Hookah smoking among a sample of Iraqi male high school students: Awareness and understanding

Ahmed Khalaf Soofi Al-Delaimy (ahmedsoofi7@gmail.com)
University of Anbar College of Medicine
Waleed Al-Ani
University of Mustansiriyah

Research article

Keywords: High school, students, Hookah use, smoking, understanding

Posted Date: November 14th, 2019

DOI: https://doi.org/10.21203/rs.2.17315/v1

Abstract

Background: The use of hookah smoking device is increasing at large scale distributing from Eastern Mediterranean region reaching Western countries. Hookah smoke users exposed to a lot of chemical compounds and to several chronic diseases. The purpose of this study is to confirm the prevalence of hookah use among a sample of male high school students in Iraq, and to provide a better understanding of cessation-related behaviors and cognitions of hookah only users.

Methods: A descriptive cross-sectional study was conducted among students in three high schools (for males only) at Karkh District, Baghdad. The study period was from Oct. 2017 till Jan. 2019 including a total of 847 male students. A structured KAP questionnaire was used to identify their knowledge and use of hookah smoking. Analysis of data was carried out using the available statistical package of SPSS-25.

Results: the overall prevalence of hookah smoking among high school male students was high (46%). More than two-thirds (70.6%) of them think that water pipe smoking is acceptable socially more than cigarette smoking. More than half of participants (55%) first heard about hookah smoking from friends and close to two-thirds (65.2%) who smoke hookah from those surround students were also friends. Almost half of respondents think hookah smoking is not encouraged in the faith of Islam (47.3%) and less than quarter (20.9%) think it's completely forbidden in Islam.

Conclusions: Hookah smoking is increasing among high school students and becoming a socially acceptable behavior that needs more public and adolescent education about its harmful effect.

Background

Globally, tobacco use is considered the second leading cause of death, and it is responsible for the deaths of 1 in 10 adults [1]. Many carcinogenic compounds are found in the smoke from tobacco which is the leading cause of different types of cancer in the body specially; lung cancer [2] is considered the leading cause of cancer mortality in the world [3]. In addition to cancer, it can cause several respiratory infections where nicotine contained in cigarette smoke decreases the immune response defending body from malignant growth [4]. Hookah "Shisha, Hubble-Bubble, Nargileh & Water-Pipe (WP)" smoking is another form of tobacco use. Although hookah smoking practice dating back at least 400 years, nowadays the use of this device to smoke is increasing at large scale from the Eastern Mediterranean region reaching to Western countries [5,6]. Hookah design features a water bowel size, hose and mouthpiece. Several studies have been shown that hookah contains harmful chemicals [7–10], and a single 45-minute hookah session can expose the smoker to 48.6 times the amount of smoke as to smoking a cigarette [11]. In the US and from 2011 to 2016, current use of hookahs increased among middle and high school students, and in the year 2016 2% of middle school students reported that they had used hookah in the past 30 days "an increase from 1.0% in 2011" [12,13].

In Iraq, few research studies related to hookah smoking among high school students were done and mostly among college students [14]. The purpose of this study was to confirm the prevalence of hookah use among a sample of young adults, also to provide a better understanding of cessation-related behaviors, intentions, and cognitions of hookah only users, and to determine appropriate future public health strategies of hookah cessation interventions.

Methods

A cross-sectional survey of adolescent students in high school was done. The sample was a convenient sample (non-probability sampling) and a random selection of three governmental high schools in Baghdad City was carried out in order to determine the prevalence of hookah smoking among those students.

Ethical approval was granted by the ethical committee at Anbar University and Baghdad Education Directorate. Informed consent was obtained from school staff and students. Study period was from Oct. 2017 till Jan. 2019.

Sample size calculation is based on the equation: (n = Z2 1-a p (1-p)/ d2) where *n* is the required sample size[15] and sample size of 847 students aged 15 to 18 years old were included in the study, with level of significance at 5%, and a random selection of high schools was made to include all eligible students. A structured KAP questionnaire form was prepared to students which include questions to identify their knowledge and use of hookah smoking, their sources to obtain tobacco hookah smoking, the effect of cultural and social relations in starting hookah smoking, and their ability to quit hookah smoking.

Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). Analysis of data was carried out using the available statistical package of SPSS–25 (Statistical Packages for Social Sciences- version 25).

Results

Table 1 show that students first heard and knew about hookah from friends (55%), brothers/sisters (16.9%), café (14.2%), media and newspaper (8.6%), internet (4.7%), and from father/mother (4.3%). Most of high school students (86.1%) know that there is café shop for hookah smoking near their residence. It was found that the friends who smoke hookah are the highest group among the people who surround the hookah user (65.2%) followed by close relatives (31.6%), brothers/sisters (31.6%) and father/mother (4.5%).

Table 1: First heard about hookah, Café near residence, smoke hookah from surrounding.

	No	%
From where the student first heard/know about Hookah?		
Father and/or Mother	36	4.3
Brothers/ Sister and/or Cousin	143	16.9
Friends	466	55.0
Media and Newspaper	73	8.6
Saw a Hookah Café shop	120	14.2
Others (internet)	40	4.7
There is a Cafe for hookah smoking around students' residence	729	86.1
Who smoke hookah from those surround the student		
Father and/or Mother	38	4.5
Brothers and/or Sisters	69	8.1
Other close relatives	268	31.6
Friends	552	65.2
None	76	9.0

Table 2 shows that the participant's opinion about different types of smoking and its effect on health from the worst to the better rate order was hookah (35.7%), cigarette (34.6%), e-cigarette (23.8%) and tobacco gum (5.9%).

Prevalence of student's opinion about Islam's opinion regarding shisha smoking as being discouraged (47.3%), forbidden (20.9%), allowed (9.3%) or don't know (22.4%).

More than two-thirds (70.6%) of the students think that water pipe smoking is more acceptable socially than cigarette smoking and 62.9% of them did not think that water pipe smoking is less harmful and less addictive than cigarette smoking.
There was agreement for the need for regulations to prevent or forbid hookah café places (81.5%).

Table 2: Opinion of participants regarding harmfulness of tobacco products, Islam's opinion, social acceptance, hookah harmfulness and addictiveness, and regulations against hookah cafe.

		No	%
In student opinion: Which is of the following types of smoking are more harmful on health?	Tobacco gum	50	5.9
	Cigarette	293	34.6
	e- cigarette	202	23.8
	Hookah	302	35.7
In student opinion: hookah smoking in Islam.	Forbidden	177	20.9
	Discouraged	401	47.3
	Allowed	79	9.3
	Don't know	190	22.4
Think that hookah smoking is acceptable socially more than Cigarette smoking?	Yes	598	70.6
	No	249	29.4
Think that hookah smoking is less harmful and less addictive than Cigarette smoking?	Yes	314	37.1
	No	533	62.9
Do agree on regulations to forbid café places	Yes	690	81.5
	No	157	18.5

Figure 1 shows that the prevalence rate of Hookah smoking among high school students was (46%).

Regarding average number of hookah smoked in the last 30 days, table 3 shows that a high prevalence rate was once (28.1%), twice (16.6%), three times (11.3%). Among hookah smokers (85.5%) smokes in the last six months. Age at first hookah was smoked; the highest rate was at the age of 16 and 15 (27.4 % and 26.3 % respectively) followed by the age of 14 (15.1%). Average number of hookah smoking sessions per day among hookah smokers were one (13.3%), two (34.3%), three (31%), four (20.7%), ≥5 times (0.8%). The prevalence of sharing the mouthpiece with others during hookah smoking was never (30.7%), sometimes (34.6%), most of times (15.1%), and always (19.7%). Prevalence rate among smokers who were completely confident that they can quit hookah smoking was (61.2%), while those who are not completely confident (21.3%), somehow confident (7.7%), not that confident (5.6%), and not confident at all (4.3%). The duration of hookah smoking at each session in minutes

was >15 (15%), 15-29 (5.1%), 30-44 (24.3%), 45-59 (6.2%), 60-119 (35.6%), and ≥120 minutes (14.2%).

Table 3: Number of hookah smoked (last month), hookah smoking in the last 6 months, age first smoked hookah, hookah sessions per day, duration of sessions, mouthpiece sharing, confident to quit hookah smoking.

		No	%
Average number of hookah smoked in the past 30 days (even one puff)	1	110	28.1
	2	65	16.6
	3	44	11.3
	4	16	4.1
	5	23	5.9
	6	6	1.5
	7---	48	12.4
	14---	32	8.3
	21---	3	0.9
	28---	32	8.2
	≥50	12	3.4
Smoking hookah in the last 6 months	Yes	335	85.7
	No	56	14.3
Age you first smoked hookah	<10 years	6	1.5
	10	14	3.6
	11	7	1.8
	12	19	4.9
	13	30	7.7
	14	59	15.1
	15	103	26.3
	16	107	27.4
	≥17 years	46	11.8
Average number of hookah smoking sessions/day	One	52	13.3
	Two	134	34.3
	Three	121	31.0
	Four	81	20.7
	Five & more	3	0.8
Sharing the mouth-piece with others during hookah smoking	Never	120	30.7
	Sometimes	135	34.6
	Most of the times	59	15.1
	Always	77	19.7
How confident that you can quit hookah smoking	Completely confident	239	61.2
	Confident	83	21.3
	Some Confident	30	7.7
	Not that Confident	22	5.6
	Not Confident at all	17	4.3
Duration of hookah smoking at each session (minutes)	<15 minutes	58	15.0
	15---	20	5.1
	30---	95	24.3
	45---	24	6.2
	60---	139	35.6
	≥120 minutes	55	14.2

Regarding the place of hookah smoking, table 4 shows that a high rate of students smoke at Café shop (61.1%) and more than three-quarters of participants in this study get their hookah tobacco from hookah shop (78%), while only less rate from friends and family member (11% and 6.4% respectively).

Low prevalence rate (only 12.9%) think that Electronic cigarette (e-cigarette) can be a substitute to hookah smoking. High prevalence rate among students was found in this study (61.3%) don't know if e-cigarette is less harmful and less addictive than hookah smoking, the rest of smokers (13.5%) think e-cigarette is less harmful and less addictive than hookah and a quarter of them (25.3%) don't think e-cigarette is less harmful and addictive than hookah.

Table 4: Place of smoking, tobacco gain, substitute, harm and addictive.

		No	%
Where student usually smoke the hookah	Home	92	23.5
	Friend's home	38	9.5
	Café	239	61.1
	Others;	22	5.9
Other places?	Relative's home	18	81.8
	Mall	1	4.5
	School	1	4.5
	Street	1	4.5
	Public garden	1	4.5
From where student get their tobacco for hookah?	Myself from hookah shop	305	78.0
	From family members	25	6.4
	From friends	43	11.0
	Others	18	4.6
Student smoke e-cigarette as substitute for hookah?	Yes	109	12.9
	No	738	87.1
Think that e-cigarette is less harmful and less addictive than hookah?	Yes	114	13.5
	No	214	25.3
	Don't know	519	61.3

Discussion

Although a lot of high school male students who smokes hookah have some appropriate opinion about the harm of hookah smoking and their agreement on regulations against café shops, still the overall prevalence of hookah smoking among students in this study was high (46%). This prevalence is an agreement with a study in Saudi Arabia (secondary school adolescence male, aged > 18 years) where the overall prevalence of hookah smoking was 44% [16]. This high rate in our study is not seen in other studies in the region, where Abbas *et al.* and Alzyoud *et al.* studies done in Iranian and Jordanian high school male students were the prevalence percentage were 6% and 24% respectively [17,18].

More than half of participants first heard about hookah smoking from friends and more than two third have friends who smoke hookah. Azodi *et al.* in their study highlighted the role of friends in hookah smoking and emphasized that being among friend who smoked hookah was the most important factor of their tendency towards using it [19]. Also Bejjani *et al.* found in his study that almost half of his students in their study had all their friends smoking hookah [20].

Among different types of tobacco smoking, hookah smoking was the highest among students who believe it causes more harm on human being health. Also the results showed high prevalence among students who believe hookah is more harmful than cigarette, but are more socially accepted. Aslam *et al.* in his review explained the significant association between hookah smoking and increased risk of heart disease, cancer and hypercholesterolemia. [21]. Although adolescence in this study believe that hookah has worse health effects on them than other types of smoking but perhaps the effect of odor, flavor and taste of hookah overcome their choice of smoking. In addition hookah device can bring new and more group of friends smoking together in restricted or specific places minimizing the impact of their smoking on public. These opinions could explain the reason beyond students think hookah smoking is more acceptable socially than cigarette smoking. Fitzpatrick *et al.* in his findings showed that attempts of hookah smoking among young adults users is associated with their conviction that it is socially acceptable [22]. A study in Beirut, Lebanon demonstrates that hookah smoking is more culturally accepted in society than cigarette smoking [23]. Momenabadi *et al.* in his article mentioned that in Iran the presence of hookah in traditional society is considered one of traditional custom icon and fashion character [24]. All this led to an increase in the prevalence of this behavior. Therefore, it is a challenge that norm of acceptance should be changed in the society and hookah users should be looked at similar to cigarette smokers.

This study showed almost half of respondents think hookah smoking is discouraged in Islam (47.3%) and less than quarter (20.9%) think it's forbidden reflecting that religion could play an important role in preventing smoking in addition to a lot of risk behaviors such as drug abuse, gambling, alcohol drinking. A study was done in Jordan where they studied smoking habits among university students in different faculties and academic level, it showed that those in religion faculty were less likely to smoke compared to those in other faculties [25].

Our study showed more than one third of participants (33.1%) first tried hookah at the age between 10–14 years, and that the highest rate was among the age of 15 and 16 year (26.3% and 27.4% respectively). Teenage follow their parents and peers in a lot of high-risk behaviors and attitudes. Studies showed that increased prevalence of hookah smoking was associated with number of friends or family members who smoke [24,26]. In our study it was found that more than one-third (34.8%) of hookah smokers share the same mouth piece of hookah device in most of time and always. Sharing same mouth piece with different group of people and friends has the opportunity to have different types of infection from mouth, sputum and lung. Munckhof *et al.* concluded in his study that transmission of tuberculosis was found in people sharing a marijuana hookah with a case of pulmonary TB [26].

Sajid *et al.* reported that carboxyhaemoglobin concentration in cigarette smokers is lower (6.1 ppm) as compared to shisha smokers (8.8 ppm) [27]. In this study more than three-quarters of adolescence smoke hookah for equal or more than 30 minutes at each session. Duration of hookah smoking sessions, depth of inhalation, and frequency of puffing all participate in the level of exposure to nicotine and other carcinogenic chemical materials present in charcoal and tobacco in shisha smoke. In this report more than three-quarters were completely confident and confident that they can quit from hookah smoking. It's doubtful they could quit hookah smoking. As mentioned above hookah has more concentration of carboxyl group, nicotine and other chemical materials than cigarette smoking that has addictive pattern once the body is saturated with its difficult to withdraw or quit from smoking.

Limitations and strength of study

The study was self-funded and a convenient sample of hookah smoking students from three high schools, Karkh District. Also the questions were of short duration in time and number so the possibility of missing other items related to smoking is present. The reason for that we couldn't take more time of students inside their class.

However, the study provided rich data and precise answers, students had filled the questionnaire in front of their teachers, and therefore there was no drop rate from students or missing forms in this study.

Conclusions

Hookah tobacco smoking rates is increasing among high school students and becoming an acceptable socio-cultural phenomena in Iraq as it is worldwide urging the need of different effective preventive measures to be started to overcome the burden of hookah smoking on children and youth adults' health through public and adolescence educational sessions and lectures explaining its harmful effect and changing its social acceptance behavior aiming to build a negative attitude towards using hookah device.

Declaration

Ethics approval and consent to participate

The Research Ethics Committee at College of Medicine, University of Anbar approved the study. All students were informed of the study purpose and the voluntary and anonymous nature of participation, before providing written informed consent.

Consent for publication

'Not Applicable'

Availability of data and material

The datasets generated and/or analyzed during the current study are not publicly available.

Competing interests

The authors declare that they have neither competing interests nor financial disclosure.

Funding

This study was self-funded.

Authors' contributions

Both authors read and approved the final manuscript.

Acknowledgements

The authors thank the study participants for their contribution to the research, as well as school staff.

Author information

Affiliations

Family & Community Medicine Department, Medical College, University of Al- Anbar

Ahmed K. Al-Dealimy

Family & Community Medicine Department, Medical College, University of Al-Mustansiriya

Waleed AT Al-Ani

Corresponding author

Correspondence to Ahmed K. Al-Delaimy

Abbreviations

KAP: Knowledge, Attitude, Practice

WP: Water Pipe

e-cigeratte: electronic cigarettes

References

1. Al-Numair K, Barber-Heidal K, Al-Assaf A, El-Desoky G. Water-pipe (shisha) smoking influences total antioxidant capacity and oxidative stress of healthy Saudi males. Journal of Food Agriculture and Environment. 2007 Jul 1;5(3/4):17.
2. Hecht SS. Tobacco carcinogens, their biomarkers and tobacco-induced cancer. Nature Reviews Cancer. 2003 Oct;3(10):733.
3. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. CA: a cancer journal for clinicians. 2005 Mar;55(2):74-108.
4. Sopori M. Effects of cigarette smoke on the immune system. Nature Reviews Immunology. 2002 May;2(5):372.
5. Neergaard J, Singh P, Job J, Montgomery S. Waterpipe smoking and nicotine exposure: a review of the current evidence. Nicotine & tobacco research. 2007 Oct 1;9(10):987-94.
6. Maziak W. The global epidemic of waterpipe smoking. Addictive behaviors. 2011 Jan 1;36(1-2):1-5.
7. Al Rashidi M, Shihadeh A, Saliba NA. Volatile aldehydes in the mainstream smoke of the narghile waterpipe. Food and Chemical Toxicology. 2008 Nov 1;46(11):3546-9.
8. Cobb C, Ward KD, Maziak W, Shihadeh AL, Eissenberg T. Waterpipe tobacco smoking: an emerging health crisis in the United States. American journal of health behavior. 2010 May 1;34(3):275-85.
9. Cobb CO, Shihadeh A, Weaver MF, Eissenberg T. Waterpipe tobacco smoking and cigarette smoking: a direct comparison of toxicant exposure and subjective effects. Nicotine & Tobacco Research. 2010 Dec 2;13(2):78-87.
10. Shihadeh A, Saleh R. Polycyclic aromatic hydrocarbons, carbon monoxide,“tar”, and nicotine in the mainstream smoke aerosol of the narghile water pipe. Food and Chemical Toxicology. 2005 May 1;43(5):655-61.
11. Eissenberg T, Shihadeh A. Waterpipe tobacco and cigarette smoking: direct comparison of toxicant exposure. American journal of preventive medicine. 2009 Dec 1;37(6):518-23.
12. Singh T. Tobacco use among middle and high school students—United States, 2011–2015. MMWR. Morbidity and mortality weekly report. 2016;65.

13. Arrazola RA, Dube SR, King BA. Tobacco product use among middle and high school students—United States, 2011 and 2012. MMWR. Morbidity and mortality weekly report. 2013 Nov 15;62(45):893.
14. Thabit MF, Mohsin MA, Niazy SM. Water pipe (Shisha) smoking among a sample of Iraqi male college students: knowledge and attitudes. Age (years). 2015;20:20-4.
15. Kadam P, Bhalerao S. Sample size calculation. International journal of Ayurveda research. 2010 Jan;1(1):55.
16. Amin TT, Amr MA, Zaza BO, Suleman W. Harm perception, attitudes and predictors of waterpipe (shisha) smoking among secondary school adolescents in Al-Hassa, Saudi Arabia. Asian Pac J Cancer Prev. 2010 Jan 1;11(2):293-301.
17. Fakhari A, Mohammadpoorasl A, Nedjat S, Sharif Hosseini M, Fotouhi A. Hookah smoking in high school students and its determinants in Iran: a longitudinal study. American journal of men's health. 2015 May;9(3):186-92.
18. Alzyoud S, Weglicki L, Kheirallah K, Haddad L, Alhawamdeh K. Waterpipe smoking among middle and high school Jordanian students: patterns and predictors. International journal of environmental research and public health. 2013 Dec;10(12):7068-82.
19. Azodi F, Sharif F, Azodi P, Shirazi ZH, Khalili A, Jahanpour F. The reasons of tendency toward hookah smoking among teens and youth in Iran-A qualitative study. Journal of Pharmaceutical Sciences and Research. 2017;9(9):1642-6.
20. Bejjani N, El Bcheraoui C, Adib SM. The social context of tobacco products use among adolescents in Lebanon (MedSPAD-Lebanon). Journal of epidemiology and global health. 2012 Mar 1;2(1):15-22.
21. Aslam HM, Saleem S, German S, Qureshi WA. Harmful effects of shisha: literature review. International archives of medicine. 2014 Dec;7(1):16.
22. Fitzpatrick M, Johnson AC, Tercyak KP, Hawkins KB, Villanti AC, Mays D. Peer Reviewed: Adolescent Beliefs About Hookah and Hookah Tobacco Use and Implications for Preventing Use. Preventing chronic disease. 2019;16.
23. Tamim H, Al-Sahab B, Akkary G, Ghanem M, Tamim N, Roueiheb ZE, Kanj M, Afifi R. Cigarette and nargileh smoking practices among school students in Beirut, Lebanon. American journal of health behavior. 2007 Jan 1;31(1):56-63.
24. Momenabadi V, Hashemi SY, Borhaninejad VR. Factors affecting hookah smoking trend in the society: A review article. Addiction & health. 2016 Apr;8(2):123.
25. Khader YS, Alsadi AA. Smoking habits among university students in Jordan: prevalence and associated factors. East Mediterranean Health J, 2008; 14(4):897-904.
26. Munckhof WJ, Konstantinos A, Wamsley M, Mortlock M, Gilpin C. A cluster of tuberculosis associated with use of a marijuana water pipe. The International Journal of Tuberculosis and Lung Disease. 2003 Sep 1;7(9):860-5.
27. Sajid KM, Akhter M, Malik GQ. Carbon monoxide fractions in cigarette and hookah (hubblebubble) smoke. JPMA. 1993;993:43.

Figures

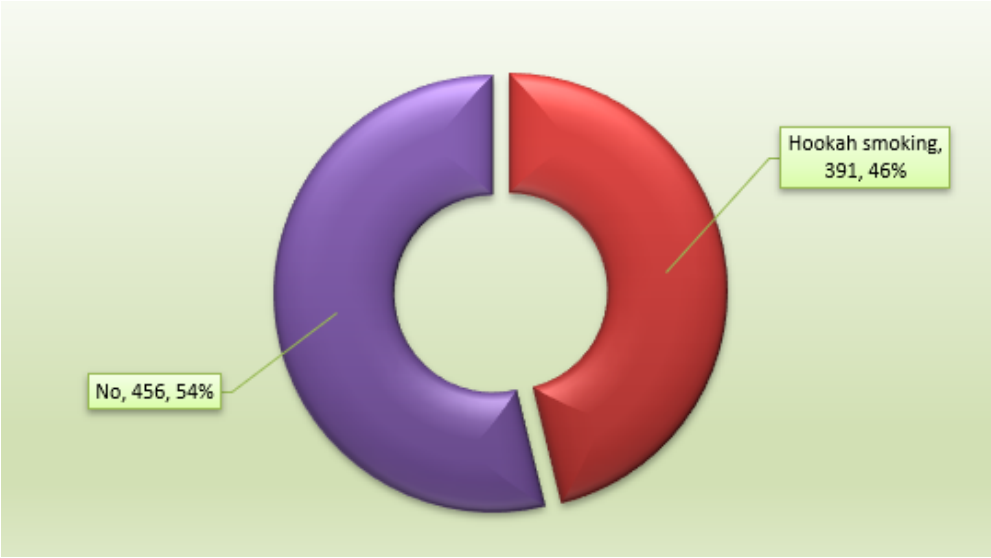

Figure 1

The prevalence of Hookah smoking among high school students.