

Prevalence of Narghile and Cigarette Smoking among Youths in Erbil, Capital City of Kurdistan, Iraq: A Cross Sectional Study

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Abstract

Original Research Article

Narghile smoking is progressively becoming prevalent and accepted behavior among youth in the middle east region. Even though the Narghile method of tobacco smoking is an old tradition among Middle Eastern adult males, its widespread emergence among adolescence is a new encounter. This study aimed to evaluate the prevalence, social acceptance, and perception of Narghile smoking among the youth in Erbil, the capital city of Iraqi Kurdistan. A cross-sectional study where 630 youths in Erbil province completed a self-administered questionnaire based on the Global Adult Tobacco Survey (GATS). Data were analyzed using the Statistical Package for Social Sciences (SPSS) software. The Results shows cigarette smokers (16.7%), as Narghile smoking accounted for 49.4%. The prevalence of current Narghile smoking among the study sample was almost twice (65.7%) as compared to (33.0%) cigarette smokers. Most participants (44.9%) smoked Narghile once per week. The majority(67.6%) started smoking Narghile after 18 years of age. More than half of participants (57.5%) agreed that Narghile is less harmful than cigarette smoking, 54.9% disagreed that Narghile smoking can transfer infectious disease and more than Half of participants stated that is not a risk factor for lung cancer and cardiovascular disorder. Moreover, 47.9% agreed that Narghile causes gum disease, 81.4% agreed that Narghile smoking reduces stress, and 46.3% believe that it may cause addiction. The study indicates that current Narghile smoking is exceedingly widespread, and its social acceptance is surpassing cigarette smoking among youth in Erbil province. Planning and implementing an awareness program are required by authorities to increase responsiveness among adolescence to thwart the spread of such tobacco smoking conduct.

Keywords: Narghile, Waterpipe, Kurdistan, Erbil, Youth, Awareness, Cigarette smoking.

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INTRODUCTION

Tobacco-related smoking is a significant public health issue worldwide, and a modifiable risk factor for the universal escalation in non-communicable illnesses in humans [1]. According to WHO (the World Health Organization) by the year 2030, mortality rate caused by tobacco smoking will rise more than 8 million, with the highest increase of these premature deaths occurring among people living in low- and middle-income countries. Furthermore, the additional burden of tobacco-related morbidities aiming the respiratory and cardiovascular systems, [2, 6].

In the last few years, the tobacco smoking tradition began to change with new and disturbing trends in Narghile or waterpipe tobacco smoking [7–9]. Narghile is known by different names in different part of the world such as waterpipe, hookah or shisha. Narghile is a smoking method that involves charcoal-heated air to pass through a perforated aluminum-foil and across the flavored tobacco known as “Mu’assel” to

create smoke that bubbles through the water before inhalation by the smoker [8].

Narghile is known as a centuries-old tradition practiced for nearly four centuries which has gained astounding popularity among youngsters and school students within the last few years. [7, 10]. There are few factors identified to be a contributor for excess attention geared towards Narghile, predominantly by adolescence: 1. The consequence of the introduction of different flavors such as Mu’assel (a syrupy tobacco mix containing molasses and vegetable glycerol), 2. The lack of Narghile specific rule and regulations, 3. The Narghile social acceptability and traditional ties, 4. the role of the internet and social media [8, 9, 11]. The pervasive use of Narghile among adolescent prompts troubling future health consequences and could prolong to an evolving new strain in the universal tobacco epidemic [7].

Data from recent studies show an upward trend and dramatic popularity in the pervasiveness of

Narghile or waterpipe among youth in numerous settings. Epidemiologic surveys have documented that cigarettes smoking has been substituted by Narghile as the most common form of tobacco smoke [13]. The studies also have shown that an hour of smoking Narghile is estimated to equal to 100 cigarettes [16]. Data from the Global Youth Tobacco Survey (GYTS) among adolescents 13–15 years old school children in several middle-eastern countries indicate the prevalence of Narghile smoking extending from 9% - 15% in which surpassing the cigarette smoking [12]. The most recent GYTS data in Kurdistan was taken in 2006 showing 11.4% of 13-15-year-old using Narghile as cigarette smoking substitute among them 13.5% boys, and 8.7% Girls of alarming concern [14].

In the Kurdistan region, the report in 2006, data on tobacco smoking from the “Tobacco Control Surveillance in Kurdistan Region, Iraq” revealed that 11.4% of 13-15 years old, 21.6% among medical students, 13.9% of dental students, and 10.1% of pharmacy students were current smokers of tobacco product [14]. While there are some data available on the prevalence of tobacco use in Kurdistan, however, the existing gaps in the literature hamper our ability to comprehend the Narghile use completely. Most studies have focused on cigarette smoking or tobacco smoking in general without stipulating the Narghile smoking pervasiveness.

Based on the existing gaps in the literature and the reference by world health organization (WHO) to fortify surveillance and monitoring tobacco smoking among various groups, there is an obligation to understand the epidemiology of Narghile or Waterpipe in the Kurdistan’s capital and examine whether it is a public health concern among Kurdish youth. Therefore, this study intended to evaluate the current prevalence of Narghile and analyze its comparison as well as associated factors with the current commonness of cigarette smoking among a sample of the population in the Erbil city. It is envisioned that this investigation will act as a reference point for the national prevalence of Narghile smoking among youth in Kurdistan’s capital city of Erbil. Furthermore, the outcome of this study is also intended to place within the regional context to make a future comparison for impending studies.

METHODS

Study design, setting, and sample

A cross-sectional study was conducted among youth in Erbil, the capital city of Iraqi Kurdistan during September- December 2018. The study utilized the standardized Global Adult Tobacco Survey (GATS) as world health organization (WHO) urges all countries to use this standard instrument for reliability and comparability in monitoring and surveillance of tobacco use [15]. Moreover, since GATS is designed to be used for both genders ages 15 and older, it makes it an ideal choice for this study [15]. Even though, the GATS

survey questions were previously validated and applied to assess tobacco use and related behaviors, the final questionnaire as paper-based in both English and local language was piloted with a sample of 20 individuals to test for validity and reliability. For reliability, core consistency and validity of substances of the questionnaire was carried out by calculating the Cronbach Alpha coefficient, which was equal to 0.84. This value specifies a decent internal consistency of the questionnaire. The survey was comprised of several segments that measured socio-demographic and educational related characteristics, patterns of Narghile or WTS and cigarette smoking, smoking environment self-related health status, knowledge, perception, attitudes, and opinions on Narghile as well as cigarette utilization.

After obtaining ethical and consensual permission from all establishments and participants, the GATS survey questionnaire distributed among participants in different settings targeting young adults from universities, shopping malls and cafes within Erbil city. Participation was voluntary, and questionnaires were not identified by name or code to ensure their complete discretion on their personal information and anonymity of their responses. All participants were asked to read and sign a consent form and access to data was restricted to the researcher. Furthermore, it was explained to participants that they could refuse to answer any question and choose to withdraw from the survey at any point. Total of 850 individuals were invited to participate in the study, out of which 681 individuals agreed to partake in the study. However, 51 were dropped due to inadequate replies to the questionnaire; therefore, the study is based on 630 valid and comprehensive responses, implying an overall response rate of 74.1%.

Data processing and statistical analysis

The GATS questionnaire specifies that existing tobacco smokers correspond to the percentage of respondents who presently smoke tobacco [15]. In this research survey, the principal outcome variable was whether the partaker was a current Narghile tobacco smoker, and the secondary outcome variable was whether the respondent was a present cigarette smoker. The survey primary outcome question being asked was whether the participant currently smokes Narghile every-day, less than daily (Once/week, twice/week, 3-4 times/week), or not smoking at all. The choice options encompassed: every day, less than daily, and not at all. According to the standardized Global Adult Tobacco Survey (GATS), every day or daily define as smoking at minimum one form of tobacco every day throughout a month or more [15]. Therefore, the analysis of this survey implies to current smoking status as (everyday/daily, or less than daily which is a once/week, twice/week, 3-4 times/week) and not a current smoker. The standard prevalence of smoking among youth was reported for each corresponding

question and covers the sociodemographic characteristic within the Erbil province.

The Statistical Package for Social Sciences (SPSS) software version 21.0 was utilized to analyze the data. Numbers and percentages were formed to

summarize categorical and insignificant data. Also, the Chi-square (χ^2) test for comparisons among subgroups was used. Additionally, the level of significance was set at ($P < 0.05$).

Table-1: Baselinesocio-demographicand individual characteristics of participants stratified by gender

Variable	Male (n = 409) N (%)	Female (n = 221) N (%)	Total (n =630) N(%)
Age			
<18 years	36 (8.8)	10 (4.5)	46 (7.3)
18 - 20 years	122 (29.8)	74(33.5)	196 (31.1)
21- 23 years	136 (33.3)	88 (39.8)	224 (35.6)
≥ 24 years	115 (28.1)	49 (22.1)	164 (26.0)
Residence			
Erbil City	159 (38.9)	83 (37.6)	242 (38.4)
Erbil Province	207 (50.6)	130 (58.8)	337 (53.5)
Other Provinces	33 (8.1)	8 (3.6)	41 (6.5)
Camp	10 (2.4)	0 (0)	10 (1.6)
Ethnicity			
Kurdish	260 (63.6)	127 (57.5)	387 (61.4)
Other	149 (36.4)	94 (42.5)	243 (38.6)
Living Arrangement			
With Family	356 (87.0)	199 (90.0)	555 (88.1)
Other	53 (13.0)	22 (10.0)	75 (11.9)
Employment Status			
Employed	60 (14.7)	17 (7.7)	77 (12.2)
Not Employed	349 (85.3)	204 (92.3)	553 (87.8)
Self-Rated Financial Status			
Poor	102 (25.0)	40 (18.1)	142 (22.5)
Good	184 (45.0)	89 (40.3)	273 (43.3)
Very Good	123 (30.0)	92 (41.6)	215 (34.1)
Current Faculty of Study			
Art and Humanities	199 (48.7)	123 (55.7)	322 (51.1)
Science	82 (20.0)	45 (20.4)	127 (20.2)
Health/Medical Sciences	40 (9.8)	17 (7.7)	57 (9.0)
Not Applicable	88 (21.5)	36 (16.2)	124 (19.7)
Academic Year			
First year	67 (16.4)	17 (7.7)	84 (13.3)
Second year	90 (22.0)	52 (23.5)	142 (22.5)
Third year	95 (23.2)	68 (30.8)	163 (25.9)
Fourth Year	102 (24.9)	70 (31.7)	172 (27.3)
Not Applicable	55 (13.5)	14 (6.3)	69 (11.0)
Academic achievement			
Acceptable	85 (23.3)	16 (7.2)	101 (16.0)
Good	160 (39.3)	85 (38.5)	245 (38.9)
Very good	101 (27.3)	88 (39.8)	189 (30.0)
Excellent	41 (10.0)	25 (11.3)	66 (10.5)
Not Applicable	22 (5.4)	7 (3.2)	29 (4.6)

(n =630)

RESULTS

Sample characteristics

Of the 850 individuals invited to participate in this study, 681 young adults responded to the survey invitation; 51 were dropped because the replies were incomplete. The study is based on 630 valid and

complete responses by young participants, indicating an overall response rate of 74.1%. The sample comprised of 409 (64.9%) Males and 221 (35.1%) females. Table 1 displays the baseline sociodemographic characteristics of participants stratified by gender. Most respondents 92.0% were from Erbil province of which

38.4% were residents of Erbil city. Respondents from the camp comprised of 1.6% and 6.5% from other regions. Majority of participants 88.1% lived with their families, and only 12.2% were employed. Most of the participating youths 80.3% were university students. More than half were students in the faculty of arts and humanities, followed by 20.2% majoring in science and 9.0% in the faculties of health and medical sciences. Majority of participants were college students as 25.9% the third year, and 27.3% were fourth-year college students and only 11.0% of participants were not attending any schools. Most of the participants 38.9% in good academic standing and 30.0% with a very good and 10.5% were in excellent academic achievements.

Table 1 illustrates other sociodemographic characteristics of the study sample.

Prevalence of Narghile and cigarette smoking

Table 2 illustrates the overall distribution of the current method of tobacco use that was reported by 379 male participants (60.2%), 140 female participants (22.2%); ($p < 0.005$). Cigarette smokers comprise 16.7% of which 21.5% male and 7.7% female. Narghile smoking accounted for 49.4% (56.2% male and 36.7% female), and 16.3% were both cigarette and Narghile smokers (14.9% male and 19.0% female). The prevalence of current Narghile smoking among the study sample was almost twice (65.7%) as compared to (33.0%) of cigarette smokers.

Table-2: Smoking status of participants according to gender

Variable	Male N (%)	Female N (%)	Total N (%)	P Value
Type of Smoking preference:				<0.005
Cigarettes	88 (21.5)	17 (7.7)	105 (16.7)	
Narghile	230 (56.2)	81 (36.7)	311 (49.4)	
Both cigarettes and Narghile	61 (14.9)	42 (19.0)	103 (16.3)	
Not a current smoker	30 (7.3)	81 (36.7)	111 (17.6)	
Currently smoke Narghile				.032
Once/week	89 (30.6)	97 (78.9)	186 (44.9)	
Twice/week	75 (25.8)	21 (17.0)	96 (23.2)	
3-4 times/week	107 (36.8)	5 (4.1)	112 (27.1)	
Daily	20 (6.9)	0 (0.0)	20 (4.8)	
Number of years of Narghile smoking (mean \pm SD)	4.13 (2.1)	1.97 (1.2)	3.24 (1.95)	0.005
Currently smoking cigarette				
Once/week	31 (20.8)	39 (66.1)	70 (33.7)	
Twice/week	43 (28.9)	11 (18.6)	54 (26.0)	
3-4 times/week	62 (41.6)	9 (15.3)	71 (34.1)	
Daily	13 (8.7)	0 (0.0)	13 (6.2)	
Number of cigarettes smoked				0.111
≤ 10 Cigarettes/Day	39 (26.2)	51 (86.4)	90 (43.3)	
10-20 Cigarettes/Day	81 (54.4)	8 (13.5)	89 (42.8)	
> 20 Cigarettes/Day	29 (19.4)	0 (0.0)	29 (13.9)	
Number of years of cigarettes smoking (mean \pm SD)	4.28 (2.8)	2.5 (1.8)	4.29 (100)	<0.005

Most of the participants 44.9% (30.6% male and 78.9% female) reported smoking Narghile once per week. Majority of participants 67.6% (61.2% male and 82.9% female) started smoking Narghile after the 18 years of age (Table 3). Most current Narghile smokers (55.0% males and 52.0% females) reported that no one in their family smoked Narghile, as 34.7% males and 44.7% female stated their brother smoked in their family. Also, 63.9% of males and 62.6% of females reported that Narghile smoking had been encouraged by friends. The location of smoking Narghile was reported by 69.8% males and 64.2% of females to be the cafe' and restaurants; moreover, only a few, about 4.5% of males and 0.0% of females, stated that they smoked at home in the presence of parents. Narghile smoking has a strong socialization factor, as illustrated in Table 3. A

small percentage (4.6%) of Narghile users smoke alone. However, 80.4% of males and 87.8% of females reported that they smoke Narghile with friends. The reason for smoking Narghile was conveyed by 42.3% of males and 49.6% of females for pleasure, and 16.8% of males and 19.5% of females stated for the easing of stress, 32.6% of males and 27.6% of females reported less harmful than cigarette, and only 1.0% of males and 1.6% of females gave the response of "just to try" (Table 3). In response to a question regarding the parents' reaction to their youngsters smoking behavior, 60.8% of males and 82.1% of females responded that they would be disciplined, whereas 13.7% males and 0.0% of females smoked Narghile at the presence of their parents without any adverse reaction by either parent. In response to the intention to quit Narghile

smoking, 41.6% of male respondents and 54.5% of females reported that they have the plan to stop this form of smoking behavior, and 58.4% males and 45.5%

females stated that they have no aim to quit smoking Narghile, Table 3.

Table-3: Characteristics of Narghile smokers according to gender

Narghile behaviors related questions	Male (n=291)	Female (n=123)	Total (n=414)
	N (%)	N (%)	N (%)
Age At what age started smoking Narghile			
≤15 years	32 (11.0)	0 (0.0)	32 (7.7)
16-18 years	81 (27.8)	21 (17.1)	102 (24.6)
>18 years	178 (61.2)	102 (82.9)	280 (67.6)
Family members who smoke Narghile			
No one	160 (55.0)	64 (52.0)	224 (54.1)
Father	24 (8.2)	3 (2.4)	27 (6.5)
Mother	5 (1.7)	0 (0.0)	5 (1.2)
Brother	101 (34.7)	55 (44.7)	156 (37.7)
Sister	1 (0.3)	1 (0.8)	2 (0.5)
Smoking Narghile was encouraged by:			
No one	92 (31.5)	42 (34.1)	134 (32.4)
Family	1 (0.3)	0 (0.0)	1 (0.2)
Friends	186 (63.9)	77 (62.6)	263 (63.5)
Relatives	9 (3.1)	2 (1.6)	11 (2.6)
Others	3 (1.2)	2 (1.6)	5 (1.2)
The site of smoking Narghile			
At home in the presence of parents	13 (4.5)	0 (0.0)	13 (3.1)
At home when parents go out	33 (11.3)	5 (4.1)	38 (9.2)
At Café and Restaurants	203 (69.8)	79 (64.2)	282 (68.1)
Others	42 (14.4)	39 (31.7)	81 (19.6)
Narghile smoking most of the times with:			
Family	9 (3.1)	0 (0.0)	9 (2.2)
Friends	234 (80.4)	108 (87.8)	342 (82.6)
Relatives	33 (11.3)	11 (8.9)	44 (10.6)
Alone	15 (5.2)	4 (3.3)	19 (4.6)
Reason for smoking Narghile?			
Imitation	3 (1.0)	2 (1.6)	5 (1.2)
Easing of stress	49 (16.8)	24 (19.5)	73 (17.6)
For pleasure	123 (42.3)	61 (49.6)	184 (44.4)
Less harmful than cigarettes	95 (32.6)	34 (27.6)	129 (31.2)
Just to try	3 (1.0)	2 (1.6)	5 (1.2)
Other reasons	18 (6.2)	0 (0.0)	18 (4.3)
Parents' reactions regarding your Narghile smoking?			
Don't care, I smoke Narghile at their presence	40 (13.7)	0 (0.0)	40 (9.7)
If they knew they would punish me	177 (60.8)	101 (82.1)	278 (67.1)
Other reactions	74 (25.4)	22 (17.9)	96 (23.2)
Intent to quit Narghile smoking			
Yes	121 (41.6)	67 (54.5)	188 (45.4)
No	170 (58.4)	56 (45.5)	226 (54.6)

Perception, knowledge, and attitude about Narghile smoking

Table 4 displays participants awareness, general knowledge and their attitude about the effect of Narghile on health and wellbeing. More than half of participants (57.5%) agreed that Narghile is less harmful to the health than cigarette smoking, while 33.5% disagreed. The majority of partakers (54.9%) disagreed that Narghile smoking can transfer infectious disease

and 53.5% stated that it is not a risk factor for lung cancer. Most of the participants (57.8%) disagreed that Narghile smoking increases the incidence of cardiovascular disorder.

Moreover, 47.9% of agreed that Narghile causes gum disease, and 77.3% believe Narghile smoking results in discoloration of teeth and oral tissues. Most (81.4%) agreed that Narghile smoking

reduces stress, and 62.2% of participants agreed that Narghile smokers are more attractive and have more friends. Over 50% of participants agreed that Narghile

smoking had become a culture, and 46.3% believe that it may cause addiction.

Table-4: Knowledge, attitude and perception about the effect of Narghile smoking on health(N = 630)

Questions associated with knowledge and attitude regarding Narghile smoking	Responses N (%)								
	Agree			Disagree			Don'tknow		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Narghile smoking is less harmful to human health than cigarettes smoking	238 (58.2)	124 (56.1)	362 (57.5)	139 (34)	72 (32.6)	211 (33.5)	32(7.8)	25(11.3)	57 (9.0)
Narghile smoking is a tool for the transmission of infectious diseases	164 (40.1)	84 (38.0)	248 (39.4)	225 (55.0)	121 (54.8)	346 (54.9)	20 (4.9)	16(7.2)	36 (5.7)
Narghile smoking is a risk factor for lung cancer	147 (35.9)	90 (40.7)	237 (37.6)	221 (54.0)	116 (52.5)	337 (53.5)	41 (10.0)	15(6.8)	56 (8.9)
Narghile smoking increases the incidence of cardiovascular disease	137 (33.5)	100 (45.2)	237 (37.6)	253 (61.9)	111 (50.2)	364 (57.8)	19(4.6)	10 (4.5)	29 (4.6)
Narghile smoking causes gum disease	184 (44.8)	118 (53.3)	302 (47.9)	142 (34.9)	68 (30.9)	210 (33.3)	83 (20.3)	35 (15.8)	118(18.7)
Narghile smoking causes discoloration of teeth and oral tissues	310 (75.8)	177 (80.0)	487 (77.3)	74 (18.1)	20 (9.0)	94 (14.9)	25 (6.1)	24(10.9)	49 (7.8)
Narghile smoking reduces stress	347 (84.8)	166 (75.1)	513 (81.4)	54 (13.2)	41 (18.6)	95(15.1)	8 (2.0)	14(6.3)	22 (3.5)
Narghile smokers are striking and have more friends	267 (65.3)	125 (56.6)	392 (62.2)	101 (24.7)	44 (19.9)	145 (23.0)	41 (10.0)	52 (23.5)	93 (14.8)
Narghile smoking has become a culture	209 (51.1)	107 (48.4)	316 (50.2)	102 (24.9)	67 (30.3)	169 (26.8)	98 (24.0)	47 (21.3)	145(23.0)
Narghile smoking may cause addiction	175 (42.8)	117 (52.9)	292 (46.3)	139 (34.0)	56 (25.3)	195 (31.0)	95 (23.2)	48 (21.7)	143(22.7)

Perception, knowledge, and attitude about cigarette smoking

Participants understanding and their attitude regarding the effect of cigarette smoking on overall health is illustrated in Table 5. The majority of participating youth agreed that cigarette smoking is a risk factor for lung cancer, cardiovascular and gum disease, discoloration of teeth and oral tissues, and may cause addiction. More than half of the participants

agreed that cigarette smoking reduces stress and it has become a culture. More than half of participants (53.6%) disagreed that cigarette smoking is less harmful than Narghile smoking, and 50.0% disagreed that cigarette smoking transmits infectious disease. Additionally, participating youth (55.3%) opposed that cigarette smokers are attractive and have more friends, Table 5.

Table-5: Knowledge, attitude and perception about the effect of cigarette smoking on health (N =630)

Questions associated with knowledge and attitude regarding Narghile smoking	Responses N (%)								
	Agree			Disagree			Don'tknow		
	Male N (%)	Female N (%)	Total N (%)	Male N (%)	Female N (%)	Total N (%)	Male N (%)	Female N (%)	Total N (%)
Cigarettes smoking is less harmful to human health than Narghile smoking	147(35.9)	138 (43.0)	285(39.0)	237(57.9)	154(48.0)	391(53.6)	25 (6.1)	29 (9.0)	54 (7.4)
Cigarettes smoking is a tool for the transmission of infectious diseases	129 (31.5)	125 (38.9)	254(34.8)	220 (53.8)	145 (45.1)	365(50.0)	60 (14.7)	51 (15.9)	111 (15.2)
Cigarettes smoking is a risk factor for lung cancer	331 (80.9)	282 (87.8)	613(84.0)	33 (8.1)	16 (5.0)	49 (6.7)	45 (11.0)	23 (7.2)	68(9.3)
Cigarette smoking increases the incidence of cardiovascular disease	348 (85.1)	285(88.8)	633(86.7)	28 (6.8)	13(4.0)	41 (5.6)	33 (8.1)	23(7.2)	56(7.7)
Cigarettes smoking causes gum disease	302 (73.8)	243 (75.7)	545(74.6)	29 (7.1)	19(5.9)	48 (6.6)	78 (19.1)	59 (18.4)	137 (18.8)
Cigarettes smoking causes discoloration of teeth and oral tissues	364 (89.0)	295(91.9)	659(90.3)	12 (2.9)	9(2.8)	21 (2.9)	33 (8.1)	17(5.3)	50(6.8)
Cigarettes smoking reduces stress	352 (86.1)	299 (93.1)	651(89.2)	25(6.1)	10(3.1)	35 (4.8)	32 (7.8)	12(3.7)	44(6.0)
Cigarettes smokers are striking and have more friends	135 (33.0)	92 (28.7)	227(31.1)	212 (51.8)	192 (59.8)	404(55.3)	62 (15.2)	37 (11.5)	99(13.6)
Cigarettes smoking has become a culture	199 (48.7)	186 (57.9)	385(52.7)	147 (35.9)	96 (29.9)	243 (33.3)	63 (15.4)	39 (12.1)	102 (14.0)
Cigarettes smoking may cause addiction	261 (63.8)	226 (70.4)	487(66.7)	102 (24.9)	62 (19.3)	164 (22.5)	46 (11.2)	33 (10.3)	79 (10.8)

DISCUSSION

The findings of this study illustrate that Narghile smoking among youth in Erbil province is more prevalent than cigarette smoking. Amongst our study sample, the higher prevalence of Narghile smoking compared to cigarette smoking supports the increased popularity of this method of smoking among youths as an acceptable alternative to cigarette smoking. This higher rate of Narghile smoking could also reflect an emerging Narghile epidemic among youth in Erbil province. Furthermore, smoking Narghile is more socially accepted as a form of contemporary lifestyle or prestige among the youth in the region.

Majority of participants (67.6%) in this survey were over the age of 18 when they began smoking Narghile. As compared to similar studies in the region the rise of Narghile smoking prevalent corresponds in the same manner during the last few years [17]. According to the study by Maziak *et al.* the upsurge of Narghile smoking within the last ten years has become an epidemic public health issue [8].

There was a substantial difference in the proportion of cigarette smoking and Narghile smoking among male and female Youth in Erbil province. Cigarette smoking was approximately three times (21.5% male and 7.7% female) as common among male compared to female youths. Additionally, Narghile smoking alone was more frequent (56.2% male and 36.7% female) among male compared to female youths in Erbil province. The survey results illustrate that there is a negative discernment of female smoking in the region's socio-cultural belief. This finding was consistent with previous studies in the region and neighboring Arab countries. A recent study by Nasih Othman *et al.*, in Sulaymaniyah province of Kurdistan region, indicates a high prevalence of waterpipe smoking among male students in comparison to females [18]. Consequently, this suggests that Narghile smoking is well-tolerated and socially accepted among youths and society. Furthermore, it displays consistency with other data from neighboring Arab countries which shows the rise of Narghile smoking as compared to cigarette smoking [19,20].

There is a great belief among many people that Narghile smoking has less health risk compared with cigarette smoking. The study reveals that Narghile smoking is a new gateway for tobacco utilization as most youths (57.5%) agreed that narghile smoking is less harmful to human health than cigarette smoking. Most of the participating youth showed disagreement that Narghile smoking is a risk factor for lung cancer and cardiovascular disease. The participants (54.9%) disagree that Narghile can be a tool for the transmission of infectious diseases, even though, most of them share the same mouthpiece. However, the survey indicates that the Majority of participants believe that Narghile smoking causes gum disease and discoloration of teeth and oral tissues. The youths, also, reported that narghile smoking not only reduces stress but also makes them more attractive. Narghile smoking, according to participating youths, has become an addictive culture and they lack the intention to quit. These troubling outcomes could provoke an alarm toward an increased risk of persistence of Narghile smoking and contribute to such form of a smoking epidemic. These attitude and perceptions among youths are consistent with similar data from studies in Syria, Iran and other Arab countries [11,20,21].

Factors that may contribute to Narghile smoking were an abundance of cafeterias, bars, and restaurants offering flavored tobacco smoke and free internet access, family or social picnics (most common in Kurdistan), and higher socioeconomic status, peer pressure and above all the lack of educational program and no specific rules and regulation for Narghile smoking.

The study displays that majority of Narghile smokers were in third and fourth years of college or university with good financial and academic standing. Therefore, These findings support the significant role of the educational system in integrating the effect of Narghile smoking on health in the school curriculum. Furthermore, the implementation of programs and policies by collaboration among the ministry of health and educational authorities to regulate and control all forms of tobacco smoking behaviors among youths who have become the victims of such addictive culture will assist in enhancing awareness among the society. Consequently, understanding this important health-risk behavior, Narghile smoking should be more cautiously and meticulously managed by the health authorities. It is imperative to implement health education initiatives dealing with this new and wildly spreading demeanor.

Research strength and limitations

The current study is not without limitations. The study covers only a small percentage of the young population in Erbil province which potentially limits its generalizability. Additionally, the study relied on self-reporting by young participants of their behavior, habits, and knowledge of this form of tobacco smoking,

which could be prone to bias in reporting and may not necessarily echo their authentic conduct. Therefore, these results may not represent all the youths in Kurdistan. However, the study is essential as it signals the pervasiveness of Narghile smoking among youth which the majority are educated university students and the level of their awareness about its harmful effect on health and wellbeing. Furthermore, the results of this study may well assist in providing information to establish and develop educational and public health awareness curricula and interventions to confront this method of tobacco smoking.

CONCLUSION

Current Narghile smoking was highly prevalent among youths in Erbil province. The study indicates a social acceptance of Narghile smoking and its emerging trend is surpassing cigarette smoking among Kurdish youths. The perception and knowledge of youths regarding Narghile smoking seem to be low which indicates the absence of health and education programs in addressing the health hazards of Narghile smoking; hence, the need for planning and implementing such programs to increase awareness among youths to prevent the spread of this rampant method of tobacco smoking behavior is essential.

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REFERENCES

1. Davis RM, Smith R. Addressing the most important preventable cause of death. *BMJ: British Medical Journal*. 1991 Sep 28;303(6805):732.
2. World Health Organization. Report on the Global Tobacco Epidemic. Geneva: The MPOWER package. 2008.
3. World Health Organization. Report on the global tobacco epidemic: warning about the dangers of tobacco. Geneva. 2011.
4. World Health Organization. Global Action Plan for the Prevention and Control of Noncommunicable Diseases, Geneva. 2013.
5. World Health Organization. Global Report on Trends in the Prevalence of Tobacco Smoking in. 2015.
6. World Health Organization. Study Group on Tobacco Product Regulation, Waterpipe tobacco smoking: health effects, research needs and recommended actions for regulators - 2nd ed. World Health Organization. 2015.
7. El-Zaatari ZM, Chami HA, Zaatari GS. Health effects associated with waterpipe smoking. *Tobacco control*. 2015 Mar 1;24(Suppl 1):i31-43.

8. Maziak W, Taleb ZB, Bahelah R, Islam F, Jaber R, Auf R, Salloum RG. The global epidemiology of waterpipe smoking. *Tobacco control*. 2015 Mar 1;24(Suppl 1):i3-12.
9. Jawad M, McEwen A, McNeill A, Shahab L. To what extent should waterpipe tobacco smoking become a public health priority?. *Addiction*. 2013 Nov;108(11):1873-84.
10. Anjum Q, Ahmed F, Ashfaq T. Knowledge, attitude and perception of water pipe smoking (Shisha) among adolescents aged 14-19 years. *JPMA. The Journal of the Pakistan Medical Association*. 2008 Jun;58(6):312.
11. Kheirallah KA, Alsulaiman JW, Al-Sakran Mohammad H, Alzyoud S, Veeranki SP, Ward KD. Waterpipe tobacco smoking among Arab youth; a cross-country study. *Ethnicity & disease*. 2016;26(1):107.
12. Moh'd Al-Mulla A, Abdou Helmy S, Al-Lawati J, Al Nasser S, Ali Abdel Rahman S, Almutawa A, Abi Saab B, Al-Bedah AM, Al-Rabeah AM, Ali Bahaj A, El-Awa F. Prevalence of Tobacco Use Among Students Aged 13-15 Years in Health Ministers' Council/Gulf Cooperation Council Member States, 2001-2004. *Journal of School Health*. 2008 Jun;78(6):337-43.
13. Elawa F, Warren CW, Jones NR. Changes in tobacco use among 13-15-year-olds between 1999 and 2007: findings from the Eastern Mediterranean Region.
14. Centers for Disease Control and Prevention (CDC). Tobacco use among students aged 13-15 years--Kurdistan Region, Iraq, 2005. *MMWR. Morbidity and mortality weekly report*. 2006 May 26;55(20):556.
15. Global Adult Tobacco Survey Collaborative Group. Tobacco questions for surveys: a subset of key questions from the Global Adult Tobacco Survey (GATS). Atlanta: Centers for disease control and prevention. 2011.
16. Surji KM, The danger of Narghile smoking. *Taw-Komalyati*. 2013;52(2):46-47
17. Maziak W, Ward KD, Soweid RA, Eissenberg T. Tobacco smoking using a waterpipe: a re-emerging strain in a global epidemic. *Tobacco control*. 2004 Dec 1;13(4):327-33.
18. Othman N, Kasem, Salih A. Waterpipe Smoking among University Students in Sulaymaniyah, Iraqi Kurdistan: Prevalence, Attitudes, and Associated Factors. *Tanaffos* 2017; 16(3): 225-232.
19. 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.
20. Almerie MQ, Matar HE, Salam M, Morad A, Abdulaal M, Koudsi A, Maziak W. Cigarettes and waterpipe smoking among medical students in Syria: a cross-sectional study. *The international journal of tuberculosis and lung disease*. 2008 Sep 1;12(9):1085-91.
21. Jradi H, Wewers ME, Pirie PP, Binkley PF, Ferketich AK. Cigarette and waterpipe smoking associated knowledge and behaviour among medical students in Lebanon/Consumption de cigarettes, utilisation de pipes a eau et connaissances et comportements associes chez des etudiants en medecine au Liban. *Eastern Mediterranean Health Journal*. 2013 Oct 1;19(10):861-9.