



## Evaluating the Knowledge and Performance of Dentists about Halitosis in Ahvaz, Tehran and Gorgan during 2014-2015

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### ABSTRACT

Halitosis or bad breath is one of the most common reasons of patients' referral to dentists. Improper performance in diagnosis and treatment of halitosis can increase psychological problems in patients. The present study intended to collect information from dentists about their performance for patients with halitosis in 2014. The current study is a descriptive research which evaluated the knowledge and performance of dentists about halitosis in three cities including Ahvaz, Tehran and Gorgan in Iran. Data collection tool was an 11-item questionnaire, which was developed, based on the similar studies. Three oral medicine specialists confirmed the validity of the questionnaire. The first section of the questionnaire encompassed demographic information and the second section focused on the knowledge of participants. The questionnaire was filled out by referring to dentistry offices in each city. Data was analyzed through Chi-square test by SPSS<sub>17</sub>. In terms of research population, %69.4 and %30.6 of dentists were respectively males and females. The age range of participants was 26 to 79 years. More than %50 of dentists declared that halitosis is prevalent between the age range of 25 to 75 years. %88.9 believed that oral diseases cause halitosis; Moreover, %93.3 of dentists did not have any appropriate devices to diagnose halitosis. About %52.2 of dentists recommended their patients to use Tongue Scraper to treat bad breath. Finally, almost %72.2 of dentists agreed to participate in training courses on halitosis. It was concluded that dentist do not have sufficient knowledge of different diagnosis methods of halitosis. Therefore, they agreed to participate in training courses on halitosis.

**Keywords:** Dentists; Iran; Halitosis; Bad Breath

### INTRODUCTION

Halitosis refers to the diagnosis of bad breath in patients' respiration (by any means) [1]. The term Halitosis has a Greek root and is derived from Halitus meaning bad breath [2]. Today, it is a common problem in societies [3] and those who suffer from chronic halitosis may have serious psychological stresses in society [4]. Intra-oral diseases are the causes of halitosis, in %80 to %90 of patients, due to the bacterial decomposition of organic substances in mouth and their transformation to Volatile Sulfur Compounds such as Hydrogen Sulfide, Methyl Mercaptan and Dimethyl Sulfide [5]. It is necessary to take a clinical examination, by a dentist, to diagnose the intra-oral factors causing bad breath such as Gingivitis, Periodontitis, tooth decay and bad dentures [6]. The special morphology of dorsal tongue, that contains abundant crypts and fissures, is an ideal place for the accumulation of different debris and growth of anaerobic bacteria (gram-negative species) which produce Volatile Sulfur Compounds. Hence, tongue is considered

as the main source of bad breath [7]. Some studies have observed the relationship between tongue coating and bad breath [8-13]. Thus, it is obvious that special consideration should also be given to tongue for the treatment of bad breath. Organoleptic method is still the standard method to diagnose bad breath amongst different diagnosis methods. However, other different methods and diagnostic devices (like Halimeter) are used along with Organoleptic to accomplish the process of diagnosis. These methods are useful particularly for patients who are complaining about bad breath merely due to psychological reasons (Pseudo-Halitus & Halitophobia) and for showing the progress of treatment in patients with halitosis [7, 14]. Halitosis is a shameful symptom that causes many personal and social problem for patients. Research has shown that the society quickly shows a negative reaction to people with halitosis. It is one of the main reasons that prompts the patients to be treated. Studies have also shown that bad breath is the third reason of patients' referral to dentistry after dental decay and periodontal diseases [3]. According to what has been discussed earlier, it can be stated that dentists are the first to provide diagnostics-therapeutic services to patients with halitosis. Of course, extra-oral halitosis' diseases mainly in Otorhinolaryngeal and Gastroenterological regions can cause bad breath in some patients. Thus, it is necessary that these patients consult specialists to treat halitosis [15, 16]. For effective control and treatment of halitosis, it is greatly important to diagnose its causes (either intra-oral or systematic disease). To this end, drawing on the history of medicine, dentistry and nutrition would be helpful. Maintaining tongue and oral hygiene, removing oral infections like tooth decay and gingivitis (Gum inflammation), using different mouthwashes containing Chlorhexidine, Triclosan and Zinc, and following vegetable dietaries are the effective ways, suggested by dentists, to treat intra-oral halitosis [14]. Furthermore, there are several different personal and social factors affecting halitosis that complicate the treatment process so that patients are hardly satisfied with halitosis treatment. On the other hand, if the treatment is not done properly [4], it can increase psychological problems in patients.

No research has been yet conducted to evaluate the performance of Iranian dentists dealing with patients who complain about bad breath; therefore, the present study intended to collect information from dentists about their performance in the diagnosis and treatment of patients with halitosis.

#### **MATERIALS AND METHODS**

The present study is a descriptive research which evaluated the knowledge and performance of dentists about the prevalence and treatment of bad breath in Ahvaz, Tehran and Gorgan, Iran. The current study had two main variables; one was the prevalence of bad breath in different cities of Iran (in dentists' views) and the other was dentists' performance in diagnosis and treatment of halitosis. The relationship between the demographic information of dentists and the aforementioned variables was investigated. The research population consisted of 180 dentists from Ahvaz, Tehran and Gorgan (60 dentists each). The intended cities were selected randomly amongst the provinces of Iran. Also, 60 dentists were selected from each city based on their medical council number list using Simple Random Sampling Method. Data collection tool was an 11-item questionnaire which was developed by the researchers based on similar credible studies. That is, the questionnaire was adopted from a similar article in this field and its validity was confirmed by three oral disease specialists after being translated to Persian. The questionnaire consisted of two types of questions; some questions were open-ended (optional) and some were MCI (Multiple Choice). Additionally, it had two sections; the first section included demographic information of participants such as sex, office location, and years of experience in dentistry. The second section focused on the knowledge and expertise of the participants about halitosis. The questionnaire was distributed to the participants and filled out personally by dentists in their office. However, there was no obligation to fill out the questionnaire although the participants were assured that their confidential information would only be used for the purpose of the current study and would not be disclosed to any third-party. Furthermore, to ensure the confidentiality of results, the participants were free to whether write their names. Consent were reached from dentists to participate in the study. finally, the required data was collected from the questionnaire and analyzed through Chi-square test by SPSS17.

#### **RESULTS**

In terms of research population, %69.4 and %30.6 of dentists were respectively males and females. The age range of participants was 26 to 79 years. The mean age and the mean experience of the dentists were 45 and 18 years respectively. All the participants (180 dentists) participated in the study. When being asked about the percentage of people who suffer from bad breath in their city, 71 dentists (%39.4) reported %0 to %25 prevalence, 61 dentist (%33.9) reported %25 to %50 prevalence, 37 dentists (%20.6) reported %50 to %70 prevalence and the rest reported

%75 to %100 prevalence of halitosis. There was not any statistically significant difference in responses of dentists amongst three cities about the prevalence of halitosis (P= 0.06) (Figure 1).

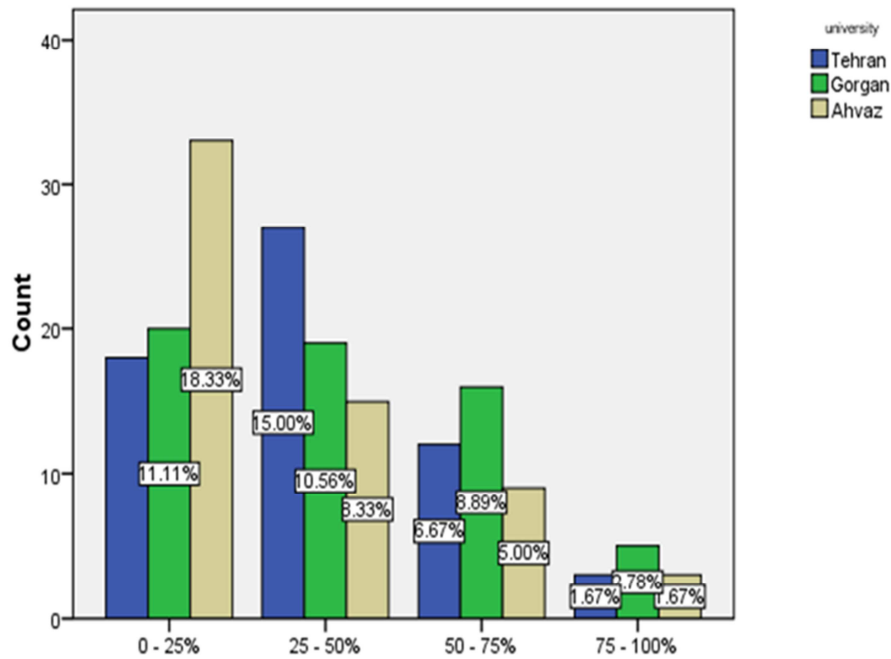


Figure 1: The Prevalence of Halitosis in the View of Dentists in Each City

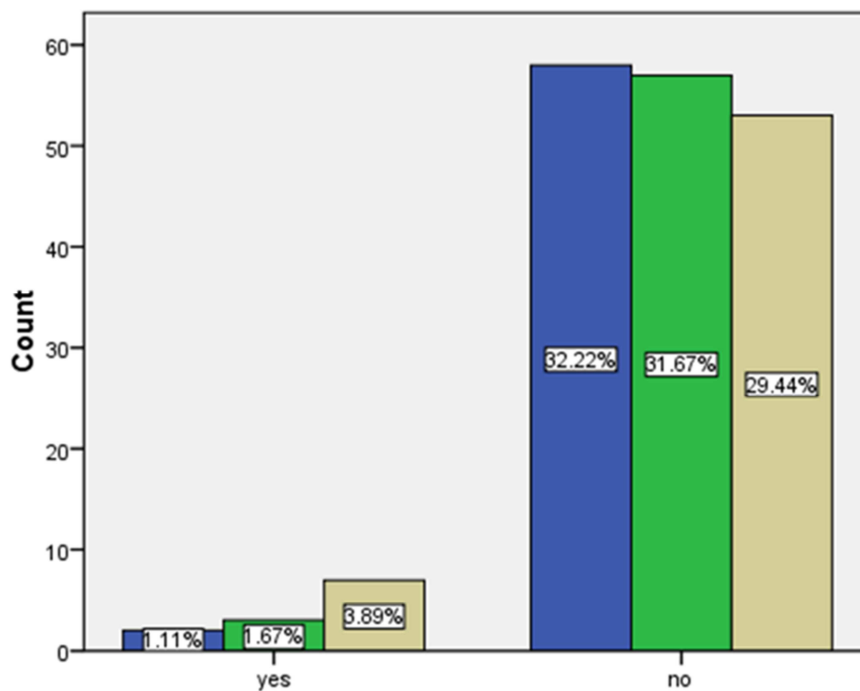


Figure 2: The Accessibility to Diagnostic Devices of Halitosis (Like Halimeter) in Dentistry Offices

In terms of the causes of halitosis, %88.9 of dentists believed that oral diseases cause halitosis. According to %9.4 of dentists, systematic diseases like diabetes and respiratory diseases are the main causes of bad breath whereas %1.7 of them considered other factors including psychological factors and hunger as the causes of bad breath. There was

not any statistically significant difference in the responses of dentists amongst three cities about the causes of bad breath ( $P=0.46$ ). In terms of treatment, %88.3 of dentists proposed that dentists are responsible for the treatment of bad breath whereas %5.6 of them believed that ENT specialist are responsible for treatment. Other physicians including internists (%4.4), GPs (%1.1) and psychiatrists (%0.6) were the subsequent priorities. In terms of diagnosis, 168 dentists (%93.3) did not have any appropriate devices to diagnose bad breath. Furthermore, 94 dentists (%52.2) recommended their patients to use Tongue Scraper to treat bad breath. There was not any statistically significant difference in the responses of dentists amongst three cities about the diagnosis of bad breath ( $P=0.85$ ) (Figure 2). Finally, it was found that 163 dentists (%90.6) have never participated in retraining courses on bad breath; accordingly, there was not any statistically significant difference in the responses of dentists for their attendance in training courses on bad breath ( $P=0.19$ ). Therefore, 130 dentists (%72.2) agreed to participate in training courses on halitosis. That is, amongst the dentists who demanded to hold training courses, %81.7 (49 dentists), %78.3 (47 dentists) and %56.7 (34 dentists) were respectively from Tehran, Gorgan and Ahvaz. There was a statistically significant difference in the demand of dentists for retraining courses ( $P=0.004$ ).

### DISCUSSION

It is a demanding job to determine the prevalence of halitosis in the world because different studies have found different results in this regard. For instance, Liu *et al.* reported %27.5 prevalence of halitosis [17]. Porter and Scully found that halitosis is prevalent from %50 to %80 in developed countries [18]. On the other hand, Bosy *et al.* proposed that %25 of adults complain about chronic halitosis [20]. However, according to most studies, the prevalence of halitosis was more than %30 to more than %50 [21-25]. In Iran, Vali *et al.* studied the relationship between halitosis and psychological problems. They found that halitosis was prevalent for %53 in their research population [26]. Haghgou *et al.*, who studied the effect of Peppermint mouthwash on high school students in Tehran, reported %24.4 prevalence of halitosis [27]. This dispersion has also been observed in the results of the present study; that is, more than %50 of dentists stated that halitosis is prevalent from %25 to %75. The results of the current study are consistent with the findings of Nathalie *et al.* who adopted the same methodology in their research [5]. The difference and dispersion of results about the prevalence of halitosis contribute to using different methodology in the determination and diagnosis of halitosis in intended research population of each study. Furthermore, Organoleptic method is considered as a standard method of halitosis diagnosis which is used in many studies. Nevertheless, it should be noted that organoleptic is a subjective method to determine bad breath in which the dentist diagnoses the bad breath by smelling the expiratory breath of the patient. Apparently, factors such as the power of smell (olfactory) and psychological state of dentist affect the results of organoleptic test [1]. The main criticism to this technique is its poor reliability and replicability [28]. Hence, the research results about the prevalence of halitosis should be interpreted with caution. The causes of halitosis can be multifactorial. However, the oral cavity has been considered as the main source of bad breath in %80 to %90 of cases. The other cases (%10 to %20) contribute to respiratory and gastrointestinal problems, metabolic and biochemical disorders and Renal and Hepatic failure. There is also no evidence of halitosis in some patients who complain about bad breath (Pseudo-Halitosis)[2, 4, 6]. According to Ghapanchi *et al.*, who studied patients referring to the school of dentistry in Shiraz, %76 of the causes of halitosis was due to intra-oral problems while the extra-oral diseases made up %18 of the causes (in total, %94 of patients had real halitosis); on the contrary, %6 of patients had Pseudo-halitosis [2]. In Talebian's study, %98.6 of patients had real halitosis and %1.4 suffered from Pseudo-halitosis [29]. The findings of Gapanchi were not in line with the results of Talebian's study in terms of the prevalence of Pseudo-halitosis and Halitophobia. The same difference has been observed in the findings of Quiryne[30] and Hammad[31] in that the former found that %16 of halitosis was due to psychological problems whereas the latter reported %2.4 prevalence of Pseudo-halitosis. The dispersion in the results of different studies is because of the fact that halitosis is a multifactorial disease [25] meaning that different psychological, cultural, economic, religious factors as well as life style affect halitosis [4, 32]. These are known as various factors influencing bad breath according to different studies [26, 29]. The comparison between the findings of the aforementioned studies and the results of the current study indicates that the knowledge of most dentist about the causes of bad breath was up to date because more than %88 of them considered oral diseases as the most prevalent causes of halitosis. Besides, for %9.4 of dentists, systematic disease like respiratory and Gastrointestinal diseases and diabetes were the causes of halitosis whereas the rest (%1.7) stated that other factors like pregnancy and psychological factors are the causes of halitosis. It is obvious that dentists decide on who is responsible for halitosis treatments based on the opinions about the causes of halitosis. Thus, %88 of dentists considered themselves as the first responsible persons for halitosis treatment; the next responsible physicians for halitosis treatment were considered to be ENT specialists, internists, GPs, and psychiatrists respectively. However, none of the dentists of Tehran and Gorgan assumed psychological factors as the

causes of halitosis; hence, they believed that psychiatrists do not deserve to treat halitosis. Whereas, %1.7 of dentists of Ahvaz had the opposite opinion. Based on their opinion, it is possible that psychological and psychosomatic factors have considerable effects on the etiology of halitosis in some patients [2, 3, 4, 6]. With respect to the fact that bad breath has been described as a serious social problem, it has been suggested that the patients with Halitophobia and Pseudo-halitosis be referred to psychiatrists to avoid worsening the situation even though they may refuse to visit a psychiatrist due to their incapability to understand their psychological states[4]. It is necessary to record a medicinal history of patient's oral examination and exhaled breath analysis to diagnose halitosis. In addition to organoleptic test, using diagnostic devices like Gas Chromatograph and Halimeter is effective to diagnose halitosis particularly in patients with Halitophobia and Pseudo-halitosis [14]. Furthermore, patients will find the diagnostic results of these devices more reliable because they are objective [29]. Therefore, the present study aimed at investigating the accessibility of diagnostic devices in dentistry offices. Only 12 dentists (%6.7), out of 180, admitted that they have diagnostic devices. Obviously, using professional diagnostic devices to detect halitosis is not common amongst Iranian dentists. It seems that insufficient knowledge about the existence of objective diagnostic methods and their merits to detect bad breath (like Halimeter) is the reason why dentists do not use such devices. This is consistent with the results of Maleki *et al.*, who evaluated the knowledge of dentists in Tehran in 2014. They found that the knowledge of dentists about halitosis particularly in halitosis diagnostic method is hardly acceptable [33]. With regard to the tendency of dentist to participate in retraining courses about halitosis, it seems that they, themselves, have felt the need for further trainings. As noted earlier, the cause of halitosis is mainly intra-oral. However, it is assumed that halitosis caused by the growth of microorganisms, producing Volatile Sulfur Compounds in dorsal tongue, is the main cause of bad breath in patients who do not have any intra-oral disease (tooth decay, Periodontitis, etc.) but complain about bad breath [7]. In their clinical evaluation of 222 Iranian patients with bad breath, Talebian *et al.* found that about %62 of patients had no evidence of pathological diseases in the mouth to cause bad breath but they all had coated tongue [29]. Different articles have shown that by using tongue cleaning, a great extent of bacterial load in tongue and, thus, halitosis decreases [34, 35]. Therefore, the oral hygiene treatment methods should also include tongue cleaning. The present research indicated that more than %50 of dentists recommended their patients to use Tongue Scraper to treat bad breath *i.e.* Halitosis. This testifies to the awareness of dentists about the role of tongue in causing halitosis.

### CONCLUSION

To conclude, although the performance of dentists in providing the patients with treatment advices is acceptable, they do not have sufficient knowledge of new methods for the diagnosis of halitosis. Therefore, they agreed to participate in training courses on halitosis that requires special consideration on the part of authorities. Despite all these, Because of a series of attractions, dentistry is the main choice of volunteers for entrance to university and higher education institutions [36-39].

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Footnotes

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