

# Adverse Effects of Nargile Smoking on Healthy Individuals in Nasiriya City, Iraq

Hasan Ali Hasan Shubbar<sup>1</sup>, Zinah M. Anwer<sup>2</sup>, Ahmed Abdulameer Daffaar<sup>3</sup>

(Pharmacist), Thi-Qar Directorate. Iraq<sup>1</sup>

Zinah M. Anwer (Assist. Prof.), Department of Clinical Pharmacy, College of Pharmacy, Baghdad University, Iraq<sup>2</sup>

Ahmed Abdulameer Daffaar (Assist. Prof.), Department of Surgery, College of Medicine, Thi-Qar University, Iraq<sup>3</sup>



---

**Keywords:**

Harmful health outcomes, intention to stop nargile, Nasiriya City, Iraq.

---

**ABSTRACT**

Smoke from a nargile contains many of the same toxicants that are in cigarettes that can also lead to acute intoxication in nargile users. Several smokers may propose they do not inhale the smoke. Although smokers just receive the smoke into the oral cavity and do not truly inhale, the body remains to absorb the nicotine across the lining of the oral cavity. The increasing frequency of usage, the sum of nargile smoked, and extended smoking periods were associated with a greater hazard of nicotine dependence. This study was intended to research the impact of smoking nargile on the health of a sample of Nasiriya people. A cross-sectional study was carried on 400 healthy Iraqi citizens who are smoking shisha in the Iraqi Cafes and restaurants in Nasiriya city. The volunteers aged 15-50 years were recruited during the period from April to July 2019 in Nasiriya to participate in this study. All volunteers were provided with oral consent to participate in the study. Materials include queries about data. Pulse rate measurement and oxygen saturation and blood pressure (systolic and diastolic) were measured by the researcher using a pulse oximeter, sphygmomanometer respectively. Most of the nargile smokers were males 95.75%, with a mean age of  $28.49 \pm 7.55$  years, 83.75% were regular smokers of nargile, and 86% smokes for more than one year. Dry throat and headache were the main detrimental effects reported by the participants. Hematological abnormalities were the main complaint about admission to hospitals. There was a significant association ( $P\text{-value} < 0.05$ ) linking socio-demographic features, nargile smoking habits, psychogenic effects, entire undesirable health outcomes and intention to stop smoking nargile, and significance association ( $P\text{-value} < 0.05$ ) linking socio-demographic features, nargile smoking habits and detrimental effects. In this study, the elements that are considerably correlated with the detrimental health effects were: regularity of smoking and frequency of smoking. Important considerations correlated to the probability of a one not proposing to stop nargile were academic achievement, the regularity of smoking, frequency of smoking, best tobacco flavor, relax feeling, mental focus or concentration change, taste in the mouth, and detrimental health effects.



## 1. INTRODUCTION

Tobacco smoking is correlated with dangerous undesirable health outcomes, and there is no proof that these outcomes are minimal dangerous if a nargile is consumed. The growing usage concurrently with the restricted extent of recognition and care for the probable health outcomes of smoking the nargile is disturbing. Particularly taking in to account the growing approbation and use of the nargile between the young people [1]. Exhaled air CO, nicotine in plasma, and heartbeat are considerably raised following 45 min of nargile smoking, nearly dual CO concentration in the blood, and three-time nicotine contact in comparison with one usual cigarette [1]. Nargile tobacco smoking was considerably correlated with: respiratory illnesses [COPD, bronchitis], oral malignancy, lung malignancy, little birthweight, metabolic syndrome, circulatory disorder [2], and mental health [3]. Speaking voice is affected by nargile smoking [4].

Nargile tobacco smoking has been correlated with periodontitis, dry socket, pre-malignant lesions, and oral and esophageal malignancy [5]. RBC count, the concentration of hemoglobin, hematocrit, WBC count and mean cell hemoglobin concentration are raised in cigarette and nargile smokers in comparison to control collection [6]. Carbon monoxide in gestation can hurt the fetus and is often supposed to be the cause for the little birth weight detected in infants born to smoking moms. Females who smoke nargile throughout their gestation leave their infants at hazard. The likelihood that infants are born with little weight and respirational distress rises extremely owing to the usage of the nargile [1].

Mental functions including attentiveness, vigilance, and remembrance were considerably diminished in healthful adult nargile smokers compared to non-nargile smokers [7]. Tobacco concurrently produced a calculated 100 million loss of life in the twentieth century, and as recorded by the WHO it will lead to one billion loss of life in the twenty-first century if the present tendency remains [1]. Flavoured tobacco is one of the main reasons behind the acceptance of nargile smoking globally, and eliminating flavors will tending adversely affect nargile gratification and upcoming consumption and that such an influence will be obvious among high- regularity in comparison to low- regularity nargile smokers [3].

## 2. Materials and Methods

### 2.1 Inclusion criteria

All nargile smokers, who are 15-50 years of age were randomly approached and asked to participate in a part of the survey regardless of ethnics, occupations and social status [8].

### 2.2 Exclusion criteria

- 1- Children aged under 15 years or people aged over 50 years.
- 2- Cigarette smoking people.
- 3- Alcoholic people.
- 4- People who have chronic diseases.
- 5- People who work in smoky environment.

### 2.3 Moral Respect

The present study was agreed by the ethical and scientific committee in the Pharmacy College/Baghdad University. Volunteers were notified about the study purposes and privacy of their answers.

## 2.4 Questionnaire

The instrument to collect the data for this study was designed by the researcher and validated by the Scientific Committee in the Pharmacy College – Baghdad University. The response to questions with either yes or no.

## 2.5 Measurement

Vital signs were measured by the researcher using instruments and tools:

- 1- Pulse oximeter: to measure oxygen saturation (as a percent) and pulse rate (beat per minute).
- 2- Sphygmomanometer: to measure systolic and diastolic blood pressure (mm Hg).

## 2.6 Statistical analysis

$\chi^2$  test (Chi-square) and Fisher's exact test with  $p < 0.05$  were applied to assess correlation linking categorical variables and result of concerns, such as the entire harmful health outcomes, intention to stop smoking nargile. All assessment were performed with IBM SPSS Statistics version 25 and Microsoft Office Excel 2010.

## 3. Results

Vital signs measured reveal that 93.25% of participants had a normal range of oxygen saturation and the remaining in were in the lower border of normal rang. Also, the majority of participants (81%) had a normal pulse rate in the range of 60-100 beats/minute. On the other hand, by using electronic sphygmomanometer: only 11.5% of participants had elevated systolic blood pressure ( $\geq 140$  mm Hg), while 29.75% had elevated diastolic blood pressure ( $\geq 90$  mm Hg), and 4.25% had diastolic blood pressure less than 60 mm Hg as demonstrated in table 1:

Item	Subcategory	N(%)	Minimum	Maximum	Mean	Standard deviation
<b>Oxygen saturation (Percent)</b>	<95%	27 (6.75)	90	100	96.99	1.46
	95-100%	373 (93.25)				
<b>Pulse rate beat/minute</b>	<60	4 (1)	55	135	88.64	14.35
	60-100	324 (81)				
	>100	72 (18)				
<b>Systolic blood pressure mm Hg</b>	<90	1 (0.25)	81	173	125.79	12.47
	90-120	118 (29.5)				
	121-139	235 (58.75)				
	$\geq 140$	46 (11.5)				
<b>Diastolic blood pressure mm Hg</b>	<60	17 (4.25)	51	114	82.17	11.74
	60-80	164 (41)				
	81-89	100 (25)				
	$\geq 90$	119 (29.75)				

Detrimental effect reported by the participants are demonstrated in table 2:

<b>Number</b>	<b>Questions</b>	<b>Yes, N (%)</b>	<b>No, N (%)</b>
<b>1</b>	<b>Dry throat</b>	<b>242 (60.5)</b>	<b>158 (39.5)</b>
<b>2</b>	<b>Headache</b>	<b>240 (60)</b>	<b>160 (40)</b>
<b>3</b>	<b>Hoarse and muffled voice</b>	<b>126 (31.5)</b>	<b>274 (68.5)</b>
<b>4</b>	<b>Nausea</b>	<b>109 (27.25)</b>	<b>291 (72.75)</b>
<b>5</b>	<b>Pain that worsens with swallowing or talking</b>	<b>82 (20.5)</b>	<b>318 (79.5)</b>
<b>6</b>	<b>Tonsils become swollen and reddish</b>	<b>67 (16.75)</b>	<b>333 (79.5)</b>
<b>7</b>	<b>Do you have other complaint not mentioned above</b>	<b>94 (23.5)</b>	<b>306 (76.5)</b>
<b>8</b>	<b>Have you been admitted to emergency or resuscitation or hospital due to smoking nargile</b>	<b>73 (18.25)</b>	<b>327 (81.75)</b>

The chief complaint in case of admission to hospital or clinic visits due to nargile smoking reported by participants are demonstrated in table 3:

<b>No</b>	<b>Chief complaint in case of admission to hospital or clinic visit due to shisha smoking .</b>	<b>Frequency (%)</b>
<b>1</b>	<b>Hematology (increase Hb, PCV &amp; blood donation or cupping )</b>	<b>37 (47.4)</b>
<b>2</b>	<b>Respiratory *</b>	<b>22 (28.2)</b>
<b>3</b>	<b>Cardiovascular **</b>	<b>8 (10.2)</b>
<b>4</b>	<b>Gastro-intestinal*** *</b>	<b>6 (7.7)</b>
<b>5</b>	<b>Headache , dizziness</b>	<b>2 (2.6)</b>
<b>6</b>	<b>Renal(pyelonephritis and nephrolithiasis)</b>	<b>1 (1.3)</b>
<b>7</b>	<b>Depression</b>	<b>1(1.3)</b>
<b>8</b>	<b>Inflammation of lymph node</b>	<b>1 (1.3)</b>

\* mean chest infection, dry cough, dyspnea, hemoptysis, allergic bronchitis, tonsillitis, productive cough.

\*\* mean ectopic beat, hypotension, hypertension, tachycardia, palpitation.

\*\*\* mean peptic ulcer, nausea, irritable bowel syndrome, decrease appetite.

Number of detrimental effect reported by participants are demonstrated in table 4:

<b>Table 4. Number of detrimental effect reported by participants</b>	
<b>Number of Detrimental effect reported by participants</b>	<b>Frequency (%)</b>
<b>Not have detrimental effect</b>	<b>59 (14.75)</b>
<b>1 effect</b>	76 (19)
<b>2 effect</b>	76 (19)
<b>3 effect</b>	73 (18.25)
<b>4 effect</b>	47 (11.75)
<b>5 effect</b>	27 (6.75)
<b>6 effect</b>	21 (5.25)
<b>7 effect</b>	17 (4.25)
<b>8 effect</b>	4 (1)

According to data analysis by chi-square that demonstrated in table 5, there was an association between some nargile smoking practices and detrimental adverse health effects:

<b>Table 5. Association between socio-demographic features, nargile smoking habits, and detrimental effects (N = 400)</b>				
<b>Item</b>	<b>Subcategory</b>	<b>0-2 detrimental effects</b>	<b>3-8 detrimental effects</b>	<b>P-value</b>
<b>Regularity of smoking</b>	Regular	168	167	<b>*0.018</b>
	Irregular	43	22	
<b>Duration of smoking</b>	≤ 12 month	33	23	0.201
	>12 month	171	173	
<b>Frequency of smoking</b>	<7 /week	62	28	<b>**0.000</b>
	≥ 7/week	149	161	
<b>Nargile session</b>	<45 min	113	92	0.330
	≥ 45 min	98	97	

\*Significant (P-value< 0.05) according to Pearson Chi-Square test.

\*\*highly Significant (P-value< 0.01) according to Pearson Chi-Square test.

Among 400 participants in this study, 249 wish to quit smoking (62.25% of participants), while 151 wants to continue (37.75% of participants). Table 6 reveals the association between socio-demographic characteristics, nargile smoking practices, psychogenic effects, physical changes, total adverse health effects and intention to quit smoking nargile:

<b>Table 6. Association between socio-demographic features, nargile smoking habits, psychogenic effects, physical changes, entire undesirable health outcomes, and intention to stop smoking nargile (N = 400)</b>				
<b>Nargile smoking status</b>	<b>Subcategory</b>	<b>Quit smoking (yes)</b>	<b>Continue smoking</b>	<b>P-value</b>
<b>Gender</b>	Male	241	142	0.187
	Female	8	9	
<b>Age</b>	≤20 years	35	23	0.468
	21-30 years	118	79	
	31-50 years	96	49	
<b>Academic achievement</b>	Secondary and below	151	109	*0.019
	Tertiary (college and institute)	98	42	
<b>Job</b>	Free work	95	69	0.264
	Officer	99	49	
	Student and Unemployed	55	33	
<b>Regularity of smoking</b>	Regular	197	138	**0.001
	Irregular	52	13	
<b>Duration of smoking</b>	≤ 12 months	40	16	0.127
	>12months	209	135	
<b>Frequency</b>	< 7/week	71	19	**0.000
	≥ 7/week	178	132	

<b>Best tobacco flavor</b>	Mint	124	57	*0.035
	Combination (mint + gum or lemon)	65	42	
	Others	60	52	
<b>Relax feeling</b>	Yes	188	132	**0.004
	No	61	19	
<b>Increase focus or concentration</b>	Yes	77	64	*0.020
	No	172	87	
<b>Taste in mouth</b>	Good	192	137	**0.001
	Bad	57	14	
<b>Appetite</b>	changed	137	89	0.443
	Unchanged	112	62	
<b>Weight</b>	changed	59	41	0.439
	Unchanged	190	110	
<b>Detrimental effect</b>	0-2 effect	120	91	*0.019
	3-8 effect	129	60	

\*Significant (P-value < 0.05) according to Pearson Chi-Square test.

\*\*highly Significant (P-value < 0.01) according to Pearson Chi-Square test.

## 4. Discussion

### 4.1 Vital signs

As demonstrated in table 1, the majority of participants in the current study had normal SBP (systolic blood pressure), DBP (diastolic blood pressure), and heart rate, the data in the present study were different from the results of (a cross-sectional study in London in 2014), which include measurements of pulse rate, MAP (mean arterial pressure) and CO (carbon monoxide) before and after nargile exposure and reveals statistically considerable variance between the measurement pre and post smoking, which established the incidence of acute computable circulatory consequences after smoking nargile [9].

While the results of oxygen saturation in the current study were reliable with the outcomes of (a study in Turkey in 2017), which shows that smoking has adverse consequences on the oxygen saturation [10].

### 4.2 Detrimental effects of shisha smoking

As demonstrated in table 2, 3, 4 the outcomes of the present study were reliable with the previous study in Malaysia, as the four record widespread harmful health impacts stated by the study participants, specifically dry throat (60.5%), followed by headache (60%), then hoarse and muffled voice (31.5%) and nausea (27.25%) [8]. Dry throat, headache, and nausea may be attributed to nicotine [11], also carbon monoxide intoxication

may cause headaches and nausea [12], [13].

The most common chief complaint in case of admission to hospital or clinic visit due to nargile smoking reported by participants in this study were due to hematological effect, followed by respiratory, then cardiovascular, and gastro-intestinal.

It is of note that only 14.75% have no detrimental effects, also more than half of the total study respondents stated having 0-2 harmful health outcomes, revealing the massive effect of nargile on consumers' health, these results also came with results of [8] study in Malaysia.

The analysis of data by chi-square in the present study identified some elements that are considerably correlated with the detrimental health effects that demonstrated in table 5 which are: regularity of smoking and frequency of smoking. The results of the present study were consistent to [8] study, which concluded that recurrent use of nargile rises the extent of exposure to the risks of nargile smoke, also additional repeated nargile smoking may suggest increase amounts of carcinogens and inhaled nicotine take in by the body that results in negative health consequences.

Participants with an interval of smoking above one year stated the maximum ratio of entire harmful health outcomes 3–8 in comparison to those who smoked for one year or less.

#### **4.3 Intention to quit smoking**

In this study, 60.25% of respondents have the intention to stop nargile smoking, which is consistent with study result [14].

Although the interval of smoking was statistically not significantly associated with intention to stop smoking nargile in the present study, the majority of participants with an interval of smoking nargile of one year and below were considerably more probable to have a greater ratio of participants with the intent to stop smoking nargile than those with a smoking interval above one year and these results were consistent with [8].

The analysis of data by chi-square in the present study identified some elements that are significantly correlated with intention to stop smoking that demonstrated in table 6 which are:

- a) Academic achievement: may be due to its effects on smokers' attitudes, knowledge of the smoking hazard [8].
- b) The regularity of smoking: Regular nargile consumers have considerably greater negative health consequences in comparison to irregular nargile consumers, nargile consumers with an interval of smoking of one year and below were considerably more probable to have a greater ratio who aim to stop smoking than nargile users of more than one-year interval [8].
- c) Frequency of smoking: increasing frequency, the sum of nargile smoked, and extended smoking periods were linked to a greater hazard of nicotine dependence [15].
- d) Best tobacco flavor: Removing flavors will be expected adversely modify nargile gratification and upcoming usage and that such an impact will be further obvious among high-regularity in comparison to low-regularity nargile smokers [3].
- e) Relax feeling: preventive interventions should be intended and employed at community or environmental levels applying health campaign concepts and examples, point to the elimination of positive views toward smoking nargile, enhancing the ability to say no, and an increase of calmness and resistance against temptations for smoking nargile [16].
- f) Mental focus or concentration change: Owing to the undesirable outcomes of nicotine on the brain,



raised nicotine dependence was stated to be linked to trouble in stop tobacco smoking [8].

- g) Taste in the mouth: The taste was attributed to pleasant flavors with distinct attractive aromas [17].
- h) Detrimental health effects: Previous studies proposes that slightly concentrated interferences that alter opinions about disadvantage and addiction of nargile smoking may improve the wish to stop smoking between university students [18], [19].

These factors may give perception into attempts at nargile regulation and interference to promote stopping nargile usage.

## 5. Conclusions

Concerning the outcomes of the present study, one can infer that:

- 1- More than half of participants had 0-2 detrimental health effects and less than half had 3-8 detrimental health effects and only 14.75% had no detrimental health effects.
- 2- The aspects that are considered linked with the detrimental health effects were: regularity of smoking and frequency of smoking.
- 3- 60.25% of respondents have the intent to stop nargile smoking, the aspects that are considerably linked to the intent to stop smoking were: academic achievement, the regularity of smoking, frequency of smoking, best tobacco flavor, relax feeling, mental focus or concentration change, taste in the mouth, and detrimental health effects.

## 6. Acknowledgment

The author would like to thank Dr. Dhia Jabbar -Head of the Department of Clinical Pharmacy- at College of Pharmacy, Baghdad University, Dr. Mustafa Nima Abdali - Arabic & Iraqi Board in medicine / respiratory specialty, for their kind and help.

## 7. References

- [1] Jukema JB, Bagnasco DE, Jukema RA. Water pipe smoking: not necessarily less hazardous than cigarette smoking. *Netherlands Heart Journal*. 2014 Mar 1;22(3):91-9.
- [2] Rezk-Hanna M, Benowitz NL. Cardiovascular effects of hookah smoking: potential implications for cardiovascular risk. *Nicotine and Tobacco Research*. 2018 Apr 5;21(9):1151-61.
- [3] Maziak W1, Ben Taleb Z2, Ebrahimi Kalan M, et al. Effect of flavour manipulation on low and high-frequency water pipe users' puff topography, toxicant exposures and subjective experiences. *Tob Control*. 2019 Jul 20. pii: tobaccocontrol-2019-055040.
- [4] Ayoub MR, Larrouy-Maestri P, Morsomme D. The effect of smoking on the fundamental frequency of the speaking voice. *Journal of Voice*. 2018 May 7.
- [5] Ramôa CP, Eissenberg T, Sahingur SE. Increasing popularity of waterpipe tobacco smoking and electronic cigarette use: Implications for oral healthcare. *Journal of periodontal research*. 2017 Oct;52(5):813-23.
- [6] Nadia MM, Shamseldein HA, Sara AS. Effects of Cigarette and Shisha Smoking on Hematological Parameters: An analytic case-control study. *IMJH*. 2015 Dec;10:44-51.
- [7] Meo SA, Bashir S, Almubarak Z, Alsubaie Y, Almutawa H. Shisha smoking: impact on cognitive

functions impairments in healthy adults. *Eur Rev Med Pharmacol Sci*. 2017 Nov 1;21(22):5217-22.

[8] Wong L, Alias H, Aghamohammadi N, Aghazadeh S, Hoe V. Shisha smoking practices, use reasons, attitudes, health effects and intentions to quit among shisha smokers in Malaysia. *International journal of environmental research and public health*. 2016 Jul;13(7):726.

[9] Kadhum M, Jaffery A, Haq A, Bacon J, Madden B. Measuring the acute cardiovascular effects of shisha smoking: a cross-sectional study. *JRSM open*. 2014 May 6;5(6):2054270414531127.

[10] Özdal M, Pancar Z, Çinar V, Bilgiç M. Effect of smoking on oxygen saturation in healthy sedentary men and women. *EC Pulmonology and Respiratory Medicine*. 2017;4(6):178-82.

[11] Motooka Y, Matsui T, Slaton RM, Umetsu R, Fukuda A, Naganuma M, Hasegawa S, Sasaoka S, Hatahira H, Iguchi K, Nakamura M. Adverse events of smoking cessation treatments (nicotine replacement therapy and non-nicotine prescription medication) and electronic cigarettes in the Food and Drug Administration Adverse Event Reporting System, 2004– 2016. *SAGE open medicine*. 2018 May 21;6:2050312118777953.

[12] Eissenberg T. Tobacco smoking using a water pipe (hookah): what you need to know. *AANA journal*. 2013 Aug;81(4):308.

[13] Kadhum M, Sweidan A, Jaffery AE, Al-Saadi A, Madden B. A review of the health effects of smoking shisha. *Clinical Medicine*. 2015 Jun 1;15(3):263-6.

[14] Kumar A, Baig S, Ansari S, Rizvi N, Sharif H, Beg AE, Rauf A, Baig FA, Majeed AA. Comparison of Shisha Smoking Behavior among Medical and Pharmacy Students. *Journal of Behavioral and Brain Science*. 2016 Jul 5;6(07):269.

[15] Bahelah R, DiFranza JR, Ward KD, Eissenberg T, Fouad FM, Taleb ZB, Jaber R, Maziak W. Waterpipe smoking patterns and symptoms of nicotine dependence: The Waterpipe Dependence in Lebanese Youth Study. *Addictive behaviors*. 2017 Nov 1;74:127-33.

[16] Momenabadi V, Hashemi SY, Borhaninejad VR. Factors affecting hookah smoking trend in the society: A review article. *Addiction & health*. 2016 Apr;8(2):123.

[17] Farag MA, Elmassry MM, El-Ahmady SH. The characterization of flavored hookahs aroma profile and in response to heating as analyzed via headspace solid-phase microextraction (SPME) and chemometrics. *Scientific reports*. 2018 Nov 19;8(1):17028.

[18] Lipkus IM, Eissenberg T, Schwartz-Bloom RD, Prokhorov AV, Levy J. Affecting perceptions of harm and addiction among college waterpipe tobacco smokers. *Nicotine & Tobacco Research*. 2011 Apr 6;13(7):599-610.

[19] Noonan D, Patrick ME. Factors associated with perceptions of hookah addictiveness and harmfulness among young adults. *Substance abuse*. 2013 Jan 1;34(1):83-5.