SEBHA UNIVERSITY JOURNAL OF MEDICAL SCIENCES VOL.19 NO. 1 2024
DOI: 10.51984/JOMS.V19I1.3504

مجلة جامعة سبها للعلوم الطبية
Sebha University Journal of Medical Sciences
Journal homepage: www.sebhau.edu.ly/journal/joms

Bad breath due to medical problems perceived by the parents of children attending the children's regional hospital in Benghazi

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Keywords:
Bad breath
medical problems
Halitosis
Children's Hospital
systemic diseases

ABSTRACT

Background: Bad breath, or halitosis, is an uncomfortable or repulsive odour coming from the mouth. It is complex and can have both oral and systemic causes, as well as be linked to certain illnesses. The purpose of the study was to evaluate bad breath as a result of health issues as reported by parents whose children are receiving care at the Children's Regional Hospital in Benghazi **Subjects and methods:** Ethical approval permission (3.1) was obtained and informed parent and child consent was sought. One hundred and sixty parents (160) accompanying their children, including inpatients and outpatients attended a children's hospital in Benghazi, Libya. They were personally interviewed with their children and written questionnaires were previously prepared. Every parent was questioned regarding their thoughts and experiences regarding their child's bad breath and related health issues. They were subsequently entered into the survey form. The accompanied children ranged in age from 2 to 12 years old and had various health issues. **Findings:** The mean age was 6.8, and the male-to-female ratio was 52.5 to 47.5%. Parents' or other people's perception of children's bad breath as a result of breathing through their mouths due to nasal issues was 96 (60.0%), which was highly significant at $p \leq 0.05$. 48.8% overall had respiratory problems, 36% had tonsillitis, 49.3% had sinusitis, and 12% (n=19) had GIT issues. . The intensity of bad breath varied from mild to very severe smelly. **Conclusion:** Bad breath released from systemically infected children is perceived by the parents or others showed another major cause rather than an oral cause for bad smell.

رائحة الفم الكريهة بسبب مشاكل طبية يراها آباء الأطفال الذين يترددون على مستشفى الأطفال الإقليمي في بنغازي

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الكلمات المفتاحية
رائحة الفم الكريهة
مشاكل طبية
رائحة الفم الكريهة
مستشفى الأطفال
الأمراض الجهازية كونها سببا فمويا
للرائحة الكريهة

الملخص

خلفية: رائحة الفم الكريهة ، أو رائحة الفم الكريهة ، هي رائحة غير مريحة أو مثيرة للاشمئزاز تخرج من الفم. إنه معقد ويمكن أن يكون له أسباب فموية وجهازية ، فضلا عن ارتباطه بأمراض معينة. كان الغرض من الدراسة هو تقييم رائحة الفم الكريهة نتيجة للمشاكل الصحية كما أفاد بها الآباء الذين يتلقى أطفالهم الرعاية في مستشفى الأطفال الإقليمي في بنغازي. **الموضوعات والأساليب:** تم الحصول على إذن الموافقة الأخلاقية (3.1) وطلب موافقة الوالدين والطفل حضر مائة وستين من الآباء (160) مرافقين لأطفالهم، بمن فيهم المرضى المنومين والخارجيون، مستشفى للأطفال في بنغازي، ليبيا. تم إجراء مقابلات شخصية مع أطفالهم وتم إعداد استبيانات مكتوبة مسبقا. تم استجواب كل والد فيما يتعلق بأفكارهم وخبراتهم فيما يتعلق برائحة الفم الكريهة لأطفالهم والمشكلات الصحية ذات الصلة. تم إدخالهم لاحقا في استمارة الاستقصاء. تراوحت أعمار الأطفال المرافقين بين 2 و 12 عاما ويعانون من مشاكل صحية مختلفة. **النتائج:** كان متوسط العمر 6.8 ، ونسبة الذكور إلى الإناث 52.5 إلى 47.5٪ . كان إدراك

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Article History : Received 20 August 2024 - Received in revised form 13 December 2024 - Accepted 20 December 2024

الوالدين أو غيرهم من الأشخاص لرائحة الفم الكريهة للأطفال نتيجة التنفس من خلال أفواههم بسبب مشاكل في الأنف 96 (60.0٪) ، وهو ما كان مهما للغاية عند ≤0.05. كان 48.8٪ بشكل عام يعانون من مشاكل في الجهاز التنفسي ، و 36٪ يعانون من التهاب اللوزتين ، و 49.3٪ يعانون من التهاب الجيوب الأنفية ، و 12٪ (العدد = 19) يعانون من مشاكل في الجهاز الهضمي. و كذلك تراوحت شدة رائحة الفم الكريهة من خفيفة إلى شديدة الرائحة. **الخلاصة:** ينظر الوالدان إلى رائحة الفم الكريهة المنبعثة من الأطفال المصابين جهازيا أو غيرهم بأنها أظهرت سببا رئيسيا آخر بدلا من

Introduction

Although oral health is a crucial component of general health, dental practitioners and medical professionals are not knowledgeable enough about the causes and treatments of bad breath.

Epidemiological research revealed that bad breath was common. Moderate halitosis affects one-third of the population, and 5% of people may have severe symptoms.[1]. Range in many countries from 42.6 of Italian children [2] to 42% in Japanese students.[3]. In Switzerland about 20%.[4], and Libyan adults' self-perception of malodor was reported by 44% of the males and 54% of the females.[5]. Bad breath also called halitosis or bad odors and smell may be a symptom of underlying disease that could be oral or non-oral sources. [6]. There are many methods to diagnose bad breath including self-reported is mostly used or using special tests such as organoleptic measurement by smelling the exiled bad odor air by the nose and mouth, gas chromatography, and BANA (Benzyl D L arginine α naphthylamide) test which assesses the proteolytic activity of anaerobic bacteria, sulphide monitoring. [6-10]

Halitosis can be subdivided into intra-oral and extra-oral halitosis, depending on the sources of origin.[11]. Most reported sources within the oral cavity because of bacterial reservoirs such as the dorsum of the tongue, saliva, and periodontal pockets, where anaerobic bacteria convert sulfur-containing amino acids to produce bad breath volatile sulfur compounds (VSCs), especially hydrogen sulfide (H_2S) and methyl mercaptan (CH_3SH). Since oral sources of bad breath can be managed effectively, special attention is to extra-oral sources due to systemic diseases such as respiratory, sinusitis, tonsilitis, etc. so it is important to differentiate between oral and extraoral sources of bad breath. [11-13].

Subjects and methods:

One hundred and sixty parents and their children were admitted to a children's hospital in Benghazi, Libya, for both inpatient and outpatient care. In-person interviews were conducted with the family members of these youngsters, and questionnaires were prepared in advance. We surveyed all of the parents about their experiences and opinions on their child's foul breath and related health issues. After that, they completed the questionnaire form. The accompanying children had a range of medical problems and ranged in age from 2 to 12. There were also 84 males and 76 girls who attended the hospital. Additionally, the parents' perceptions confirmed the severity of the foul breath. (In the appendix).

Results

The total number of children in the study was 160 with a mean age of 6.79 and SD was 2.95), the highest number of children (22) is seen at the age of 7, and the lowest number (9 children) belongs to the age of 2. In Table 1.

Table 1: Age distribution among the study group

The age	Number of children	Percentage
2	9	5.6%
3	18	11.2%
4	16	10.0%
5	20	12.5%
6	12	7.5%
7	22	13.8%
8	13	8.1%
9	12	7.5%
10	16	10.0%
11	12	7.5%
12	10	6.2%
Total	160	100.0%

Regarding the distribution of children according to gender; male children were slightly more than half 84 (52.5%), while girls were 67 (47.5%) were demonstrated in Table 2.

Table 2: Distribution of the study group by gender

The children who breathed from the mouth due to nasal problems and had bad breath (halitosis) was 96 (60%) while those who breathed normally and had halitosis was 39% (n= 62), the difference was statistically significant $p \leq 0.05$ (Chi-square test), In table 3.

Table 3: The frequency of bad breath in children who breathe via their mouths due to nasal problems, as noticed by parents

Presence of a child's bad breath	bad breath from mouth breathers due to nasal problems			Total
	Yes N (%)	no N (%)	I don't know N (%)	N (%)
present in girls	43 (27.0%)	33 (21%)	0 (0.0%)	76
Present in boys	53 (33.1%)	29 (19.3%)	2 (0.013%)	84
Total	96 (60.0%)	62 (39%)	2 (0.01%)	160 (100%)

According to Table 4, the prevalence of halitosis was 78 (48.8%) among people with respiratory issues and 41.2% (n=65) among those who did not. Among those who were unaware 17 (11.0%) were unaware.

Table 4: The frequency of children with respiratory issues and bad breath as reported by parents

Presence of a child's bad breath	child's bad breath with respiratory problems			Total
	Yes N (%)	no N (%)	I don't know N (%)	N (%)
Present in girls	39 (24.4%)	23 (14.4%)	14 (8.8%)	76
Present in boys	39 (24.4%)	42 (67.2%)	3 (1.9%)	84
Total	78 (48.8%)	65 (41.2%)	17(11.0%)	160

The presence of halitosis among those who have GIT problems was 12% (n=19) of the total sample of 160 children, (Table 5).

Table 5: The frequency of children with GIT issues and bad breath as reported by parents

The presence of a child's bad breath	child's bad breath with GIT problems			Total
	Yes N (%)	No N (%)	I don't know	N (%)
Present in girls	10 (13%)	46 (35.7%)	6 (8%)	79
Present in boys	9 (11%)	69 (82.1%)	6 (7%)	84
Total	19 (12%)	115 (72%)	12 (8%)	160 (100%)

According to the parents' reports, 36% of the children with tonsillitis (n = 57) had bad breath connected to the illness, compared to 25.0% without tonsillitis (n = 40). $p \leq 0.05$. In Table 6.

Table 6: The frequency of tonsillitis-related bad breath in children as reported by parents

Presence of child halitosis	child's bad breath with tonsillitis of child			Total
	Yes N (%)	No N (%)	I don't know	N (%)
present in girls	26 (28.2%)	14 (46.5%)	39	79
Present in boys	31 (37%)	26 (53.5%)	27 (32.0%)	84
Total			66 (41.3%)	160 (100%)

	57 (36.0%)	40 (25.0%)		

In Table 7, children with sinusitis had a higher prevalence of halitosis (49.3%; n = 79) than did children without sinusitis (33.0%; n = 51).

Table 7: The frequency of sinusitis-related children's bad breath as reported by parents

The presence of a child's bad breath	child's bad breath with sinusitis			Total
	Yes N (%)	No N (%)	I don't know	N (%)
present in girls	36 (46%)	35 (44.3%)	8 (10.1%)	79
Present in boys	43 (51.1%)	36 (44.0%)	5 (6.0%)	84
Total	79 (49.3%)	51(33.0%)	11 (7.0%)	160 (100%)

In Table 8, Parents' perceptions of the severity of their children's foul breath were assessed for children with respiratory issues, and the results revealed mild (60%) to moderate (20%), severe (11%), and very strong (10%) bad breath. Children with tonsillitis had mild (41%), moderate (39%), severe (18%), and very strong (2%), varying degrees of bad breath. In contrast, children with sinusitis were assessed for mild (50%), moderate (35%), intense (19%), and very strong (8%). On the other hand, children with GIT issues exhibited mild (50%), moderate (33%), and severe (17%) levels of bad breath. Nasal issues causing irregular mouth breathing were classified as mild (50%), moderate (35%), severe (14%), and very strong (2%).

Table 8: The degree of severity of children's bad breath as reported by parents

Disease	Mild N (%)	Moderate N (%)	Strong N (%)	Very strong N (%)	Total
Mouth breathing	24 50 %	17 35 %	7 14.%	1 2 %	49
Tonsilitis	18 41 %	17 39 %	8 18%	1 2 %	44
Sinusitis	13 50%	9 35%	5 19 %	2 8 %	26
Respiratory	21 60%	7 20 %	4 11 %	3 10 %	35
GIT	3 50 %	2 33 %	1 17%	0 0.00%	6

Discussion

This is the first study in Libya to concentrate on how a group of children who attend the main regional Children's Hospital in Benghazi perceive patients with different medical problems to have foul breath. Direct questioning and asking the parents about their children's medical history and filling out a performed questionnaire regarding the history of bad breath (halitosis) from their children. Bad breath or halitosis may be physiological and can be present in healthy individuals in the morning bad breath results from hyposalivation and fermentation of oral bacteria and disappears after a meal and oral cleaning. [14,15]. Pathological bad breath is further subdivided into either oral or extra-oral causes. [16,17].

Extra-oral halitosis, covering about 5–10% of all cases of halitosis, might be a manifestation of a serious disease for which treatment is much more complicated than intra-oral halitosis. It is therefore of the utmost importance to differentiate between intra-oral and extra-oral halitosis. [18,19]. In addition, children with tonsillitis had a greater prevalence of halitosis (71.23%) compared to those without (53.49%). Halitosis, on the other hand, was 57.6% (n=53) among those without respiratory issues and 66.7% (n=42) among those with respiratory issues. Furthermore, the children with GIT issues demonstrated that the rates of halitosis were 64.3% and 47.3% (n=9) among those with GIT issues. Thus, our research is consistent with prior studies that found that the nose, throat, or, to a lesser extent, people with GIT issues are the primary sources of bad breath. [20-22].

According to our study, children with sinusitis had 70.6% more foul breath than children without sinusitis (57%), and children who breathed through their mouths due to nasal diseases had far worse bad breath (60.0%) than those who breathed properly and had halitosis (39%). Infection of the nose and paranasal sinuses is called rhinosinusitis due to anatomical mucosal continuity between boundaries and may be accompanied by a halitosis symptom.[23]. Furthermore, small parts of foreign bodies are trapped in children's noses causing inflammation and bad smells and that commonly happens in young children who usually try new things through their noses. [24,25,26]. In children, tonsil infection, as a result, causes an awful smell in the mouth. [27,28]. The present study also evaluated the degree of bad breath intensity as reported by the parents of the children among those who had mouth breathing habits, sinusitis, and tonsilitis ranging from a mild degree

Mouth breathing habits may lead to dryness and the loss of washing effect of saliva, causing microbial fermentation and multiplication faster, resulting in bad breath. Snoring or mouth breathing during the night plays an important role in creating smelly breath. [29,30. 31].

. Diseases such as diabetes, stomach infections, kidney failure, liver problems, and cancer of the mouth lead to bad odors of the mouth, in children undergoing chemotherapy may develop fungal infections that lead to bad smells. [32]. Some medications are causing dry mouth. Antihistamines, tranquilizers and Phenothiazines reduce saliva production. Thus, it diminishes spontaneous washing of the oral cavity which increases halitosis. Inappropriate and excessive use of antibiotics can cause the loss of beneficial bacteria in the mouth, and give them opportunities for oral fungal to grow. The use of antibiotics for more than a month can lead to a smelly mouth in children. [32,33].

Management of nonoral sources requires treatment of the underlying cause, whereas suspected oral sources require referral for a dental evaluation.[34].

To assess whether or not a patient's complaint of foul breath is related to oral causes, a thorough history including dental and medical information is taken when screening patients who complain of bad breath.[35].

Conclusions

Parents or children may perceive poor breath as a result of a variety of medical conditions. The intensity of symptoms that parents of children with respiratory illnesses, tonsillitis, sinusitis, mouth breathing, and GIT disorders report as part of their child's foul breath. In comparison to those who breathed properly, a greater proportion of people had halitosis and breathed through their mouths. respiratory issues, tonsillitis, and sinusitis, out of the 160 youngsters in the study, 12% (n=19) had halitosis. This is a lower percentage of those with GIT issues. This study has the advantage of being the first to identify the non-oral aetiology of odorous breath among youngsters in Libya who require a multidisciplinary solution.

Acknowledgment: We would like to express our gratitude to those with children who agreed to take part in this study to improve the findings, as well as to the medical staff at Children's Hospital who made it possible for us to get in touch with the hospitalised kids.

- Conflict of Interest • No conflict of interest exists.
- No financial support was gained.

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Appendix

Bad breath due to medical problems perceived by the parents of children attending the children's regional hospital in Benghazi

Section A: General information regarding: 1. Gender: o Male o Female 2. Age (in years).

Section 2: Questionnaire regarding the child's health and one that was obtained from in-person interviews with the parents of children who were either inpatients or outpatients at the hospital.

Have you noticed your child's regular mouth breathing?	Yes	No	I don't know
Is your youngster experiencing respiratory issues?			
Is your youngster complaining of gastrointestinal issues?			
Is your youngster suffering from tonsillitis?			
Does your child have sinusitis at the moment?			

Section 3: Assessment of the severity of foul breath resulting from medical conditions as reported or perceived by the study sample's parents

There is no bad breath present detected.	Almost no foul breath was found.
Very little foul breath was found. And can be transient. (Mild)	Although the parents may see this, the examination is unable to identify it.
Bad breath is moderate	This can be detected through the examination
Bad breath is strong	The evaluation confirmed that this unpleasant odour is strong.
Extremely pungent and unpleasant odour	can be smelt or recognized by the assessor from a great distance.