RESEARCH ARTICLE

Fallacies about Water Pipe Use in Turksih University Students - What Might Be the Consequences?

Muge Tuncay Alvur[1], Nursan Cinar[2]*, Funda Akduran[2] Cemile Dede[3]

Abstract

Background: The popularity of the narghile waterpipe, also referred to as hookah, shisha or hubble-bubble has increased tremendously during the past few decades. The aim of this study was to expose perception of narghile among a representative sample of university students in Sakarya University campus. Materials and Methods: Written approval was taken from the local education authority. An anonymous questionnaire which was prepared by the investigators and contained 17 questions was administered. Nine of the questions were related to socio-demographic characteristics and eight were related to the students harm perceptions about waterpipe. A total of 1,320 questionnaries were received and after preliminary evaluation 1,255 (95.7%) were found to be suitable for evaluation. The data was evaluated in SPSS program by using percentages and averages. Results: The mean±SD age of the students was 20.8±2.29 years (min 18, max 32). There were 864 (68.8%) females and 391 (31.2%) males. A total of 6.3 % of the students (n=79) believed that waterpipe is not harmful because its smoke does not burn the lungs. Almost one-third (n=318) think that the carcinogenic chemicals are filtered while waterpipe smoke passes from the water; 12.1 % of the students (n=152) checked "true" for the statement of "waterpipe smoke contains no nicotine". It is seen that 14.0 % of the students (n=176) think waterpipe with fruit/ aroma is healthier than plain waterpipe. Conclusions: As a result of this study, it is found out that a substantial number of university students have false beliefs on harmful effects of waterpipe smoking.

Keywords: University students - water pipe - fallacies

Asian Pac J Cancer Prev, **15 (5)**, 1977-1980

Introduction

The popularity of the narghile waterpipe, also referred to as hookah, shisha or hubble-bubble has increased tremendously during the past few decades (Tamim et al., 2003; Chaaya et al., 2004; Maziak et al., 2004; 2005; Akl, 2011) and has spread beyond the bounds of Arab countries to other parts of the world, including Europe and America (Smith-Simone et al., 2008; Jarrett et al., 2012; Shihadeh et al., 2012).

Sakarya is a small providence of Turkey located in the Marmara region. Sakarya University is a state university founded in 1992. Among all state universities Sakarya University is the 6th most populated (overall population is 47,226) and has a campus student population of 14,943 situated at 13 faculties, four institutes, four vocational schools and one conservatoire (overall population is 47226). The first study on narghile was conducted in the capital city, Ankara. Between 15:00 and 19:00 hours the people who were smoking narghile (n=273) were interviewed. 80% was male and the mean age was 23 years. 40% of the smokers claimed that they do not smoke (Subasi et al., 2005; Smith-Simone et al., 2008). Resurrection of narghile with new names "aromatic" or maassel brought tremendous health treats with it. Even though narghile smoking likely exposes users to high levels of various toxicants and that the practice may be addictive (Maziak et al., 2005), it is popularly perceived as less harmful and toxic than cigarette smoking because of the purported filtering effect of the water bubbler (Kandela, 2000; Ward et al., 2007; Smith-Simone et al, 2008; Griffiths et al., 2011; Al-Naggar and Bobryshev, 2012).Volatile aldehydes, especially formaldehyde, acetaldehyde and acrolein were shown in narghile smoke (Al Rashidi et al., 2008). These are associated with a significant number of cigarette smoking diseases including chronic pulmonary disorder and cancer (Cogliano et al., 2004). The aim of this study was to expose perception of narghile among a representative sample of university students in Sakarya University campus.

Materials and Methods

Written approval was also taken from the local education authority. Participants gave verbal consent for the use of their data for the purpose of this study. Given that the Sakarya University campus population is 14,042 and reported 32,5% (Poyrazoglu et al., 2010) prevalence of narghile smoking among university students, sample size was calculated as 887 with 5% confidence limit and

*[1]Department of Family Medicine, Kocaeli University Faculty of Medicine, Kocaeli, [2]Sakarya University School of Health Sciences,[3] Vocational School of Health Sciences, Sakarya, Turkey *For correspondence: ndede@sakarya.edu.tr*

99% confidence level. Questionnaires were distributed randomly to students on Sakarya University campus .The participants completed an anonymous, voluntary, self-report questionnaire. Survey administrators were research personnel (including CD and FA) who emphasized that responses would be anonymous and confidential. An anonymous questionnaire which was prepared by the investigators and contained 17 questions was administered. Nine of the questions were related to socio-demographic characteristics, eight were related to the students' harm perception about waterpipe smoking. The students in the study group were visited at their classrooms and were informed about the purpose of the study both verbally and in writing. A total of 1320 questionnaries were given. The questionnaire was completed by the students under the supervision of one of the investigators and then taken back. After preliminary evaluation 1255 (95.7%) questionnaires were found suitable for evaluation. The data was evaluated in SPSS program (version 17) and presented by using percentages and averages.

Results

The mean±SD age of the students was 20.75±2.29years (min 18, max 32). There were 864 (68.8%) females and 391 (31.2%) males.

A total of 6.3% of the students (n=79) believe that waterpipe is not harmful because its smoke does not burn the lungs, 25.33% (n=318) think that the carcinogenic chemicals are filtered while waterpipe smoke passes from the water and 4.24% have no idea. 12.11% of the students (n=152) replied "yes" to the statement "Waterpipe contains no nicotine" while 0.64% replied "I have no idea" to this statement. It is seen that 14.02% of the students (n=176) think waterpipe with fruit/aroma is healthier than plain waterpipe, 1.2% have no idea about the issue. A total of 18% of the students (n=226) think that waterpipe with fruit/aroma is not addictive while 1.05% have no idea (Table 1).

Table 1. Socio-demographic Characteristics of the Study Participants

Variables	Categories	No.	%
Age (Mean±SD), years		20.75±2.29	
Gender	Female	864	68.8
	Male	391	31.2
Faculty	Engineering	159	13.9
	Health	347	30.6
	Arts and Sciences	191	16.8
	Management	166	14.6
	Economy	117	10.3
	Fine Arts	64	5.6
	Technical	53	4.7
	Physical Education	39	3.4
Accomodation	Dormitory	559	49.3
	At home wtih friends	322	28.4
	With family	191	16.8
	With relatives	28	2.5
	Other	28	2.5

Discussion

The fact that waterpipe is being more widely used in various parts of the world is considered as a global tobacco epidemic by the authorities of public health. Smoking waterpipe is an important transition gate to nicotin addiction (Chaouachi et al., 2009). Recently, the use of tobacco in the form of waterpipe has increased significantly among young in Turkey. The young are not informed enough about the addictive and harmful characteristics of waterpipe. The recent increase in waterpipe smoking by the young and young adults shows that a new area to combat has occurred in terms of tobacco control throughout the world. The prevalent news on this issue and the waterpipe cafes sprouting up around university campuses clearly prove this increase (Subasi et al., 2005; Ward, 2007; Quenqua, 2011). It is seen that university students have false beliefs about some aspects of waterpipe smoking. The literature, however, reports that that health effects of waterpipe smoking are expected to be similar to those of cigarette smoking. Abughosh et al. (2012) have stated that students can provide cigarettes easily and quickly while they need time and preparation to smoke waterpipe and thus they are exposed to nicotine more than 45-60 minutes. Subasi et al. (2005) have detected in their study that 54.6% of the subjects know that waterpipe smoking is harmful to health, whereas 18.3% does not have any information on the harmful effects of waterpipe smoking. In the study, it is found out that 21.99% (n=276) of the students have stated that they would not be addicted to waterpipe smoking while 0.72% (n=9) did not have any idea on this subject. In the study of Subasi et al. (2005) 53.5% of the students (n=146) stated that they thought waterpipe did not have an addictive effect. Likewise, in the study of Hassoy et al. (2011) 52.3% of the students stated that waterpipe did not have an addictive effect as cigarette. It is clear that young people who smoke waterpipe do not have enough knowledge on the harmful effects of waterpipe smoking, and since they do not consider waterpipe as a product

Table 2. Distribution of the Students' Harm Perception about Water pipe

ITEMS	Yes		No		No idea	
	n	%	n	%	N	%
Cancer-causing chemicals are filtered while water pipe smoke is passing through the water.	318	25.33	884	70.43	53	4.24
Water pipe smoke is not harmful because it dosen't burn the lungs.	79	6.3	1176	93.70	----	----
Water pipe dosen't contain nicotine.	152	12.11	1095	87.25	8	0.64
Fruity/ flavored water pipe tobacco is healthier than pure tobacco.	176	14.02	1064	84.78	15	1.2
Water pipe with pure tobacco is not addictive.	204	16.25	1047	83.42	4	0.33
Water pipe with fruity/ flavored tobacco is not addictive.	226	18	1016	80.95	13	1.05
Various common diseases (cold, flu, herpes, ...) are transmitted with the use of mouthpiece collectively.	1156	92.11	99	7.89	----	----
Germs do not grow in water pipe because its smoke is filtered through the water.	100	7.96	1132	90.19	18	1.85
There is not "water pipe addiction ".	276	21.99	970	77.29	9	0.72

of tobaco, they do not think it will be addictive. In the study that Abughosh et al. (2012) have performed with university students, it is found out that students widely believe waterpipe is not as harmful as cigarette. In their study among 3770 students, Suffin et al. (2011) have seen that students believe waterpipe has less harmful effects compared to cigarette. AL-Naggar and Saghir (2011) determined in their study that 48.5% of the participants mentioned that shisha is less harmful than cigarettes and 55% reported that shisha is less addictive.

A total of 6.3% of the students (n=79) believe that waterpipe is not harmful because its smoke does not burn the lungs, 25.33% (n=318) think that the carcinogenic chemicals are filtered while waterpipe smoke passes from the water and 4.24% have no idea. In the studies, it is emphasized that waterpipe smoking has many risks such as lung diseases and cancer (Knishkowy et al., 2005; Primack et al., 2008; Noonan et al., 2009; Akl et al., 2010; Abughosh et al., 2012). A recent systematic review of studies of health effects of waterpipe smoking shows that waterpipe smoking doubles the risk of lung cancer (Akl et al., 2010; Maziak, 2013). More recently, a recent-case control study of the association between waterpipe smoking and lung cancer in the Kashmir valley showed that waterpipe smoking is associated with a 6-fold increase in lung cancer risk compared to nonsmoking (Koul et al., 2011; Maziak, 2013). India and other Asian countries including some of the Middle East counties, oral and oropharyngeal malignancies are very high in comparison with other regions in the world, with this particularly high prevalence being attributed to the influence of carcinogens and region-specific epidemiological factors, especially tobacco including water pipe smoking (WPS), betel quid chewing and viruses such as high-risk HPVs and EBV (Koul et al., 2011). In the study of Hassoy et al. (2011) a total of 25.7% of the subjects think that the smoke of waterpipe is filtered out the harmful chemicals while it passes through the water. However, it is detected that waterpipe smoke contains a high density of carbon monoxide, nicotine, tar and heavy metals (arsenic, chrome, lead, nickel, cobalt, chrome, etc.). Furthermore, waterpipe smokers spend about 45 minutes or an hour smoking waterpipe, thus they are exposed to many harmful chemicals during this time. So, even though they smoke waterpipe infrequently, they may get harmed by it (Shihadeh et al., 2005; Knishkowy et al., 2005; Abughosh et al., 2012). In the study by Maziak et al., it is declared that the amount of nicotine in waterpipe is higher than the one in cigarette (Akl et al., 2010; Koul et al., 2011; Maziak, 2013). Smoke from water pipes contains most of the compounds that are also present in cigarette smoke, albeit in different proportions. More importantly, the longer duration of a WPS session leads to a much higher yield of tar, nicotine, carbon monoxide, polycyclic aromatic hydrocarbons and heavy metals than cigarette smoking (Rastam et al., 2010). This resurgence of waterpipe tobacco smoking may be due in part to the mistaken belief that waterpipes are less harmful and less addictive than cigarettes. Evidence to the contrary reveals that, as with cigarette smoke, waterpipe smoke contains many toxicants (Blank et al., 2013). In the study, 12.11% of the students (n=152) replied "yes" to the statement "Waterpipe contains no nicotine" while 0.64% replied "I have no idea" to this statement. In the studies, waterpipe smoking is declared to cause nicotine addiction (Knishkowy et al., 2005; Primack et al., 2008; Noonan et al., 2009; Abughosh et al., 2013). In the study, it is seen that 14.02% of the students (n=176) think waterpipe with fruit/aroma is healthier than plain waterpipe, 1.2% have no idea about the issue. A total of 18% of these students (n=226) think that waterpipe with fruit/aroma is not addictive while 1.05% have no idea. In the study by Hassoy et al., it is detected that 13.6% of the subjects think that pieces of fruit or aroma added in the waterpipe make it healthier. Waterpipe tobacco with aroma has been used as a method to attract waterpipe smokers since the beginning of 1990s. In some studies it is expressed that the number of people who prefer aromatic waterpipe is more than a total of 80% (Maziak et al., 2004; John et al., 2006; Primack et al., 2006). The fruit aroma in waterpipe glosses over the harmful toxines in tobacco with its nice smell and sweet flavour. Although it is perceived as being more healthy due to its nice flavour, the truth is just the opposite (Chaaya, 2004). A total of 14.02% of the students included in the study (n=176) have stated that waterpipe tobacco with fruit/aroma is healthier compared to the plain tobacco. Though, herbal tobacco is as harmful as plain tobacco in that it exposes the smoker to tar and carcinogen substances (T.C. Ministry of Health Brochure, 2013).While a total of 7.96% (n=100) replied "yes" to the statement "when the smoke of waterpipe is filtered through water, there will be no microbial growth in it", 1.85% stated that they had no idea. A total of 7.89% (n=99) of the students think that the common use of mouth pieces does not cause any contamination. In the study by Subasi et al. (2005) it is seen that only 1.4% of the students (n=31) think that transmission of diseases is possible by waterpipe smoking. When literature is studied it is seen that transmission of diseases such as tuberculosis, herpes and hepatitis is possible due to the common use of mouth pieces (Munckhof et al., 2003; Chaaya et al., 2004). Abughosh et al. (2012) and Akl et al. (2010) have expressed in their studies that it causes periodental diseases.

In limitation, since the aim of this study was to determine the views of university students about the effects of waterpipe smoking on health, it was not questioned whether the student smoked or not. Comparative studies on the state of waterpipe smoking of the young people and their views about its harmful effects on health may be planned in further studies. This study was carried out in a particular university, so it cannot be generalized for the whole university students and geographical regions. Similar studies among university students in different cultural groups and different geographical regions can be performed in the future.

In conclusion, As a result of this study, it is found out that a substantial number of university students have false beliefs on harmful effects of waterpipe smoking. It is essential that families and society, young people in particular be informed about health hazards of it. It would make a significant contribution in helping the young people keep healthy if they were warned about the harmful effects of waterpipe smoking and they in creased their awareness on the subject.

Acknowledgements

Thanks to the students who participated in this study.

References

Abughosh S, Wu I-H, Rajan S, Peters JR, Essien J (2012). Waterpipe Smoking Among Students in One US University: Predictors of an Intention to Quit. *J Am College Hlth*, **60**, 528-35

Akl EA, Gaddam S, Gunukula SK, et al (2010). The effects of waterpipe tobacco smoking on health outcomes: a systematic review. *Int J Epidemiol*, **39**, 834-57.

Akl EA, Gunukula SK, Aleem S, et al (2011). The prevalence of waterpipe tobacco smoking among the general and specific populations: a systematic review. *BMC Public Health*, **11**, 244.

Al Rashidi M, Shihadeh A, Saliba NA (2008). Volatile aldehydes in the mainstream smoke of the narghilewaterpipe. Food Chem. *Toxicol*, **46**, 3546-9.

Al-Naggar RA, Bobryshev YV (2012). Shisha smoking and associated factors among medical students in Malaysia, *Asian Pac J Cancer Prev*, **13**, 5627-32.

Al-Naggar RA, Saghir FSA (2011). Water pipe (shisha) smoking and associated factors among Malaysian university students. *Asian Pac J Cancer Prev*, **12**, 3041-7.

Blank MD, Brown WK, Goodman RJ, Eissenberg T (2013). An Observational Study of Group WaterpipeUse in a Natural Environment. Nicotine & Tobacco Research Advance Access published August, **13**, 7-1.

Chaaya M, El-Roueiheb Z, Chemaitelly H, et al (2004). Argileh smoking among university students: a new tobacco epidemic. *Nicotine Tob Res*, **6**, 457-63.

Chaaya M, Jabbour S, El-Roueiheb Z, Chameitelly H (2004). Attitudes, and practices of argileh(waterpipe or hubble-bubble) and cigarette smoking among pregnant women in Lebanon. *Addictive Behaviors*, **29**, 1821-31.

Chaouachi K (2009). Hookah (Shisha, Narghile) smoking and environmental tobacco smoke (ETS), A critical review of the relevant literature and the public health consequences. *Int J Environ Res Public Health*, **6**, 798-84.

Cogliano V, Grosse Y, Baan R, et al (2004). Advice on formaldehyde and glycol ethers. *Lancet Oncol*, **5**, 528.

Eissenberg T, Ward KD, Smith-Simone S, Maziak W (2008). Waterpipe tobacco smoking on a U.S. College campus: prevalence and correlates. *J Adolesc Health*, **42**, 526-9.

Griffiths MA, Harmon TR, Gilly MC (2011). Hubble Bubble Trouble: The Need for Education About and Regulation of Hookah Smoking, *Journal of Public Policy & Marketing*, **30**, 119-32.

Hassoy H, Ergin I, Davas A, Durusoy R, Karababa OA (2011). Determining the factors effecting the cigarette, narghile and hand- rolled tobacco smoking among medical technology vocational training school students and evaluation of their opinions about starting and continuing with their habits of smoking. *Respiratory J*, **13**, 91-9.

Jarrett T, Blosnich J, Trowek C, Horn K (2012). Hookah Use Among U.S. College Students: Results From the National College Health Assessment II. *Nicotine Tob Res*, **14**, 1145-53.

John U, Riedel J, Rumpf HJ, Hapke U, Meyer C (2006). Associations of perceived work strain with nicotinedependence in a community sample. *Occup Environ Med*, **63**, 207-11.

Kandela P (2000). Nargile smoking keeps Arabs in Wonderland. *Lancet*, **356**, 1175.

Knishkowy B, Amitai Y (2005). Water-pipe (narghile) smoking: an emerging health risk behavior. *Pediatrics*, **116**, 113-9.

Koul PA, Hajni MR, Sheikh MA, et al (2011). Hookah smoking and lung cancer in the Kashmir valley of the Indian subcontinent. *Asian Pac J Cancer Prev*, **12**, 519-24.

Maziak W (2013). The waterpipe: An emerging global risk for cancer. *Cancer Epidemiol*, **37**, 1-4.

Maziak W, Eissenberg T, Ward KD (2005). Patterns of waterpipe use and dependence: implications for intervention development. *Pharmacol Biochem Behav*, **80**, 173-9.

Maziak W, Tabbah K (2005). Smoking among adults in Syria: proxy reporting by 13-14 year olds. *Public Health*, **119**, 578-81.

Maziak W, Ward KD, AfifiSoweid RA, EissenbergT (2004). Tobacco smoking using a waterpipe: are-emerging strain in a global epidemic. *Tob Control*, **13**, 327-33.

Maziak W, Ward KD, Eissenberg T (2004). Factors related to frequency of narghile (waterpipe) use: the first insights on tobacco dependence in narghile users. *Drug Alcohol Depend*, **76**, 101-6.

Munckhof WJ, Konstantinos A, Wamsley M, Mortlock M, Gilpin C (2003). A cluster of tubercu- losis associated with use of a marijuana water-pipe. *Int J Tuberc Lung Dis*, **7**, 860-5.

Noonan D, Kulbok PA (2009). New tobacco trends: waterpipe (hookah) smoking and implications for healthcare providers. *J Am Acad Nurse Pract*, **21**, 258-60.

Nuwayhid IA, Yamout B, Azar G, Kambris MA (1998).Narghile (hubble-bubble) smoking, low birth weight, and other pregnancy outcomes. *Am J Epidemiol*, **148**, 375-83.

Poyrazoglu S, Sarli S, Gencer Z, Gunay O (2010). Waterpipe (narghile) smoking among medical and non-medical university students in Turkey.Ups. *J Med Sci*, **115**, 210-6.

Primack BA, Aronson JD, Agarwal AA (2006). An old custom: a new threat to tobacco control, (Letter). *J Am Public Health Assoc*, **96**, 1339.

Primack BA, Sidani J, Agarwal AA, et al (2008). Prevalence of and associations with waterpipetobacco smoking among U.S. university students. *Ann Behav Med*, **36**, 81-6.

Quenqua, D (2011). Putting a crimp in the hookah. New York Times. May 2011.

Rastam S, Li F, Fouad MF, et al (2010).Water pipe smoking and human oral cancers. *Medical Hypotheses*, **74**, 457-9

Shihadeh A and Saleh R (2005). Polycyclic aromatic hydrocarbons, carbon monoxide, "tar", and nicotine in the mainstream smoke aerosol of the narghilewaterpipe. *Food Chem Toxicol*, **43**, 655-61.

Shihadeh A, Salman R, Jaroudi et al (2012). Does switching to a tobacco-free waterpipe product reduce toxicant intake? A crossover study comparing CO, NO, PAH, volatile aldehydes, "tar" and nicotine yields. *Food Chem Toxicol*, **50**, 1494-8.

Smith-Simone S, Maziak W, Ward KD, Eissenberg T (2008). Waterpipe tobacco smoking: knowledge, attitudes, beliefs, and behavior in two U.S. samples. *Nicotine Tob Res*, **10**, 393-8.

Subası N, Bilir N, Ilhan E, et al (2005). Knowledge, attitude and behaviors of narghile smokers on narghile smoking. *Turk Thoracic J*, **6**, 137-43.

Sutfin LE, McCoy PT, Reboussin AB, et al (2011).Prevalence and Correlates of WaterpipeTobacco Smoking by College Students in North Carolina. *Drug Alcohol Depend*, **115**, 131-6.

Ministry of Health leaflet (2013). Protect Your Air: NArghile is More Dangerous Than Cigarette Smoking. http://www.havanikoru.org.tr/dosya/Docs_Mevzuata_iliskin_Belgeler/NargileBrosur.pdf

Tamim H, Terro A, Kassem H, et al (2003). Tobacco use by university students, Lebanon, 2001. Addiction, **98**, 933-9.

Ward KD, Eissenberg T, Gray JN, et al (2007). Characteristics of U.S. waterpipe users: a preliminary report. *Nicotine Tob Res*, **9**, 1339-46.

Wolfram RM, Chehne F, Oguogho A, Sinzinger H (2003). Narghile (water pipe) smoking influences platelet function and (iso-) eicosanoids. *Life Sci*, **74**, 47-53.