

Original Article



Moving Toward a Smoke-free Campus: A Survey of Students' Knowledge, Behavior, and Opinions

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Abstract

OBJECTIVE: This study examines the tobacco and product use status of university students, their awareness of smoke-free campuses, and the relationship between tobacco use awareness and tobacco use status.

MATERIAL AND METHODS: Data were collected using a questionnaire for students ($n = 15.515$) who continued their education at a state university. The questionnaire consisted of three sections: sociodemographic, tobacco and product use behaviors, and a Smoke-free Campus Awareness Scale (SCAS). The chi-square test was used for categorical variables, and the Kruskal-Wallis test was used for continuous variables.

RESULTS: 28.5% of the university students were active smokers, and 48.7% were exposed to passive smoking on campus. When the SCAS scores were compared according to the smoking status of the students, never smokers (median: 44.0, $Q1=36.0$ - $Q3=48.0$), active smokers (median: 27.0, $Q1=20.0$ - $Q3=36.0$), and recent quitters (median: 33.0- $Q1=11.0$ - $Q3=43.0$) ($P < 0.001$). SCAS scores were compared according to gender; the median score of female students ($Q1=31.0$ - $Q3=46.0$) was statistically higher than that of male students ($Q1=19.0$ - $Q3=44.0$). Non-smokers were found to be statistically more uncomfortable with being exposed to secondhand smoke on campus than smokers ($P < 0.001$).

CONCLUSION: Most students were unaware of the smoke-free campus policy but were aware that passive smoking is an important public health problem. The fact that male students and smokers oppose implementation requires investigation of the reasons for these attitudes in future studies, and monitoring tobacco use trends after implementation is important to effectively evaluate smoke-free campus implementation.

KEYWORDS: Cigarette smoking, students, university tobacco policies, smoke-free policy, tobacco control

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INTRODUCTION

The use of tobacco and other tobacco products is a source of many diseases, especially cancer, and it ranks first among the preventable risk factors.¹ Approximately eight million people die worldwide every year because of diseases associated with the use of tobacco and related products.² Studies have shown that the annual damage caused by cigarette consumption to the economy of the United States is approximately 600 billion dollars.³ Effective methods should be used to combat addiction, which has serious health and economic effects. In this context, the World Health Organization (WHO) proposed the Framework Convention on Tobacco Control (FCTC) in 2003 as a guide for countries to combat the harmful health effects of tobacco and tobacco products.² In this context, serious steps have been taken in our country since 2008 in line with the FCTC recommendations, and the success achieved has been shown as an example for other countries by WHO.⁴

Tobacco and tobacco products are not only harmful to consumers. It also harms the health of other people who share the same environment as those who use these products. Exposure to smoke and thus carcinogenic substances due to the use of these products by others even though they do not use these products themselves is called second-hand smoke and is a serious health problem in terms of public health.⁵

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Tobacco manufacturers use marketing methods to gain new customers and replace the addicts they have lost due to anti-tobacco campaigns initiated under the leadership of the WHO and receiving great support worldwide. In this context, university students have significant potential. Because they become lifelong users when they become addicted, the tobacco industry employs special marketing techniques for young people.⁶

According to researchers conducting in recent years, cigarette packet sales have been increasing in Türkiye. The prevalence of smoking among university students in Türkiye varies between 20% and 48%.⁷ In this context, the Ministry of Health presented a Smoke-Free Air Space 'DHS' campaign to the public in 2008 with the priority of protecting and treating public health.⁸ Smoke-free areas offer cleaner, healthier areas to employees and those who use them, increase employee success, reduce diseases, increase work efficiency, and reduce the risk of fire.¹

This study aimed to (1) determine university students' tobacco and tobacco product use status, (2) determine university students' thoughts and awareness about smoke-free campuses, and (3) examine the relationship between smoke-free campus awareness and tobacco and tobacco product use status. In this study, data on a smoke-free campus at our university will be obtained and used in the strategies developed in line with the data obtained.

MATERIAL AND METHODS

Study Design

This was a cross-sectional epidemiological study.

Population and Sample

The study population includes undergraduate students ($n = 15,515$) who study at faculties, colleges, and vocational schools on the central campus of Kırşehir Ahi Evran University. Sampling was performed in this study. Epi Info 7.2.5. software was used for sample calculation. In the sample of the study, the prevalence was calculated as 28.8%, the margin of error was 5%, the pattern effect was 2%, and the confidence level was 95% and 630 people.⁹ The number of samples to be taken was determined by the stratified sampling method according to the class sizes of the faculties, colleges, and vocational schools. At the end of the study, 703 questionnaires were collected, and when blank and incorrectly filled out questionnaires were

excluded from the study, a total of 688 questionnaires were collected (Figure 1).

Data Collection Tool

A questionnaire consisting of 34 questions was used as the data collection tool. The questionnaire consisted of three parts. The first part consists of questions examining the sociodemographic characteristics created by the literature review. In the second part, questions are given about tobacco and tobacco product usage status and the characteristics of students who use tobacco and tobacco products.^{7,10} In the third part, the Smoke-free Campus Awareness Scale (SCAS) was used.

SCAS; Dereli et al.¹¹ 2023 in Türkiye. The SCAS was determined to be valid and reliable and can measure the opinions and awareness of individuals about smoke-free campus application and smoking in campus areas. The SCAS is a one-dimensional scale consisting of 11 items scored on a 5-point Likert (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). A minimum of 11 and a maximum of 55 points were obtained from the scale, and as the score increased, the level of smokeless campus awareness of individuals increases.

Data Collection

Prior to the study, class availability lists for faculties, colleges, and vocational schools were obtained. The data were collected from the 1st, 2nd, 3rd, and 4th grades (including 5th and 6th grades for the faculty of medicine) according to the number determined by the stratified sampling method according to class availability using the Google online survey method. Before the questionnaires were collected, the purpose of the study and what they would do were explained to the students, after which their consent was obtained.

Ethical Permission

This study was approved by the Kırşehir Ahi Evran University Health Sciences Scientific Research Ethics Committee (decision no: 2024-06/34, date: 05.03.2024), and necessary permissions were obtained from Kırşehir Ahi Evran University.

Statistical Analysis

Descriptive statistics are presented as the number of units (n), percentage (%), median (M), and interquartile range (Q_1 - Q_3). The normality of continuous variables was tested using the Kolmogorov-Smirnov test ($P < 0.001$). The dependent variables of the study were the students' scores on the smoke-free campus scale; the independent variables were sociodemographic characteristics, smoking status, smoking status of the people around them, and opinions and knowledge about the smoke-free airspace. The Mann-Whitney U test and Kruskal-Wallis test were used for comparisons between groups. Pearson's chi-square test was used to determine differences between the variables. The data were evaluated using the IBM Statistical Package for the Social Sciences Statistics standard concurrent user, version 26 (IBM SPSS Corp.; Armonk, NY, USA) statistical package program. The statistical significance level was set as $P < 0.05$.

Main Points

- Only one-fifth of the students were aware of the smoke-free campus initiative.
- The majority of students recognized that passive smoking is a significant public health issue.
- Male students and those who smoke opposed the smoke-free campus initiative.
- Attitudes toward tobacco use should be assessed not only before the implementation of the smoke-free campus policy and should be monitored over time.
- Gathering this information is crucial for planning measures to prevent students from smoking.

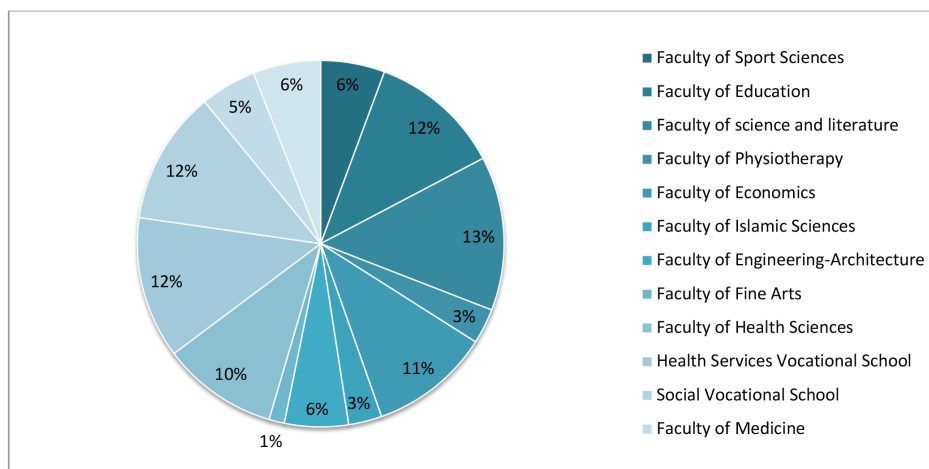


Figure 1. Faculties and number of students from which data will be collected

RESULTS

The median age of the students who participated in the study was calculated as 21.0 (Q₁=20.0-Q₃=22.0). Of the students, 64.4% (n = 443) were female, 34.7% (n = 239) were studying in their second year, and 68.9% (n = 474) were living in dormitories. The perceived income status of 73.1% (n = 503) of the students was moderate, and 12.8% (n = 88) had a chronic disease diagnosed by a doctor (Table 1). The median score of the SCAS administered to the students was found to be 40.0 (Q₁=24.0, Q₃=45.0). In the scale items, 59.6% of the students ‘agree’ or ‘strongly agree’ with the item ‘Smoke-free campus should be implemented in every university’. 33.0% of the students ‘agree’ or ‘strongly agree’ with the item ‘It will be easy to adapt to the smoke-free campus application’. 39.2% of the participants stated that the smoke-free campus implementation would increase the rate of smoking cessation (Figure 2).

When the smoking status of university students was analyzed, 28.5% (n = 196) were active smokers and 4.5% (n = 31) had quit smoking within the last 6 months. 31.7% (n = 218) of the students stated that most of their close friends smoked, and 23.3% (n = 160) stated that half of their close friends smoked. In addition, 11.5% (n = 79) of the participants stated that both of their parents smoked (Table 2). It was found that 6.8% (n = 47) of the participating students used e-cigarettes, 6.4% (n = 44) used hookah, and 4.5% (n = 31) used other tobacco products.

Among the participants, 27.4% (n = 188) indicated that they had tried e-cigarettes but did not continue their use. Among non-smokers, 2.6% (n = 12) stated that they used e-cigarettes every day, while 16.9% (n = 78) stated that they tried and did not continue. Among smokers, 15.4% (n = 35) also used e-cigarettes every day, and 44.9% (n = 102) tried e-cigarettes. Among smokers, 16.0% (n = 110) stated that they wanted to quit smoking, whereas 10.8% (n = 74) were undecided. It was found that 23.7% (n = 163) of the students who smoked had tried to quit smoking at least once.

The opinions and knowledge of the students regarding smokeless campus applications and passive exposure are presented in Table 3. It was determined that only 17.3% (n = 119) of the participants had heard of the smoke-free campus application

Table 1. Distribution of sociodemographic characteristics of the students

Variables	Number (n)	Percentage (%)
Gender		
Female	443	64.4
Male	245	35.6
Class		
1 st grade	204	29.6
2 nd grade	239	34.7
3 rd grade	147	21.4
4 th grade	62	9.0
5 th grade	19	2.8
6 th grade	17	2.5
Accommodation		
With family	115	16.7
The dormitory	474	68.9
Home/apartment alone	44	6.4
Homes or apartments with flatmates	55	8.0
Perceived income		
Good	102	14.8
Medium	503	73.1
Poor	83	12.1
Chronic disease diagnosed by a physician		
No	600	87.2
Yes	88	12.8

before. Moreover, 83.7% (n = 576) of the participants stated that passive smoking was a very serious problem, and 48.7% (n = 335) stated that they were exposed to passive smoking on campus. Among the students studying at the central campus, 35.6% (n = 245) believed that smoking should be banned in the indoor and outdoor areas of the campus, and 45.9% (n = 316) believed that smoking should be banned only in indoor areas.

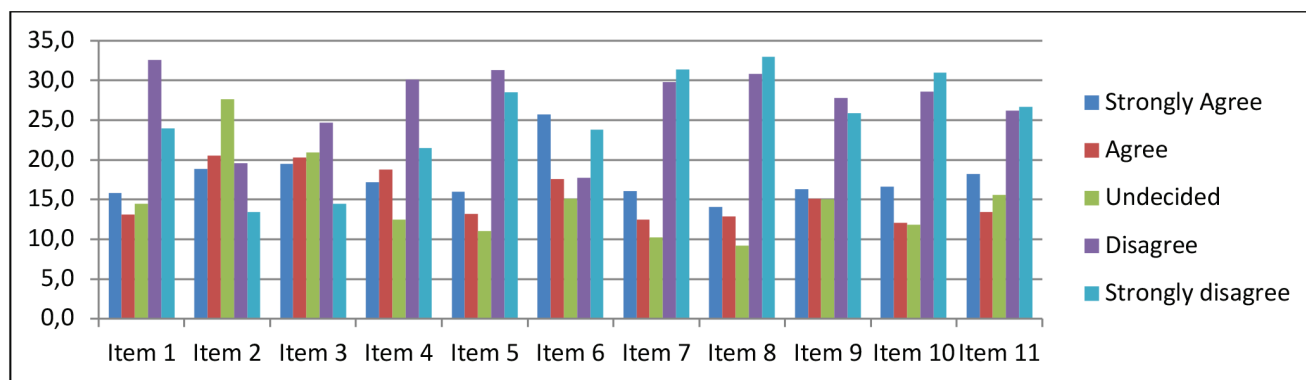


Figure 2. Distribution of responses to the items of the Smoke-free Campus Awareness Scale

Item 1: Trainings and activities related to a smoke-free campus should be held at the university. Item 2: It will be easy to adapt to the smoke-free campus application. Item 3: Smoke-free campus application increases smoking cessation rates. Item 4: Smoking in universities encourages smoking. Item 5: Smoke-free areas should be increased on smoke-free campuses. Item 6: I do not go out to smoke alone between classes and work on campus. Item 7: Passive smoking decreases with the implementation of smoke-free campus. Item 8: Smoke-free airspace should be increased. Item 9: Smoke-free airspace are a factor that can help quit smoking. Item 10: Smoke-free campuses should be implemented in every university. Item 11: Smoke-free airspace should be implemented in both open and closed areas

Table 2. Smoking status of participants and their environment

Variables	Number (n)	Percentage (%)
Smoking status of the mother and father		
None of them use it.	319	46.4
Only one of them uses it.	290	42.1
They are both using	79	11.5
Smoking status of friends		
None of them use it.	88	12.8
Very few people use it.	222	32.3
Half of the people use it.	160	23.2
Most use	218	31.7
Smoking status		
Never used	435	63.2
Former user	26	3.8
New user	31	4.5
Active user	196	28.5
*The place most commonly used by smokers		
Off campus	40	17.7
Equal amounts of on-campus and off-campus	161	71.2
In the campus	26	11.1

*Active and new quitters have answered

Furthermore, 70.2% (n = 483) of the students agreed that the consumption of tobacco and tobacco products in front of doors and windows could be harmful to people inside buildings.

The median score of the SCAS administered to the students was calculated as 40.0 (Q₁=24.0, Q₃=45.0). The distribution of responses to the SCAS items is presented in Table 4. A statistically significant difference was found between the groups according to the students' smoking status ($P < 0.001$).

This difference was due to the difference between never smokers (median: 44.0, Q₁=36.0-Q₃=48.0), active smokers (median: 27.0, Q₁=20.0-Q₃=36.0), recent quitters (median: 33.0, Q₁=11.0-Q₃=43.0), and never smokers (median: 44.0, Q₁=36.0-Q₃=48.0) ($P < 0.001$, $P < 0.001$ respectively). In addition, when the SCAS score was compared by gender, the median score of female students was 42.0 (Q₁=31.0-Q₃=46.0), while the median score of male students was 33.0 (Q₁=19.0-Q₃=44.0).

The smoking rate of male students was higher than that of female students ($P < 0.001$). The smoking rate of students living with their parents or in dormitories was lower than that of students living alone or in a flat/apartment with a flatmate ($P < 0.001$). Students with poor perceived income status had a higher smoking rate ($P = 0.005$). No statistically significant difference was found according to education level or presence of chronic disease. The smoking status of both parents was found to be higher among students who smoked ($P < 0.001$). The smoking rate of university students increased significantly as the smoking rate of their friends increased ($P < 0.001$). Non-smokers were more likely to be disturbed by passive exposure on campus ($P < 0.001$) (Table 4).

DISCUSSION

In this study, it was determined that one-third of the university students were active smokers; the majority of the students knew that passive cigarette exposure is a serious problem, and half of them were exposed to passive cigarette smoke on campus. Only 17.3% of the students had heard about smoke-free campus practices before and scored high on the SCAS.

According to the WHO 'Türkiye Health Survey 2019' report, 27.2% of individuals over the age of 15 use tobacco products every day and 3.4% use tobacco products occasionally.¹² In studies conducted on university students, 35% of students were found to smoke in a study conducted in İzmir.¹³ In another study conducted in Çukurova, 52.1% of students reported using tobacco or tobacco products.¹⁴ In a study conducted with university students in the Eastern Black Sea region, 31.3%

Table 3. Distribution of participants' opinions about smoke-free campuses

Variables	Number (n)	Percentage (%)
I feel uncomfortable being exposed to secondhand smoke on campus		
No	190	27.6
Yes	335	48.7
No answer	163	23.7
Have you heard about the smoke-free campus application?		
No	545	79.2
Yes	119	17.3
No answer	24	3.5
Your thoughts about the risks of the passive inhalation of cigarette smoke to human health		
Very serious, lethal	161	23.4
Very serious disease	415	60.4
It is not a very serious air risk	73	10.6
Not a serious risk at all, no harm done	14	2.0
No answer	25	3.6
Information on smoking bans in indoor public spaces and workplaces		
A lot of reading	280	40.7
He could hear a little	318	46.2
I didn't hear much	52	7.6
Heard nothing	16	2.3
No answer	22	3.2
Should smoking be banned in open areas at universities?		
It should be banned at all levels.	245	35.6
It should be limited to indoor areas only.	316	45.9
It should only be allowed in indoor areas and in canteens and cafés.	59	8.6
It should be free in all areas.	46	6.7
No answer	22	3.2
Consuming tobacco and tobacco products in front of doors and windows is harmful to people inside buildings.		
Strongly agree	323	46.9
Agree	160	23.3
Undecided	97	14.1
Disagree	45	6.5
Strongly disagree	38	5.5
No answer	25	3.7

were found to be smokers.¹⁵ In another study conducted in the Central Anatolia region, 29.57% of university students were reported to be smokers.¹⁶ Although smoking among university students in Italy was found to be 19%, the rate was found to be 14.7% in a study conducted in Portugal.^{17,18} According to the WHO 2020 tobacco report, the WHO European region had

a prevalence of 27.4%.¹ Compared with European countries, the rate of smoking is higher among university students in our country.

Studies conducted in recent years have revealed that smoking rates are higher in men than in women. According to the 2016 report of the 'Global Adult Tobacco Survey', while the smoking rate in men was 44.1%, this rate was 19.2% in women.¹⁹ Studies conducted on university students in Niğde, Adana, and İstanbul provinces reported that smoking was more common among male students.^{10,14,20} In this study, we found that the prevalence of smoking was higher among male students, which is consistent with the literature. The reasons for this may include the fact that social attitudes in Türkiye do not approve of women smoking, and women tend to consult more sources of information about their health.

In a study covering 15 low- and middle-income countries, it was reported that the rate of e-cigarette use was below 10% in most countries except Romania (4.4%) and Russia (3.5%), whereas the rate of 'never use' was below 10% and the rate of 'current use' was approximately 1%.²¹ In a study conducted in an adolescent group, the rate of e-cigarette use was found to be 1.02%, while in a study conducted on university students in İstanbul, this rate was found to be 8.5%.^{10,22} In another study conducted in Adana, 0.92% of e-cigarette users were found, and in another study conducted in İzmir, 19.1% e-cigarette users were found.^{13,14} In a study conducted on only medical faculty students from the same university, the rate was found to be 4.6%.²³ This wide range in e-cigarette use may be related to socioeconomic factors. It is seen that e-cigarette use is higher in regions with higher economic levels. It is believed that this may be due to the widespread belief that e-cigarettes are 'smoking cessation' and 'less harmful'.

The prevalence of smoking was higher among individuals living alone or with a flatmate in a flat or apartment than among those living with family or in dormitories. A study conducted by Ulukoca et al.²⁴ reported that people living with friends were more likely to smoke. In another study conducted in Kars province, the risk of smoking increased 1.67-fold in those living at home with friends.²⁵ The fact that living with family or in a dormitory environment is more controlled may be a factor that prevents individuals from starting smoking. In addition, smoking is expected to be more prevalent among individuals who live with their friends, which is an important factor in smoking initiation.

According to the study results, smoking was found to be higher among individuals with poor and moderate perceived incomes. Studies conducted in Qatar and Jordan have reported that higher income levels increase the risk of smoking.^{26,27} These differences at the international level may be due to differences in the cultural and traditional structures of the countries. In another study of university students in Türkiye, no relationship was found between perceived income level and smoking.^{13,28} In another study, it was reported that there was a relationship between smoking and family income.²⁹ In Türkiye, low incomes may increase the risk of smoking by affecting family education and close friends.

Table 4. Comparison of smoking status with other variables

Variables	Smoker		Non-smoker		P
	Number (n)	Percentage (%)	Number (n)	Percentage (%)	
Gender					
Female	83	18.7	360	81.3	0.001
Male	113	46.1	132	53.9	
Class					
1 st grade	54	26.5	150	73.5	0.727
2 nd grade	67	28.0	172	72.0	
3 rd grade	47	32.0	100	68.0	
4/5/6 th grade	28	28.6	70	71.4	
Accommodation					
With family	33	28.7	82	71.3	0.001
The dormitory	117	24.7	357	75.3	
Home/apartment alone	20	45.5	24	54.5	
Homes or apartments with flatmates	26	47.3	29	52.7	
Perceived income					
Good	33	32.4	69	67.6	0.005
Medium	128	25.4	375	74.6	
Poor	35	42.2	48	57.8	
Chronic disease diagnosed by a physician					
No	170	28.3	430	71.7	0.814
Yes	26	29.5	62	70.5	
Smoking status of the mother and father					
None of them use	79	24.8	240	75.2	0.001
Only one of them uses	80	27.6	210	72.4	
They both use	37	46.8	42	53.2	
Smoking status of friends					
None of them use it.	2	2.3	86	97.7	0.001
Very few people use it.	23	10.4	199	89.6	
Half of the people use it.	45	28.1	115	71.9	
Most use	126	57.8	92	42.2	
I feel uncomfortable being exposed to secondhand smoke on campus.					
No	159	83.7	31	16.3	0.001
Yes	31	9.3	304	90.7	
Have you heard about the smoke-free campus application?					
No	161	29.5	384	70.5	0.833
Yes	34	28.6	85	71.4	

Of the students who smoked cigarettes, 11.0% stated that they smoked more cigarettes inside the campus, and 71.2% stated that they smoked equally inside and outside the campus. A study comparing before and after the smoke-free university campus implementation found that the prevalence of smoking on campus statistically decreased significantly.³⁰ These findings suggest that smoke-free campuses are expected to decrease smoking rates among students. Most students (79.2%) who participated in the study were not aware of the smoke-free

campus application. A study conducted by Acımiş et al.²⁸ reported that only 2.7% of university students were aware of smoke-free campus practice. These data demonstrate that students did not sufficiently comprehend the smokeless campus application. Increasing awareness of smoke-free campus practices, announcing successful examples in other universities, and encouraging students to gain awareness and advocate in universities where such practices do not exist may encourage students to advocate.

Almost all non-smoking students stated that they felt uncomfortable about being exposed to secondhand smoke on campus. Studies conducted in Italy and Serbia found that most participants had been exposed to passive smoking within the last week.^{18,31} In a study conducted on the adolescent population in Türkiye, >80% of adolescents were passive smokers.³² The majority of participants believed that passive exposure would cause diseases on human health, and more than half of them believed that smoke-free campuses would reduce passive exposure. As a result, it is clear that the belief in the necessity of protection from passive exposure is widespread, and smoke-free campus practices should be implemented not only in closed areas but also in open areas.

In this study, 35.6% of the participants supported the prohibition of smoking in open areas on university campuses, but almost all of those who provided this support were non-smokers. A study conducted in Europe reported that the majority of students and employees supported smoke-free campus practices, but former and current smokers opposed bans in open areas, despite supporting tobacco-free practices.³³ The median score of the SCAS was 40.0. This value is close to the maximum score, indicating that most students believe that smoke-free campus implementation will reduce passive exposure, encourage smoking cessation, and support its implementation. In a study involving five universities in the United States, 77.5% of the participants stated that they supported the implementation of smoke-free campuses. In this study, passive exposure decreased from 41.2% to 32.8% after the smoke-free campus implementation, and smoking decreased from 13.0% before implementation to 10.3%.³⁴ In another study conducted in Türkiye, half of the students stated that they would definitely support a smoke-free campus.²⁹

This study is limited in generalizability because it covers only students at one university. Although the findings may be informative for other universities, the results are more reflective of the university where the study was conducted. Second, the study was based on questionnaire responses, which may have led to biases, such as a lack of compliance and misinterpretation of the question. Third, due to the total number of students at the university, the population could not be reached; thus, data were collected using the stratified sampling method. Therefore, there is a potential bias. These problems are mostly valid for the survey results and are difficult to control. The limitations of the study should be taken into consideration when reviewing the results.

Despite these limitations, students' tobacco use habits and risk perceptions, as well as their awareness of and support for smoke-free campus implementation, were evaluated. This will help guide future efforts to prevent and reduce tobacco use by students. Baseline data reflecting the prevalence and causes of tobacco use can be used to plan and evaluate future prevention and cessation strategies.

CONCLUSION

In our study aimed to evaluate students' knowledge and attitudes toward the concept of a smoke-free campus, it was observed that only one-fifth of the students had heard of the smoke-free campus application, and the majority of them knew that passive

smoking is an important public health problem. For this reason, it is believed that students will be supported in future smoke-free campus applications. It was understood that most students did not know about the smoke-free campus application, but they were aware of the importance of preventing passive smoking, the indoor bans implemented for this purpose, and the prevention of use near doors and windows. Male students opposed the smoke-free campus application. The reasons for these should be investigated in future studies. Tobacco use and opinions should not only be evaluated before implementation of the smokeless campus, but also trends should be monitored after implementation. This is of great importance in the evaluation of smokeless campus implementation. Accessing this information may help plan measures to prevent students from starting to smoke.

Ethics

Ethics Committee Approval: This study was approved by the Kırşehir Ahi Evran University Health Sciences Scientific Research Ethics Committee (decision no: 2024-06/34, date: 05.03.2024), and necessary permissions were obtained from Kırşehir Ahi Evran University.

Informed Consent: Consent form were filled out by all participants.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Ü.T.B., H.İ., Concept: Ü.T.B., H.İ., Design: Ü.T.B., Data Collection or Processing: Ü.T.B., H.İ., Analysis or Interpretation: Ü.T.B., Literature Search: Ü.T.B., H.İ., Writing: Ü.T.B., H.İ.

Conflict of Interest: No conflict of interest was declared by the authors.

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