INVESTIGATION OF TOBACCO CONSUMPTION AND TOBACCO CONSUMPTION BEHAVIOR AMONG FOUNDATION UNIVERSITY STUDENTS IN TURKEY

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I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science

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This is to certify that I have read this thesis and that it, in my opinion, is fully adequate, in scope and quality, as a thesis for the Degree of Master of Science in the field of Economics of the Graduate School of Social Sciences.

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Esma BİŞKİN KAYA

ABSTRACT

INVESTIGATION OF TOBACCO CONSUMPTION AND TOBACCO CONSUMPTION BEHAVIOR AMONG FOUNDATION UNIVERSITY STUDENTS IN TURKEY

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This study inquiries into the factors that increase the risk of using cigarette and hookah and, for current smokers, the factors that affect expenditures on these products by foundation university students in Turkey. It also examines the joint relationship between cigarette and hookah consumption behaviors. The data used in the study was collected by an internet-based survey. In the econometric analyses, logistic regression was used to examine the risks of hookah use and smoking. Moreover, the bivariate probit model is used to analyze the joint relationship between hookah and cigarette consumption. Results indicate that male students are more likely to use these tobacco products than females. In addition, a higher number of people using cigarettes and hookah in the social network of a student increases both the risk of using these products and the amount of expenditure. The estimates from the bivariate probit model reveal that hookah and cigarette use are correlated.

Keywords: Cigarette, Hookah, Bivariate Probit, Logistic,

ÖZ

TÜRKİYE'DE VAKIF ÜNİVERSİTELERİNDE OKUYAN ÖĞRENCİLERİN TÜTÜN TÜKETİMİ VE TÜTÜN TÜKETİM DAVRANIŞLARININ İNCELENMESİ

BİŞKİN KAYA, Esma

Yüksek Lisans., İktisat Bölümü

Tez Yöneticisi: Prof. Nur Asena CANER

Bu çalışmada, vakıf üniversitelerinde okuyan öğrencilerin sigara ve nargile kullanma olasılıklarını arttıran faktörler ve mevcut kullanıcıların bu ürünler için yaptıkları aylık harcamayı etkileyen faktörler araştırılmaktadır. İlave olarak, sigara ve nargile tüketim davranışlarının birbiriyle ilişkisi incelenmektedir. Çalışmanın datası internet tabanlı anket ile toplanmıştır. Çalışmada nargile ve sigara kullanım risklerini analiz etmek için lojistik regresyon kullanılmıştır. Bu tezde ilave olarak, tanımlayıcı istatistikler ile nargile ve sigara tüketimin birbiriyle ilişkisini analiz etmek için iki değişkenli probit model kullanılmaktadır. Çalışmanın sonuçlarına göre, erkek öğrencilerin kız öğrencilere göre bu tütün ürünlerini kullanıyor olma olasılıkları daha yüksektir. Ayrıca, öğrencilerin çevrelerinde sigara ve nargile kullanan kişilerin çoğalması, öğrencilerin hem bu ürünleri kullanma risklerini hem de mevcut kullanıcıların harcama tutarlarını arttırdığı gözlenmiştir. Son olarak, sigara ve nargile tüketimi birbirini etkilediği iki değişkenli probit model ile gösterilmiştir.

Anahtar Kelimeler: Sigara, Nargile, İki-Değişkenli Probit, Lojistik

To those who inspired it and will not read it…

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ABBREVIATION LIST

AOR	:	Adjusted Odds Ratio
CCRRNT	:	Current Cigarette User
CDS	:	The Center for Research and Community Development Services
CEA	:	Carcinoembronic Antigen
CEVER	:	Cigarette User for Ever Used
COPD	:	Chronic Obstructive Pulmonary Disease
FCTC	:	The Framework Convention on Tobacco Control
FDA	:	U.S. Food and Drug Administration
GATS	:	Global Adult Tobacco Survey
GPA	:	Grade Point Average
HCRRNT	:	Current Hookah User
HEVER	:	Hookah User for Ever Used
MoH	:	Ministry of Health of Turkey
OBS	:	Number of Observations
OLS	:	Ordinary List Squares
OR	:	Odds Ratio
SD	:	Standard Deviation
SRB	:	Smoking-Related Behavior
TL	:	Turkish Liras
TURK STATS	:	Turk Statistic Institute
U.S.	:	United States
WHO	:	World Health Organizations

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CHAPTER I

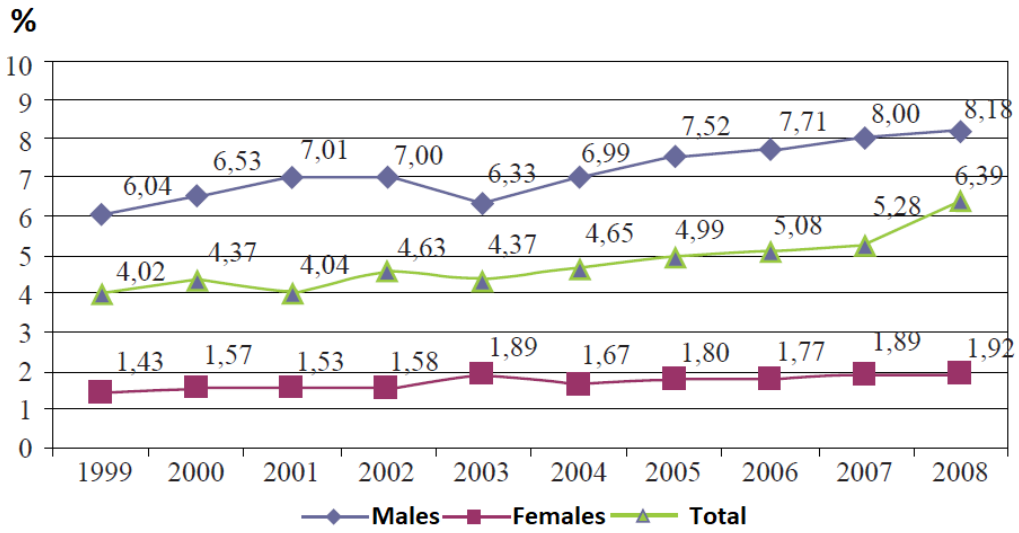
INTRODUCTION

According to the World Health Organization (WHO), worldwide 12% of all deaths among individuals aged 30 or over is attributed to tobacco. This figure is higher for men (16%) than it is for women (7 %.) In the United States (U.S.), for adults aged 30 or over the percentage of deaths attributed to tobacco is 16% (17% for men and 15% for women). In European countries, while the overall figure is 16%, the difference between men and women is quite significant (25% for men and 7% for women) (WHO Global Report on Mortality Attributable to Tobacco, 2012).

In Turkey, 17.1% of all individuals use tobacco products. For men and women, this figure is 41.5% and 13.1%, respectively. 94.8% of tobacco users use manufactured cigarettes and 0.8% of them use hookah (Global Adult Tobacco Usage Statistics, 2012). According to Global Adult Tobacco Survey (GATS), in Turkey, initial age for daily smokers 17.1, and more than half of daily smokers (58.7 %) started to use cigarette before age 18, which is the legal minimum age for buying tobacco.

Also, according to WHO, 23% of adults in Turkey use a cigarette as a daily smoker (WHO, 2017). The danger passed to human health by tobacco products is obvious. Lung cancer is one of the most important and known diseases that may occur due to tobacco products. According to Turkish Statistical Institute (Turk Stats), in Turkey, lung cancer deaths resulting from the use of tobacco rose from 6.0% to 8.2% during a period of 9

years from 1999 to 2008. Among women, this figure changed from 1.4% to 1.9% (See Graph 1.1.).



Graph 1.1. The Ratio of Deaths from Lung Cancer to Total Deaths

There is a large literature on tobacco-related behaviors and health hazard of tobacco products. Moreover, there are studies about tobacco products that are alternative to cigarette. Since the legislation controlling cigarette use entered into force, the use of alternative tobacco products, especially hookah (which is also as known shisha, narghile, or water pipe) has increased (Gilreath et al., 2016; Stephen and Dorsey, 2005). This research analyzes the tobacco-related behaviors among private university students in Ankara, Turkey. It explores which factors increase the risk of using cigarette and hookah among the students aged 18-26. To explain these factors, two different types of users are studied, namely "current users" and "ever users" for both cigarette and hookah. In addition, the factors that affect the amount of expenditure on these products are also investigated.

The first part of the study provides information on the effects of tobacco use on health, with some important statistics from Turkey and other countries. The second part of the study reviews the literature that examines tobacco-related behavior and hookah behavior among young students, together with the underlying motivations associated with these behaviors.

The third part of the study explains the data and the analysis method used in the research and provides health-related statistics about students, as well as descriptive statistics about dependent and independent variables. In the fourth chapter of the study, the results of the analysis are evaluated and in the last part, the results are interpreted and discussed in detail. Moreover, some recommendations are purposed for decreasing smoking rate among students and for enhancing awareness of students for both cigarette and hookah.

CHAPTER II

TOBACCO PRODUCTS

2.1. Health Hazards of Tobacco Products

Using tobacco products causes major health problems and it may lead to death. According to the Tobacco Atlas, more than 7,1 million deaths are caused by tobacco products annually. (The Tobacco Atlas 2018). Moreover, using tobacco products damages almost all organs in the human body dramatically. The products include more than 70 carcinogens and more than seven thousand toxic materials (The Tobacco Atlas 2018). Also, more than 4.000 ingredients have mutagenic effects. Some of them are shown in Table 2.1. with their different phases (Behr and Nowak, 2002).

Particulate Phaze	Gas Phase
Tar	Carbon Monoxide
Nicotine	Oxides of Nitragen
Aramatic Hydrocarbons	Aldehydes
Phenol	Hydrocyanic Acid
Cresol	Acrolein
B-Naphthylamine	Ammonia
Benzo(a)pyrene	Nitrosamines
Catechol	Hydrazine
Indole	Vinly Chloride
Carbazole	

Table 2.1. Selected Constituents of Cigarette Smoke

Based on these facts, it is observed that using tobacco products causes many chronic illnesses, which do not result in sudden death. Some of the diseases that may occur due to tobacco products usage include: “Cardiovascular diseases, pulmonary disorders,

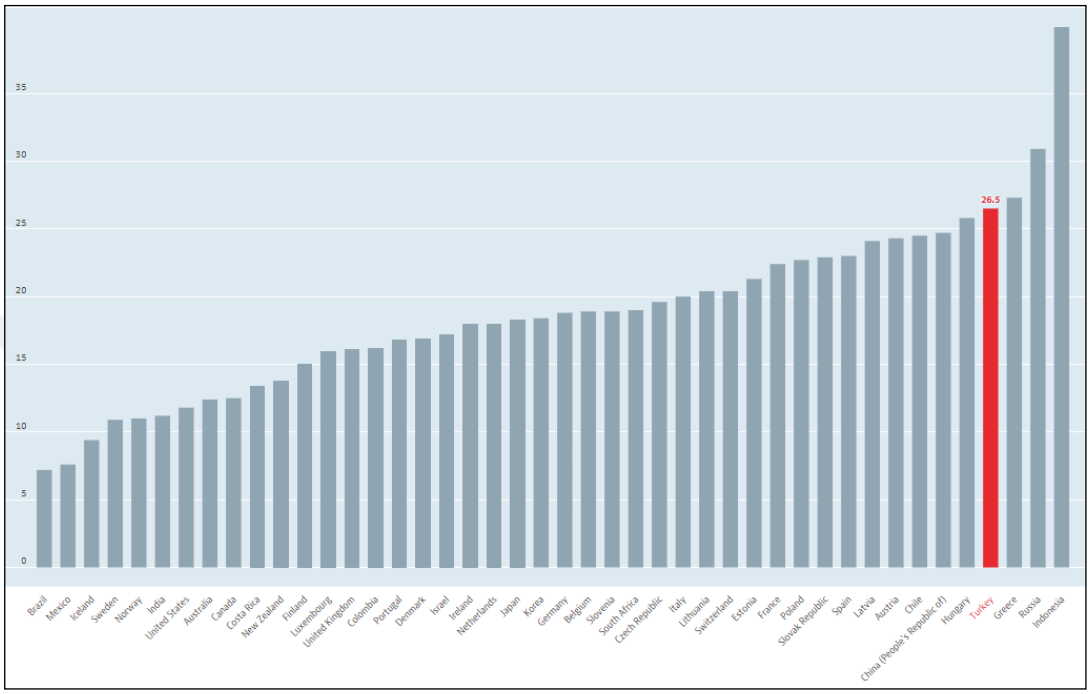
COPD (Chronic Obstructive Pulmonary Disease) as a result of narrowing of the bronchi, clogging of vessels and related paralysis, gastritis, ulcers and cancer in the stomach, skin yellowing, wrinkles, skin cancer, bad breath and yellowing of teeth. Smoking during pregnancy leads to preterm labor and various developmental disorders and consequently, and postpartum milk discontinuation" (https://www.yesilay.org.tr/tr/bagimlilik/sigara-ve-tutun-bagimliligi).

In addition, tobacco products are harmful to human health, not only for direct smokers but also for passive smokers. A passive smoker or second-hand smoker is a non-smoker, who is exposed to tobacco smoke radically. Time, volume, and frequency of exposure to tobacco smoke are essential criteria that affect second-hand smokers. Children, pregnant women, and babies are more susceptible to the harmful effects of tobacco products. Exposure to tobacco smoke for just 30 minutes has the same physical effects as it creates on long-term smokers and causes many diseases such as cancer, heart disease, and COPD. For pregnant women, exposure to smoke increases the risk of having their babies born smaller (http://birakabilirsin.org/pasif-icicilik/). According to GATS in Turkey, respondents stated that they are exposed to cigarette smoke at cafes (26.6%), at home (38.3%), and at private cars (26.4%). The WHO report puts forth that, more than half a million people die for each year because of being passive smokers (WHO, 2013).

2.2. Some Statistics on Tobacco Use

According to the definition adopted by OECD, daily smokers are aged 15 or older and report that they smoke every day. As shown in Graph 2.1., the daily smoking rate in Turkey is 26.5%, this rate is the 4th highest daily usage rate across 41 countries, and the

first three highest rates belong to Indonesia (39.9%), Russia (30.9%), and Greece (27.3%) respectively.



Graph 2.1. Daily Smokers % of Population

Source: OECD, 2019

Across OECD countries (34 countries), Turkey ranks the 2nd highest usage rate (26.5%). When the usage rate of men among OECD countries is examined, Turkey ranks first with 40.1%. Other countries in the top five are Latvia (36.0%), Lithuania (33.9%), Greece (33.8%), and Korea (32.9%) respectively. For women, while Australia ranked first place with 22.1%, Turkey ranks 21st with 13.3% usage rate. Lastly, the average usage of tobacco rates for all OECD countries is %18.31. The rate is %23.11 for men and %14.02 for women. The comparison of OECD averages to Turkey averages

shows that the usage rate of men in Turkey is quite higher than OECD, and usage rate of women in Turkey is lower than the OECD average (OECD, 2019).

2.3. Policy Measures and Legislations

Due to the health, environmental and economic damages caused by tobacco products, many governments have decided to control the use of tobacco products and to raise awareness among individuals on these issues. Since exposure to cigarettes causes serious health problems, some governments imposed laws that prohibits indoor usage. With the enforcement of such smoke-free-laws, a noteworthy decline has been observed in the level of exposure (The Tobacco Atlas 2018). These laws helped reduce the level of exposure of passive smokers in bars and restaurants in several European Union member states substantially, whereas exposure remained radically high in some countries, such as Greece (nearly 80%).

In some countries, another legislation that intends to decrease tobacco consumption is the prohibition of menthol, which is the most well-known flavor for tobacco products. Some of the countries, that have enforced laws banning the sale of tobacco products with menthol flavor are EU countries, five Canadian provinces, Brazil, Turkey and Ethiopia (The Tobacco Atlas 2018).

Another noteworthy measure to reduce tobacco consumption is to legally compel the packages of tobacco products to include cautionary labels. In the U.S., health-warning labels have been used on cigarette packages for a long time. The first warning label was “CAUTION: CIGARETTE SMOKING MAY BE HAZARDOUS TO YOUR HEALTH.”. The warning has appeared on cigarette packages for nearly forty years.

(https://www.rjrt.com/tobacco-use-health/public-health-information/). In the U.S., as required by the U.S. Food and Drug Administration (FDA), graphic warning labels have been embedded into cigarette packaging since 2012. The studies assert that when compared to the stimulating texts containing only the texts, the warning texts containing the pictures are more memorable (Strasser et al., 2012). Used in 66 different countries including Turkey, these warning labels generally consist of seven different themes, which are an addiction, chemicals, emissions and constituents, babies and children, health effects (Arteries and death) and financial. In the literature, there are various studies that examine the effect of these different cautionary labels on the consumption of tobacco products (Hammond et al., 2006; O'Hegarty et al., 2006).

The World Health Organization, which deals with all these regulations under a single heading, has increased its efforts to reduce tobacco use and introduced MPOWER regulations in 2008. Each capital represents one comprehensive measurement for controlling the usage of tobacco.

- Monitoring
- Protecting
- Offering
- Warning
- Enforcing
- Raising

Each of these measurements helped governments not only to guide them for controlling tobacco but also aroused great positive repercussions worldwide.

2.4. Measures and Legislations in Turkey

The first law no: 4207 which is named "TÜTÜN MAMULLERININ ZARARLARININ ÖNLENMESINE DAIR KANUN" on tobacco products was adopted on 7 November 1996. The scope of this law was expanded with the law no: 5727 which is named "TÜTÜN MAMULLERİNİN ZARARLARININ ÖNLENMESİNE DAİR KANUNDA DEĞİŞİKLİK YAPILMASI HAKKINDA KANUN" in 2008.

At the 56th World Health Assembly - WHO, in Turkey, the first international agreement on tobacco control, the Framework Convention on Tobacco Control was adopted in 2003. It was signed by the Minister of Health Recep AKDAĞ on 28 April 2004, and was accepted by the Turkish Grand National Assembly and entered into force. Turkey is the 43rd country that accepted assembly. In 2006, the National Tobacco Control Program was established. 'Provincial Tobacco Control Boards" were established in 81 provinces in 2007 for the National Tobacco Control Program implementation. With the amendments made to the Law No. 5727, smoking was prohibited in the public indoor area in May 2008. Then, in Jul 2009 the indoor public smoking ban was extended to include hospitality sector work places. In 2010, the government imposed a requirement for cigarette packages to include health warning labels. Also, 171 Smoking Cessation Hotline was opened on 27 October 2010 in Ankara. Later, the city was changed to Tekirdağ in 2004. The authority to impose penalties on workplaces with a smoking ban was taken from the municipalities and given to local superiors with the law no:6111 in 2011. In 2012, the law no. 6354 prohibited brand sharing and made it obligatory to place pictured Turkish warning labels or messages on tobacco packages and hookah bottles on both faces, covering not less than 65% of the area of these faces,

signifying the damages of tobacco products Also, with this law, it is forbidden to sell to people under the age of 18 and to make them available for consumption.

Conspicuously, Turkey is the first country who performs MPOWER measures of WHO. In 2013, with the amendment of the Law no: 4207, drivers were banned from smoking. The National Tobacco Control Program Action Plan covering the 2015-2018 period was updated in line with the needs of our country in accordance with the spirit of FCTC in 2015The National Tobacco Control Program Action Plan covering the 2015-2018 period was updated in line with the needs of our country in accordance with the spirit of FCTC in 2015. With this plan following measures were taken. Smoking is prohibited within 5 meters of entries for publicly accessible places. Also, smoking is banned in public parks and similar areas. The Tobacco Control Strategy Paper and Action Plan have been updated to cover the 2018-2023 period in order to protect all individuals from health, economic, environmental and social damages of tobacco products. The Tobacco Control Strategy Paper and Action Plan have been updated to cover the 2018-2023 period in order to protect all individuals from health, economic, environmental and social damages of tobacco products. Is was adopted in May 2018. Then, on December 5, 2018, the "Düz Paket Uygulaması " came into force. On December 5, 2018, the "Düz Paket Uygulaması " came into force. With this exercise, uniform designs were used in all cigarette packages such same fonts, colors. Also with this law, the percent of warning label area on tobacco products increased from 65% to 85%. Moreover, the use of tobacco products on televisions was banned.

Moreover, a media campaign which is called "Dumansız Hava Sahası" was also launched in Turkey. Owing to this campaign, a social impact was created, and

individuals became more aware of the consequences of tobacco usage (https://www.tuseb.gov.tr/enstitu/tacese/ulkemizde-tutun-kontrol-calismalari).

2.5. Policy Measures

Considering the detrimental health effects of tobacco use, it is clear that necessary policy measures need to be taken to change the incentives to use tobacco products. According to CDS' study and FCTC, there are several recommendations not only for decreasing rate of using tobacco but also decreasing initiation rate of using tobacco products.

- An implementation of smoke-free-laws,
- Higher prices for tobacco products and more taxes,
- Regulations for tobacco sales,
- Media campaigns that aim to raise awareness on the harmful effects of tobacco use,
- Making official forbidding rules for advocacy, provocations, and promoting for tobacco products.

CHAPTER III

LITERATURE

The social science literature on tobacco products and their health effects has proliferated in line with the increase in the number of studies in the field of medicine. Numerous studies have been conducted on the health hazards of tobacco products and in the last two decades, researchers have begun to do research on other issues as well. One of these issues is smoking hookah (waterpipe or shisha), which is a widespread tobacco product among young people.

The majority of the articles in the literature investigate the negative health effects of using tobacco specifically cigarettes and hookah and the characteristics of individuals who consume it. The other main topics about tobacco products in literature can be classified as the prevalence of tobacco use and the popularity of hookah among young adults, how hookah consumption behavior changes across cigarette smokers and non-smokers, and awareness of the individuals, the effects of social media, and the sufficiency of legislative arrangements on tobacco products.

3.1. Side Effects of Using Hookah and the Characteristics of Users

The literature on the side effects of hookah use on health includes Sajid et al. (2008) which investigate the level of carcinoembryonic antigen (CEA) serum levels in individuals who consume water pipe and cigarette smokers. “CEA is a substance found on the surface of some cells. It is a type of glycoprotein produced by cells of the

gastrointestinal tract during embryonic development. It is produced in very small amounts after birth. The level of CEA in the bloodstream is thus relatively low unless certain diseases - including certain forms of cancer - are present" (https://www.medicinenet.com/carcinoembryonic_antigen/article.htm#how_is_the_cea_test_used). The study is conducted with 59 samples of exclusive man smokers with ages ranging from 20-80. Individuals taking part in this study are divided into three groups (light, medium, heavy) according to their frequency of smoking to observe CEA serum levels. According to the results, individuals who smoke heavily smokers (up to 2 hours per day, 1-3 smoking sessions) have a higher risk of cancer than medium (up to 2 hours per day in 1- 3 smoking sessions) or light smokers (up to 20 min per day in 1 smoking session).

Another study showing the health hazards of water pipe use is Eissenberg and Shihadeh (2009). They investigate the negative side effects of hookah by comparing the test results of the participants with their results from the cigarette use after they were exposed to the toxic substances of cigarette and pipe water. The participants in the study (N=31, M=21.4 years, SD: 2.3) include monthly water pipe smokers (M=5.2 use/month, SD=4.0) and weekly smokers (M=9.9 cigarettes/day, SD=6.4). For the study, each participant smokes hookah for 45-minutes and a cigarette. Measurements have been made 5 minutes after the smoking session. The data which collected in 2009 includes carbon monoxide (CO) and blood carboxyhemoglobin (COHb), plasma nicotine, heart rate, and puff topography. When the COHb level in the blood is examined for a period of 45 minutes. Because the average duration of smoking is 5 minutes, the level of COHb in the blood for smokers remains constant after the first five minutes and subsequently

decreases. On the other hand, for hookah smokers, the COHb level in the blood increases regularly during the 45 minutes smoking session. It is also shown that the higher COHb level in the blood related to shisha using comparing with using cigarette is significant for all post-smoking time period. By investigating plasma nicotine level in the blood, this article also shows that in the after the 45 minutes using hookah, the higher nicotine level associated with using hookah relative to using a cigarette. As a result, this article emphasizes that cigarette and water pipe contain the same toxic substances.

Korhonen et al. (2018) look into whether the use of psychoactive materials, like tobacco, have neurotoxic and neuromodulatory effects at the beginning of life, which can also be related to suicide-related behaviors. Specifically, the initiation age to start smoke may be a significant factor for the risk of different somatic and mental side effects for health outcomes (DeBry and Tiffany, 2008). Therefore, in this study, researchers investigate the relationship between suicide-related behaviors (SRB) and tobacco use. To research the individuals' health-related attitudes, a longitudinal twin study called FinnTwin12 is conducted in 1994. To examine the purpose of the study, 1330 twins (626 males, 704 females) are used from the FinnTwin12 project. To collect data researchers, make interviews professionally. The data consists of twins aged 14-17.5, and adults aged 22. Then, logistic regression is used to examine whether tobacco use in adolescence is associated with SRB. Also, the “odds ratios (OR)” and “adjusted odds ratios (AOR)” with 95% confidence intervals are computed. Then, by using the statistical software Stata (version 13) some modeling is done and noticeable results are obtained.

In summary, exposure to tobacco and nicotine at an early age is likely to be one of the causes of SRB for adolescents. The study shows that designing prevention programs for females who have vulnerability for suicide-related behavior must be taken. Moreover, researchers have suggested that more research is needed on the relationship between tobacco or nicotine and SRB to prevent young adults and females from the risk of suicide.

One of the studies investigating the prevalence of hookah use and popularity of hookah among young adults is Smith-Simone et al. (2006). In this article, the motivation for the use of water pipe among U.S. young adults as well as the adults' belief, attitudes, knowledge, and perception of water pipe tobacco has been investigated. A survey is conducted via SurveyMonkey.com, including 56 questions for addressing demographics, hookah usage behaviors, and smoking patterns as well as the use of other psychoactive substances. And, for this study, a sample is collected from hookah cafes (n=101) which are in Richmond, Virginia and an internet forum called “HookahForum.com” (n=110). In this study, proportional data are obtained by regression analysis

In this study, there are 161 males and 40 females. The participants (86%) are at the age ranking 18 to 24. 60% of participant use first-time water pipe at before age 18. Currently, hookah using rate is daily for 19%. Respectively, 41%, 29%, and 12% for the rate of weekly, monthly and less than 30 days. On average, individuals are more likely to use hookah on weekends (75%) compared to weekdays (43%). And, the participants state that an average water pipe smoke session takes one hour or more. One of the main features of using is a group of friends using only one water pipe at the same time in a restaurant or cafe. While the major part of participants state that they have their own

water pipe and most of them purchase on the internet. The majority of the participants (80%) states that they are not dependent on the water pipe and they could quit smoking water pipe. However, a large majority (68%) states that they have not made any attempt to quit until that time. In conclusion, the vast majority of the participants who are young adults in the U.S. believe that water pipe tobacco tastes and smells good; it has a relaxing effect and is an opportunity to socialize with friends. Moreover, they believe that the water pipe will be more popular in the next five years.

Braun et al. (2012) assesses the beliefs and perception of hookah users at a Midwestern University in the US and also investigates what other drug-related high-risk behaviors are associated with using hookah. For this study, the participants are selected randomly, and an online survey is sent to 2000 participants from a Midwest University. In this study, cross-sectional data analysis is used to determine the prevalence and motivating factors of using shisha. Obtained data is entered to Statistical Package for the Social Sciences (SPSS) version 16.0. In these statistical analyses, type I error rate of 5% is assumed. With analyzing the data, descriptive statistics including percentages, means, and standard deviations are calculated to investigate demographic characteristics of participants for hookah. As a result, they show that 60% of participants reports smoking hookah at least once in the previous 30 days while 15% of them reports smoking hookah at least once in their lifetime. In addition, 42% of participants regularly use water pipe at least once a month. According to the average participants in the survey, the using hookah session takes 44 minutes. Almost all of the participants state that they learn water pipe from their close friends and they also state that they prefer to use hookah with their friends. As the study suggests, noticeable reasons for the participants to use hookah

are socializing and peer effects. In addition, a significant majority believe that they can stop using the water pipe at any time. According to the participants, the most important damages to the health of the water pipe, respiratory, cardiovascular and cancer effects. On the contrary, 14% of the participants are unsure for what kind of health effects are caused by smoking hookah. In this article, Spearman rho correlations are used to calculate for comparing water pipe use and other high-risk drugs and alcohol-related behaviors. And, it showed that there are statistically significant relationships and a moderately strong correlation between water pipe users and using tobacco monthly. The other finding is that there are statistically significant with low correlations of water pipe and marijuana smoking and 30-day alcohol use. In conclusion, this study shows that there is an optimistic bias about hookah like other studies suggest in the literature and water pipe has a wide prevalence among students. Additionally, the motivation for using hookah such as peer influences, relaxing and, a social gathering is needed to be understood to prevent young people from high-risk behaviors.

3.2. How Hookah Consumption Behavior Changes Across Cigarette Smokers and Non-smokers and Awareness of the Individuals

Barnett et al. (2013) interpret usage for hookah and categorize attitudes of cigarette using and socio-demographic factors. In this study, an intercept sampling method is used, and the number of participants is 1203. In this study, a computer-based survey is applied to the participants who are university students. The University campus is divided into three groups to collect data by using program CAPI (computer-assisted personal interview). Then, the data observed from the participants are weighted to match the University population of students registered during the same semester. Weighted data

which includes socio-demographic data such as student based on ethnicity and race, sex, level of education, and college affiliation are used to minimize sampling bias. For this research bivariate (chi-square and t-test) and multivariate (logistic regression) tests are applied to identify differences between cigarette and shisha users. In details, thanks to logistic regression, odds ratios for shisha use by demographics and cigarette use are calculated. In this study, 2 models are structured by researchers. The first one is used to investigate prediction for hookah use at all time frames (ever, past year, or current) with only demographic factors. And, then the other model is used to predict cigarette for the same time frames.

As a result, hookah is more prevalent than cigarette smoking for “ever use” and “past year use”. However, water pipe has more prevalence than a cigarette, a cigarette is more used often. In this study, Hispanic participants state that they use cigarette and hookah followed by whites, Asian, and others. In addition, there are no age differences for each time frame for both cigarette and hookah. As expected, finding in this study, 56% of participants state that their first use of tobacco products are cigarettes. And, they tried it before at the age of 18. Likewise, students’ first hookah is more likely before at the age of 18. The major part of participants (73%) state that they use tobacco products with their friend, and they use it in a cafe, restaurant, their parent's/friend's house or dormitory.

In conclusion, in the discussion part of the article, the researcher’s advice that some efforts need to be made to obstruct the prevalence of tobacco products. They also suggest that the prevalence of all tobacco products, even the new ones needs to be under control on progressing.

Singh et al. (2017) consist of a collection of several articles which have different methods to search for the motivation of hookah use. As mentioned in the article, the 'initiation' is the important data for the hookah use onset or the progression from non-smoker to an experimental user or regularly using. In this study, sampling is carried out in accordance with the purpose of the study. In addition, criteria, the articles selected included the participants who are high school/college/university students. Considering the other criteria such as age ranking, significant results are obtained in this study which included 26 research articles in total.

As a result, the important reason to try water piper among young people is wondering and popularity which called curiosity by youth. In addition, another reason to initiate shisha is a positive feature of shisha among young adults such as socializes, gathering groups, something to do with friends. Another significant cause which accepted as a cultural norm to use water pipe believes that 'less harmful than cigarette smoking'. Last but not least influence youth to initiate water pipe is media influence. Some articles which included in this study show that some social media platform such as Twitter, YouTube affected young people.

In summary, this study shows that there are many reasons or risk to initiate water pipe smoking. Thus, some actions need to be taken rapidly to prevent the rising prevalence of shisha.

3.3. Effects of Social Media on Tobacco Consumption

Some of the studies which are done by the World Health Organization (WHO) shows that using tobacco product have many side effects. Therefore, the purpose of Nakkash et

al. (2011) is researching the causes to use more tobacco recently in the Middle East region. In this research, Lebanon is chosen to study place. In 2007, some interviews are made with adolescents. Participants are divided into some groups which represented smoking status, gender, age groups, and urban/rural residence. Sensory characteristics of water pipe, consumerism, and intervention are some theme covered in this article.

By explaining the theme of availability of shisha, the articles show that because water pipe is easy to find in cafes and restaurants, the prevalence of smoking water pipe has increased.

Affordability of water pipe tobacco smoking, the second theme in the article, points out that water pipe also developed as a purchasable thing to spend time in cafés or at home, with a little-incurred cost. Because it is sharable among smokers, it is more affordable.

Lastly, the results of the development of hookah tools and tobacco flavors theme are as follows. Change in style of shisha apparatus increased marketing potential. Moreover, more attractive designing such colorful reed stop takes a place in cafes and makes shisha more popular or trend. Also, innovations in the flavor of shisha contributed to the rising in use and motivated initiation.

In conclusion, there are many reasons that cause the spread of the water pipe. And, the increasing prevalence of use hookah especially among adolescents has been documented in countries of Europe and the US. The article results confirm the necessity of implementing some policies and strategies for all tobacco products, including the water pipe.

Krauss et al. (2015) investigate the effects of popular social media called Twitter on individuals about encouraging or discouraging using hookah. For the research, approximately 14,5 million tweets are examined from April 12 to May 10 in 2014. The 358,523 tweets are related to hookah terms and, the 39,824 tweets are selected by using the Klout Score System. Then, the 5000 tweets are selected randomly and, these tweets are used for this study. After that, "Crowd-Flower (http://www.crowdflower.com)", an online corporation whose platform manages an on-demand, the online workforce is used to divide to tweet in terms of 3 themes which are pro-hookah group, anti-hookah group and, neutral groups.

The vast majority (87% or 4,307) of tweets normalizes hookah. Conversely, only nearly 7% of tweets are against to hookah. Also, 46% of tweets are about being willing to use hookah or being smoking shisha. In addition, 19% of tweets are about hookah cafes or products.

In conclusion, a social media tool Twitter has many tweets about promoting hookah and lots of them are not about promotions or advertisements. Conversely, there are enough tweets about hookah cafes/bars or products and, these tweets may influence young people to use hookah. Hence, to decrease pro-hookah influences, social media can be useful for public health campaigns, informing youth. Also, social media can be signal or guide for the legislation about smoke-free law because it has a huge effect on people.

3.4. Prevalence of Hookah Use and Popularity of Hookah among Young Adults

Brockman et al. (2012) investigate the prevalence of hookah use among college students in the USA. An online survey is conducted in two universities for this study.

The response rate among 307 participants is 70%. In this study, socio-demographic and tobacco use data are obtained from Facebook profiles by using descriptive statistics. And, bivariate logistic regression is used to examine covariates of lifetime hookah use (outcome); ORs and their 95% CI are obtained for independent variables including age, gender, race/ethnicity, university, and substance use. More than 50% of the participants were Caucasian. 27.8% of participants stated that they are lifetime hookah users. With the multivariate modeling of lifetime hookah use, this study shows that hookah users are more likely to use cigarette (OR = 3.41, $p < 0.05$) and cannabis (OR = 15.01, $p < 0.001$) than hookah non-smokers.

In conclusion, more than 25% of college students use hookah and shisha smoking is associated with poly-substances use. Therefore, hookah may cause different health problems besides nicotine addiction for individuals.

Minaker et al. (2015) explain the patterns of the generality of smoking water pipe among young people. To investigate the prevalence of hookah this study is conducted for Canadian Students of grades 9-12. In this study, The Youth Smoking Survey (YSS) which is biennial, nationally generalizable, school and paper-based survey is used to measures determinants of tobacco use among adolescents. There are public and private schools in nine provinces (N=450). In the survey, there are socio-demographic questions and questions about the behavior of using tobacco products such as: "In the last 30 days, did you use any of the following?". Two main objectives are to examine the prevalence and correlates of shisha, perceptions of the harm of hookah smoking and to test the relationship between each of them. Assumptions of logistic regressions are checked and then, "Akaike's information criterion (AIC) goodness-of-fit tests" are used to check

model fit. In this study, logistic regressions are conducted using PROC SURVEYLOGISTIC in SAS 9.3. (SAS Institute Inc, Cary, North Carolina)

In conclusion, the vast majority of participants think that shisha is healthier than a cigarette. Also, comparing females and males, males had higher odds of ever using hookah and last-30-day hookah use. As an expected finding, half of the hookah smokers are preferred to use flavored shisha. Therefore, researchers suggested that the authority can make a policy related to youth hookah smoking.

Abdullah et al. (2017) design a cross-sectional study to investigate the prevalence of using hookah in Canada. For this study, "the Canadian Tobacco Use Monitoring Survey" 2011 and 2012 is used. By analyzing data, current hookah usage status, socio-demographic variables, and smoking-related factors are investigated. Bivariate and multivariate logistic regressions to acquire the "odds ratio (OR)" and "95% confidence interval (95% CI)", are used.

The 1.8% of people who at the age of under 18, is current water pipe smokers. And, for the group of age 18-24, this rate is 4%. Moreover, 16.7% of the participants are current cigarette smokers. Quebec which is one of the ten provinces in the study has the highest prevalence level of ever using hookah (11.3%). Male gender, age with 18-24 is statistically significant demographic predictors for "ever water pipe tobacco smoking" at the multivariate level. Level of education is a significant predictor of ever use shisha among the socio-economic variables.

In conclusion, this paper shows that the prevalence of using water pipe in Canada by using “Youth Smoking Survey (YSS)”. The results of this work point out that water pipe smoking is changeable by age, education, and the province of residence.

Since the popularity of the hookah has increased enormously during the past years, the purpose of Alvur et al. (2014) indicates the perception of hookah among university students. To show this perception, Sakarya University campus is chosen. By taking approval from local education authority, a survey which includes 17 questions applied to participants. This survey includes socio-demographic questions and questions about the perception of students about tobacco products especially hookah. In total 1225 (95.7%) of responses are accepted for this study. Then, the percentages and averages of collected data are entered to SPSS to investigate.

The mean age of the students is between 18 and 32, with an average of 21 years. And, 68.8% of the participants are females. In this study, very important results are obtained which show the student perception as follows.

The number of students who think that hookah is not harmful is quite small (6.3%). However, a considerable number of participants believe that the cargionic chemicals are filtered by passing from the water of shisha (25.33%). It is seen that 14.02% of the students (n=176) considered that water pipe with fruit/aroma is more in good health than a level water pipe. Last but not least result of the study is the total of 18% of the students (n=226) believe that water pipe with fruits aroma is not addictive.

In conclusion, there are many misunderstandings among university students. Therefore, it is necessary that especially young adults must be informed about water

pipe about the side effects of it to individuals' health. Also, the awareness of water pipe smoking is a significant matter for decreasing the rising of the prevalence of it.

Pulcu and McNeill (2014) investigate smoke exposure and puffing profiles by comparing water pipe smokers. The sampling includes 130 participants of which 110 cigarette smokers and 20 water pipe smokers. The participants are willing to attend this study and they knew the study from flyers and posters on bulletin boards across the university campus in Istanbul. Also, regular smoking of water pipes at least 3 times a month is the eligibility criteria for participants who smoke water pipe. None of the participants had self-reported lung and heart disease and pregnancy. In the study, cigarette smokers visited the laboratory in the next 24 hours after smoking, but water pipe smokers nearly in the fourth day after a smoking session at the same time. Then, in the laboratory, some measurements and puff recording are made for the level of 1-hydroxypyrene(1-HOP), carbon monoxide (CO), cotinine, saliva, and urine. To investigate the level of ingredients "CreSSmicro (Clinical Research Support System)" topography device is used. In this study addition to measurement in the laboratory, a brief survey is conducted to participants. Also, all participants visit by 2 times; therefore, there are no dropouts from the work.

As the results of the survey and measurement, two groups of the study, water pipe, and cigarette smokers are differed by gender. And, hookah smoking group is significantly younger than a cigarette. The other important results of the study as follow: (1) "the average number of puffs taken by water pipe smokers is nearly eight times greater than the average number of puffs taken by cigarette smokers." (2) "Puffing duration of water pipe smokers is longer and larger in volume than that of cigarette

smokers". Therefore, the total smoke volume inhaled on average per each session of hookah using a is nearly 14 times higher than per cigarette.

In conclusion, this study shows that there are differences in biomarkers between cigarette and hookah users. Also, this study showed that acute exposure is much greater for hookah than cigarette smoking.

Hammal et al. (2016) investigate that the knowledge and awareness of leaders in the community such as family physicians, pharmacists, tobacco counselors, social workers and educators about water pipe. By using qualitative methods, there are 27 interviews in this study. For an interview, there are some abbreviations used as follows: Teachers (T), family physicians (FP), pharmacists (PH), Public Health Nurses (PHN), tobacco counselors (TRC) and social services employees (SS). Critical case sampling and maximum variation sampling are used in the data. All interviews take 30-45 minutes. Then, the data collected are presented using QSR-Nvivo 10.

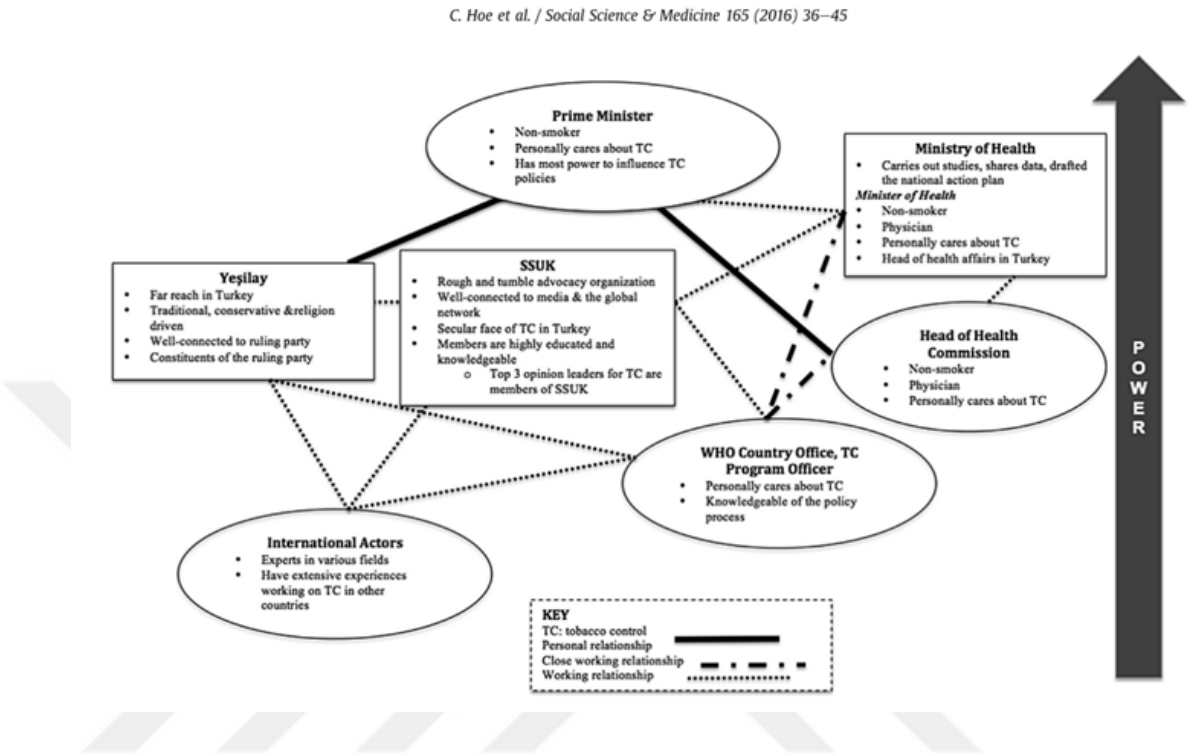
Many participants believe that water pipe tobacco use has been increasing in the last few decades. Also, they state that they do not know how the prevalence of using shisha in huge countries or states. The major of participants indicates that the initiation age of using water pipe of youth is affected by their social environment. As the main objective of the article, most participants report that they do not know a lot about shisha. The interviewers state that education is important for every area including the general public, healthcare professionals, decision-makers, and students. Lastly, most of the participants state that they do not know regulation concerning about hookah.

In summary, a selective part of individuals has many false known facts. And, they state that there are many reasons to motivate water pipe smoking like easy to access, believing shisha healthier than cigarette, cultural relations, social environments, and lack of regulations.

3.5. Sufficiency of Legislative Arrangements on Tobacco Products

Hoe et al. (2016) explore why the hookah becomes more popular and to investigate the factors of how tobacco control politics can be a new political priority for the Turkey government. For this research, Multiple Streams Framework is used, and a mixed-method study approach is applied to collect data which are gathered 3 data sources. Also, not only qualitative data but also quantitative data are included in this research. For qualitative data, documents and interviews are used to understand the cause of factors affecting political preferences development for the last 30 years. And, some surveys are conducted to collect quantitative data which are a guide for the identification of the powerful positions and leaders. Then, to ensure the data convergence qualitative and quantitative data are triangulated. To obtain qualitative data, there are lots of documents published are used such as interviews, newspaper articles, published literature, and Turkey's National Tobacco Laws. And for the quantitative data, a survey is conducted. And, the survey is included 12 questions about the behavior of the participants, the rating for the relationship between nominations of opinion leaders and tobacco control community, and powerful individuals in the tobacco control community in Turkey. For this research, STATA, version 11 and Microsoft Excel, version 2011 are used, and triangulation is applied using a matrix to specify the point of convergence between interviews, documents, and survey.

Figure 3.1. Key Actor Characteristics and Personal Relationship



Because the Ministry of Health (MoH) declared that the first countrywide ratio for the smoking which is 44% of the population in 1988, the tobacco control advocates were alarmed to this dramatic ratio. After that, the first legislation accepted by the Grand National Assembly is vetoed by Turgut Özal. Therefore, the National Coalition on Tobacco or Health (SSUK) is established. Finally, in 1996, the first anti-tobacco law (No. 4207 Preventing Harms of Tobacco Products (1996)) was enacted. In 2002, the Justice and Development Party (AKP) were elected as a leading party, and results show that AKP is more proper for the tobacco control strategies.

In conclusion, with the positive improvements, tobacco control mechanism increased in Turkey, and it became a political priority. As the diagram above shows, lots of

different group of actors have an irreplaceable role for tobacco control. Lastly, this article suggests that a powerful encouraging development may help persuade governments to act.

Because of the differences, for all control strategies about cigarette cannot be a good solution for the hookah. Therefore, Lopez et al. (2017) explore and identifies the differences between hookah and cigarettes exposure from a policy perspective.

According to WHO, cigarette tobacco smoking (CTS) is more preferred by smokers than other tobacco products. Because CTS has huge worldwide effects, some useful intervention began. After that, in 2003 the first treaty about health enacted: The Framework Convention on Tobacco Control (FCTC; WHO, 2003). Comparing water pipe tobacco smoking and CTS, both have the same inhalation mechanism, and both CTS and WTS have serious effects on individuals' health as mentioned above. On the contrary, there have to be differences between prevention of CTS and WTS because of the WTS differs from the toxicant pose, physiologic property, type of usage, environmental issue, and the policy environment.

Considering the policy environment, for CTS there are many legislation and regulation, but for WTS almost no attempt is done. For example, tax for WTS has a lower rate than CTS (Jawad and Millett, 2014; Morris et al., 2012; WHO, 2014a). Also, the tools of water pipe and charcoal are untaxed.

Considering CTS and WTS, for CTS there exists warning labels on packages, reversely the water pipe tools have not such warning for the danger of WTS. Also, even the packages have the warning label; users cannot be able to see these labels because of

the using method. (i.e. hookah cafés). In addition, there is so weak literature about this matter.

In summary, as many studies show, articles about WTS's health effects are not adequate, and to expanding literature articles about WTS from different perceptions are needed to be studied. And, there is minor intervention to prevent and control WTS. Hence, global and national efforts need to be achieved for all counties even developing ones. Lastly, the article suggests that prevention for WTS and controlling it must be more noticeable.

CHAPTER IV

DATA and METHODOLOGY

4.1. The Data

4.1.a. Study Population and Sampling

In this thesis, the data were collected via an online survey of students from 2 private universities, namely, TOBB University of Economics and Technology and İhsan Doğramacı Bilkent University in Ankara, Turkey during the 2018-19 academic year.

The population of interest in the study is the total number of students in the private universities of Ankara (population = 53,455, female= 26,674, male= 26,781, https://istatistik.yok.gov.tr/). The sample used in the thesis consists of 2,577 students who responded to the survey, which constitutes 30.4% of the population (n = 16,259).

4.1.b. Data Collection and Study Instrument

The survey used in this study is based on a study analyzing similar topics consisting of 46 questions (Appendix A) including questions on socio-demographics, use of tobacco products and income levels. The questions are divided into the following 7 modules:

- Socio-Demographic Module
- Cigarette Module
- Hookah Module

- Smoking-Hookah Comparison Module
- Income-Related Module
- Disease Module
- Electronic Cigarette Module

The survey was conducted online on www.surveymonkey.com, which is widely used for academic purposes. It is designed to let the respondents to skip the questions that are irrelevant to them, so that they can focus only on the parts that apply to them. The survey took approximately 6-7 minutes to complete.

The ethics committee endorsement required for the implementation of the survey was taken from TOBB University of Economics and Technology Humanitarian Research Evaluation Board on 15 February 2018.

TOBB University of Economics and Technology students were invited to the survey by e-mail with the survey link (https://tr.surveymonkey.com/r/tobbtutunanketi2018) and reminder emails were sent every three weeks. The survey remained open for approximately 3.5 months. The total number of invitations is 4.544 and the total number of respondents is 1.215.

Permission was obtained from the Vice Rector for Academic Affairs with the approval of the ethics committee to conduct the survey to the students of I.D. Bilkent University. Authorized staff from the computer center sent an e-mail invitation with the survey link to the Student Affairs (https://tr.surveymonkey.com/r/bilkenttutunanketi2018). However, the authorities did not share the information about how many students were invited. The survey was open

for a total of 33 days. Reminder emails were sent. The total number of respondents is 1.362.

In the study, the surveys of 2.525 out of 2.577 respondents who answered at least the first five questions of the survey were used. At the last step, a data set with the answers of the students aged 18-26was created (n = 2.458).

4.1.c. Data Cleaning and Definitions

4.1.c.i. Correction

The consistency of the answers given by the respondents is important for the results of the study. Therefore, certain logical procedures have been applied to the questions in the cigarette and hookah module during the preparation phase of the survey. These logical procedures are explained in "Appendix A".

In this respect, taking the content of the survey questions and the logical procedures into consideration, the errors identified in certain parts of the answers were corrected. In the correction process, the respondents' initial answers were considered as true and their inconsistent answers in the following questions were translated into missing values.

In the 10th question of the survey the highest category of spending on cigarettes was “300 TL or above” in the TOBB University survey, whereas it was “500 TL or above” in the I.D. Bilkent University survey. To determine the top-level of money spent on smoking, the Pareto Curve method (Parker and Fenwick, 1989) was used. By using the whole data set, which ranges corresponds to "300 TL or above” was calculated. Then, the upper limit for the amount of expenditure on smoking was calculated.

Finally, in the 10th and 19th questions, the ranges of spending given were converted to continuous variables by taking the midpoints of these ranges.

4.1.c.ii. Definitions

Based on the answers given to Question 5 of the survey, 2 different smoker definitions according to smoking behavior was generated. The respondents who selected the answer "Yes, I am still using it" to this question are defined as "current user", those who did not are defined as "non-current user", those who selected the answer "No, I never used." Are defined as "never user" and those who selected any other answer are defined as "ever-user". Using the answers to Question 14, similar definitions were generated for hookah use.

The fourth question of the survey asks the GPA of the students. In Turkey, the lowest undergraduate GPA required for postgraduate education is 2.50. Therefore, the participants were divided into two groups based on their GPA as high (at least 2.50) or low (less than 2.50) GPA.

The 28th and 30th questions of the survey aimed to examine the cigarette and hookah consumers of the respondents' circles respectively. Based on the answers to these questions, the individuals into two groups as "Most of their friends are cigarette/hookah smokers" and "Most of their friends are non-smokers of cigarette/hookah". Based on these questions' respond, two dummies variables were created which are CIMITATE and HIMITATE respectively.

In order to proxy the level of access to the financial resources of the students, a "wealth" variable was created based on the student's living arrangement and whether the

student has a car. Six dummy variables were used for each student's "wealth" by on interacting students' living arrangement (3 categories) with whether the student has a car or not (2 categories).

4.2. Methods

4.2.a. Descriptive Statistics

This section provides summary tables based on survey results. The age range of by study sample is 18-26. (M: 21.05, SD: 1.76). The sample consists of 2,458 individuals with of 1,271 males (M age: 21.15, SD: 1.84) and 1,187 females (M age: 20.95, SD: 1.67).

As shown in Table 4.1., 40.6% of the survey participants are students of the School of Engineering, 22.5% are students of the Faculty of Economics and Administrative Sciences. With respect to GPA, 45.8% of the students were in the range of 2.01-3.00. Among all the students, the percentage of the students who have a GPA over 2.50 is 67.5% (Table 4.1.).

While 43.21% of the students are current smokers, this rate is 37.99% for females and 48.06% for males. If we look at the ratio of never-smokers, this rate is 33.70 % of females and 26.12% of the males are never-smokers. 59.36% of the students stated that most of the people around them smoke. This figure is 55.69% for females; 62.79% for males (See Table 4.2.).

More than half of the students (50.73%) stated that they have tried hookah but have not continued. The percentage of those who still use is 17.41%, whereas those who have never tried hookah accounts for 30.31% of the respondents. While 9.60% of females still

use hookah, this rate is 24.70% in males. Females who have not tried any hookah are 38.42% of all females and this figure is 22.74% for males (See Table 4.2.).

More than half (50.60%) of the students who participated in the survey stated that the hookah is more harmful than cigarettes. The number of students who responded to the question about the harmfulness of hookah and cigarette is 2,222. Of the participants, 1,237 (55.67%) stated that hookah is more harmful than a cigarette, 334 (15.03%) of participants stated that cigarettes are more harmful than hookah and 473 (21.28%) of students stated that these are equally harmful. The response of 178 participants is "no idea".

Also, the survey contains questions about which factors motive students to use hookah. The number of students who responded to the question about the motivations is 2,337. Of the participants, 1,699 (72.70%) stated that people use hookah because hookah is being aromatic and spreads good fragrance. 1,221 (52.25 %) of participants stated that hookah makes people enjoyment. 1,187 of participants stated that hookah makes people socialize or participate in friends' environments See Table 4.3.). While 428 of the students are current hookah users, the most selected motivation is the being aromatic /spreading fragrance which is selected by 318 (74.30 %) current hookah users. 274 (64.02 %) of current hookah users stated that people use hookah because of enjoyment. Of the current hookah users, 150 (35%) stated that being shareable, being not burning throat, making sociable and fun chatting are reasons to use hookah (See Table 4.4.).

The survey contains questions about monthly spending on tobacco. The participants are asked how much money they spend monthly on cigarettes. The answer choices are increasing by 10 TL and, the upper limit reaches to "500 TL or more". The average

monthly expenditure for cigarettes is 196.99 TL (OBS .: 965, SD: 126.37 min.:5 TL, max .: 586 TL). Next, the participants are asked how much money they spend monthly on a hookah. The answer choices are increasing by 20 TL and the upper limit reaches to "250 TL or more". The average monthly expenditure for hookahs is TL 38.13 (OBS.: 394, SD: 68.66 min.:10 TL, max.: 428 TL).

65.22% of the students stated that they have no chronic illness. While 209 females have a chronic illness, this number is 132 for males. The most common disease associated with the use of tobacco products was reported as "Oral odor and reeling in teeth". 940 of the participants stated that they observed this disease.

4.2.b. Empirical Models

In order to analyze the survey results, 9 empirical models were established. First three of them examine students' smoking behaviors and analyze how much money they spend on cigarettes. Second three models were established to examine students' hookah usage behavior and analyze how much money they spend on the hookah. Last three models aim to reveal the relationship between using hookah and smoking behaviors and whether they affect each other or not.

4.2.b.i. Cigarette: Current User

Here, the following model was estimated to study the correlates of smoking behavior:

$$CCRRNT_i = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 CIMITATE \qquad (1)$$

$CCRRNT_i$ is i's current smoking status. If the student "i" is a current smoker, $CCRRNT_i$ equals to 1, if the student "i" is not a current smoker, $CCRRNT_i$ equals to 0.

AGE is a continuous variable and shows "i"'s age between 18-26.

MALE is a gender dummy variable. If it equals 1, the student is male. If it equals 0, then the student is female.

As it was stated before, the participants were divided into two groups based on their GPA as high (at least 2.50) or low (less than 2.50) GPA. Then, a dummy variable was created by using this. The dummy variable, named GPA equals 1 if the GPA is low (less than 2.50). Conversely, it equals to 0, if the GPA is high (at least 2.50).

WEALTH is a scale variable in the model. It represents the wealth status of the students. It ranges from 1to 6. This was used as a dummy variable in the model and the bases category, which is the minimum value of this scale was chosen.

As it was stated before, the participants were divided into two groups based on the density of the smoking status of their friends. CIMITATE shows that whether most of the friends around the student smoke or not. If it equals to 1, most of the friends around the student smoke. Otherwise, there are two options. First one is that friends of student do not smoke. The second one is that some of the friends smoke.

4.2.b.ii. Cigarette2: Ever User

The following model is estimated to identify the factors that are influential on whether the cigarette has been ever tried or not.

$$CEVER_i = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 CIMITATE \qquad (2)$$

$CEVER_i$ shows that "i"th student has smoked at least once or not. If the student "i" has tried at least once and is using currently, $CEVER_i$ is equal to 1, if the student "i" has never-tried, $CEVER_i$ is equal to 0.

4.2.b.iii. Cigarette3: Expenditure

The following model was estimated to examine the factors that affect the monthly spending on tobacco consumption.

$$CEXP = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 CIMITATE \quad (3)$$

An ordinary least squares (OLS) was used to find out the correlates of expenditure on smoking among current smokers. CEXP is the logarithm of the amount of money spent on cigarettes.

4.2.b.iv. Hookah1: Current User

This section aims to identify the factors that affect the hookah behavior. The following model was estimated to examine why hookah is currently being used and why it has ever been tried.

$$HCRRNT_i = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 HIMITATE \quad (4)$$

The same procedures are applied here as mentioned for Cigarette1 models.

Differently from Cigarette1 model, HIMITATE shows that whether most of the friends around the student smoke hookah or not. Similarly, if it equals to 1, most of the friends around the student use hookah.

4.2.b.v. Hookah2: Ever User

The following model is estimated to identify the factors that are influential on whether the hookah has been ever tried or not.

$$HEVER_i = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 HIMITATE \quad (5)$$

The same procedures are applied here as mentioned for Cigarette2 models.

4.2.b.vi. Hookah3: Expenditure

The following model was estimated to examine the factors that affect the monthly spending on tobacco consumption:

$$HEXP = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH + \beta 5 HIMITATE \quad (6)$$

A linear regression model was used to find out the expenditure on hookah made by current smokers of hookah. HEXP is the logarithm of the amount spent on the hookah.

4.2.b.vii. Cigarette and Hookah: A Bivariate Model

The following model examined the relationship between current smoking and whether hookah has ever been tried.

$$CCRNT_i = = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH \quad (7)$$

$$HEVER_i = = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 GPA + \beta_4 WEALTH \quad (8)$$

A bivariate probit model using equations (7) and (8) was used. Additional models of the relationship between being a current smoker and being a current hookah user and the relationship between being a current hookah user and being a student that has ever tried smoking are given in Appendix C.

Departments	TOBB University				Bilkent University				Total Students				Grand Total	
	Male		Female		Male		Female		Male		Female		N	%
	N	%	N	%	N	%	N	%	N	%	N	%		
Engineering Faculty	356	14,48	173	7,04	341	13,87	128	5,21	697	28,36	301	12,25	**998**	**40,6**
Faculty of Economics and Administrative Sciences	129	5,25	121	4,92	130	5,29	173	7,04	259	10,54	294	11,96	**553**	**22,5**
Faculty of Arts and Sciences	20	0,81	93	3,78	78	3,17	130	5,29	98	3,99	223	9,07	**321**	**13,06**
Faculty of Fine Arts, Design and Architecture	44	1,79	98	3,99	27	1,1	76	3,09	71	2,89	174	7,08	**245**	**9,97**
Faculty of Law	40	1,63	50	2,03	43	1,75	71	2,89	83	3,38	121	4,92	**204**	**8,3**
Faculty of Management	-	-	-	-	50	2,03	56	2,28	50	2,03	56	2,28	**106**	**4,31**
Others	7	0,28	17	0,69	6	0,24	1	0,04	13	0,53	18	0,73	**31**	**1,26**
Total	596	24,25	552	22,46	675	27,46	635	25,83	1271	51,71	1187	48,29	**2458**	**100**
GPA	**Male**		**Female**		**Male**		**Female**		**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
0,00-1,00	18	0,73	9	0,37	11	0,45	9	0,37	29	1,18	18	0,73	**47**	**1,91**
1,01-2,00	123	5	92	3,74	27	1,1	19	0,77	150	6,1	111	4,52	**261**	**10,62**
2,01-3,00	307	12,49	285	11,59	270	10,98	263	10,7	577	23,47	548	22,29	**1125**	**45,77**
3,01-4,00	148	6,02	166	6,75	367	14,93	344	14	515	20,95	510	20,75	**1025**	**41,7**
Total	596	24,25	552	22,46	675	27,46	635	25,83	1271	51,71	1187	48,29	**2458**	**100**
Being Succesful	**Male**		**Female**		**Male**		**Female**		**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
0,00-2,50	314	12,77	222	9,03	151	6,14	112	4,56	465	18,92	334	13,59	**799**	**32,51**
2,51-4,00	282	11,47	330	13,43	524	21,32	523	21,28	806	32,79	853	34,7	**1659**	**67,49**
Total	596	24,25	552	22,46	675	27,46	635	25,83	1271	51,71	1187	48,29	**2458**	**100**
Living Place	**Male**		**Female**		**Male**		**Female**		**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Home with family	300	12,21	346	14,08	227	9,24	312	12,69	527	21,44	658	26,77	**1185**	**48,21**
Dormitory	172	7	138	5,61	278	11,31	229	9,32	450	18,31	367	14,93	**817**	**33,24**
Home with peer or alone	80	3,25	41	1,67	98	3,99	61	2,48	178	7,24	102	4,15	**280**	**11,39**
NA*	44	1,79	27	1,1	72	2,93	33	1,34	116	4,72	60	2,44	**176**	**7,16**
Total	**596**	**24,25**	**552**	**22,46**	**675**	**27,46**	**635**	**25,83**	**1271**	**51,71**	**1187**	**48,29**	**2458**	**100**
Having Car	**Male**		**Female**		**Male**		**Female**		**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Yes	313	12,73	228	9,28	291	11,84	257	10,46	604	24,57	485	19,73	**1089**	**44,3**
No	199	8,1	274	11,15	256	10,41	304	12,37	455	18,51	578	23,52	**1033**	**42,03**
NA	84	3,42	50	2,03	128	5,21	74	3,01	212	8,62	124	5,04	**336**	**13,67**
Total	596	24,25	552	22,46	675	27,46	635	25,83	1271	51,71	1187	48,29	**2458**	**100**
Wealth 1-6	**Male**		**Female**		**Male**		**Female**		**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
Dormitory and no car	100	4,07	104	4,23	174	7,08	157	6,39	274	11,15	261	10,62	**535**	**21,77**
Home with family and no car	70	2,85	146	5,94	47	1,91	116	4,72	117	4,76	262	10,66	**379**	**15,42**
Home with peers or alone and no car	29	1,18	24	0,98	35	1,42	31	1,26	64	2,60	55	2,24	**119**	**4,84**
Dormitory and having car	60	2,44	26	1,06	76	3,09	59	2,40	136	5,53	85	3,46	**221**	**8,99**
Home with family and having car	211	8,58	185	7,53	161	6,55	175	7,12	372	15,13	360	14,65	**732**	**29,78**
Home with peers or alone and having car	42	1,71	17	0,69	54	2,20	23	0,94	96	3,91	40	1,63	**136**	**5,53**
NA	84	3,42	50	2,03	128	5,21	74	3,01	212	8,62	124	5,04	**336**	**13,67**
Total	596	24,25	552	22,46	675	27,46	635	25,83	1271	51,71	1187	48,29	**2458**	**100**

*NA: Not Answered

Table 4.1. Socio-Demographic Statistics

Have you ever used cigarettes so far?	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Yes, I am still using it.	611	48,07	451	37,99	**1062**	**43,21**
Yes, I quited	95	7,47	57	4,80	**152**	**6,18**
Yes, I tried, but I did not go on.	233	18,33	279	23,50	**512**	**20,83**
No, I never used it.	332	26,12	400	33,70	**732**	**29,78**
Total	1271	100	1187	100	**2458**	**100**
Most of the people around cigarette use	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	798	62,79	661	55,69	**1459**	**59,36**
No	357	28,09	466	39,26	**823**	**33,48**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**
Have you ever used hookah so far?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes, I am still using it.	314	24,70	114	9,60	**428**	**17,41**
Yes, I tried, but I did not go on.	646	50,83	601	50,63	**1247**	**50,73**
No, I never used it.	289	22,74	456	38,42	**745**	**30,31**
NA	22	1,73	16	1,35	**38**	**1,55**
Total	1271	100,00	1187	100,00	**2458**	**100**
Most of the people around hookah use	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	264	20,77	134	11,29	**398**	**16,19**
No	891	70,10	992	83,57	**1883**	**76,61**
NA	116	9,13	61	5,14	**177**	**7,20**
Total	1271	100	1187	100	**2458**	**100**
Which of the following is the correct information about the harms of cigarettes and hookah?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Hookah and cigarettes are equally harmful.	211	16,60	262	22,07	**473**	**19,24**
Hookah is more harmful than cigarette.	622	48,94	615	51,81	**1237**	**50,33**
Cigarette is more harmful than Hookah .	193	15,18	141	11,88	**334**	**13,59**
No idea.	98	7,71	80	6,74	**178**	**7,24**
NA	147	11,57	89	7,50	**236**	**9,60**
Total	1271	100	1187	100	**2458**	**100**

Table 4.2. Statistics about Smoking-Related Behavior

Why people use hookah?	Grand Total	
	N	%
Being aromatic, spreading fragrance	1699	72,70
Enjoyment	1221	52,25
Socialize, participate in friends' environments	1187	50,79
Can be shared with friends	681	29,14
More fun chatting	647	27,69
Without burning your throat	635	27,17
Be a good visual for social media sharing	535	22,89
The environment (light, music, decoration, food, etc.) is nice and relaxing	436	18,66
Being a traditional air, being part of our culture	403	17,24
The intriguing effect of social media visuals	314	13,44
Total	**2337***	-

*: The number of students answered the question (Multiple choices can be selected.)

Table 4.3. Students' Motivations for Hookah

Why people use hookah?	Grand Total	
	N	%
Being aromatic, spreading fragrance	318	74,30
Enjoyment	274	64,02
Without burning your throat	152	35,51
Can be shared with friends	150	35,05
Socialize, participate in friends' environments	150	35,05
More fun chatting	149	34,81
Being a traditional air, being part of our culture	107	25,00
The environment (light, music, decoration, food, etc.) is nice and relaxing	69	16,12
Be a good visual for social media sharing	27	6,31
The intriguing effect of social media visuals	18	4,21
Total	**428***	-

*: The number of current hookah users answered the question (Multiple choices can be selected.)

Table 4.3. Motivations of Current Hookah Users

Having a chronic illness	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Yes	132	10,39	209	17,61	**341**	**13,87**
No	845	66,48	758	63,86	**1603**	**65,22**
I do not know.	82	6,45	96	8,09	**178**	**7,24**
NA	212	16,68	124	10,45	**336**	**13,67**
Total	1271	100	1187	100	**2458**	**100**
Mark tobacco-related diseases among your friends, relatives, and acquaintances.*	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Oral odor and reeling in teeth	398	42,34	542	57,66	**940**	**100**
Heart and vascular diseases	314	51,82	292	48,18	**606**	**100**
Chronic lung diseases (Bronchitis, COPD, etc.)	253	44,46	316	55,54	**569**	**100**
Gastritis, ulcer and stomach cancer	135	42,86	180	57,14	**315**	**100**
Skin wrinkle, wrinkle, skin cancer	114	39,04	178	60,96	**292**	**100**
Blockage in veins and associated paralysis	110	51,40	104	48,60	**214**	**100**
Prostate cancer	34	54,84	28	45,16	**62**	**100**
Preterm birth in pregnancy and consequently various developmental disorders in child, and postpartum discontinuation.	20	37,04	34	62,96	**54**	**100**
Cervical cancer	14	42,42	19	57,58	**33**	**100**
Bladder cancer	17	60,71	11	39,29	**28**	**100**
I do not know anyone who uses tobacco products	9	42,86	12	57,14	**21**	**100**
I know people who use tobacco products, but I do not know whether they have a disease.	427	60,14	283	39,86	**710**	**100**

*:The percentage of the line is calculated on the total person marking the disease.

Table 4.4. Health-Related Statistics

CHAPTER V

RESULTS

In this chapter, the results of the study are presented in three sections. In the first section, the factors that increase the risk of smoking are explained. The explanations are categorized under two definitions; "current" and "ever" user. In this part, the factors that are correlated with the expenditure on smoking are analyzed as well. In the second section, the factors that increase the risk of using hookah are examined. As in the first section, they are presented in three different ways. In the last section, whether there is a relationship between smoking and using hookah is tried to be found out.

In the first two chapters, logistic regression is used to identify the risks that increase the use of tobacco products. Following the results of the regressions, the odds ratios (OR) of the coefficient estimates are presented. In order to examine the survey questions related with expenditure, a linear regression model is used. Lastly, in the third section, a bivariate probit regression is used. After examining the regression results, “athrho” coefficient is analyzed to decide whether the model is significant or not.

5.1. Cigarette Use

5.1.a. Cigarette 1

As shown in Table 5.1., when the age variable increases by one unit, the probability of individuals being a current user increases by 7%. Table 5.1. shows that the gender factor has a significant difference. Being male increases the risk of being a current

smoker significantly. The analysis of the GPA variable puts forth that it is more likely that the students who are unsuccessful smoke compared to the successful students. The odds ratio of C_IMITATE is 5.32 (95% CI: 4.28-6.61) and it implies that people around the students play a very important role for being a current smoker. Considering the income levels of the students, it is found that the students who have a car and share a residence with roommates are much more likely to smoke compared to those living in dormitories and those without a car. Among the students who do not have a car, those who stay at home with their peers are more likely to be smokers than those who stay at dormitory.

On the other hand, in this regression, our classification rate is 67.39% and the area under “The Receiver Operating Characteristic (ROC) Curve” is 0.7422. When the model is tested using Pearson Chi2 and Hosmer-Lemeshow Chi2 tests, it cannot be rejected and therefore it is deemed to give statistically significant results. Additional relevant regressions are presented at the appendix (Appendix C).

VARIABLES	Odds Ratio	%95 Confidence Interval (CI)
AGE	1.07 **	1.014-1.135
	(0.0308)	
MALE	1.30***	1.078-1.589
	(0.1295)	
GPA	1.53***	1.256-1.885
	(0.1595)	
C_IMITATE	5.32***	4.280-6.612
	(.05902)	
wealth		
Home with family and no car	1.09	.8085-1.473
	(0.1671)	
Home with peers or alone and no car	2.77***	1.766-4.361
	(0.6399)	
Dormitory and having car	1.15	.8161-1.641
	(0.2063)	
Home with family and having car	1.16	.9071-1.498
	(0.14939	
Home with peers or alone and having car	2.45***	1.589-3.796
	(0.5456)	
_cons	0.03***	.0100-.1098
	(0.0202)	

Number of Observation : 2,122
Pseudo R2: 1.1379
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.1. Regression of Current User of Cigarette

5.1.b. Cigarette 2

As shown in the Table 5.2., age, being male, and being unsuccessful have a similar effect, like being a current smoker, on being an ever user. People who smoke around students cause students to use cigarette at least once in their life. The odds ratio of C_IMITATE is 3.78 and statistically significant. If the students who live at home with their peers are compared with the students who live in a dormitory, it appears that living home with peers creates a high risk than living in a dormitory in terms of using cigarette

at least once throughout the life-time. Among the students who live with their peers, it is found that the students who have car are more likely to try cigarette at least once than the others.

On the other hand, in this regression, the classification rate is 70.83% and the area under “The Receiver Operating Characteristic (ROC) Curve” is 0.7124. When the model is tested by using Pearson Chi2, it is not found statistically significant in a %95 confidence interval. However according to the results of the Hosmer-Lemeshow Chi2 tests, the model cannot be rejected, it gives statistically significant results. Additional relevant regressions are presented at the appendix (Appendix C).

VARIABLES	Odds Ratio	%95 Confidence Interval (CI)
AGE	1.07**	1.013-1.139
	(.0321)	
MALE	1.28**	1.045-1.568
	(.1325)	
GPA	1.32**	1.059-1.659
	(.1517)	
C_IMITATE	3.78***	3.100-4.622
	(.3855)	
wealth		
Home with family and no car	1.02	.7579-1.373
	(.1546)	
Home with peers or alone and no car	2.03***	1.218-3.414
	(.5361)	
Dormitory and having car	.941	.6618-1.338
	(.1691)	
Home with family and having car	1.06	.8265-1.381
	(.1399)	
Home with peers or alone and having car	2.46***	1.402-4.326
	(.7078)	
_cons	.170***	.0490-.5815
	(.1066)	

Number of Observation : 2,122
Pseudo R2: 0.1006
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.2. Regression of Ever User of Cigarette

5.1.c. Cigarette 3

For examining the monthly expenditure of students for smoking, the factors that affect spending among the students who currently smoke are taken into consideration. As Table 5.3. shows, statistically, students' expenditure on cigarettes is not affected by being successful or unsuccessful. On the other hand, age and being male are found to have a positive effect on spending more on cigarette. As the previous results suggest, people who smoke around students affect students. In other words, environmental

factors are positively correlated with spending more on cigarette. However, wealth levels are not statistically significant for spending more money on cigarette.

Although the regression yields above results, when the explanation power of the linear regression model is questioned, it is observed that the R2 is quite low. For this model, additional linear regression models are given at Appendix C.

VARIABLES	CEXP
AGE	0.0498**
	(0.0203)
MALE	0.313***
	(0.0725)
GPA	0.0947
	(0.0716)
C_IMITATE	0.722***
	(0.0968)
Home with family and no car	-0.0978
	(0.118)
Home with peers or alone and no car	0.112
	(0.145)
Dormitory and having car	0.177
	(0.131)
Home with family and having car	0.00687
	(0.0966)
Home with peers or alone and having car	0.202
	(0.136)
Constant	2.986***
	(0.442)
Observations	837
R-squared	0.114

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.3. Regression of Amount of Expenditure on Cigarette

5.2. Hookah Use

5.2.a. Hookah 1

When the age variable increases by one unit, the probability of using hookah increases by 6% and it is statistically significant at the 10% significance level. Considering the success variable, being unsuccessful is found to be riskier than being

successful for being a current hookah user. The odds ratio is 1.26 and it is statistically significant at the 10% significance level. Table 5.4. implies that being male and having a lot of people around who smoke affect students' probability of using hookah currently. In this regression, maximum effect belongs to a H_IMITATE variable (OR: 6.97, 95% CI: 5.35-9.08). As an important result, considering staying at the dormitory and staying home with family, it is found that staying with family has a diminishing effect on using hookah. The odds ratio of this is lower than 1 and it is statistically significant at the 5% significance level (See Table 5.4.).

When the explanation power of the regression is examined, it is observed that the classification of the model is very high rate, %83.92 and the area under the ROC curve is 0.7722. When the model is tested by using Pearson Chi2 and Hosmer-Lemeshow Chi2 tests, it is decided that the model cannot be rejected under both tests. In other words, the model gives statistically significant results. Additional relevant regressions are presented at the appendix (Appendix C).

VARIABLES	Odds Ratio	%95 Confidence Interval (CI)
AGE	1.06*	.9926-1.146
	(.0392)	
MALE	2.65***	2.027-3.472
	(.3642)	
GPA	1.26*	.9762-1.645
	(.1687)	
H_IMITATE	6.97***	5.353-9.080
	(.9397)	
wealth		
Home with family and no car	.599**	.3880-.9257
	(.1329)	
Home with peers or alone and no car	1.26	.7310-2.178
	(.3515)	
Dormitory and having car	.711	.4488-1.126
	(.1669)	
Home with family and having car	.866	.6278-1.196
	(.1426)	
Home with peers or alone and having car	1.11	.6758-1.848
	(.2869)	
_cons	.018***	.0040-.0877
	(.0147)	

Number of Observation : 2,121
Pseudo R2: 0.1658
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.4. Regression of Current User of Hookah

5.2.b. Hookah 2

To investigate which factors affect individuals to use hookah at least once in their life equation (5) is estimated. When the AGE increases by one unit, the probability of being an ever hookah user increases %18 significantly at the %99 confidence level. The odds ratio of variable male is 2.02 and it is statistically significant at %99 confidence level. This implies that being a male is riskier than being a female in terms of using hookah at least once in life at the same age group. Comparison of students based on their academic success indicates that students who have lower grades than others are riskier than those

who have higher grades for trying hookah. The odds ratio of GPA which gives the aforementioned result is 1.54 and it is statistically significant at all confidence levels. It can be stated that people who use hookah around students affect students negatively since the odds ratio of variable “H_IMITATE” is greater than one and it is statistically significant at all significance levels. In other words, students are more likely to use hookah when they are surrounded by hookah users (See Table 2). The analysis of the interaction variable “wealth”, which is determined by “living arrangement” and “having a car or not”, points out that having roommates increases one’s likelihood of using hookah. In other words, the odds ratio of the dummy which represents people "Home with peers or alone and no car" and dummy which represents people "Home with peers or alone and having a car" are greater than two and they are significant for all significance levels (see Table5.5.).

When the explanatory power of the regression is examined, it is observed that the classification of the model is very high rate, %69.35, and the area under the ROC curve is 0.6809. When the model is tested by using Pearson Chi2 test, it is not found to be statistically significant in a %95 confidence interval. However, considering Hosmer-Lemeshow Chi2 tests, the model cannot be rejected, it gives statistically significant results. Additional relevant regressions are presented at the appendix (Appendix C).

VARIABLES	Odds Ratio	%95 Confidence Interval (CI)
AGE	1.18***	1.118-1.259
	(.0359)	
MALE	2.02***	1.656-2.467
	(.2055)	
GPA	1.54***	1.245-1.925
	(.1720)	
H_IMITATE	1.61***	1.220-2.130
	(.2293)	
wealth		
Home with family and no car	.969	.7306-1.286
	(.1398)	
Home with peers or alone and no car	2.11***	1.268-3.520
	(0.5511)	
Dormitory and having car	1.08	.7678-1.543
	(0.1939)	
Home with family and having car	1.19	.9319-1.533
	(0.1518)	
Home with peers or alone and having car	2.64***	1.523-4.603
	(.7470)	
_cons	.030***	.0088-.1065
	(.0194)	

Number of Observation : 2,121
Pseudo R2: 0.0706
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.5. Regression of Ever User of Hookah

5.2.c. Hookah 3

The analysis of the monthly expenditure of students on hookah is restricted only to students who currently use hookah. As Table 5.6. shows, statistically, students' expenditure on hookah is not affected by being successful or unsuccessful. Besides, age and being male has no significant effect on spending more money on hookah. As the previous results suggest, people around students who smoke hookah are influential on students. In other words, environmental factors are positively correlated with spending more money on hookah. Generally, wealth levels are not statistically significant for

spending more money on hookah. However, living with family and having a car have a positive effect on spending more money on hookah.

Although the regression yields above results, when the explanation power of the linear regression model is questioned, it is observed that the R2 is quite low. For this model, additional linear regression models are given at Appendix C.

VARIABLES	HEXP
AGE	0.0169
	(0.0305)
MALE	0.106
	(0.121)
GPA	0.174
	(0.107)
H_IMITATE	0.291***
	(0.105)
Home with family and no car	0.0700
	(0.191)
Home with peers or alone and no car	0.125
	(0.219)
Dormitory and having car	0.282
	(0.191)
Home with family and having car	0.340**
	(0.132)
Home with peers or alone and having car	0.267
	(0.208)
Constant	2.175***
	(0.664)
Observations	342
R-squared	0.064

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.6. Regression of Amount of Expenditure on Hookah

5.3. Results of Comparison of Cigarettes and Hookah

In this section it is examined whether the decisions to smoke and to use hookah are joint decisions (i.e. whether they are correlated) or not. For this purpose, equations (7) and (8) are estimated jointly, by using a bivariate probit model. The estimate of "rho"

shows the estimate of the correlation coefficient between the error terms of the two equations.

5.3.a. Cigarette and Hookah

Table 5.7. shows that there is a relationship between being a current smoker and being an ever hookah user significantly. The “athrho” is 0.79 and is significant for all significance levels. The variable of age is statistically significant for two dependent variables. Being male has a similar effect for two independent variables. On the other hand, being male is more effective on “HEVER” variable than “CCURRENT”. Compared to students who stay in a dormitory and do not have a car, students who stay with a peer at home and have a car carry more risk in terms of using both tobacco products.

When the model is tested by using Pearson Chi2 test, the chi2 (1) result is 290.343 and the p-value is 0.000, which means that the model is statistically significant to show the relationship between current smokers and ever hookah users.

In this part, the crosses of cigarette and hookah behaviors according to their usage status are also presented. The results are given at the Appendix C in detail.

VARIABLES	CCURRENT	HEVER	
AGE	0.0519***	0.0916***	
	(0.0164)	(0.0174)	
MALE	0.217***	0.455***	
	(0.0572)	(0.0598)	
GPA	0.370***	0.267***	
	(0.0602)	(0.0651)	
Home with family and no car	0.0317	-0.0156	
	(0.0878)	(0.0877)	
Home with peers or alone and no car	0.538***	0.443***	
	(0.132)	(0.148)	
Dormitory and having car	0.0529	0.0697	
	(0.103)	(0.106)	
Home with family and having car	0.108	0.128*	
	(0.0740)	(0.0760)	
Home with peers or alone and having caR	0.630***	0.561***	
	(0.128)	(0.152)	
Constant	-1.637***	-1.824***	
	(0.346)	(0.366)	
athrho			0.790***
			(0.0464)
Observations	2,122	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.7. Regression of Comparison Cigarette and Hookah

CHAPTER VI

CONCLUSION AND DISCUSSION

This research explores the tobacco consumption behaviors of private foundation university students, their spending on cigarettes and hookah, and the relationship between smoking cigarettes and using hookah. In order to shed light on the students' tobacco-related behaviors, some important descriptive statistics and regression analyses are used in this study.

The study is based on a sample of 2458 students who study at two universities (TOBB-ETÜ and Bilkent) in Ankara (M age = 21.05, SD: 1.78, min = 18, max = 26). 48.29% of the sample is women (M age: 20.95, SD: 1.67), and the remaining 51.71% is men (M age: 21.15, SD: 1.84). Data were collected by an online voluntary survey. All students were asked questions about their smoking status. 43.21% of the students (48.07% of men and 37.99% of women) are current smokers. For comparison, the GATS study reported that in Turkey, 27.1% of adults (at age 15 or older) are current smokers (41.5% of men and 13.1% of women) (WHO, 2013). Compared to these results, the share of current-smokers is higher for students attending private universities than the overall adult population in ages 15 or over, and this difference is more noticeable for females (Appendix B).

In this research, of the 2420 people who answered the question about the use of hookah, 17.39% stated that they are current hookah users (25.14% of men and is 9.74% of women). On the other hand, the GATS study in Turkey puts forth that the overall

share of current hookah users is 0.8% (1.1% of men and 0.5% of women). This study reveals that the rate is substantially higher for students at private universities. A similar study in the U.S. reveals that among university students 8.4% are current hookah users (Primack et al., 2012). Earlier studies typically examined current users of hookah. One distinction of this research is that it considers ever-users of hookah, in addition to current users. The survey results indicate that 66.22% of the respondents fall into the ever-user category (76.86% of men and 61.06% of women). Therefore, this study shows that hookah is one of the most popular tobacco products among college students and more than half of the students has tried hookah at least once (Appendix B).

This research also investigates how much money current smokers allocate to cigarettes and hookah from their monthly budget. Out of 1062 current cigarette users, 965 students shared information about their expenditure on cigarettes. Among these students, 19.48% spend about 300-350 TL per month on cigarettes. Taking the midpoints of the expenditure brackets, the overall average monthly expenditure was found to be 197 TL (OBS: 965, SD: 126.37, min: 5, max: 586, median: 195). Out of the 428 current hookah users in the sample, 394 students shared information about their expenditure on hookah. Among these students, the average monthly expenditure (again, calculated by taking the midpoints of brackets) was 38.13 TL (OBS: 394, SD: 68.66, min: 10, max: 428, median: 10).

The net minimum wage in Turkey was 1,603.12 TL for the year in which the survey was conducted (http://iskanunu.com/asgari-ucret/). From this standpoint, the average monthly cigarette expenditure of the current cigarette-user students studying at a private university is 12.28% of the net minimum wage. The corresponding share is lower

(2.37%) for hookah spending, yet it is still considerable. The lower rate of hookah consumption (relative to cigarettes) generally stems from the nature of the hookah ritual and the lower mobility of hookah, both of which consequently reduces the frequency of hookah use.

An examination of the characteristics of cigarette and hookah users reveals the following results. First of all, the gender factor creates significant differences (57.53% of the 1062 current cigarette users are men, whereas 42.47% are women.73.36% of the 424 current hookah users are men and 26.64% are women). As also found in earlier studies, tobacco use is more common among men than among women. This observation may have a cultural explanation.

The living arrangement of the student has been found to be another prominent factor that affects smoking behavior. 50.55% of current cigarette users live with their families, 31.36% live in a dormitory, and 18.09% live alone or with a peer (among 995 smokers who share information about living arrangement). 46.35% of current hookah smokers live with their families, 37.03% live in a dormitory, and 16.62% live alone or with a peer (among 397 smokers who share information about living arrangement). Surprisingly, for both tobacco products most of the current smokers live at home with their families.

When the current smoking situation of the students depends on their living place is taken into consideration, 38.19% of students who stay at a dormitory are current cigarette users (n=817). 42.45% of students who stay with their family are current cigarette users (n=1,185). Strikingly, 64.29% of students who stay at home alone or with peers are current cigarette users (n=280) (among 2282 students who share information about the living arrangement and smoking status of cigarette). These figures are higher

for "ever-user" students. 66.95% of students who stay at a dormitory are ever users. 69.28% of students who stay with their family are "ever-user". 84.64% of students who stay at home alone or with peers are "ever-user".

Another important factor is the financial resources that the student has access to. Although neither family income nor wealth was directly asked in the survey, car ownership was seen as a good proxy on which reliable information can be easily collected. More than half of current smokers (55.43% of 902 cigarette smokers and 55.56% of 369 hookah users) stated that they have a car (Appendix B).

In this study, logistic regression was used to study the factors that affect students' smoking behavior. In additional, OLS was used to investigate the correlates of expenditure on smoking among current smokers. The following results are obtained from these regressions:

Age was found to be statistically significant for being a current smoker or an ever smoker. As students spend more time at the university, they become more likely to initiate or try tobacco use. Age also has been found to have a positive effect on the monthly expenditure on cigarettes, but not on the expenditure on hookah.

Similar to the findings in descriptive statistics, the regression results show that there are gender differences in tobacco-related behaviors. Men are more likely to be current or ever users than women, as found in other studies in the literature (Ingrid, 1991; Grunberg et al., 1991; Bauer et al., 2007). Moreover, being a male is positively correlated with higher expenditure on cigarettes, but it does not have a significant effect on the expenditure on hookah. Academic success is another important factor.

Students with a GPA less than 2.51 have a higher tendency for cigarette smoking. Furthermore, they have a higher tendency for using hookah (OR: 1.54, 95% CI: 1.24-1.92). On the other hand, academic success is not associated with the expenditure on tobacco among users.

This research also takes into account the social network effects on tobacco-related behaviors. If most friends of the student smoke, then the student is 5 times more likely to smoke, compared to a student with only a few smoking friends (OR: 5.32, 95% CI:4,28-6.12). For hookah use, the corresponding odds ratio is 6.97 for regular hookah users (95% CI: 5.35-9.08). For ever hookah users, the odds ratio is 1.61 (95% CI: 1.22-2.13). The social network affects one's spending on cigarettes, as well (Coeff.: 0.722, SD: 0.0968, 95% CI: 0.531-0.911). The network effect can be explained by the anecdotal evidence that smoking helps students socialize with other students. For hookah users, having a network of users is also positively correlated with spending money on hookah (Coeff.: 0.291, SD:0.105, 95% CI: 0.084-0.496).

Evidence suggests that hookah is used as a tool for socialization among students. A single hookah can be shared with everyone at the table. In the survey, students were asked about their opinions about why people use hookah. More than 1 thousand students stated that it enables people to socialize and helps to be a part of the friendship network. Evidence also suggests that adding various pleasant aromas to tobacco used in hookah is a successful marketing tool. In the survey, the most-often stated the reason (by almost 75% of the respondents) for why people use hookah was that it is aromatic and fragrant. Participants stated as other important reasons that smoking hookah is yielded pleasure, that it does not burn one's throat (like cigarettes may), that it can be shared, and that

photographs of hookah look nice when shared on social media (Table 4.3. and Table 4.4.).

The results indicate that the friendship network affects a student's choice about tobacco consumption. There are various results in the literature that are consistent with the results. This situation is attributed to the argument that young people use tobacco products to socialize and become popular among their friends (Biglan et al., 1995; Robalino et al., 2018).

In this study, in order to proxy the level of access to the financial resources of the students, a "wealth" variable which is created based on the student's living arrangement and whether the student has a car is used. Six dummy variables for each student's "wealth" are created by interacting student's living arrangement (3 categories) with whether the student has a car or not (2 categories). The cross of living at a dormitory and having no car is used as the base category. Following results are obtained by comparing the base category with other categories.

Students who live at home alone or with peers and have no car have a higher risk of being current cigarette smokers compared to the students of the base category (OR:2.77, 95% CI: 1.76-4.36). Moreover, the odds ratio of the group which comprises of students who live at home with their friends and who have a car is 2.45 and statistically significant at all significance levels. This may be due to the influence of staying at home with peers and the influence of a high level of wealth leading to more cigarette using. On the other hand, when the average cigarette price is considered, it can be said that it is purchasable for all students who are in a private university. Therefore, the first reason

seems to be more acceptable for the sample of this study. When the effect of the scale variable on expenditure is examined, it is seen that it does not give a meaningful result.

Compared to the base category, students who live at home with their family and have no car are less likely to be a current hookah user (OR: 0.59, 95% CI: 0.38-0.92). This result is statistically significant for the 90% significance level. This can be explained by the argument that the parents have a positive effect on the students to be a non-smoker for hookah. On the other hand, in terms of the ever hookah users, who have tried hookah at least once, the scale variable is found to have similar statistical effects as current cigarette users. The odds ratio of category 3, which includes students who stay at home with peers and have no car is 2.11 and it is statistically significant for all significance levels. Also, the odds ratio of category 6, which includes students who stay at home with peers and have a car is 2.64 and it is also significant. The analysis of the effect of the scale variable on expenditure sets forth that it is significant for category 5, which includes students who stay at home with family and have a car. It is found that being in category 5 increases spending money on hookah.

In this study, whether the hookah behaviors and cigarette behaviors of the students affect each other or not are also examined. To find out whether a relationship exists or not, the bivariate probit regression model is used. The regression model gives that there is a significant relationship between being a current cigarette user and an ever hookah user. The “athrho” coefficient of the regression is 0.79 and it is statistically significant for the 99% confidence interval. Also, different regression analyses are conducted based on the usage of these tobacco products. Details are included in Appendix C. The outcome of the analysis indicates that if students are current cigarette users, this

behavior affects being an ever hookah user or being a current hookah user. Because of this reason, in order to reduce hookah consumption preventive actions should also be taken for hookah, such as more taxes, warning labels, ads, etc.

Once and for all, this study may have some shortfalls that may have affected the results. To start with the survey questions, first, the monthly spending questions asked for cigarette and hookah have price ranges. These ranges are converted to continuous variables by taking middle points. In this regard, the monthly expenditure does not reflect the real values for both cigarette and hookah.

Moreover, in this study, how the income level of the students affects their tobacco consumption behavior is analyzed. To analyze this issue, questions such as the type of accommodation, having a car/or not, income source are asked to the students. Also, interaction variables are created by combining the answers to those questions. Most of the models show that as income level increases, so does the smoking. According to the definitions used in the study, we did not distinguish people who smoke a lot and use a smaller number of cigarettes by behavioral aspect.

According to the results of this study, there are significant differences in gender between the ages of 18-26 in the use of tobacco products and those studying at a private university. Therefore, preventive policy practices for the use of tobacco products should have different sensitivities according to gender. In general, for private university students, an increase in the wealth level of individuals may increase the probability of using tobacco. Also, nearly more than half of the sample stated that they live with their family and they receive support from their family (Appendix B). Therefore, it can be

recommended that the parents need to provide more information about tobacco products to their children.

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APPENDIX

APPENDIX A

A.1. Survey Questions

The questions of the survey are as follows.

Q1. What is your gender?
Q2. What is your birth year?
Q3. What is your academic major?
Q4. What is your Grade Point Average (GPA) score?
Q5. Have you ever used cigarettes?
Q6. How old were you when you smoked your first cigarette?
Q7. How often do you smoke?
Q8. Had you been smoking on a daily basis or occasionally in the past?
Q9. How many cigarettes do you smoke per day?
Q10. How much money do you spend for smoking per month?
Q11. Do you think that you would consume more cigarettes if there was no smoking ban in closed areas?
Q12. When do you smoke your first cigarette of the day (or when did you smoke your first cigarette of the day in the past?)?
Q13. Have you tried to quit smoking in the last twelve (12) months?
Q14. Have you ever used a hookah?
Q15. How old were you when you first used hookah?
Q16. Have you used hookah in the last thirty (30) days?
Q17. Do you use water pipe (hookah) regularly?
Q18. What often do you use hookah?
Q19. How much money do you spend per month on hookah?
Q20. Have you tried to quit hookah smoking in the last twelve (12) months?
Q21. Where do you usually use hookah?
Q22. Do you usually use the hookah alone, or are you sharing it?
Q23. How many different places can you use hookah in your neighborhood, university, or the other places?
Q24. Why do you think people use water pipes?
Q25. How do you make money?
Q26. Where were you living when you were studying in college?
Q27. Which of the following statements best describes your income?
Q28. Do any of your friends smoke?
Q29. Does your girl/boyfriend (or your ex-girlfriend/boyfriend) smoke?
Q30. Does any of your friends use water pipes (hookah)?

Q31. Does your girl/boyfriend (or your ex-girlfriend/boyfriend) use water pipe?
Q32. Do you agree with the statement "I would use more cigarettes if I had more money"?
Q33. Do you agree with the statement "I would smoke more if the cigarettes were cheaper"?
Q34. Do you agree with the phrase "I would use more water pipes if I had more money"?
Q35. Do you agree with the phrase "I would use more water pipe if the water pipe was cheaper"?
Q36. Are there any legal regulations for indoor hookah smoking?
Q37. Which of the following is the correct information about the harms of cigarettes and water pipe smoking?
Q38. Have you encountered a warning such as "Harmful to health" etc. in the places where the hookah is used?
Q39. Where are you exposed to secondhand cigarette smoke?
Q40. Where are you exposed to secondhand hookah smoke?
Q41. Do you have any of the following illnesses that are caused by tobacco products use?
Q42. Do you have any chronic illnesses?
Q43. Have you ever heard of a product called electronic cigarette?
Q44. Have you ever used electronic cigarettes?
Q45. Do you have someone using electronic cigarettes around you?
Q46. Do you have a car?

A.2. Survey Modules

The survey consists of 7 modules.

1. The Socio-Demographic Module includes Q1-Q2-Q3-Q4-Q26.
2. The Cigarette Module includes Q5-Q6-Q7-Q8-Q9-Q10-Q11-Q12-Q13-Q28-Q29-Q39.
3. The Hookah Module includes Q14-Q15-Q16-Q17-Q18-Q19-Q20-Q21-Q22-Q23-Q24-Q25-Q30-Q31-Q36-Q38-Q40.
4. The Smoking-Hookah Comparison Module includes Q37.
5. The Income-Related Module includes Q27-Q32-Q33-Q34-Q35-Q46.
6. The Disease Module includes Q41-Q42.
7. The Electronic Cigarette Module includes Q43-Q44-Q45.

A.3. Question Skip Logic

Rule 1: For any question between Q5-Q13, if the student chose "No, I never used" or "I do not smoke", then the student was automatically forwarded to the Hookah module (Question 14).

Rule 2: For any question between Q14-Q23 questions, if the student chose "No, I did not use. "or "I do not smoke.", then the student was automatically forwarded to Q23.

A.4. Data Cleaning Details

The constraint required for a valid survey was that the student answers the first five questions completely. The responses to the survey questions were evaluated separately for each module.

In this study, we assume that in each module the first answer of the student is more likely to reflect the truth.

First, we cleaned the data by checking answers to the later questions (i.e., the "forward" method). In the smoking module, if the student chose the option "I never used" or "I quitted", then we changed the answers to the following smoking-related questions to "missing". We implemented this method for both cigarette and hookah modules.

After that, we cleaned the data by using a similar but "backward" method. At this step, we moved backwards in the survey and changed the non-logical answers to a missing value.

In questions 29 and 31, we revised the answers as follows: First, if "Yes" or "No" options were selected in Question 29, the "I have no boy/girlfriend." response in question 31 was changed to a missing value. Secondly, if "I have no boy/girlfriend." options were selected in Question 29, the "Yes" or "No" responses in question 31 were changed to a missing value.

A.5.Ethics Committee Approval

The ethics committee endorsement required for the implementation of the survey was taken from TOBB University of Economics and Technology Humanitarian Research Evaluation Board on 15 February 2018. The official letter regarding the decision is given below.

Figure A.1. Ethical Approval

Tarih: 15.02.2018
Toplantı No: 2018 Şubat /01
Karar No: 2018 Şubat /01-1

Sayın Prof. Dr. Nur Asena CANER

TOBB Ekonomi ve Teknoloji Üniversitesi
İktisadi ve İdari Bilimler Fakültesi
İktisat Bölümü

İnsan Araştırmaları Değerlendirme Kurulu'na etik yönden değerlendirilmek üzere sunmuş olduğunuz 2018-01 kayıt nolu "Türkiye'de Vakıf Üniversitesi Öğrencileri Arasında Nargile Tüketimi ve Nargile Tüketimi Davranışının Araştırılması" başlığını taşıyan projeniz etik yönden uygun görülerek onaylanmasına karar verilmiştir.

Bilgilerinizi rica ederiz.

TOBB Ekonomi ve Teknoloji Üniversitesi
İnsan Araştırmaları Değerlendirme Kurulu

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APPENDIX B

B.1. Additional Gender Statistics by Modules

How do you make a living?	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
With family support	812	63,89	889	74,89	**1701**	**69,20**
By scholarship	261	20,54	199	16,76	**460**	**18,71**
I do not want to say	70	5,51	26	2,19	**96**	**3,91**
Working	51	4,01	29	2,44	**80**	**3,25**
NA	77	6,06	44	3,71	**121**	**4,92**
Total	1271	100	1187	100	**2458**	**100**
What do you think about your income level?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
My income is enough to cover my expenses; I can save some amount.	623	49,02	564	47,51	**1187**	**48,29**
My income is enough to cover my expenses, but I can't save.	465	36,59	497	41,87	**962**	**39,14**
My income is not enough to cover my expenses.	67	5,27	66	5,56	**133**	**5,41**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**

Table B.1.1. Statistics about Economic Status

Age of onset for cigarette	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Before 14 years	108	8,50	40	3,37	**148**	**6,02**
Between 14-18 years	529	41,62	436	36,73	**965**	**39,26**
After 18 years	292	22,97	305	25,70	**597**	**24,29**
I never smoked.	1	0,08		0,00	**1**	**0,04**
NA	341	26,83	406	34,20	**747**	**30,39**
Total	1271	100	1187	100	**2458**	**100**
Current Smoking Status	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I smoke every day.	512	40,28	354	29,82	**866**	**35,23**
I don't smoke right now.	248	19,51	270	22,75	**518**	**21,07**
Not every day, but occasionally I smoke.	88	6,92	91	7,67	**179**	**7,28**
NA	423	33,28	472	39,76	**895**	**36,41**
Total	1271	100	1187	100	**2458**	**100**
Past Smoking Status	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I smoked every day.	432	33,99	228	19,21	**660**	**26,85**
Not every day, but occasionally.	274	21,56	310	26,12	**584**	**23,76**
I just tried, I didn't go on.	183	14,40	210	17,69	**393**	**15,99**
NA	382	30,06	439	36,98	**821**	**33,40**
Total	1271	100	1187	100	**2458**	**100**

Table B.1.2. Smoking Statistics by Gender

"... of my friends use cigarette."	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Most	681	53,58	550	46,34	**1231**	**50,08**
Some	345	27,14	431	36,31	**776**	**31,57**
All	117	9,21	111	9,35	**228**	**9,28**
None of them use	12	0,94	35	2,95	**47**	**1,91**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**
Does your girl/boyfriend use cigarette?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yeah	391	30,76	546	46,00	**937**	**38,12**
No	492	38,71	364	30,67	**856**	**34,83**
I didn't have a boy/girlfriend	272	21,40	217	18,28	**489**	**19,89**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**
Do you agree with the statement " I would use more cigarettes if I had more money"?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I never agree.	659	51,85	671	56,53	**1330**	**54,11**
I do not agree.	352	27,69	322	27,13	**674**	**27,42**
No idea / undecided.	78	6,14	90	7,58	**168**	**6,83**
I agree.	41	3,23	32	2,70	**73**	**2,97**
I totally agree.	25	1,97	12	1,01	**37**	**1,51**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**
Do you agree with the statement " I would smoke more if the cigarettes were cheaper"?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I never agree.	77	6,06	110	9,27	**187**	**7,61**
I do not agree.	594	46,73	589	49,62	**1183**	**48,13**
No idea / undecided.	114	8,97	105	8,85	**219**	**8,91**
I agree.	327	25,73	293	24,68	**620**	**25,22**
I totally agree.	43	3,38	30	2,53	**73**	**2,97**
NA	116	9,13	60	5,05	**176**	**7,16**
Total	1271	100	1187	100	**2458**	**100**

Table B.1.3. Friends and Perceptions for Cigarette

Age of onset for cigarette	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Before 14 years	104	8,18	62	5,22	**166**	**6,75**
Between 14-18 years	636	50,04	422	35,55	**1058**	**43,04**
After 18 years	210	16,52	224	18,87	**434**	**17,66**
NA	321	25,26	479	40,35	**800**	**32,55**
Total	1271	100	1187	100	**2458**	**100**
Used in past 30 days	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	184	14,48	60	5,05	**244**	**9,93**
No	768	60,42	653	55,01	**1421**	**57,81**
NA	319	25,10	474	39,93	**793**	**32,26**
Total	1271	100	1187	100	**2458**	**100**
Regular Using	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	66	5,19	13	1,10	**79**	**3,21**
No	878	69,08	698	58,80	**1576**	**64,12**
NA	327	25,73	476	40,10	**803**	**32,67**
Total	1271	100	1187	100	**2458**	**100**
Frequency of Hookah Use	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Once in a month	11	0,87	3	0,25	**14**	**0,57**
Two to three per month	20	1,57	3	0,25	**23**	**0,94**
Once a week	10	0,79	3	0,25	**13**	**0,53**
Two or more times a week	17	1,34	2	0,17	**19**	**0,77**
Every two months or less	177	13,93	82	6,91	**259**	**10,54**
I don't use hookah.	327	25,73	403	33,95	**730**	**29,70**
NA	709	55,78	691	58,21	**1400**	**56,96**
Total	1271	100	1187	100	**2458**	**100**
Multi-use, number of shared contacts	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
With one person	163	12,82	57	4,80	**220**	**8,95**
2 persons	84	6,61	37	3,12	**121**	**4,92**
Use alone	58	4,56	15	1,26	**73**	**2,97**
3 persons	51	4,01	22	1,85	**73**	**2,97**
4 or more	37	2,91	8	0,67	**45**	**1,83**
NA	878	69,08	1048	88,29	**1926**	**78,36**
Total	1271	100	1187	100	**2458**	**100**

Table B.1.4. Statistics for Hookah Usage

"... of my friends use hookah."	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Some	757	59,56	725	61,08	**1482**	**60,29**
Most	234	18,41	123	10,36	**357**	**14,52**
All	30	2,36	11	0,93	**41**	**1,67**
None of them use	134	10,54	267	22,49	**401**	**16,31**
NA	116	9,13	61	5,14	**177**	**7,20**
Total	1271	100	1187	100	**2458**	**100**
Does your girl/boyfriend use hookah?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yeah	167	13,14	253	21,31	**420**	**17,09**
No	704	55,39	651	54,84	**1355**	**55,13**
I didn't have a boy/girlfriend	263	20,69	212	17,86	**475**	**19,32**
NA	137	10,78	71	5,98	**208**	**8,46**
Total	1271	100	1187	100	**2458**	**100**
Do you agree with the statement " I would use more hookah if I had more money"?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I never agree.	98	7,71	90	7,58	**188**	**7,65**
I do not agree.	678	53,34	739	62,26	**1417**	**57,65**
No idea / undecided.	62	4,88	43	3,62	**105**	**4,27**
I agree.	258	20,30	219	18,45	**477**	**19,41**
I totally agree.	28	2,20	7	0,59	**35**	**1,42**
NA	147	11,57	89	7,50	**236**	**9,60**
Total	1271	100	1187	100	**2458**	**100**
Do you agree with the statement " I would smoke more if the hookah were cheaper"?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
I never agree.	117	9,21	94	7,92	**211**	**8,58**
I do not agree.	659	51,85	720	60,66	**1379**	**56,10**
No idea / undecided.	86	6,77	69	5,81	**155**	**6,31**
I agree.	236	18,57	204	17,19	**440**	**17,90**
I totally agree.	26	2,05	11	0,93	**37**	**1,51**
NA	147	11,57	89	7,50	**236**	**9,60**
Total	1271	100	1187	100	**2458**	**100**
See warning label for hookah or not?	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
No, I didn't.	517	40,68	554	46,67	**1071**	**43,57**
I did not pay attention.	293	23,05	319	26,87	**612**	**24,90**
Yes, I did see.	214	16,84	90	7,58	**304**	**12,37**
I've never been to hookah places.	100	7,87	135	11,37	**235**	**9,56**
NA	147	11,57	89	7,50	**236**	**9,60**
Total	1271	100	1187	100	**2458**	**100**

Table B.1.5. Friends and Perceptions for Hookah

B.2.Additional Smoker Statistics by Gender

Age of onset for cigarette	Total Students				Grand Total	
	Male		Female		N	%
	N	%	N	%		
Before 14 years	76	12,44	20	4,43	**96**	**9,04**
Between 14-18 years	356	58,27	256	56,76	**612**	**57,63**
After 18 years	175	28,64	173	38,36	**348**	**32,77**
NA	4	0,65	2	0,44	**6**	**0,56**
Total	611	100	451	100	**1062**	**100**
Current smoking status	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Not every day, but occasionally I smoke.	88	14,40	91	20,18	**179**	**16,85**
I smoke every day.	512	83,80	354	78,49	**866**	**81,54**
NA	11	1,80	6	1,33	**17**	**1,60**
Total	611	100	451	100	**1062**	**100**
Past smoking status	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Not every day, but occasionally.	193	31,59	208	46,12	**401**	**37,76**
I smoked every day.	368	60,23	204	45,23	**572**	**53,86**
I just tried, I didn't go on.	22	3,60	17	3,77	**39**	**3,67**
NA	28	4,58	22	4,88	**50**	**4,71**
Total	611	100	451	100	**1062**	**100**
Number of cigarettes used daily	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
10 or less	137	22,42	164	36,36	**301**	**28,34**
11-21	273	44,68	154	34,15	**427**	**40,21**
21-30	72	11,78	21	4,66	**93**	**8,76**
31 and above	14	2,29	3	0,67	**17**	**1,60**
NA	115	18,82	109	24,17	**224**	**21,09**
Total	611	100	451	100	**1062**	**100**
First cigarette after awake	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Within 31-60 minutes	135	22,09	87	19,29	**222**	**20,90**
In 5 minutes	75	12,27	28	6,21	**103**	**9,70**
After 60 minutes have passed	220	36,01	238	52,77	**458**	**43,13**
Within 6-30 minutes	133	21,77	61	13,53	**194**	**18,27**
NA	48	7,86	37	8,20	**85**	**8,00**
Total	611	100	451	100	**1062**	**100**
Attempt to quit	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yeah, I tried.	235	38,46	151	33,48	**386**	**36,35**
No, I didn't.	294	48,12	228	50,55	**522**	**49,15**
NA	82	13,42	72	15,96	**154**	**14,50**
Total	611	100	451	100	**1062**	**100**

Table B.2.1. Statistics for Current Cigarette Users

	Total Students				Grand Total	
Age of onset for hookah	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Before 14 years	46	14,65	8	7,02	**54**	**12,62**
Between 14-18 years	196	62,42	66	57,89	**262**	**61,21**
After 18 years	71	22,61	39	34,21	**110**	**25,70**
NA	1	0,32	1	0,88	**2**	**0,47**
Total	314	100	114	100	**428**	**100**
used in past 30 days	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	144	45,86	33	28,95	**177**	**41,36**
No	169	53,82	81	71,05	**250**	**58,41**
NA	1	0,32		0,00	**1**	**0,23**
Total	314	100,00	114	100	**428**	**100**
Regular using	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes	66	21,02	13	11,40	**79**	**18,46**
No	247	78,66	101	88,60	**348**	**81,31**
NA	1	0,32		0,00	**1**	**0,23**
Total	314	100	114	100	**428**	**100**
Usage frequency of hookah	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Once in a month	11	3,50	3	2,63	**14**	**3,27**
Two to three per month	20	6,37	3	2,63	**23**	**5,37**
Once a week	10	3,18	3	2,63	**13**	**3,04**
Two or more times a week	17	5,41	2	1,75	**19**	**4,44**
Every two months or less	177	56,37	82	71,93	**259**	**60,51**
NA	79	25,16	21	18,42	**100**	**23,36**
Total	314	100	114	100	**428**	**100**
Attempt to quit	**Male**		**Female**		**N**	**%**
	N	**%**	**N**	**%**		
Yes, I tried.	15	4,78	6	5,26	**21**	**4,91**
No, I didn't.	270	85,99	92	80,70	**362**	**84,58**
NA	29	9,24	16	14,04	**45**	**10,51**
Total	314	100	114	100	**428**	**100**

Table B.2.2. Statistics for Current Hookah Users

B.3. Descriptive Statistics on Monthly Spending Amounts

Monthly spending on cigarette	Total Students				Grand Total		
	Male		Female		N	%	%*
	N	%	N	%			
0-10 TL	13	2,13	14	3,10	**27**	**2,54**	**2,54**
10-20 TL	16	2,62	23	5,10	**39**	**3,67**	**6,21**
20-30 TL	21	3,44	15	3,33	**36**	**3,39**	**9,60**
30-40 TL	8	1,31	19	4,21	**27**	**2,54**	**12,15**
40-50 TL	14	2,29	33	7,32	**47**	**4,43**	**16,57**
50-60 TL	20	3,27	13	2,88	**33**	**3,11**	**19,68**
60-70 TL	6	0,98	4	0,89	**10**	**0,94**	**20,62**
70-80 TL	4	0,65	5	1,11	**9**	**0,85**	**21,47**
80- 90TL	7	1,15	12	2,66	**19**	**1,79**	**23,26**
90-100 TL	13	2,13	6	1,33	**19**	**1,79**	**25,05**
100-110 TL	7	1,15	11	2,44	**18**	**1,69**	**26,74**
110-120 TL	14	2,29	13	2,88	**27**	**2,54**	**29,28**
120-130 TL	15	2,45	10	2,22	**25**	**2,35**	**31,64**
130-140 TL	10	1,64	6	1,33	**16**	**1,51**	**33,15**
140-150 TL	23	3,76	22	4,88	**45**	**4,24**	**37,38**
150-160 TL	21	3,44	17	3,77	**38**	**3,58**	**40,96**
160-170 TL	8	1,31	11	2,44	**19**	**1,79**	**42,75**
170-180 TL	10	1,64	10	2,22	**20**	**1,88**	**44,63**
180 -190 TL	3	0,49	5	1,11	**8**	**0,75**	**45,39**
190-200 TL	7	1,15	3	0,67	**10**	**0,94**	**46,33**
200-210 TL	12	1,96	12	2,66	**24**	**2,26**	**48,59**
210-220 TL	6	0,98	2	0,44	**8**	**0,75**	**49,34**
220-230 TL	11	1,80	4	0,89	**15**	**1,41**	**50,75**
230-240 TL	11	1,80	8	1,77	**19**	**1,79**	**52,54**
240-250 TL	11	1,80	9	2,00	**20**	**1,88**	**54,43**
250-260 TL	18	2,95	6	1,33	**24**	**2,26**	**56,69**
260-270 TL	9	1,47	1	0,22	**10**	**0,94**	**57,63**
270-280 TL	6	0,98	6	1,33	**12**	**1,13**	**58,76**
280-290 TL	5	0,82	10	2,22	**15**	**1,41**	**60,17**
290-300 TL	51	8,35	26	5,76	**77**	**7,25**	**67,42**
300-350 TL	136	22,26	52	11,53	**188**	**17,70**	**85,12**
350-400 TL	23	3,76	10	2,22	**33**	**3,11**	**88,23**
400-450 TL	6	0,98	3	0,67	**9**	**0,85**	**89,08**
450-500 TL	5	0,82	2	0,44	**7**	**0,66**	**89,74**
500 TL or above	9	1,47	3	0,67	**12**	**1,13**	**90,87**
NA	52	8,51	45	9,98	**97**	**9,13**	**100**
Total	611	100	451	100	**1062**	**100**	**100**

*: Cumulative Percentages

Table B.3.1. Expenditure on Cigarettes

Monthly spending on hookah	Total Students				Grand Total		
	Male		Female		N	%	%*
	N	%	N	%			
0-20 TL	157	50,00	62	54,39	219	51,17	51,17
20-40 TL	64	20,38	21	18,42	85	19,86	71,03
40-60 TL	30	9,55	10	8,77	40	9,35	80,37
60-80 TL	12	3,82	7	6,14	19	4,44	84,81
80-100 TL	5	1,59	2	1,75	7	1,64	86,45
100-150 TL	4	1,27	2	1,75	6	1,40	87,85
150-200 TL	6	1,91	0	0,00	6	1,40	89,25
200-250 TL	3	0,96	0	0,00	3	0,70	89,95
250 TL or above	8	2,55	1	0,88	9	2,10	92,06
NA	25	7,96	9	7,89	34	7,94	100
Total	314	100	114	100	428	100	100

*:Cumulative Percentages

Table B.3.2. Expenditure on Hookah

APPENDIX C

C.1. Additional Regressions of Cigarette

VARIABLES	(1) CCRRNT	(2) CCRRNT	(3) CCRRNT	(4) CCRRNT	(5) CCRRNT	(6) CCRRNT
AGE	0.148***	0.131***	0.111***	0.115***	0.0828***	0.0703**
	(0.0236)	(0.0239)	(0.0261)	(0.0269)	(0.0268)	(0.0287)
MALE	0.390***	0.349***	0.396***	0.285***	0.363***	0.270***
	(0.0827)	(0.0836)	(0.0907)	(0.0930)	(0.0928)	(0.0989)
GPA		0.587***	0.602***	0.421***	0.603***	0.431***
		(0.0887)	(0.0959)	(0.0986)	(0.0973)	(0.104)
Home with family and no car					0.0532	0.0876
					(0.144)	(0.153)
Home with peers or alone and no car					0.873***	1.021***
					(0.213)	(0.231)
Dormitory and having car					0.0839	0.146
					(0.167)	(0.178)
Home with family and having car					0.177	0.154
					(0.121)	(0.128)
Home with peers or alone and having car					1.028***	0.899***
					(0.209)	(0.222)
CAR			0.119			
			(0.0919)			
CIMITATE				1.713***		1.672***
				(0.106)		(0.111)
Constant	-3.595***	-3.423***	-3.112***	-4.146***	-2.631***	-3.406***
	(0.499)	(0.504)	(0.546)	(0.573)	(0.565)	(0.611)
Observations	2,458	2,458	2,122	2,282	2,122	2,122

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C.1.1. Results of Cigarette Current User

VARIABLES	(1) CEVER	(2) CEVER	(3) CEVER	(4) CEVER	(5) CEVER	(6) CEVER
AGE	0.144***	0.130***	0.110***	0.100***	0.0862***	0.0724**
	(0.0262)	(0.0264)	(0.0284)	(0.0284)	(0.0290)	(0.0299)
MALE	0.342***	0.312***	0.368***	0.238**	0.339***	0.247**
	(0.0892)	(0.0897)	(0.0966)	(0.0983)	(0.0986)	(0.103)
GPA		0.468***	0.467***	0.265**	0.462***	0.282**
		(0.101)	(0.108)	(0.110)	(0.109)	(0.114)
Home with family and no car					-0.00464	0.0199
					(0.144)	(0.152)
Home with peers or alone and no car					0.647**	0.713***
					(0.253)	(0.263)
Dormitory and having car					-0.0892	-0.0605
					(0.171)	(0.180)
Home with family and having car					0.100	0.0662
					(0.125)	(0.131)
Home with peers or alone and having car					1.051***	0.901***
					(0.280)	(0.287)
CAR			0.0713			
			(0.0975)			
CIMITATE				1.388***		1.331***
				(0.0988)		(0.102)
Constant	-2.324***	-2.165***	-1.844***	-2.237***	-1.400**	-1.771***
	(0.550)	(0.551)	(0.589)	(0.595)	(0.607)	(0.627)
Observations	2,458	2,458	2,122	2,282	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.1.2. Results of Cigarette Ever Used

VARIABLES	(1) CEXP	(2) CEXP	(3) CEXP	(4) CEXP	(5) CEXP	(6) CEXP
AGE	0.0534***	0.0490**	0.0511**	0.0449**	0.0565***	0.0498**
	(0.0190)	(0.0191)	(0.0206)	(0.0210)	(0.0188)	(0.0203)
MALE	0.368***	0.356***	0.347***	0.320***	0.380***	0.313***
	(0.0673)	(0.0673)	(0.0734)	(0.0749)	(0.0664)	(0.0725)
GPA		0.161**	0.140*	0.151**	0.0825	0.0947
		(0.0678)	(0.0732)	(0.0735)	(0.0673)	(0.0716)
Home with family and no car				-0.0689		-0.0978
				(0.121)		(0.118)
Home with peers or alone and no car				0.0907		0.112
				(0.149)		(0.145)
Dormitory and having car				0.150		0.177
				(0.135)		(0.131)
Home with family and having car				0.0241		0.00687
				(0.0997)		(0.0966)
Home with peers or alone and having car				0.276**		0.202
				(0.140)		(0.136)
CAR			0.0939			
			(0.0741)			
CIMITATE					0.671***	0.722***
					(0.0925)	(0.0968)
Constant	3.567***	3.601***	3.515***	3.662***	2.894***	2.986***
	(0.407)	(0.407)	(0.437)	(0.446)	(0.411)	(0.442)
Observations	965	965	837	837	921	837
R-squared	0.039	0.045	0.048	0.054	0.101	0.114

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.1.3. Results of Expenditure on Cigarettes

C.2. Additional Regressions of Cigarette Hookah

VARIABLES	(1) HCRRNT	(2) HCRRNT	(3) HCRRNT	(4) HCRRNT	(5) HCRRNT	(6) HCRRNT
AGE	0.0449	0.0347	0.0442	0.0294	0.0855**	0.0647*
	(0.0300)	(0.0304)	(0.0333)	(0.0340)	(0.0342)	(0.0368)
MALE	1.119***	1.099***	1.165***	1.119***	0.963***	0.976***
	(0.118)	(0.119)	(0.128)	(0.130)	(0.129)	(0.137)
GPA		0.279**	0.305**	0.320***	0.207	0.237*
		(0.113)	(0.123)	(0.124)	(0.126)	(0.133)
Home with family and no car				-0.506**		-0.512**
				(0.208)		(0.222)
Home with peers or alone and no car				0.0513		0.233
				(0.260)		(0.279)
Dormitory and having car				-0.323		-0.341
				(0.218)		(0.235)
Home with family and having car				-0.104		-0.143
				(0.153)		(0.165)
Home with peers or alone and having car				0.128		0.111
				(0.236)		(0.257)
CAR			0.0174			
			(0.121)			
HIMITATE					1.898***	1.942***
					(0.128)	(0.135)
Constant	-3.185***	-3.056***	-3.306***	-2.830***	-4.524***	-3.973***
	(0.639)	(0.643)	(0.699)	(0.719)	(0.733)	(0.786)
Observations	2,458	2,458	2,122	2,122	2,281	2,121

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.2.1. Results of Hookah Current User

VARIABLES	(1) HEVER	(2) HEVER	(3) HEVER	(4) HEVER	(5) HEVER	(6) HEVER
AGE	0.200***	0.187***	0.191***	0.169***	0.201***	0.172***
	(0.0271)	(0.0273)	(0.0296)	(0.0302)	(0.0286)	(0.0303)
MALE	0.735***	0.708***	0.777***	0.747***	0.721***	0.704***
	(0.0907)	(0.0913)	(0.0989)	(0.101)	(0.0960)	(0.102)
GPA		0.512***	0.458***	0.456***	0.467***	0.437***
		(0.103)	(0.110)	(0.111)	(0.106)	(0.111)
Home with family				-0.0355		-0.0310
				(0.144)		(0.144)
Home with peers				0.716***		0.748***
				(0.260)		(0.260)
Dormitory and ha				0.0909		0.0850
				(0.177)		(0.178)
Home with family				0.187		0.178
				(0.127)		(0.127)
Home with peers				0.969***		0.974***
				(0.282)		(0.282)
CAR			0.173*			
			(0.0989)			
HIMITATE					0.456***	0.478***
					(0.136)	(0.142)
Constant	-3.716***	-3.564***	-3.791***	-3.371***	-3.941***	-3.482***
	(0.568)	(0.570)	(0.616)	(0.632)	(0.599)	(0.634)
Observations	2,458	2,458	2,122	2,122	2,281	2,121

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C.2.2. Results of Hookah Ever Used

VARIABLES	(1) HEXP	(2) HEXP	(3) HEXP	(4) HEXP	(5) HEXP	(6) HEXP
AGE	0.0184	0.0117	-0.00195	-0.000826	0.0296	0.0169
	(0.0261)	(0.0262)	(0.0283)	(0.0302)	(0.0278)	(0.0305)
MALE	0.134	0.118	0.111	0.126	0.148	0.106
	(0.107)	(0.107)	(0.117)	(0.122)	(0.110)	(0.121)
GPA		0.205**	0.211**	0.199*	0.187*	0.174
		(0.0970)	(0.105)	(0.108)	(0.100)	(0.107)
Home with family and no car				0.0775		0.0700
				(0.192)		(0.191)
Home with peers or alone and no car				0.0975		0.125
				(0.221)		(0.219)
Dormitory and having car				0.276		0.282
				(0.193)		(0.191)
Home with family and having car				0.325**		0.340**
				(0.133)		(0.132)
Home with peers or alone and having car				0.272		0.267
				(0.210)		(0.208)
CAR			0.274***			
			(0.105)			
HIMITATE					0.286***	0.291***
					(0.100)	(0.105)
Constant	2.538***	2.610***	2.739***	2.677***	2.065***	2.175***
	(0.565)	(0.564)	(0.605)	(0.646)	(0.608)	(0.664)
Observations	394	394	342	342	367	342
R-squared	0.005	0.016	0.042	0.043	0.041	0.064

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.2.3. Results of Expenditure on Hookah

C.3. Results of Bivariate Models

VARIABLES	(1) CCRRNT	(2) HCRRNT	(3) /	(4) CCRRNT	(5) HCRRNT	(6) /	(7) CCRRNT	(8) HCRRNT	(9) /	(10) CCRRNT	(11) HCRRNT	(12) /
AGE	0.0918***	0.0290*		0.0813***	0.0236		0.0687***	0.0296		0.0508***	0.0214	
	(0.0145)	(0.0170)		(0.0147)	(0.0172)		(0.0160)	(0.0187)		(0.0164)	(0.0192)	
MALE	0.242***	0.620***		0.216***	0.609***		0.245***	0.643***		0.225***	0.619***	
	(0.0514)	(0.0632)		(0.0518)	(0.0634)		(0.0561)	(0.0686)		(0.0572)	(0.0697)	
GPA				0.365***	0.158**		0.374***	0.173**		0.373***	0.180**	
				(0.0551)	(0.0642)		(0.0596)	(0.0694)		(0.0602)	(0.0700)	
Home with family and no car										0.0364	-0.255**	
										(0.0881)	(0.111)	
Home with peers or alone and no car										0.540***	0.0450	
										(0.131)	(0.148)	
Dormitory and having car										0.0538	-0.200	
										(0.103)	(0.124)	
Home with family and having car										0.111	-0.0533	
										(0.0742)	(0.0864)	
Home with peers or alone and having car										0.636***	0.0833	
										(0.128)	(0.138)	
athrho			0.259***			0.250***			0.273***			0.270***
			(0.0391)			(0.0393)			(0.0427)			(0.0429)
CAR							0.0736	0.00493				
							(0.0568)	(0.0677)				
Constant	-2.235***	-1.916***		-2.119***	-1.853***		-1.926***	-2.001***		-1.622***	-1.743***	
	(0.308)	(0.362)		(0.310)	(0.363)		(0.336)	(0.394)		(0.346)	(0.406)	
Observations	2,458	2,458	2,458	2,458	2,458	2,458	2,122	2,122	2,122	2,122	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.3.1. Current Usage for both

VARIABLES	(1) CEVER	(2) HEVER	(3) /	(4) CEVER	(5) HEVER	(6) /	(7) CEVER	(8) HEVER	(9) /	(10) CEVER	(11) HEVER	(12) /
AGE	0.0857***	0.117***		0.0774***	0.109***		0.0659***	0.112***		0.0508***	0.0977***	
	(0.0154)	(0.0157)		(0.0155)	(0.0158)		(0.0169)	(0.0173)		(0.0173)	(0.0176)	
MALE	0.219***	0.454***		0.200***	0.435***		0.235***	0.478***		0.218***	0.461***	
	(0.0536)	(0.0542)		(0.0539)	(0.0545)		(0.0581)	(0.0590)		(0.0593)	(0.0601)	
GPA				0.270***	0.292***		0.270***	0.258***		0.269***	0.257***	
				(0.0592)	(0.0600)		(0.0636)	(0.0644)		(0.0642)	(0.0649)	
Home with family and no car										0.00111	-0.0169	
										(0.0882)	(0.0879)	
Home with peers or alone and no car										0.390***	0.437***	
										(0.146)	(0.149)	
Dormitory and having car										-0.0549	0.0621	
										(0.105)	(0.107)	
Home with family and having car										0.0598	0.122	
										(0.0756)	(0.0762)	
Home with peers or alone and having car										0.592***	0.542***	
										(0.151)	(0.152)	
athrho			1.021***			1.011***			1.020***			1.012***
			(0.0452)			(0.0452)			(0.0487)			(0.0487)
CAR							0.0393	0.108*				
							(0.0587)	(0.0592)				
Constant	-1.377***	-2.159***		-1.277***	-2.058***		-1.094***	-2.201***		-0.813**	-1.945***	
	(0.324)	(0.330)		(0.325)	(0.331)		(0.351)	(0.359)		(0.362)	(0.370)	
Observations	2,458	2,458	2,458	2,458	2,458	2,458	2,122	2,122	2,122	2,122	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.3.2. Ever Used for both

VARIABLES	(1) CCRRNT	(2) HEVER	(3) /	(4) CCRRNT	(5) HEVER	(6) /	(7) CCRRNT	(8) HEVER	(9) /	(10) CCRRNT	(11) HEVER	(12) /
AGE	0.0934***	0.112***		0.0828***	0.103***		0.0703***	0.106***		0.0519***	0.0916***	
	(0.0145)	(0.0155)		(0.0147)	(0.0156)		(0.0160)	(0.0170)		(0.0164)	(0.0174)	
MALE	0.237***	0.447***		0.210***	0.428***		0.237***	0.473***		0.217***	0.455***	
	(0.0513)	(0.0540)		(0.0517)	(0.0543)		(0.0560)	(0.0587)		(0.0572)	(0.0598)	
GPA				0.363***	0.303***		0.371***	0.268***		0.370***	0.267***	
				(0.0551)	(0.0600)		(0.0596)	(0.0646)		(0.0602)	(0.0651)	
Home with family and no car										0.0317	-0.0156	
										(0.0878)	(0.0877)	
Home with peers or alone and no car										0.538***	0.443***	
										(0.132)	(0.148)	
Dormitory and having car										0.0529	0.0697	
										(0.103)	(0.106)	
Home with family and having car										0.108	0.128*	
										(0.0740)	(0.0760)	
Home with peers or alone and having car										0.630***	0.561***	
										(0.128)	(0.152)	
athrho			0.801***			0.787***			0.803***			0.790***
			(0.0426)			(0.0427)			(0.0463)			(0.0464)
CAR							0.0733	0.113*				
							(0.0568)	(0.0590)				
Constant	-2.264***	-2.046***		-2.148***	-1.943***		-1.953***	-2.085***		-1.637***	-1.824***	
	(0.308)	(0.326)		(0.310)	(0.327)		(0.335)	(0.355)		(0.346)	(0.366)	
Observations	2,458	2,458	2,458	2,458	2,458	2,458	2,122	2,122	2,122	2,122	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.3.3. Current Cigarette Users VS Ever Used for Hookah

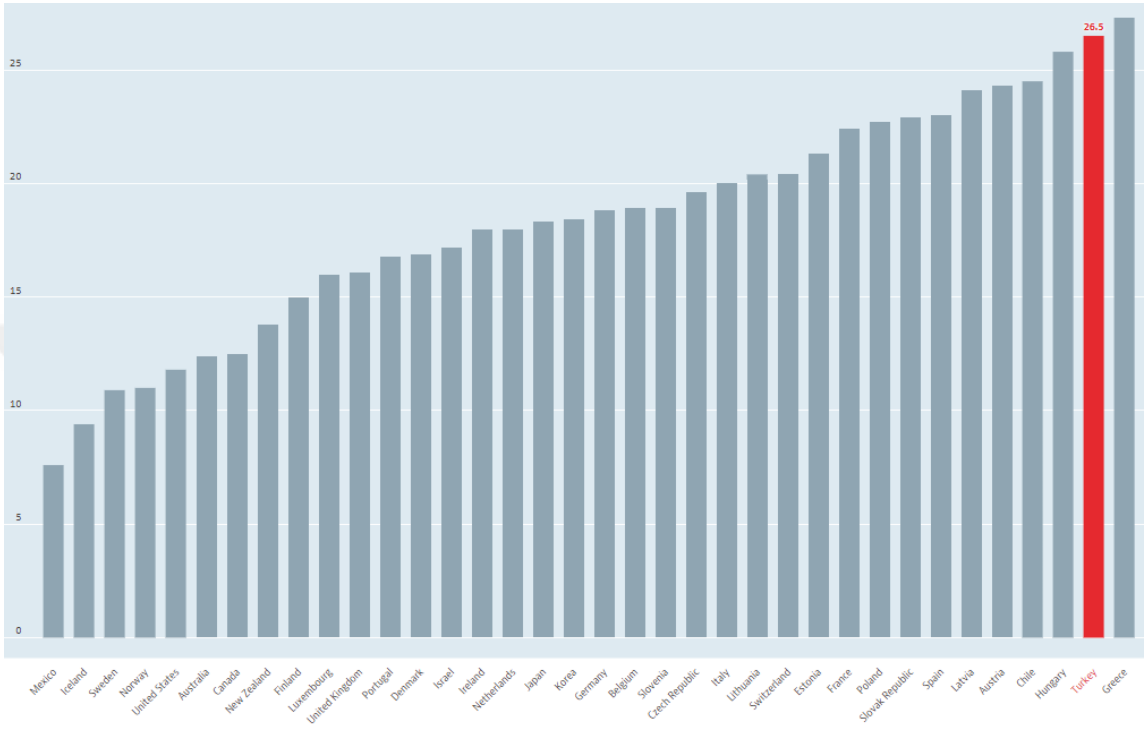
VARIABLES	(1) CEVER	(2) HCRRNT	(3) /	(4) CEVER	(5) HCRRNT	(6) /	(7) CEVER	(8) HCRRNT	(9) /	(10) CEVER	(11) HCRRNT	(12) /
AGE	0.0846***	0.0274		0.0762***	0.0221		0.0645***	0.0277		0.0508***	0.0194	
	(0.0154)	(0.0170)		(0.0156)	(0.0171)		(0.0169)	(0.0187)		(0.0172)	(0.0192)	
MALE	0.207***	0.612***		0.189***	0.600***		0.225***	0.635***		0.206***	0.610***	
	(0.0536)	(0.0631)		(0.0539)	(0.0633)		(0.0581)	(0.0685)		(0.0592)	(0.0696)	
GPA				0.273***	0.164**		0.274***	0.178**		0.272***	0.185***	
				(0.0594)	(0.0640)		(0.0638)	(0.0693)		(0.0643)	(0.0699)	
Home with family and no car										-0.00163	-0.262**	
										(0.0881)	(0.111)	
Home with peers or alone and no car										0.381***	0.0404	
										(0.145)	(0.149)	
Dormitory and having car										-0.0516	-0.193	
										(0.105)	(0.123)	
Home with family and having car										0.0583	-0.0522	
										(0.0757)	(0.0862)	
Home with peers or alone and having car										0.594***	0.0865	
										(0.151)	(0.138)	
athrho			0.373***			0.365***			0.385***			0.383***
			(0.0451)			(0.0452)			(0.0490)			(0.0494)
CAR							0.0411	0.00987				
							(0.0588)	(0.0677)				
Constant	-1.349***	-1.878***		-1.247***	-1.816***		-1.062***	-1.959***		-0.809**	-1.696***	
	(0.325)	(0.361)		(0.326)	(0.362)		(0.351)	(0.393)		(0.361)	(0.406)	
Observations	2,458	2,458	2,458	2,458	2,458	2,458	2,122	2,122	2,122	2,122	2,122	2,122

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.3.4. Ever Used for Cigarette VS Current Users for Hookah

APPENDIX D

D.1. Additional Figures



Graph D.1. Daily Smoking Rate in OECD Countries

Source: OECD, 2019