

# The Prevalence of University Students' Use of Tobacco Products, Their Opinions on Their Effects on Health, and the Factors Affecting Use

*Üniversite Öğrencilerinin Tütün Ürünlerini Kullanım Prevalansı, Sağlık Üzerine Etkilerine İlişkin Görüşleri ve Kullanımı Etkileyen Faktörler*

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Başkent University Faculty of Medicine, Department of Public Health, Ankara, Turkey



## Abstract

**Objective:** It was aimed to examine the prevalence of use of tobacco products, the reasons for the first use, opinions on tobacco products' effects on health, and factors affecting the waterpipe use of university students enrolled in technical, social, and health sciences in this study.

**Materials and Methods:** This cross-sectional study was conducted with a 43-item questionnaire among fourth-year students from three educational fields of a university with 72.3% participation rate was in Ankara, Turkey in March 2019.

**Results:** 21.1% of the students were current waterpipe users and 32.6% were current cigarette smokers. For both cigarette and waterpipe, "curiosity" was the most common reason first reported use, followed by socializing and related reasons. For both tobacco products, there was consensus on whether they were harmful to health and on the positive effects of quitting. Regarding the addictive effect, significantly more of the participants gave lower scores for waterpipe than for cigarettes (46.4% versus 83.5%). The risk factors for being current waterpipe use were the students' cigarette smoking and waterpipe use in the family or close friends.

**Conclusion:** Waterpipe use was relatively common among university students and socialization was important as a risk factor for being a current user. The addictive effect of waterpipe can be emphasized more in awareness campaigns. The fight against tobacco should be conducted by peer work and targeting all tobacco products and regardless of students' educational fields.

## Keywords

Tobacco, cigarette, waterpipe, health, student

## Anahtar Kelimeler

Tütün, sigara, nargile, sağlık, öğrenci

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## Address for Correspondence/Yazışma Adresi:

Hüseyin Örün, Asst., Başkent University Faculty of Medicine, Department of Public Health, Ankara, Turkey

Phone : +90 545 360 92 06

E-mail : dr.huseyin.orun@gmail.com

ORCID ID: orcid.org/0000-0002-4384-0881

\*Contributed equally to this work.

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## Öz

**Amaç:** Bu çalışmada teknik, sosyal ve sağlık bilimlerinde öğrenim gören üniversite öğrencilerinin tütün ürünleri kullanım yaygınlığının, ilk kullanım nedenlerinin, tütün ürünlerinin sağlığa etkilerine ilişkin görüşlerinin ve nargile kullanımını etkileyen faktörlerin incelenmesi amaçlanmıştır.

**Gereç ve Yöntemler:** Kesitsel tipteki bu araştırma, 43 soruluk bir anket ile Mart 2019'da Ankara'da %72,3 oranında katılım ile bir üniversitenin üç eğitim alanında öğrenim gören dördüncü sınıf öğrencileri arasında gerçekleştirilmiştir.

**Bulgular:** Öğrencilerin %21,1'i halen nargile kullanıcısı ve %32,6'sı halen sigara içicisiydi. Hem sigara hem de nargile için "merak" ilk kullanım için en sık bildirilen neden iken, bunu "sosyalleşme" ve ilişkili nedenler izlemiştir. Her iki tütün ürünü için de sağlığa zararları ve bırakmanın olumlu etkileri konusunda fikir birliği vardı. Bağımlılık yapıcı etki konusunda, sigaraya nazaran nargile için katılımcıların daha

fazla bir kısmı anlamlı olarak daha düşük puanlar verdiler (%46,4 ve %83,5). Halen nargile kullanıyor olma durumu için risk faktörleri öğrencinin sigara kullanıyor oluşu ile ailede veya yakın arkadaşlarda nargile kullanımı olarak bulunmuştur.

**Sonuç:** Üniversite öğrencileri arasında nargile kullanımı görece yaygın bulundu ve sosyalleşme, halen nargile kullanıyor olmak için bir risk faktörü olarak önemliydi. Nargilenin bağımlılık yapıcı etkisi bilinçlendirme kampanyalarında daha çok vurgulanabilir. Tütünle mücadele, öğrencilerin eğitim alanları ne olursa olsun, tüm tütün ürünlerini hedef alan akran çalışmaları ile yürütülmelidir.

## Introduction

Currently, 19.2% of the world population over 15-year-old are tobacco users (1). Eight million people die each year due to tobacco (2). Health expenditures due to diseases attributed to cigarette smoking were calculated as 422 billion USD for 2012 (1). Considering cigarette consumption, Turkey ranks second among Organization for Economic Co-operation and Development countries (3). The prevalence of daily tobacco use increased from 26.5% in 2016 to 28.0% in 2019 (4).

The use of alternative tobacco products other than cigarettes is gradually increasing. Waterpipe, also known as hookah, is consumed more than cigarettes in some Middle Eastern countries (5). Several studies have revealed that tobacco use begins between 16-18 ages (6,7). One in 5 young adults use at least one tobacco product in Turkey according to the latest Global Adult Tobacco Survey (8).

In the present study, we aimed to examine the prevalence of tobacco products use, the reasons for first use, opinions on the effects of tobacco products on health, and the factors affecting current waterpipe use among senior university students enrolled in technical, social and health sciences.

## Materials and Methods

The population of this cross-sectional study was the fourth-year students in a university in Ankara, Turkey (n=1974). We used the sample size formula for stratified rate estimation for the waterpipe smoking rate estimation of the population. Accordingly, we calculated the minimum (min) sample size as 386 volunteers using stratified sampling from three education areas, with a 20% non-response rate,  $d=0.05$  error and  $\alpha=0.05$  while  $\sqrt{Ph} = Qh = 0.50$ . We distributed this number (n) to the strata in proportion to their weight, and 63, 216, 107 volunteers were allocated in "technical sciences", "social sciences," and "health sciences", respectively. The departments were randomly selected to reach the n of students

determined for the three scientific fields. Variables such as age and gender were not taken into account in the selection of students.

After the approval provided by Başkent University Institutional Review Board (project no: KA19/68, date: 26.02.2019), data collection was carried out in March 2019 through a 43-item questionnaire about the participant's educational background, some demographic characteristics, and opinions on the use of cigarettes and waterpipes prepared by the researchers. Modifications were made after pilot testing. Participants were asked to score their perceptions of (i) the harm, (ii) the addictive effects, (iii) the positive effects of quitting cigarette smoking and waterpipe use on health as the 5-point Likert scale with "no idea" option. The participation rate was 72.3% (n=279).

Current waterpipe smokers were considered those who used waterpipe at least once in the last year. Former waterpipe smokers were considered those who used waterpipe at least once but never used it in the last year. Never waterpipe smokers were considered those who have never used a waterpipe. Definition of current, former, and never cigarette smoking accepted by a glossary of Centers for Disease Control and Prevention (9).

## Statistical Analysis

N and percentage (%), mean with standard deviation, and median with min-maximum values were used for descriptive statistics. Comparisons were conducted using the independent t-test and one-way analysis of variance (ANOVA) with Tamhane test for continuous variables and chi-square test for categorical variables. Binary logistic regression analysis with the Backward-Wald method were performed to present factors associated with current waterpipe use and the results are showed with odds ratios with a 95% confidence interval (CI). SPSS 26.0 was used in all analyses, and  $\alpha<0.05$  was considered significant except for  $\alpha=0.016$  for assessing post-hoc test results.

### Results

A total of 279 students (39.8% health, 37.6% social and 22.6% technical sciences) were included in the study. The mean age of the participants was 22.8±1.2 years. Of the participants, 72.4% were women, and 65.9% was living with their family. Of the participants, 77.2% and 51.1% reported that none of the family members and five best friends used waterpipes. Of the participants, 67.0% had tried to smoke a cigarette and 57.3% had tried to use waterpipe at least once in their lifetime. No significant difference was found regarding the ages of first trials of cigarette and waterpipe by the educational fields (p=0.882 and p=0.386). No

significant difference was found between the ages of the first trial of waterpipe regarding being a current waterpipe using status (p=0.571).

Of the participants, 65.4% used waterpipes and 59.5% smoked cigarettes firstly before 18 years old. The mean age of the first cigarette trial was 16.5±3.5 years, and it was 16.8±2.4 years for waterpipe. Of the participants, 32.6% were current cigarette smokers, 21.1% used waterpipes at least once in the last year (Table 1). Most (93.2%) waterpipe smokers stated that they smoke outside the house. More than half of the participants (56.1%) did not consider quitting waterpipe use.

“Socialization” (30.6%) for waterpipe and “stress relief” (20.9%) for cigarettes are the first ranks for reason of use. While 92.5% of the participants scored that hookah use is harmful to health, 46.4% scored it was addictive, also, 83.5% of them scored that quitting hookah use would have a positive effect on health. It has been shown these rates are quite high for cigarettes (Figure 1).

There was a significant difference between the students from educational fields regarding their opinions on the addictive effect of cigarette smoking (p=0.011; 4.35±0.94 in health sciences vs. 4.68±0.60 in social sciences), but not the waterpipe use (Table 2). In other cases, no statistical difference was observed by fields of education. The mean scores on the harm of waterpipe to health and addictive effect of waterpipe use were lower (p=0.019 and p=0.001) among the current than non-current users of waterpipe.

The waterpipe use prevalence was higher among men (p=0.003), those who have family members who use a waterpipe (p<0.001), whose father and brother use a waterpipe (p=0.005 and p=0.002, respectively), who have friends use a waterpipe (p<0.001), who have

Table 1. Characteristics of participants' use of tobacco products		
Variable	Number (n)	Percent (%)
<b>The age of first tobacco product use</b>		
<b>Cigarette (n=185)</b>		
≤14	36	19.5
15-17	74	40.0
≥18	75	40.5
Mean ± SD	16.5±3.5	
<b>Waterpipe (n=159)</b>		
≤ 14	23	14.5
15-17	81	50.9
≥18	55	34.6
Mean ± SD	16.8±2.4	
<b>The status of tobacco products use (n=279)</b>		
<b>Cigarette</b>		
Never smoker	175	62.7
Former smoker	13	4.7
Current smoker	91	32.6
<b>Waterpipe</b>		
Never user	119	42.7
Former user	101	36.2
Current user	59	21.1
At least once a year, but less than once a month	39	14.0
At least once a month, but less than once a week	16	5.7
At least once a week	4	1.4
Smoking and waterpipe use were asked separately. Therefore, a participant may use both tobacco products. SD: Standard deviation		

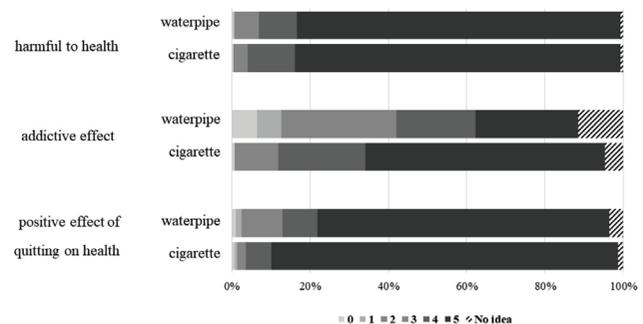


Figure 1. Distribution of participants' opinions on health effects of cigarette and waterpipe smoking

**Table 2. Comparison of the participants' opinions on the health effects of tobacco products use by their educational field**

Question	Educational field (Mean ± SD)			p-value
	Health	Social	Technical	
Cigarette smoking is harmful to health	4.75±0.65	4.85±0.43	4.73±0.63	0.281
Cigarette smoking is addictive	4.35±0.94	4.68±0.60	4.36±0.99	0.011*
Quitting cigarette smoking has a positive effect on health	4.73±0.89	4.89±0.48	4.86±0.44	0.178
Waterpipe using is harmful to health	4.79±0.61	4.71±0.76	4.59±0.96	0.228
Waterpipe using is addictive	3.30±1.62	3.44±1.57	3.12±1.43	0.468
Quitting waterpipe using has a positive effect on health	4.50±1.12	4.54±0.94	4.61±0.89	0.765

The harmful effects on health be scored as "0= No harm at all, 5= Very harmful", addictive effects as "0= Not at all addictive, 5= Highly addictive" and positive effects of quitting on health as "0= Not at all, 5= Very effective" as the Likert scale.  
The analysis was made excluding the students who said they "have no idea". Tamhane test was preferred since post-hoc tests did not distribute the variances homogeneously.  
\*A statistical significance was observed among students studying in health and social sciences. SD: Standard deviation

smoked cigarettes and who were current cigarette smokers ( $p < 0.001$ ). The prevalence of waterpipe use among the students in health science was lower than the students in the technical and social sciences ( $p = 0.005$ ).

The binary logistic regression showed that the model accuracy of predicting the risk of being a current waterpipe user was 81.4% with excluding for missing data of five cases. Since the  $n$  of former cigarette smokers was low and its 95% CI was wide, this result may be excluded from the model. The presence of a waterpipe user in the family of the participant increased the risk of being a current waterpipe smoker 5.980 times (95% CI: 2.708-13.204;  $p < 0.001$ ). In addition, the presence of waterpipe users among friends increased the risk of being a current waterpipe smoker by 4.144 times (95% CI: 1.872-9.173;  $p < 0.001$ ). Also, being a current cigarette smoker increased the risk of being a current waterpipe smoker 3.756 times (95% CI: 1.710-8.252;  $p = 0.001$ ).

## Discussion

In this study, it has been shown that current smoking (32.6%) and current waterpipe use (21.1%) can be evaluated as critical level. "Curiosity" was the first rank reported reason of use for cigarettes and waterpipe. Socialization and related choices were marked more in the individuals who use waterpipe than cigarettes. While there was a consensus among the participants regarding the harms of cigarettes and waterpipes and the positive effects of quitting on health, the waterpipe was taken a dramatically

lower score compared to cigarettes regarding addictive effects (46.4% vs. 83.5%). In addition, current waterpipe smokers evaluated that the harm and addictive effect of waterpipe to health are lower than former and never smokers. Logistic regression results showed the importance of current smoking and waterpipe use in the social environment among the possible risk factors affecting waterpipe use.

In our study, the prevalence of current cigarette smoking was 32.6%, which was higher than the prevalence of waterpipe use (21.1%). The prevalence of cigarette smoking among university students in Turkey varies between 24.4% and 50% (10-12). The prevalence of waterpipe use among university students in Turkey, both in our study (21.1%) and in other studies from Turkey (10,11,13,14) can be seen approximately 10 times higher (12.7-31.1%) than the prevalence in adults (15-17). These data confirm that university students are a risk group for waterpipe use. Even though waterpipe use cannot be considered a major worldwide problem, it does show that it is a public health threat regarding the prevalence of its use among young people.

More than half of the participants have tried to use waterpipes or cigarette smoking at least once in their lifetime. Of the ever users, 65% tried waterpipe use, 59.5% tried cigarette smoking for the first time under the age of 18, which is prohibited by legal regulations in Turkey (18). Also, the commercial establishments offering waterpipe should be at least 100 meters away from the schools (19). The high prevalence of tobacco product trials in adolescence and 93.2% of

the students' preference of cafes and waterpipe cafes for waterpipe use may be indicated problems in the implementation of the law.

In our study, 43.9% of current waterpipe users wanted to quit. Considering the prevalence of waterpipe cessation desire (14-48%) in the northern part of the world (20), our result can be thought as an opportunity for interventions.

In the presented study, it was a striking finding that current cigarette smoking increased the risk for current waterpipe use by 3,756 times. In a study, approximately 59% of waterpipe users were found to use at least one more tobacco product (21). In a study from Turkey, cigarette smoking was indicated to increase the risk of waterpipe use by 7.1 times (22). This finding shows that a person who consumes one tobacco product is more likely to use another tobacco product.

Due to the nature of cross-sectional studies, it is difficult to establish a causal relationship. The literature review was carried out in both English and Turkish to minimize the publication bias and to observe the cultural and geographical differences in waterpipe use. To avoid forced-choice bias, yes/no questions were tried to be kept to a min, and other bias reasons related to the questionnaire were tried to be minimized by applying a pre-test and rearranging the questionnaire. There may be a family information bias for related questions, and also volunteer, recall and response fatigue biases.

## Conclusion

In this study, like other studies in Turkey, we determined that the prevalence of waterpipe use among university students was quite high and that waterpipe smoking was used for socialization. While almost all students who used waterpipes reported that they used it in public places outside the home, it is also noteworthy that more than half of them started smoking under the age of eighteen despite legal regulations. It indicates that is necessary to closely monitor the implementation of legal regulations and to inspect more effectively the places where waterpipe is offered. Also, the struggle against the use of tobacco products by young people should be started before university age. Waterpipe use was relatively common among university students and socialization was important as the reason and as a risk factor for being a

current user. The addictive effect of waterpipe can be emphasized more in awareness campaigns. The fight against tobacco should be conducted by peer work and targeting all tobacco products and regardless of students' educational fields.

## Ethics

**Ethics Committee Approval:** The study was approved by the Başkent University Institutional Review Board (project no: KA19/68, date: 26.02.2019).

**Informed Consent:** Cross-sectional study.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Concept: N.B.A., Design: N.B.A., Data Collection or Processing: N.B.A., Analysis or Interpretation: H.Ö., E.T., Literature Search: N.B.A., H.Ö., E.T., Writing: N.B.A., H.Ö., E.T.

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

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