Original Article

Knowledge of Dentists about Halitosis in Tehran(2004)

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ABSTRACT

Statement of the problem: Halitosis is a common condition. Many oral diseases, as well as several systemic diseases, may cause halitosis. According to some studies the prevalence of this symptom is more than 50%.

Purpose: The aim of this study was to evaluate the knowledge of general practitioners (dentists), who work in Tehran, about "halitosis"**.**

Material & Methods: In this cross-sectional, descriptive study 379 dentists were evaluated. The questionnaire consisted of 15 multiple choice questions (5 choices with one of them being an "I don't know"). There were 5 questions for evaluating knowledge about etiology of halitosis, 4 questions about pathogenesis, 4 questions on diagnosis and differential diagnosis, and 2 questions for treatment. Criterion scores (of 15) calculated as sum of correct answers and ¼ for an "I don't know" answer. Spearman- Brown's reliability index was 0.8. Chi-square and Lawshe's ω test were used for statistical analysis.

Results: Mean (±standard deviation) of criterion scores was 8.06±2.15 out of 15 (median of 8; range of 2.75 to 13). The mean of correct and wrong answers were 7.3±2.3 (median of 7) and 4.7±2.4 (median of 5), respectively. According to extreme groups' scores all items were appropriately distinctive. Difficulty degree varied from 8.2% to 86.5%.

Conclusion: The level of general practitioners' knowledge was relatively low. Only about half of study population could achieve a criterion score more than 7.5 out of 15.

Key Words: Dentist, Halitosis, Oral Disease.

INTROUDUCTION

Bad breath is a common condition which usually originates in the mouth itself and thus falls under the responsibility of the dental practitioner.

Dentists are often asked about bad breath, and often don't know quite what to say. This is probably because dental school curricula either do not include the subject in their curriculum altogether, or cover it only in the most cursory manner. Dentists should know how to treat oral malodor.

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In the large majority of cases (85-90% is a fair estimate) the origin of the odor is in the oral cavity itself.

Further more, most cases of bad breath can be a warning signal for periodontal disease or, occasionally, a systemic problem. Finally, many dentists themselves suffer from bad breath and although they do not know it, but their staff and patients do.[1,2]

Halitosis is a latin word composed of two parts: "Halitos" meaning breathing and "osis" indicating abnormal condition.[3-5]

It signifies bad odor in the exhalated air from mouth or nose and is a common complain in the adult population.[7,8] Although halitosis has been recognized in the past; but it has become a very important social problem in modern societies.[9-12]

It is difficult to evaluate halitosis prevalence but it has been reported as over 50 %.[4] In the people of over 60 years of age, it is 24%, in the family members of students of the brazilian college, 31%, in Japan, Yasuno has

reported 30% by using organoleptic method. In the USA 25 million have this problem.

Oral debris together with microbes in the dorsum of the tongue and the dental plaque are probably responsible for more than 90% of the halitosis in the mouth.[15,16] Therefore, dentists clearly have an important role in diagnosis and treatment of halitosis.[16] If the source of halitosis is oral cavity, then treatment is by cleaning the tongue, reducing the plaque and also if necessary prescribing mouthwash and certain diets.

The systemic factors responsible for halitosis are investigated by taking a patient history and also medical examination. In persistent cases, a medical physician should be consulted.[17]

Many people, even in higher social and cultural levels, do not pay attention to their bad breath, this will damage their personality and their relationships.[18,19]

The aim of this study was to determine the level of general dentists' knowledge about halitosis, working in Tehran in 2004.

MATERIAL & METHODS

This study was a cross-sectional descriptive study. The statistical population was the general dentists in Tehran.

The sampling method was cluster random sampling. The number of samples in every cluster was 55. Totally 379 persons (133 females and 246 males) were included. This sample size was in accordance with the minimum sampling proposed by Krejcie and Morgan.

After selecting the samples, the questionnaires along with blank answering sheets were taken to the dental offices. The dentists were asked to answer all the questions and if they didn't know the correct answer, they would select the fifth option which was "I don't know". It was explained to them that the wrong answers were not considered as negative scores. There was no time limit for answering the questions.

Data analysis*:*

Total raw scores were calculated using S=R+O/K, Where "S" stands for the total score, "R" for the number of correct answers, "O" for the number of "I don't know" answers and "K" for the number of options other than "I don't know" (K=4). The difficulty level of each question was evalated separately. To ascertain discrimination index, we compared upper groups (27% first) and lower groups (27% last). We used Chi-square test and lawshe's ω for statistical analysis of the index. Internal consistency of the questionnaire was evaluated using spearman-Brown index for reliability. The distribution of answers for each question was determined by two dimensional tables. Distribution curve of the total scores was drawn and also standard deviation of fifth to ninety fifth percentages was determined. All the above were processed by using SPSS 9 software or manually.

Method of test preparation

In order to evaluate knowledge, a questionnaire containing 26 questions based on Linde one of the leading references in periodontal diseases, were prepared. Each question consisted of a sentence which the participant would decide whether it was correct or false. These questionnaires were verified by two specialists in oral medicine and then were given to 15 general dentists. After collecting the first questionnaire, the second one was prepared with 20 multiple choice questions (including one "I don't know" option). The questions included topics "definition, pathogenesis, etiology, diagnosis and treatment". A specialist in oral medicine selected necessary questions to evaluate all of them (20 questions). Afterwards the questions were again evaluated by another specialist in oral medicine and also by a general physician who had a great deal of experience in designing questions. Once again content validity was reconfirmed.

The second pilot study was performed by assessing 25 general dentists. In this investigation the reliability index of Spearman-Brown was 0.8 Seventeen questions had good discrimination indices. The other three questions were eliminated. From the remaining questions, two pairs of questions which were assessing same subject and had same difficulty level were mixed together. According to the distribution of the answers. The last questionnaire had fifteen multiple choice (4) questions which also all had an option of "I don't know". Validity of questions were again evaluated and confirmed. The questionnaire was edited literarily.

RESULTS

Table 1 demonstrates the distribution of answers. All of the four optional answers were chosen by different dentists. Question number two was answered by "I don't know" (seven answers, 1.8%) which had the lowest score comparing with question number 11 which had the highest score of "I don't know" (268 answers, 70.7%).

Difficulty levels: Difficulty levels of the questions were between 8.2% (questions 4 and 5) and 86.5% (question number 14) (Table 2).

In general, 3 questions had difficulty level under 20% and were categorized as the most difficult questions (questions 4,5,11). Two questions had difficulty levels between 20 and 40 percent which were relatively hard (questions 7,8). The difficulty levels in 5 questions were 40 to 60 percent (intermediate) (1,3,9,10,12) and 3 questions were relatively easy which 60 to 80 percent of the dentists had answered correctly (6,3,15). In addition, there were two very easy questions with the difficulty level of over 80 percent.[2,14]

Discrimination indices: Table 3 shows the number of correct, incorrect, and "I do not know" answers in the upper 27% of lower 27% groups (according to the total score). According to the Chi-square test the upper 27% group had answered more to each of the questions: Therefore, all of the questions were able to distinguish upper groups from lower ones. Furthermore, lawshe's ω has reached a similar result.

Total score: On average every dentist answered correctly to 7.3±2.3 (median 7) of the questions. But two dentists had not answer correctly to any one of the questions and one person had 13 correct answers. Diagram 1 shows the distribution of the subjects. The highest score for wrong answers was 12, which 2 dentists had acquired this. In contrast 2 dentists did not have any wrong answers (Diagram two). Average number of questions which were answered incorrectly were 4.7±2.4 (median 5) in each questionnaire. Number of "I don't know" answers in every questionnaires was 3.0±2.1 (median 3). Also the average score gained by general dentists in this study was 8.06±2.15 (range: 2.75 to 13.00, Maximum score 15). The average score of 8 and 95% confidence interval were for scores Between 7.84 to 8.28. Percentages are demonstrated in Table 4 (Please also refer to Diagram 3).

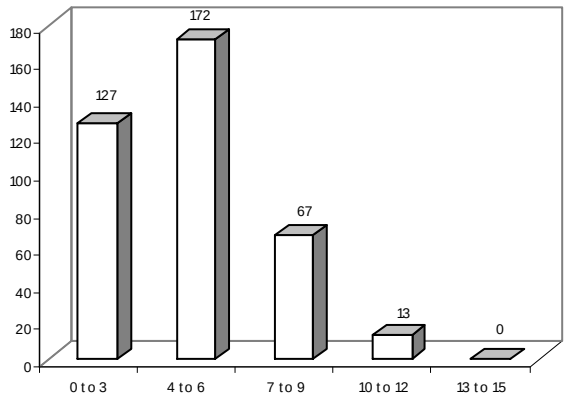

Fig. 1: Frequency of correctly answered questions

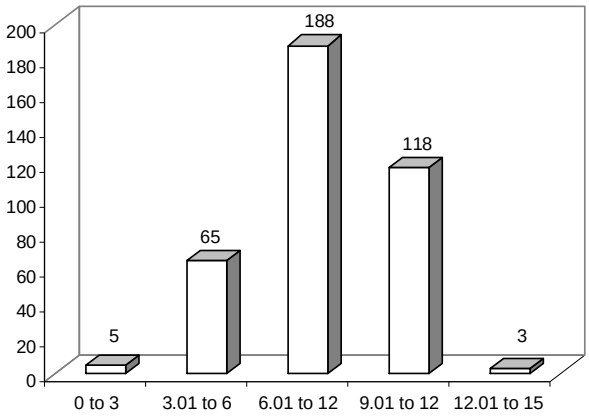

Fig. 2: Frequency of incorrectly answered questions

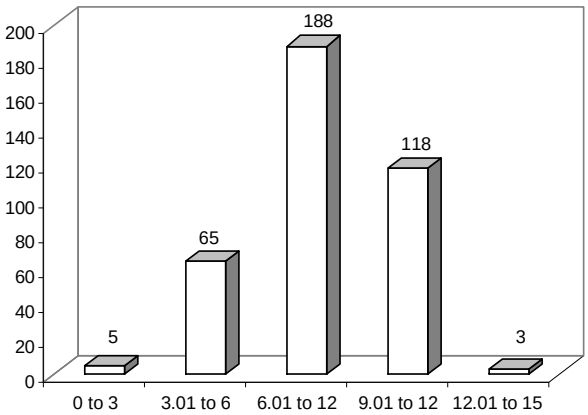

Fig.3: Frequency of total scores

Table 1. Distribution of different answers to questions

(numbers inside parentheses shows the percentages)

Question Number	A	B	C	D	I do not know	Correct answer
1	46 (12.1)	197 (52.0)	39 (10.3)	17 (4.5)	80 (21.1)	B
2	8 (2.1)	12 (3.2)	308 (81.3)	44 (11.6)	7 (1.8)	C
3	36 (9.5)	176 (46.4)	25 (6.6)	28 (7.4)	114 (30.1)	B
4	51 (13.5)	27 (7.1)	31 (8.2)	168 (44.3)	102 (26.9)	C
5	31 (8.2)	43 (11.3)	27 (7.1)	23 (6.1)	255 (67.3)	A
6	69 (18.2)	250 (66.0)	32 (8.4)	16 (4.2)	12 (3.2)	B
7	156 (41.2)	37 (9.8)	138 (36.4)	27 (7.1)	21 (5.5)	C
8	109 (28.8)	62 (16.4)	124 (32.7)	34 (9.0)	50 (13.2)	A
9	78 (20.6)	214 (56.5)	46 (12.1)	22 (5.8)	19 (5.0)	B
10	206 (54.4)	76 (20.1)	38 (10.0)	42 (11.1)	17 (4.5)	A
11	27 (7.1)	32 (8.4)	27 (7.1)	25 (6.6)	268 (70.7)	B
12	30 (7.9)	51 (13.5)	26 (6.9)	204 (53.8)	68 (17.9)	D
13	10 (2.6)	32 (8.4)	259 (68.3)	19 (5.0)	59 (15.6)	C
14	328 (86.5)	22 (5.8)	15 (4.0)	4 (1.1)	10 (2.6)	A
15	24 (6.3)	8 (2.1)	280 (73.9)	22 (5.8)	45 (11.9)	C

Table 2. The difficulty degree of the questions

Question Number	Subject	Difficulty level (percent)
1	Etiology	52.0
2	Etiology	81.3
3	Pathogenesis, etiology	46.4
4	Pathogenesis, etiology	8.2
5	Diagnosis	8.2
6	Etiology	66.0
7	Pathogenesis	36.4
8	Differential diagnosis	28.8
9	Differential diagnosis	56.5
10	Treatment	54.4
11	Pathogenesis, etiology	8.4
12	Etiology	53.8
13	Etiology	68.3
14	Diagnosis	86.5
15	Treatment	73.9

Table 3. Discrimination properties of the questions between 27% upper and lower (each 103 case) according to total scores

Question Number	27% upper		27% lower		P value X^2	
	Correct	Incorrect or I don't know	Correct	Incorrect or I don't know		
1	86	17	29	74	63.955	<0.001
2	99	4	64	39	36.004	<0.001
3	76	27	35	68	70.252	<0.001
4	15	88	6	97	4.295	<0.038
5	17	86	4	99	8.961	<0.003
6	95	8	39	64	66.959	<0.001
7	57	46	14	89	39.739	<0.001
8	53	50	6	97	52.468	<0.001
9	78	25	35	68	36.245	<0.001
10	85	18	35	68	49.903	<0.001
11	16	87	2	101	11.931	<0.001
12	89	14	26	77	78.128	<0.001
13	93	10	48	55	45.516	<0.001
14	102	1	74	29	30.588	<0.001
15	93	10	60	43	27.665	<0.001

Lawsh' Sw	P value	ULI (Johnson Index)
0.80	<0.001	0.55
0.70	<0.001	0.34
0.60	<0.001	0.40
0.20	<0.05	0.09
0.30	<0.005	0.13
0.90	<0.001	0.54
0.65	<0.001	0.42
0.75	<0.001	0.46
0.60	<0.001	0.42
0.75	<0.001	0.49
0.40	<0.001	0.14
0.95	<0.001	0.61
0.70	<0.001	0.44
0.72	<0.001	0.27
0.90	<0.001	0.32

DISSCUSION

Investigation of the level general dentists' knowledge about halitosis demonstrates that half of the participants had answered correctly to less than half of the questions (7 questions). Whereas we expected the number of wrong answers to be reduced by inserting the option of "I don't know". Half of the dentists answered incorrectly to more than one third of the questions (5 questions). These two facts can explain the average score of the general dentists which was 8.1±2.2. Since part of the score of the dentists was due to choosing "I don't know" instead of incorrect answers, when average and median scores were 8 (only 0.5 more than half of the questions). Infact, more than half of the general dentists' correct answers (incorrect answers subtracted from correct answers) were less than half. This shows the weakness of the dentist's awareness about "halitosis".

Therefore, a few experts were asked to assess the questions to see whether some points had been neglected or repeated a few times. According to the experts view, the most important point in halitosis (a sign not a disease) is to know the etiology. Diagnosis and proper treatment is dependent on knowing different etiologies. In order to evaluate this aim, 5 questions about different aspects of etiology of halitosis were selected. The number of correct answers demonstrated a range between 52 and 81 percent.

The incorrect answers in these five questions were not chosen by more than one fifth of the dentists. Gastroesophagal reflex was considered as one of the common causes of halitosis by18.2%.

Furthermore, when the dentists were asked to choose between the 4 groups of drugs which are usually prescribed by physicians (ricyclic antidepressants, anti-histamines, anti-

cholinergic and NSAIDs) only half of the participants answered correctly. This question had been designed in a certain way, so that if the participant had some inability in memorizing or lack of knowledge could relate the first option with the other two answers. In this case, because the majority of conventional anti-depressants have both anti-histamine and anti-cholinergic effects, there was a relation between the answers.

In the next question 68.3% of subjects chose metronidazole as a drug that can cause halitosis instead of the other three common drugs (acetaminophen, aspirin and codeine). This is important because according to Varshowsaz et al,[20] metronidazole was the fourth antibiotic prescribed to the patients (17%) by general dentists working in Tehran based on national insurance health records between 2003-2004. Due to the great amounts of medical drugs used in Iran, sufficient information should be given regarding adverse effects of heavily used drugs. The other important investigated point was the knowledge about pathogenesis of halitosis, which was assessed through four questions. Difficulty level higher than 50% was not seen in any of the questions. Two questions of this topic were the hardest ones among all of the questions. The difficulty levels of these questions were Between 8.2% to 46.4%.

Another point, the three combined questions in the questionnaire (questions 4,5,20) were known as the hardest questions and all three had difficulty levels lower than 10%. Knowledge, about the process of pathogenesis, apart from giving a more correct understanding of the present disease, makes it easier to select the suitable treatment. While dorsum of the tongue is the main origin for halitosis in people with healthy teeth and periodontal tissues,[1,4,9,22] 41.2% had chosen esophagus and pharynx as the origins of halitosis and 16.9% had chosen lungs or interdentally space as a correct answer.

Two questions from the total 15 questions were about diagnosis and 2 about differential diagnosis of the causes of halitosis. Level of difficulty of these questions was in a wide range from 8.2% to 86.5% (hardest and easiest questions). Only 8.2% knew that gas chromatography is the best method to assess halitosis but 14.3% had chosen sulfide monitoring as one of the most practical methods. Awareness about diagnosis is essential in assessing the treatment procedure, differential diagnosis and also treatment costs. Differentiating between odors inhaled orally and also from nose was recorded in 86.5% of dentists. About 28.8% of general dentists recognized pseudo halitosis. Adequate information about diagnostic methods and assessment of halitosis (question 5) and also differentiating pseudo halitosis from true ones (question 8) will help solving the possible problems.

Color changing of tongue was thought to be physiological by 20.6%. Finally, 2 questions were about the awareness of dentists about the treatment. Apart from dentists, specialists in the fields of Ear, Nose and Throat, Internal Medicine,Nephrologists, Gastroenterologists, Pulmon- ulogists and Psychologists also have patients with halitosis complaints.

Therefore, consultation in these cases could help in diagnosis and treatment. According to the question number ten, 20.1% of the dentists mentioned the necessity of consultation with ENT specialists. While 12.1% and 5.8% did not considered same necessity with Nephrologists and Psychologists respectively.

CONCLUSION

It could be stated that the general knowledge of dentists about halitosis, especially in pathogenesis and diagnostic methods was at a minimum acceptable score and even barely acceptable.

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