. The Statistical Package for the Social Sciences version 21.0 package program was used to analyze the data. Descriptive statistics are presented with numbers and percentages for categorical variables, while the arithmetic mean and standard deviation are used for continuous variables. The chi-square test was used to compare categorical variables, and the Kolmogorov-Smirnov analysis was used to test the compatibility of data to normal distribution.

RESULTS: The student smoking rate increased significantly as the number of semesters increased ($P = .021$). The smoking rate of male students was higher than that of female students ($P = .001$). The smoking rate of students living with their family or relatives was lower ($P = .020$). Smokers (14.7%) were more likely to have heard about the introduction of smoke-free zones on campus than nonsmokers (11%) ($P = .280$). 81.4% of students affirmed the statement, "The number of smoke-free rooms should be increased," and 84.3% responded, "I support the existence of smoke-free spaces." Nonsmoking students (90.8%) are more likely to agree that smoke-free spaces should be increased than those who smoke (57.7%) ($P < .001$). Among the students, 17.6% of nonsmokers and 37.8% of smokers find the information about smoke-free spaces sufficient ($P < .001$). The rate of those who consider smoke-free space inspections to be sufficient is lower for nonsmoking students than for nonsmokers ($P = .017$). Nonsmokers (89.5%) support the existence of smoke-free spaces to a higher degree than smokers (71.2%) ($P < .001$).

CONCLUSION: One-third of Pamukkale University Faculty of Medicine students smoke, and smoking rates are higher among men and those who do not live with family or relatives. All participants strongly support the existence of smoke-free zones (84.3%), while a proportion of tobacco users (31.4%) support the implementation of a smoke-free campus. Student opinions of the smoke-free zones and the smoke-free campus application are more positive among nonsmokers than smokers.

KEYWORDS: Smoke-free campus application, fighting tobacco, smoke-free zone

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INTRODUCTION

The nicotine found in tobacco is addictive, and the use of these products causes many negative health problems, including cardiovascular disease, respiratory disease, and more than 20 different types of cancer. More than 8 million people die every year as a result of tobacco use. Cigarettes are the most widely consumed tobacco product in the world. It causes physical and psychological addiction.^{1,2} Globally, 942 million men and 175 million women aged 15 years and older smoke.³ According to Turkish Statistical Institute (TUIK, 2019), the proportion of people aged 15 years and older who use tobacco daily is 28%. Adolescence is considered the riskiest time among other age groups in addiction.^{4,5} The Global Youth and Tobacco Survey (2017) reported the rate of current smokers as 17.9% and the rate of those who have tried smoking at least once as 40.2%.⁶ The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) attaches great importance to the prevention of tobacco use among young people.^{7,8} In our country, the Tobacco Control Strategy Paper and Action Plan emphasize the prevention of tobacco use among youth.⁹ This has made advocacy for smoke-free campuses even more important. Tobacco-free college/campus practices are pioneering work in different

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parts of the world. Their recognized goal is to ensure protection from all types of harmful effects of tobacco in the college environment.¹⁰

The practice of tobacco-free universities includes the most important goals, such as eliminating tobacco use in indoor and outdoor areas, prohibiting tobacco sales on campus, supporting those who want to quit smoking, and spreading healthy lifestyle habits in universities.¹¹ University of Michigan (2012)¹² for the first time in the world. The request for a smoke-free campus accepted by the Ministry of Health and the Council of Higher Education in our country is also included in Circular No. 2015/6 of the Presidency of the Public Health Institution of Turkey (Article 3).¹³ It is still applied by Bilkent, Hacettepe, and Başkent Universities.¹⁰

In this study, we aimed to investigate the prevalence of smoking among Pamukkale University Faculty of Medicine students and their views and behaviors regarding smoke-free practices on campus.

MATERIAL AND METHODS

The population of this cross-sectional study consists of 1463 students enrolled in the Faculty of Medicine at Pamukkale University during the academic year 2021-2022. The study was conducted between April 1 and 29, 2022, at the Faculty of Medicine. The study's sample size was calculated to be 454 individuals with a confidence interval of 95%, a precision rate of 3%, and a known prevalence value of 19.6% using the Open Epi program. A questionnaire was implemented in person in the study, and a total of 548 students were reached.

The dependent variables of the study are the smoking status of the medical students and their views about requesting a smoke-free campus, while the independent variables include sociodemographic characteristics, the time they spend smoking indoors, the smoking status in their place of residence, the place where they smoke the most, and their knowledge about the request for a smoke-free campus.

The questionnaire, which was created based on a literature review, contains 8 questions on sociodemographic characteristics, 5 questions on smoking habits, 6 questions on the Fagerström nicotine addiction test, 2 questions on the request for a smoke-free campus, and 20 questions about the opinions

and behaviors related to smoke-free zone. The questionnaire consists of 41 questions in total.

The Fagerstrom Test for Nicotine Dependence

Fagerstrom and Schneider¹⁴ developed the Fagerstrom Test for Nicotine Dependence (FTND) to detect nicotine dependence due to smoking. It is a 6-item scale that includes questions about the time of the first cigarette smoked after waking up, challenges in places where smoking is prohibited, an indispensable smoking time during the day, number of cigarettes smoked per day, amount of cigarettes smoked in the morning, and smoking status when ill. In Turkey, the validity and reliability study was conducted by Uysal et al¹⁵ (Cronbach alpha 0.56). Each item on the scale is scored 0, 1, 2, or 3, and the range of scores obtained with the scale is 0-10. The higher the score on the scale, the more severe the cigarette addiction is. 0-2 points are classified as very low, 3-4 points as low, 5 points as medium, 6-7 points as high, and 8-10 points as very high.

Statistical Analysis

The Statistical Package of the Social Sciences® version 21.0 package program (IBM Corp., Armonk, NY, USA) was used to analyze the data. Descriptive statistics are presented with numbers and percentages for categorical variables, while the arithmetic mean and standard deviation are used for continuous variables. The chi-square test was used to compare categorical variables. Whether the responses given in the test conformed to the normal distribution was tested using the Kolmogorov-Smirnov method. The significance level was set as $P < .05$. Twelve views (3, 4, 6, 7, 13, 14, 15, 16, 17, 18, 19, 20) from opinions and behavioral suggestions related to smoke-free zones were selected, and the chi-square test was applied according to smoking status.

Ethics Committee Approval

Ethical approval was obtained for the study from the Pamukkale University Ethics Committee for Non-Interventional Clinical Research, dated March 31, 2022, and with the number E-60116787-020-193171. Verbal informed consent was obtained from the patients who agreed to take part in the study.

RESULTS

Sociodemographic Characteristics and Smoking Behavior

The mean age of participants in the study is 21.72 years. 20.1% of the participants are 2nd semester students, and 10.9% are 5th semester students. 52.9% of our participants are women. 98.2% of students are single, and 46.0% live alone. Those who live at home with their families constitute 20.3% of the participants. 36.7% of mothers and 52.9% of fathers are university graduates. The income of 54.2% of the students is equal to their expenses (Table 1). 54.2% of participants have never smoked in their lives. 31.9% have smoked more than 5 packs of cigarettes. Current smokers are 28.5% of the participants. While 41.7% of smokers reported that they could go without smoking for more than 5 hours, only 9.6% reported that they could not smoke for more than half an hour. 73.7% of participants smoke in their homes. The most common places to smoke are school (45.5%) and home (32.1%). The mean score of smoker students on the

Main Points

- The unstoppable rise in smoking frequency in Turkey necessitates strong public health measures.
- Anti-smoking measures targeting higher education youth are urgently needed.
- It is seen that non-smoking physician candidates (89.5%) support the practice of smoke-free areas more than smokers (71.2%) on campus ($P < .001$).
- National determination is important in the transition to "Smoke-Free Campus Practices" initiated by World Health Organization.

Table 1. Sociodemographic Characteristics of Participants

Age (Mean SD)	21.72 ± 2.28	
Variables	n	%
Term		
Term 1	103	18.8
Term 2	110	20.1
Term 3	97	17.7
Term 4	87	15.9
Term 5	60	10.9
Term 6	91	16.6
Gender		
Female	290	52.9
Male	258	47.1
Marital status		
Married	7	1.3
Single	538	98.2
Divorced	–	–
Other	3	0.5
Place of residence		
At home with his family	111	20.3
At home with a friend	87	15.9
At home with relatives	3	0.5
Living alone	252	46
Dormitory	95	17.3
Mother’s Educational Status		
Illiterate	9	1.6
Literate	16	2.9
Primary school graduate	102	18.6
Secondary school graduate	54	9.9
High School Graduate	166	30.3
University graduate/master/doctorate	201	36.7
Father’s education status		
Illiterate	3	0.5
Literate	12	2.2
Primary school graduate	61	11.1
Secondary school graduate	38	6.9
High School graduate	144	26.3
University graduate/master/doctorate	290	52.9
Income rate		
Income less than expenditure	72	13.1
Income equal to expenditure	297	54.2
Income more than expenditure	179	32.7
Lifetime Cigarette Smoking		
Never smoked	297	54.2
Smoked less than 100 (5 packs) and quit	76	13.9
Smoked more than 100 (5 packs)	175	31.9
Current smoking status		
Yes	156	28.5
No	392	71.5
Some features belonging to the smoking group		
Duration that they can stay indoors without smoking	15	9.6
Half an hour	43	27.6
30 min-2 h	33	21.2
2-5 h	65	41.7
More than 5 h		
Smoking at place of residence		
Yes	115	73.7
No	41	26.3

(Continued)

Table 1. Sociodemographic Characteristics of Participants (Continued)

Age (Mean SD)	21.72 ± 2.28	
Variables	n	%
The place where they smoke the most		
School	71	45.5
Home	50	32.1
Dorm	8	5.1
Other	27	17.3
Dependency level of smoking students		
<i>(FTND Total score is 2.19 ± 1.35, the range of scores obtained from the scale varies between 0 and 10.)</i>		
Very slightly dependent	69	45.7
Slightly dependent	29	19.2
Moderately dependent	19	12.6
Highly dependent	23	15.2
Very highly dependent	11	7.3

Fagerstrom scale for nicotine addiction was 2.19, and the addiction level of smoker students was 45.7% (Table 1). The smoking rate of university students increased significantly as the number of semesters increased ($P = .021$). The smoking rate of male students was higher than that of female students ($P = .001$). The smoking rate of students living with their family or relatives is lower ($P = .020$) (Table 2). Although there is no statistical significance, smokers (14.7%) were more likely than nonsmokers (11%) to report that they had heard of a smoke-free campus ($P = .280$). Smokers (4.5%) were more likely to know of smoke-free campuses than nonsmokers (2%) ($P = .145$) (Table 3).

Use of Smoke-Free Zones and Smoke-Free Campuses

About 81.4% of participants agreed with the statements, “There should be more smoke-free rooms.” 84.3% said, “I support the existence of smoke-free rooms,” and 74.5% said, “There should be smoking cessation studies (training/seminars) at universities.” The percentages of the answers “no” or “I don’t have an opinion” are as follows: 85% for the statement, “It is difficult for you not to smoke in places where smoking is prohibited (libraries, theaters, hospitals, etc.),” 76.6% to “Information about smoke-free zones is sufficient,” 87.4% for the statement, “Controls of smoke-free zones are sufficient,” 77.6% to the statement, “It is difficult to go out alone to smoke during class breaks or recesses,” and 79% to the statement, “The smoking ban is an attack on the individual’s rights” (Table 4). A higher percentage of nonsmokers (90.8%) than those who smoke (57.7%) believe that the number of smoke-free rooms should be increased ($P < .001$). While 17.6% of nonsmoking students found information about smoke-free zone adequate, 37.8% of smoking students found it sufficient ($P < .001$). Non-smokers find their smoke-free zone information sufficient ($P = .017$). Nonsmokers (89.5%) are more supportive of smoke-free areas than smokers (71.2%) ($P < .001$). Students who smoke think the smoking ban is complicated to implement and that the smoking ban is an attack on individuals’ rights to a greater extent compared to nonsmokers ($P < .001$). About 54.6% of nonsmokers and 44.2% of smokers reported that the university smoking ban encourage students to smoke ($P = .029$). In addition, 46.9%

Table 2. Smoking Status of the Participants According to Their Socio-demographic Characteristics

Variables	Smoker		Nonsmoker		P
	n	%	n	%	
Term					.021
Term 1	17	16.5	86	83.5	
Term 2	30	27.3	80	72.7	
Term 3	36	37.1	61	62.9	
Term 4	23	26.4	64	73.6	
Term 5	22	36.7	38	63.3	
Term 6	28	30.8	63	69.2	
Gender					<.001
Female	59	20.3	231	79.7	
Male	97	37.6	161	62.4	
Marital status					1.000
Married	2	28.6	5	71.4	
Other (single, divorced)	154	28.5	387	71.5	
Place of residence					.020
Next of kin or family	22	19.3	92	80.7	
Other	134	30.9	300	69.1	
Education level of mother					.924
Secondary school graduate and below	52	28.7	129	71.3	
High school graduate and above	104	28.3	263	71.7	
Education level of father					.203
Secondary school graduate and below	27	23.7	87	76.3	
High school graduate and above	129	29.7	305	70.3	
Family income level					.616
Income less than expenditure	24	33.3	48	66.7	
Income equal to expenditure	82	27.6	215	72.4	
Income more than expenditure	50	27.9	129	72.1	

of nonsmokers and 25.6% of smokers indicated that the smoking ban would lead to an increase in smoking as a result of the smoking ban ($P < .001$). While 79.6% of nonsmoking students indicated that activities on smoking cessation (training/seminars) should be conducted at universities, 61.5% of smokers affirmed this statement ($P < .001$). Nonsmoking students affirmed the statements "Universities should establish

Table 3. Information Status of Participants on Smoke-Free Campus Application by Smoking Status

Variables	Smokers		Nonsmokers		P
	n (%)	n (%)	n (%)	n (%)	
Knowledge about the smoke-free campus policy					.280
Yes	23 (14.7)	43 (11.0)			
No	133 (85.3)	349 (89.0)			
Knowledge of campuses with smoke-free campus policy					.145
Yes	7 (4.5)	8 (2.0)			
No	149 (95.5)	384 (98.0)			

a smoke-free campus," "If there is a smoke-free campus, the rate of smoking cessation will increase," and "If a smoke-free campus is established, it will be easy to adapt to this process" to a greater extent than nonsmokers ($P < .001$) (Table 5).

DISCUSSION

In our study, about one-third of students smoke, 84.3% support smoke-free zones, and 62.8% support a smoke-free campus.

In a study conducted in 2016 at Pamukkale University Faculty of Medicine, smoking prevalence was found to be 18.8%.¹⁶ A study conducted between 2016 and 2017 among first- and sixth-year students at Katip Çelebi University Faculty of Medicine in İzmir revealed that smoking prevalence was 16.6%.¹⁷ In other studies conducted in 2017-2018 among first- and sixth-year medical students in Zonguldak and Konya, smoking prevalence was 33% and 11.57%, respectively.^{18,19} In another study conducted in 2019 with medical school students in Kahramanmarař, smoking prevalence was 22.9%.²⁰

In studies investigating tobacco dependence among medical students in Turkey, the smoking rate varied between 17.6-52.6%.²¹ In a cross-sectional study among medical students in Pakistan, the prevalence of smoking among medical students was 13.4%, which was lower than our study.²² A joint study conducted at the medical schools of Brown University in the United States and the University of Bologna in Italy concluded that the prevalence of smoking at the University of Bologna (29.5%) was significantly higher than at Brown University (6.1%).²³ In the study, in contrast to other studies, it was found that the prevalence of smoking was significantly higher in the third year (37.1%) compared to the other years. It was found that the frequency of smoking in the 3rd year was twice as high as in the 1st year. This could be due to the influence of peers. Other studies on medical students show that the frequency of smoking increases during medical school.^{17,18,24} This difference could be due to the different study environments and time differences.

In this study, smoking prevalence was higher in males than females. The reason could be the strong influence of traditional and cultural structures in Turkey and the fact that the society does not approve of women smoking. Similar results were found in studies by Babar et al²², Emirođlu et al²⁵, Dađtekin et al²⁶ and La Torre et al.²⁷ This study found that

Table 4. Distribution of Views and Behaviors of the Participants Regarding Smoke-free Zones

Propositions	n (%)	
	Yes	No—No Idea
It is difficult for you not to smoke in places where smoking is prohibited (libraries, theaters, hospitals, etc.).	82 (15)	466 (85)
Not smoking indoors is a factor for quitting smoking.	244 (44.5)	304 (55.5)
Smoke-free zones should be increased.	446 (81.4)	102 (18.6)
Information about smoke-free zones is sufficient.	128 (23.4)	420 (76.6)
Smoke-free zone inspections are sufficient.	69 (12.6)	479 (87.4)
I support the existence of smoke-free zones.	462 (84.3)	86 (15.7)
It is difficult to go out alone to smoke during class breaks or recesses	123 (22.4)	425 (77.6)
The increase in nonsmoking areas affects you.	297 (54.2)	251 (45.8)
Long lesson times/long breaks increase the desire to smoke.	217 (39.6)	331 (60.4)
Smoke-free zones affect the frequency of my visits to these places.	284 (51.8)	264 (48.2)
The prohibition of smoking is a complex and difficult regulation to implement.	221 (40.3)	327 (59.7)
Prohibition of smoking is an attack on the rights of individuals.	115 (21)	433 (79)
Smoking in universities encourages students to smoke.	283 (51.6)	265 (48.4)
As a result of the smoking ban, there will be an increase in smoking cessation.	224 (40.9)	324 (59.1)
Studies on smoking cessation (trainings/seminars) should be conducted in universities.	408 (74.5)	140 (25.5)
There should be a smoke-free campus policy at universities.	344 (62.8)	204 (37.2)
If there is a smoke-free campus policy, the rate of smoking cessation increases.	289 (52.7)	259 (47.3)
If a smoke-free campus policy is implemented, it will be easy to adapt to this process.	240 (43.8)	308 (56.2)

smoking frequency was higher among those who lived alone with their friends at home, in their apartment, or in a dormitory than among those who lived with their family and

relatives. This finding, consistent with the literature,^{25,28-30} could be because they were with friends who smoked and were separated from their families. This suggests that peer

Table 5. Distribution of Some of the Participant Views on Smoke-free Zones According to Smoking Use

Propositions	Smokers n (%)		Nonsmokers n (%)		P
	Yes	No—No Idea	Yes	No—No Idea	
Smoke-free zones should be increased.	90 (57.7)	66 (42.3)	356 (90.8)	36 (9.2)	<.001
Information about smoke-free zones is sufficient.	59 (37.8)	97 (62.2)	69 (17.6)	323 (82.4)	<.001
Smoke-free zone inspections are sufficient.	28 (17.9)	128 (82.1)	41 (10.5)	351 (89.5)	.017
I support the existence of smoke-free zones.	111 (71.2)	45 (28.8)	351 (89.5)	41 (10.5)	<.001
The prohibition of smoking is a complex and difficult regulation to implement.	80 (51.3)	76 (48.7)	141 (36)	251 (64)	.001
Prohibition of smoking is an attack on the rights of individuals.	54 (34.6)	102 (65.4)	61 (15.6)	331 (84.4)	<.001
Smoking in universities encourages students to smoke.	69 (44.2)	87 (55.8)	214 (54.6)	178 (45.4)	.029
As a result of the smoking ban, there will be an increase in smoking cessation.	40 (25.6)	116 (74.4)	184 (46.9)	208 (53.1)	<.001
Studies on smoking cessation (trainings/seminars) should be conducted in universities.	96 (61.5)	60 (38.5)	312 (79.6)	80 (20.4)	<.001
There should be smoke-free campus policies at universities.	49 (31.4)	107 (68.6)	295 (75.3)	97 (24.7)	<.001
If there is a smoke-free campus policy, the rate of smoking cessation increases.	50 (32.1)	106 (67.9)	239 (61)	153 (39)	<.001
If a smoke-free campus policy is implemented, it will be easy to adapt to this process.	45 (28.8)	111 (71.2)	195 (49.7)	197 (50.3)	<.001

Values in bold indicate statistical significance.

influence was still important in increasing smoking frequency during the study period. The WHO indicates that factors associated with smoking include being away from family and the presence of smokers around the individual.³¹ Smoking students stated that they agreed with the view that the smoking ban restricts the individual rights of individuals with a higher frequency than nonsmoking students. Similar results were found in studies by Baştürk et al¹⁷ and Baykan et al.³²

It was found that the frequency of agreement on the statement, "Universities should apply for a smoke-free campus" was higher among nonsmokers than smokers. A similar result was found in a study by Kekliktepe,³³ which evaluated university students' views on the application of a smoke-free campus. The higher support for a smoke-free campus policy among nonsmokers might be related to their addiction habits. When we look at the responses to the propositions, "Universities should have a smoke-free campus policy," "If there is a smoke-free campus policy, the rate of smoking cessation will increase," and "If there is a smoke-free campus policy, it will be easy to adapt to this process," it shows that smokers find it less suitable. At the same time, nonsmokers support the smoke-free zone in the campus environment, with a significant difference. In this study, nonsmokers were found to agree more often than smokers with the view that smoking cessation will increase due to the smoking ban. This result is consistent with the study of Keklitepe³³ on Üsküdar University students. In the study, 1 out of 10 people responded "yes" to the statement, "Smoke-free zone controls are sufficient." The study by Demir et al³⁴ in 2016 on employees in tobacco control facilities found that only 37% of the participants thought adequate monitoring was being conducted. It is noteworthy that tobacco control staff also believe that adequate control is not conducted.

Although there are many studies on the reasons for smoking among university students and the factors associated with smoking, the studies on the practice of smoke-free campuses are limited. This study, which focuses on smoke-free zones and smoke-free campuses, is very important. Since it is a cross-sectional study, causality between variables is weak.

One-third of medical school students at Pamukkale University smoke, with a higher proportion among males and those who do not live with family or relatives. All participants strongly support the existence of a smoke-free zone (84.3%), while some (31.4%) tobacco users support the use of a smoke-free campus. Student opinions of smoke-free zones and smoke-free campus applications are more positive among nonsmokers than smokers. We provide training programs to raise awareness among physician candidates who will play a key role in the fight against tobacco products concerning smoke-free zones and campuses. Young people at universities should be encouraged never to start smoking and to quit permanently if they still smoke. We recommend that university senates support the fight against tobacco through smoking cessation polyclinics and smoke-free campus practices.

Ethics Committee Approval: This study was approved by the Ethics Committee of Pamukkale University (Approval No: E-60116787-020-193171, , Date: March 31, 2022).

Informed Consent: Verbal informed consent was obtained from the patients who agreed to take part in the study.

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