

Perception and level of knowledge about halitosis among students and patients

Percepção e nível de conhecimento sobre halitose entre estudantes e pacientes

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Abstract

This study aimed to assess individual perception and level of knowledge of students and patients about halitosis. Two groups of volunteers of both genders between 18 and 60 years old, totaling 225 subjects, answered a questionnaire containing eight questions relating to perception, causes, and treatment of halitosis. The group of patients (P) consisted of 150 individuals seeking dental services at the School of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Brazil, and the Group of students (S) consisted of 75 students of Dentistry at the same University. In Group P, 45.3% of participants believed they had halitosis, while in Group S, this percentage was only 16.2%. In matters relating to the causes and treatment of halitosis, it was found that the Group P marked more options related to the correct knowledge about halitosis when compared to Group S. It is possible to conclude that patients reported greater halitosis perception than students, and also that they showed a better knowledge about the halitosis etiology and treatment.

Descriptors: Halitosis, knowledge, perception, behavior.

Resumo

O presente estudo analisou a percepção e o nível de conhecimento de estudantes e pacientes sobre halitose. Dois grupos de voluntários de ambos os gêneros, entre 18 e 60 anos, totalizando 225 participantes, responderam a um questionário que continha oito questões relativas à percepção, às causas e ao tratamento da halitose. O grupo de pacientes (P) consistiu-se de 150 indivíduos que procuraram os serviços odontológicos da Faculdade de Farmácia, Odontologia e Enfermagem da Universidade Federal do Ceará, Brasil, e o grupo de estudantes (S), de 75 alunos de Odontologia da mesma Universidade. No grupo P, 45,3% dos participantes acreditava ter halitose, já no grupo S, esse percentual foi de apenas 16,2%. Em relação às causas e aos tratamentos da halitose, encontrou-se que o grupo P assinalou mais opções relacionadas com o correto conhecimento sobre halitose quando comparados com o grupo S. É possível concluir que os pacientes relataram maior percepção da halitose do que os estudantes, bem como têm demonstrado maior conhecimento sobre a origem e tratamento da halitose.

Descritores: Halitosis, knowledge, perception, behavior.

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Introduction

Halitosis, bad breath, bad mouth odor, *foetor oris* or *foetor ore* are terms that designate an unpleasant olfactory breath perception. This alteration is due to the presence of low molecular weight odorivectors, from oral cavity, whose main components are volatile sulfur compounds^{20,22}. Halitosis can be divided into three categories: genuine halitosis, pseudo-halitosis and halitophobia, the first one being subdivided into physiological and pathological. Genuine pathologic halitosis can have either oral or extraoral causes^{4,22}.

However, in about 80-90% of the cases found, the origin is the result of oral microbial activity, as in deep carious lesions, periodontal disease, oral infection, peri-implant disease, pericoronitis, mucosal ulcerations, food impaction, and especially tongue coating^{10,12}. When the origin of halitosis comes from some extra-oral cause, these factors may be disorders of the upper and lower respiratory tract, gastrointestinal tract disorders, some systemic diseases, metabolic disorders, drugs, and carcinomas²¹.

Several damages to the quality of life can be triggered by the presence of halitosis, including difficulties in relationships and in communication of the individual in his social environment, leading him to isolation and, consequently, losing his self-esteem⁶. In the last few years, it has been seen a greater request for aesthetics and good looks. This has led to an increased number of subjects with these concerns, which has included a stronger demand for information, diagnosis, and treatment of halitosis¹¹.

In general, people seem unable to say precisely whether or not they have any changes in breath, which can make self-perception about halitosis somewhat dubious^{6,18}. However, self-perception about halitosis can be a successful factor for the diagnosis and treatment of this disorder¹. In this context, there is also the importance of assessing knowledge of oral conditions from patients, obtaining this during an interview or through a questionnaire, which presents extreme scientific validity and thus assists in clinical Dentistry conduct⁸.

This study aimed to verify individual perception and level of knowledge of students and patients about halitosis.

Methodology

Research subjects

The target population of this study belongs to the city of Fortaleza, Brazil, and consisted of 225 participants of both genders, aged between 18 and 60 years. The participants were divided into two groups. The first group (P) comprised 150 patients who sought the dental services of the School of Pharmacy, Dentistry and Nursing, Federal University of Ceará in the period November 2009 to May 2010, and consisted of 119 wo-

men and 31 men. The second group (S) was formed by 75 students, regularly enrolled at the dental school of the same University, and consisted of 34 women and 41 men.

To be included in this study all participants must had sufficient cognitive ability to understand and answer the requested questionnaire. They also needed to be non-smokers, have at least 10 teeth, and absence of any systemic disease related to halitosis, such as diabetes, depression, and heart conditions. It was excluded those with caries and any surgical wound, pregnant and lactate women were also excluded. In the group S, it was necessary that they were attending or had completed the discipline of Periodontology.

The sample was set according to the estimate that the services offered by the dental clinics of the referred University are sought by 1000 people in a period of one year. It was considered representative of this population, 15% of all the individuals seeking treatment. With respect to group S, there were 500 students regularly enrolled in the developmental period of the study. For the choice of sample size, it was used the same proportion.

Questionnaire

All participants answered a questionnaire containing eight questions related to the perception of halitosis, as well as its etiology and treatment (Figure 1).

Ethical aspects

The study was approved by the Ethics in Research Committee of the referred institution under protocol 288/09. All volunteers signed a consent form.

QUESTIONS

1. Do you think you have bad breath?
2. How did you identify bad breath?
3. Have you ever sought treatment?
4. Where?
5. What can cause bad breath?
SMOKE, STOMACH DISEASES, GUM BLEEDING,
MOUTH CANCER, SOME TYPES OF FOOD, BAD
ORAL HYGIENE, PHARYNGITIS AND CARIES
6. Can bad breath be treated?
7. Have you ever tried to hide bad breath with mints or chewing gums?
8. Can bad breath cause damage to social and family life?

Figure 1 – Questionnaire applied.

Statistical analysis

Clinical data regarding the average age of patients were compared using Student's t test. To evaluate the relationship between an answer of the questionnaire

of a group in relation to the answer of the other one, Chi-squared and Odds Ratio (OR) tests were used. In all procedures, it was adopted a significance level of 5%.

Results

We analyzed 150 questionnaires from group P and 74 questionnaires from group S, as a student, after the study had being completed, withdrew the Statement of Informed Consent. Group P consisted of 119 women (79.3%) and 31 men (20.7%) with a mean age of 39.9 ± 11.1 years. On the other hand, group S was composed of 34 women (45.9%) and 40 men (54.1%) with a mean age of 22.6 ± 2.1 years. Differences were observed between these means ($p < 0.05$).

On first question, the volunteers were asked to say whether or not believed to have some unpleasant breath alteration. Among the participants in group P, 45,3% ($n = 68$) believed to have halitosis, whereas this number was much lower in group S, with only 16.2% ($n = 12$). There was a statistical difference between the two groups, where the components of the group P believed they had halitosis 4.3 times more than those in group S (OR = 4,3, 95% confidence interval: 2.1 to 8.6).

Questions 2, 3, and 4 were answered only by participants who reported a positive response in the first question. The second question asked about the form of identification of halitosis. In group P, it was found that 38% ($n = 57$) of the patients identified their bad breath through self-perception. In group S, only 10.8% ($n = 8$) identified their halitosis this way. The identification by another person's alert was 8.0% ($n = 12$) in group P and 5.4% ($n = 4$) in group S. No differences were observed between groups for these parameters.

The demand for treatment was reported by only 6.7% ($n = 10$) in group P and 1.4% ($n = 1$) of the participants in group S. Of the ten patients in group P, nine sought dental care for the treatment of halitosis, while the only student to seek treatment sought the otorhinolaryngologist. Also, there was no statistically significant difference between groups.

The question related to the possible causes of halitosis, contained eight possible causes to be marked

(Figure 1). The most often mentioned answers by both groups, with no statistical difference between groups, were smoking, stomach diseases, and poor oral hygiene (Table 1). Only the items gums bleeding, mouth cancer, pharyngitis and caries showed statistical differences between groups. It was observed in all cases, that these differences were statistically higher in group P.

With regard to the existence of some form of treatment for halitosis, it was found that 94.7% ($n = 142$) of the participants in group P and 97.3% ($n = 72$) of the participants in group S agreed that there is treatment for halitosis. There were no statistical differences between the two groups.

The attempt to mask the breath, using mints or chewing gum, was reported by 48.7% ($n = 73$) of the participants in the group P and 67.6% ($n = 50$) of the participants of group S. It was observed that students do it 2.1 times more often than patients (OR = 2.1, 95% confidence interval: 1.2 - 3.8).

Regarding the possible interrelationship between halitosis and their social relationships, 94.67% ($n = 142$) of the participants in Group P and 100% ($n = 74$) of the participants in group S reported that halitosis is detrimental to social life. No statistical difference between the two groups was observed.

Discussion

The aim of this study was to evaluate perception and level of knowledge about halitosis in patients and students from a university in the northeastern Brazil. Breath self-diagnosis is a matter of considerable public interest, since many individuals seek treatment for halitosis based on their perception, trying to diagnose their own breath through various techniques or other people's perception in their social environment. It was observed that the patients were more aware and critical about their halitosis when compared to the students.

Data from the present study also revealed that the patients assessed believed 4.3 times more often to have halitosis than students. These data contrast with data on knowledge related to halitosis, that is, even though more informed, more patients believed to have halitosis. An important aspect concerning the studies of self-

Table 1 – Answer of the subjects of the study about possible causes of halitosis.

	Group P	Group S
Smoke	90,0% (n=135)	88,2%(n=66)
Caries	87,3% (n=131)*	59,5% (n=44)
Gum bleeding	72,7% (n=109)*	43,2% (n=32)
Oral cancer	80,7% (n=121)*	33,8% (n=25)
Poor oral hygiene	91,3% (n=137)	97,3% (n=72)
Stomach diseases	91,3% (n=137)	90,5% (n=67)
Pharyngitis	78,0% (n=117)*	52,7% (n=39)
Some types of food	68,7% (n=103)	73,0% (n=54)

* $p < 0,05$ – Chi-square test.

-perception of halitosis is the differentiation between genuine halitosis, pseudo-halitosis, and halitophobia. If there is no oral malodor, but the patient believes that he has this unpleasant sensation, this can be diagnosed as having pseudo-halitosis. If after the treatment for genuine or pseudo-halitosis the patient still believes to have some change in breath, he will have a new diagnosis, halitophobia²². This condition has been regarded as important in the diagnosis and treatment of individuals who complain of halitosis¹⁶. Even in the absence of a scientifically reliable method for the individual to believe in his self-analysis, measures have been used by people to identify the extent of their own breath, such as smell the floss, rubbing their fingers on the gum, lick their wrist and smell it or exhaling breath placing their hand on the mouth¹⁸. These methods can be somewhat subjective which can lead to a greater belief of halitosis among patients.

However, the low prevalence of self-perception among students may be due to the fact that they are students of Dentistry and take a better care of oral health and therefore present less halitosis. Other causes may also explain this. Those who have genuine halitosis, a possible olfactory fatigue can be detected, making it impossible for them to recognize its own oral malodor³. Furthermore, the mouth odor as well as other body odors is seen as an intimidating topic by the individuals who suffer from that condition¹³. On the other hand, it may be more embarrassing to alert a Dentistry student about his breath, which may explain the greatest perception of group P. One study showed that each individual has his own perception about the odor of his breath, but this perception can vary from a mild or no distortion to a psychiatric disorder⁶. In such cases, the patient should be referred to a qualified professional for treatment.

It was also observed that most of the participants believe that bad breath has treatment. This result corroborates with the findings of Brazilian Association of Halitosis in which was found that the majority of Brazilian population believe that there is a solution for bad breath². However, treatment of halitosis has been little sought. It is likely that this fact occurs due to embarrassment to share this situation or the inability of some individuals to realize their condition, but it may also be because there are people who do not know the existence of treatment or who are confused about which professional look for. That fact can be expressed in a study that found that only 14% of group of 600 Lebanese were diagnosed for bad breath by a dentist, reflecting a negative role in detection and treat that condition⁵.

The most interesting fact observed in this study was the level of knowledge of patients and students. Patients reported a greater number of correct answers on questions involving causes for halitosis. Some fac-

tors can be singled out to explain this. Patients may seek, in mass communication means, information about that problem. Moreover, the mean age of both groups showed a statistically significant difference, in that way, patients, for being older, may have sought and consequently received more information on the subject for a longer time. Another factor would be the higher percentage of women in group P (79.3%) than in the group S (45.9%). It has been shown that women have better care of their health in general⁹ and so consequently would be in related to halitosis. However, the poor knowledge of students on the subject can serve as a warning that this issue is vaguely addressed in Brazilian universities. When this study was conducted, the subject was not taught at the School of Dentistry of the referred University. Thus, the response from students should have been based on empirical knowledge, acquired prior to entering the course of Dentistry. This can be modified, because the attitudes in relation to oral health of dental students are directly related to their experiences, theoretical and practical, experienced in the process of learning during the graduation course. An important reflection of these attitudes is designed in attempts to improve the oral health of their patients¹⁵. These attitudes should be developed and reinforced during the trainings in the course, including the approach to the subject in the classroom and more situations where the issue halitosis can be discussed.

In general, the degree of knowledge of both groups was considered low, especially because the item stomach diseases has been noted more than carries and gum disease with respect to the halitosis cause. Studies indicate that about 80-90% of the etiology of halitosis originates in the oral cavity, especially from tongue coating^{10,12}. Thus, being halitosis a problem rarely disclosed and discussed in the academic community and the general population, more attention should be given to this matter, aiming a better understanding and, consequently, a decrease in the number of people affected by bad breath.

According to Rösing et al.¹⁹ (2009) and Van den Broek²¹ (2007), the habit of chewing gum is largely used as a way of masking the odor of the mouth due to easy availability in a daily life. The mechanisms that chewing gum can interfere with the production of odorivectors include stimulation of saliva producing a cleansing effect and causing a reduction of volatile sulfur compounds (VSC); in sugar gums, there is a lowering in the pH of the mouth and, therefore, less production of VSC, because these are produced in a neutral or alkaline mean; and the presence of anti-halitosis substances in the products.

Rösing et al.¹⁹ (2009) aimed to analyze the effect of two chewing gums, one of them containing sucrose and another containing xylitol and zinc citrate, in the production of VSC in individuals with healthy perio-

dontium. These authors concluded that the production of VSC is decreased by the use of chewing gums for a period of 60 minutes, without differences between groups. Thus, it is understandable that students, even empirically, use this benefit of chewing gum to mask their own breath. In contradiction with the self-perception reported, students seem to care much more in solve, immediately and provisionally, their bad breath when compared with the group of patients.

In summary, our data have no intention to encourage the indiscriminate use of chewing gum, especially to those with oral pathologic halitosis and severe periodontitis, because of its temporary effect. Furthermore, it is well known that the frequent habit of chewing gum is harmful to the stomatognathic system, and it has been proven that people who chewed gum intensively (at least 3h a day) were about two times more prone to experience joint noises and about three times more prone to show muscle sensitivity when compared with those who did not chew gum intensively⁷.

Regarding the impact or injury that halitosis may reflect the social and affective life of a person, it was observed in this study that almost 100% of the participants, regardless of group, believed that halitosis can affect the social and affective life of a person. Oho et al.¹⁴ (2001) showed in their study that the emotional state of those without halitosis was more stable compared to the bearers of bad breath, noting that this could negatively influence the psychological state of individuals¹⁴. Rendeiro et al.¹⁷ (2007) found that 42.9% of patients in a clinic of a University in Rio de Janeiro, had their daily activities negatively affected by the presence of halitosis¹⁷. Considering these aspects mentioned above, more attention should be given to this issue, aiming at better quality of life of individuals suffering from halitosis.

Conclusion

Patients reported greater perception of halitosis than students, as well as have demonstrated greater knowledge about the origin and treatment of halitosis. It is likely that the age difference between the participants contributed to these results.

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