**Saudi Journal of Oral and Dental Research (SJODR)** **ISSN 2518-1300 (Print)**
Scholars Middle East Publishers **ISSN 2518-1297 (Online)**
Dubai, United Arab Emirates
Website: http://scholarsmepub.com/

# Oral Health Effects in Shisha Smokers - A Study among Arabs and Indians in UAE

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**Original Research Article**

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**Article History**
*Received: 08.06.2018*
*Accepted: 21.06.2018*
*Published: 30.06.2018*

**DOI:**
10.21276/sjodr.2018.3.6.4

**Abstract:** Shisha/ Waterpipe smoking has become a global epidemic, especially among youth. Health effects of WTS have not been studied extensively like the cigarette smoking. There is a dire need to study and document health effects of water pipe smoking in general and specifically on the oral cavity. 100 subjects under each category were studied: Exclusively Shisha smokers, Exclusively Cigarette smokers, Cigarette and shisha smokers and non-smokers. Along with the Arab population, Indian populations residing in UAE were also studied. After a brief explanation of the study, and obtaining a written consent signed from the study participants, a questionnaire was administered to collect data. A detailed case history was taken. Oral examination included soft tissue and hard tissue examination. Simplified oral hygiene was calculated. Respiratory problems and Sleep disturbance were mainly reported among shisha subjects. Moderate to mild stains and calculus along with periodontitis was recorded. Complains of bad breath and dry mouth was reported. One case of mixed white and red patches was noted in shisha smoker. The finding of our study could be substantial evidence that WTS alone has the potential to cause deleterious oral health effects and could even lead to pre-malignant lesions.

**Keywords**: Waterpipe tobacco smoking, shisha, hookah, oral health.

## INTRODUCTION

Waterpipe has been used for smoking tobacco for centuries [1,2]. The water pipe has various namesdepending on the locality like Argile, Narghile, Shisha, Hookah, Hubble bubble. It is commonly referred to as shisha/shisha in United Arab Emirates (UAE) and hookah in India.

The name Waterpipe tobacco smoking (WTS) is used for the last 2 decades in the English language scientific literature to refer to any variety of instruments that involves tobacco smoke passing through water before inhalation [3].

The use of water pipe is increasing daily, by all age and sex groups. Waterpipe smoking has become a global epidemic, especially among youth[4-6]. Because cigarette smoking is a taboo in the society for females, and shisha has a cultural tag in the Middle East region women are increasingly gravitating towards this.[7] Studies have proved that the narghile smoke contains toxic substances like carbon monoxide, formaldehyde, nitrogen, nitric acid, polyhydrocarbons, chromium, arsenic, lead and volatile aldhehydes that are as harmful, if not, more harmful than cigarettes [3, 8, 9-12].

Acute respiratory diseases and lung impairment are proven health risks. Other health hazards include an increased risk of developing cancers, cardiovascular and chronic respiratory diseases. Indulging in waterpipe smoking during pregnancy, can lead to low fetal birth weight. Passive smoking from waterpipe smoke, similar to cigarettes, poses a serious health risk to non-smokers. Infectious diseases, such as Tuberculosis, might spread when waterpipe is shared among smokers [13-15].

WTS has not been studied in depth like the cigarette smoking. Though there have been few studies conducted, there is a dire need to document its ill health effects systemically and on oral cavity. Since the oral mucosa is exposed to the smoke and toxins from WTS directly, studying the effects on oral health will definitely be beneficial in a greater understanding. The general public perception is that WTS is harmless. The use of waterpipe just as with other forms of tobacco can be regulated if there is more awareness of its health effects.

## METHOD

Along with the Arab population, Indian populations residing in UAE were also studied. A total sample size of Four hundred was studied. 100 subjects under each category were studied: Exclusively Shisha smokers, Exclusively Cigarette smokers, Cigarette and shisha smokers and non-smokers.

After a brief explanation of the study, and obtaining a written consent signed from the study participants, a questionnaire was administered to collect data. A detailed case history was taken followed by a clinical examination. The subjects were asked about experiencing any systemic symptoms related to respiratory system or cardiovascular system. Oral cavity was examined for stains, plaque, calculus, cavities, and periodontal diseases. Simplified oral hygiene index (SOHI) was calculated. Soft tissue was examined to check for the presence of any lesion.

## RESULTS

**Table-1: Medical History among subjects in all the groups**

| | | Group | | | | | |
|---|---|---|---|---|---|---|---|
| | | Sheesha | | Cigarette | | Sheesha + Cigarette | |
| | | Count | % | Count | % | Count | % |
| Medical History | no medical history | 98 | 98.0% | 92 | 92.0% | 79 | 79.0% |
| | Respiratory problems | 2 | 2.0% | 8 | 8.0% | 3 | 3.0% |
| | Cardiovascular problems | 0 | 0.0% | 0 | 0.0% | 12 | 12.0% |
| | Sleep disturbance | 0 | 0.0% | 0 | 0.0% | 6 | 6.0% |

$\chi 2 = 42.8$, df = 6, p <0.001*

Breathing difficulty was seen in 2% of Sheesha group, 8% of cigarette group 3% of subjects in Sheesha and Cigarette group. 12% of Sheesha and Cigarette group showed cardiovascular problems and 6% Sleep disturbance was seen in the same group. In the study significant association was observed for medical history between three groups.

**Table-2: Association between oral findings with four groups**

| | | Group | | | | | | | | P value |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sheesha | | Cigarette | | Sheesha + Cigarette | | Control | | |
| | | Count | % | Count | % | Count | % | Count | % | |
| Good SOHI | Absent | 94 | 94.0% | 100 | 100.0% | 88 | 88.0% | 98 | 98.0% | 0.001* |
| | Present | 6 | 6.0% | 0 | 0.0% | 12 | 12.0% | 2 | 2.0% | |
| Fair SOHI | Absent | 28 | 28.0% | 50 | 50.0% | 73 | 73.0% | 18 | 18.0% | <0.001* |
| | Present | 72 | 72.0% | 50 | 50.0% | 27 | 27.0% | 82 | 82.0% | |
| Poor SOHI | Absent | 78 | 78.0% | 50 | 50.0% | 39 | 39.0% | 84 | 84.0% | <0.001* |
| | Present | 22 | 22.0% | 50 | 50.0% | 61 | 61.0% | 16 | 16.0% | |
| Stains | Present | 100 | 100.0% | 100 | 100.0% | 100 | 100.0% | 100 | 100.0% | - |
| Periodontitis | Absent | 81 | 81.0% | 76 | 76.0% | 76 | 76.0% | 81 | 81.0% | 0.687 |
| | Present | 19 | 19.0% | 24 | 24.0% | 24 | 24.0% | 19 | 19.0% | |

In the study there was significant association between SOHI with four groups.

**Fig-1: Severe stains and calculus in subjects smoking both shisha and cigarette**

**Fig-2: Mild to moderate stains in exclusive Shisha smokers**

**Fig-3: Severe caries was seen in heavy shisha smoker**

**Fig-4: Loss of teeth in heavy shisha smoker due to mobility**

**Fig-5: Mixed white and red patches on buccal mucosa of exclusive shisha smoker**

**Fig-6: Regressing lesion after patient quit shisha**

## DISCUSSION

According to CDC and many other studies, when compared to cigarette, shisha use is associated with greater CO and higher amount of smoke exposure. Although the exposure to nicotine is similar, WT smokers do get exposed to at least some of the same toxins and has same potential of causing health risks if not more[16]. In our study the participants did not have any systemic diseases like diabetes, hypertension etcetera. They did not have any major health conditions. Few of the participants that explained any symptom were breathlessness and tightness in chest. Very interestingly these were people working in shisha café and are exposed to environmental smoke all day along with their own indulgence of shisha sessions. Although the finding was less when compared to cigarette and shisha smokers and cigarette smokers it must be noted that WTS does cause similar effects.

Smoke inhaled from waterpipe passes through the respiratory tract and hence makes it the primary target by transferring highly toxic and mutagenic substances. This can be as mild as slight alteration of normal physiology to manifesting mild to severe clinical conditions which depends on individual's immune system and variety of other factors. In a study done by WHO in Egypt, broncho-alveolar lavage was inspected along with and serum levels of trace elements in the waterpipe smokers and there was a significant evidence of inflammatory process. The results concluded that waterpipe results in more destructive in respiratory system compared to non-smokers. Trace elements zinc, coper, iron and magnesium found in waterpipe smokers in this study have been linked to higher incidence of chronic obstructive pulmonary disease[17].

In a study done by Boskabady in Tehran concluded when compared with cigarette smokers that inhale smoke deeply, WTS showed similar effects on their lung like reduced lung capacities, coughing and increased tightness in chest[18].

Other symptom explained by the subjects was sleep disturbances. WTS induced sleep disorders has been studied in 2001 where an apnea/hypopnea index was more among shisha smokers than in cigarette smokers. People are under the impression that consuming shisha will help them to wind down. This study has clearly demonstrated that the later effects are contrary to the elation they feel during shisha session [17]. Other studies have found that WT smoking participants although few in number were diabetic, hypertensive and asthmatic [19].

Nicotine dependence is common in both cigarette and hookah smokers. Restivo in her study has demonstrated the association of hookah smoking with periodontal disease, oral cancer, lung cancer, hypertension, and other cardiovascular diseases. They are also at a higher risk of communicable diseases due to sharing of the mouthpieces and organisms transmitted through the water body[20]. Tobacco use is a proven contributor to close to half of all periodontal disease seen in adults[2].

Among oral findings, plenty of stains and calculus were found in the subjects who were smoking both shisha and cigarette (fig. 1). Shisha smokers showed bad oral hygiene if not more than cigarette smokers (fig. 2). Severe caries was also seen in heavy shisha smoker (fig 3). Apart from plaque and calculus, periodontal health was affected too and the patient had lost his teeth due to mobility (fig. 4). A previous study also found water pipe smoking increases the likelihood of periodontal disease more than cigarette smoking has been found to[22]. There seemed to be an increased incidence of periodontal disease in WT smokers compared to cigarette smokers. A study provides evidence indicating that shisha smokers were associated with significantly altered oral microflora. Subgingival area of waterpipe smokers showed presence of Acinetobacter and Moraxella species along with a higher frequency of Candida albicans 22.

Observational study conducted in South Jakarta concluded that the WTS habit might cause similar oral lesions like any other tobacco smoking habit. Leukoedema followed by gingivitis were the most common oral lesions in 90%-100% of those who smoked shisha exclusively. Coated tongue and keratosis were also seen among shisha smokers. The heat produced by shisha led to the disruption of the secretion of salivary glands and resulted in xerostomia among all shisha smoking participants [26]. Dry mouth and bad breath was a complaint from most of shisha smokers in our study which is explained by these results. Both xerostomia and periodontal disease could lead to halitosis.

The fewness of studies on health effects of shisha and especially its relations to cancer is something researchers should work on given the fact how shisha is rampantly spreading all over the globe. El Hakim has proposed that WTS has adverse effects on general health and may predispose to oral cancer **[**25]. A study by Koul.PA and others has established the association of smoking Hookah which is a form of WTS to lung cancer in population of Kashmir [26]. Only one participant in our study showed white patches on both the cheeks in a patient who smoked exclusively shisha for the last 14 years after moving to Dubai (fig. 5). The subject had no other habits and followed a strict vegetarian diet. He doesn't consume alcohol and he doesn't smoke cigarettes. The reason he started smoking shisha is the hype it has created in the Middle East. Since his first puff he was hooked on to it and continued to smoke it every weekend for hours. One of the other reasons quoted by the subject was that it is the most convenient form of entertainment. He is from an educated family and both parents are doctors. He himself is a well educated person and is working as a senior engineer in a reputed company. This shows how unaware general public is about the effects of WTS. There is dearth of information linking shisha/WTS use and lung cancer or oral cancer in UAE. The finding of our study could be a stepping stone to gather more evidence that WTS alone has the potential to cause deleterious health effects and lead to morbidity and mortality. Good news is that after intervention patient decided to quit shisha and his lesion has started regressing! (fig. 6). With right and timely intervention it was stopped from progressing into malignant lesion.

## CONCLUSION

Results of our study will immensely help to build research capacity in this critical area in the region. Further epidemiological studies should be undertaken in order to determine whether WTS is associated with

incidence of Lung cancer/ Oral cancerous lesions. By creating awareness among the general public, it is also hoped that more strategies of primary prevention may be implemented.

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