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## Characteristics and treatment outcome of patients with halitosis at a suburban health facility

C. D. Odai\*<sup>1</sup>, C. C. Azodo<sup>2</sup>, N. Osazuwa-Peters<sup>2</sup> and O. N. Obuekwe<sup>3</sup>

<sup>1</sup>Department of oral and Maxillofacial Surgery, University of Benin Teaching Hospital, Benin City, Nigeria

<sup>2</sup>Department of Periodontics, University of Benin Teaching Hospital, Benin City, Nigeria

<sup>3</sup>Department of oral and Maxillofacial Surgery, University of Benin, Benin City, Nigeria

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**ABSTRACT: Objective:** To investigate the demography, intraoral features and treatment outcome of halitosis in a suburban clinical setting. **Patients and Methods:** Prospective observational study, involving consecutive and consenting patients with complaints of halitosis in Eden dental clinic, Uslu between January 2006 and December 2008. Data of interest were demography, type of halitosis, intraoral characteristics and treatment outcome. Data analysis was done using Epi-Info version 3.3. **Results:** A total of 41 patients was involved in this study. The female: male ratio was 2.2:1 and 60-69 year age group constituted 19.5%. Student and housewives made up 39% of the group. About one-third (34.1%) had the symptom for 24-35 months. Sufferers were made aware of symptom by friends (31.7%) and 24.4% spouse. Delusional halitosis accounted for only 7.3% of the cases. Oral hygiene was fair in 68.3%, retention index was 3 for 43.9%, 43.9% had one carious tooth, 39% had single missing tooth, 58.5% had prosthesis, and 70.8% had restorations. Majority (51.2%) had scaling and polishing, replacement of prosthesis and restoration as the treatment modality. The treatment outcome was satisfactory for 90.2% and unsatisfactory 9.8%. **Conclusion:** Our study revealed that the majority of patients with a primary complaint of halitosis were elderly females. Also most of our patients had satisfactory treatment outcome.

**Keywords:** Characteristics, treatment outcome, halitosis, suburban health facility

## Introduction

Halitosis is a term derived from the Latin word "halitus," meaning breath, and the Greek suffix "osis," meaning condition<sup>1</sup>. Halitosis is defined as noticeable unpleasant odour that emanates from the mouth which is objectionable to others<sup>2</sup>. In the early 20s, it became popularized by the makers of Listerine who used it as a marketing ploy in advertising their product<sup>3</sup>.

It is a universal medico-social problem affecting 50-65% of the adult population amounting to millions of people worldwide<sup>4</sup>. It is estimated to be the third most frequent reason for seeking dental aid, following tooth decay and periodontal disease<sup>5</sup>.

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\*To whom correspondence should be addressed.

E-mail: [docemekus@yahoo.com](mailto:docemekus@yahoo.com)

Halitosis is an embarrassing symptom with significant personal and social impact on those suffering from it<sup>6</sup>. Recent survey and opinion poll have shown that people quickly develop negative impressions of those who have bad breathe<sup>7</sup>.

The causes of halitosis can be oral or non-oral. Oral causes make up 90% which include poor oral hygiene, periodontal diseases, tongue coat, food impaction, unclean dentures, faulty restorations, oral carcinomas, and throat infections<sup>8</sup>. Gingivitis, periodontitis and tongue coating, are the most frequent oral causes<sup>9</sup>, of halitosis.

The objective of this study was to investigate the demography, intraoral-related features and treatment outcome of halitosis in a suburban clinical setting.

## **Patients and Methods**

This was a prospective observational study of 41 consecutive and consenting patients with complaints of halitosis in Eden dental clinic, Uselu, Egor Local Government Area, Edo State from January, 2006 to December, 2008 Data collected were demography, type of halitosis, intraoral characteristics and treatment outcome. The data was analyzed with Epi-Info statistical software version 3.3 and result presented as tables and bar charts. The demographic variables recorded include age, gender, occupation, duration of halitosis before presentation, and whether motivation to seek care was by second person or self consciousness.

Halitosis was classified as genuine and delusional using organoleptic assessment. The organoleptic assessment was conducted by a single examiner. Oral hygiene of the patients was classified as poor, fair and good using Simplified Oral Hygiene Index. Retention index<sup>10</sup> which scored plaque retentive factors on a 4 point scale; 0,1,2,3 was also used. The retention index scoring is outlined below:

0 = no caries, no calculus, no imperfect margin of dental restorations

1 = supragingival cavity, calculus, imperfect margin of dental restoration.

2 = subgingival cavity, calculus or no imperfect margin of dental restoration.

3 = large cavity, abundance of calculus or grossly insufficient margin fit of dental restoration in a supra and/or subgingival location.

Intraoral examination was done to assess the presence of carious lesion, restoration and prosthesis. Treatment was done according the possible implicated aetiological factors and they include scaling and polishing, restorations and partial denture replacement. Treatment outcome was assessed subjectively by patient as either satisfactory or unsatisfactory. However the treatment outcome was confirmed objectively using organoleptic assessment protocol.

## **Results**

The result showed gender difference with female comprising 68.3% (Table 1). Most commonly affected age group was 60-69 year age group (19.5%), the next was 30-39, 40-49 and 50-59 which had 17.1% each (Table 2). Students 19.5%, house wives (19.5%) and pensioner (14%) were the most affected occupational group (Table 3). About one-third (34.1%) had suffered the symptom for 23-35 months, before presentation (Table 4). The majority of the patients became aware of their halitosis through their friends (31.7%) and spouse (24.4%). The remaining (43.9%) of the patients discovered themselves that they had halitosis (Fig. 1).

**TABLE 1: GENDER DISTRIBUTION.**

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	13	31.7
Female	28	68.3
Total	41	100

**TABLE 2: AGE DISTRIBUTION**

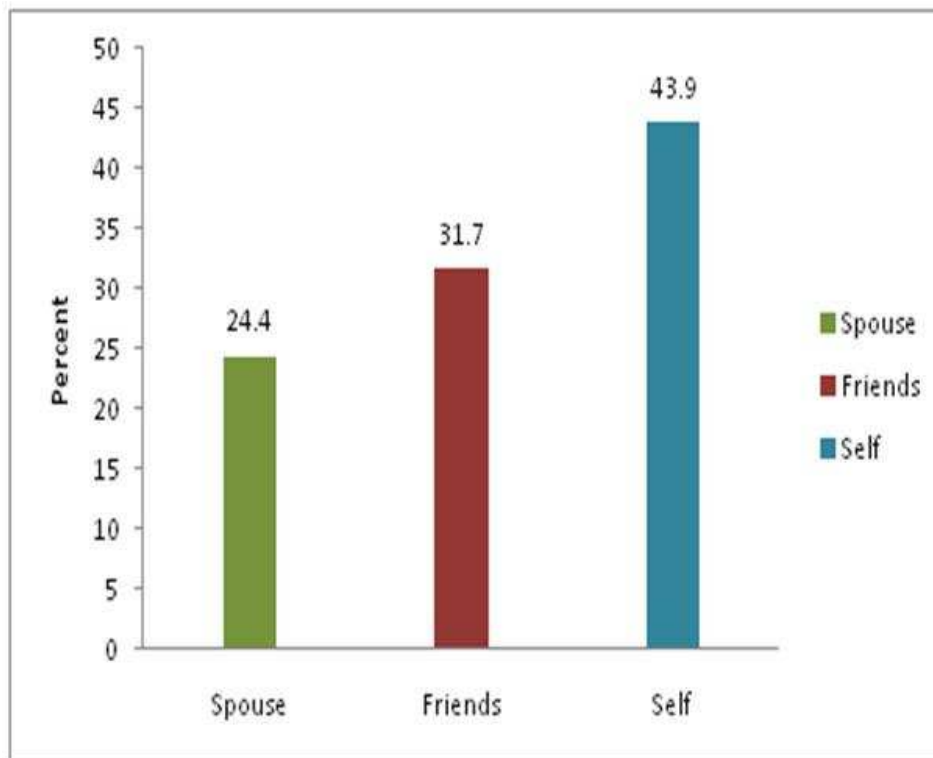
<b>Age (Years)</b>	<b>Frequency</b>	<b>Percent</b>
< 20	4	9.8
20 – 29	4	9.8
30 – 39	7	17.1
40 – 49	7	17.1
50 – 59	7	17.1
60 – 69	8	19.5
70 – 79	2	4.9
≥ 80	2	4.9
Total	41	100

**TABLE 3: OCCUPATION OF PATIENTS**

<b>Occupation</b>	<b>Frequency</b>	<b>Percent</b>
Student	8	19.5
Applicant	3	7.3
Housewife	8	19.5
Artisan	4	9.8
Civil Servant	4	9.8
Banker	3	7.3
Businesswoman	5	12.2
Pensioner	6	14.0
Total	41	100

**TABLE 4: DURATION OF HALITOSIS PRIOR TO PRESENTAION**

Duration (Months)	Frequency	Percent
< 12	1	2.4
12 – 23	5	12.2
24 – 35	14	34.1
36 – 47	5	12.2
48 – 59	4	9.8
60 – 71	3	7.3
72 – 83	3	7.3
84 – 95	1	2.4
96 and above	5	12.2
<b>Total</b>	<b>41</b>	<b>100</b>



Spouse=24.4%, Friends= 31.7% and Self conscious=43.9%

**FIGURE 1: SOURCE OF AWARENESS OF HALITOSIS**

Clinical assessment revealed perceivable halitosis in 80.5% of the patients and delusional halitosis in 19.5% (Table 5). Retention index was 3 in 43.9% of patient (Table 6).

Assessment of oral hygiene using simplified oral hygiene index revealed the following result: Poor=22%, Fair= 68.3 and Good= 9.8% (**Fig. 2**). **Fig. 3** depicts intraoral features of the patients as:

Restoration: Present =70.7% (Amalgam 65.9%, composite 4.9%) Absent =29.3%

Dental caries: Present =85.4 and Absent =14.6%

Prosthesis: Present =58.5% (P.D 56.1%, bridge 2.4%) and Absent =41.5.

**Fig. 4** depicts treatment outcome as:

Satisfactory = 90.2% and Unsatisfactory = 9.8%

Cause of Unsatisfactory outcome: Delusional= 75% and Genuine= 25%

**TABLE 5: ORGANOLEPTIC ASSESSMENT OF HALITOSIS IN THE PATIENTS**

Halitosis	Frequency	Percent
No	8	19.5
Yes	33	80.5
<b>Total</b>	<b>41</b>	<b>100</b>

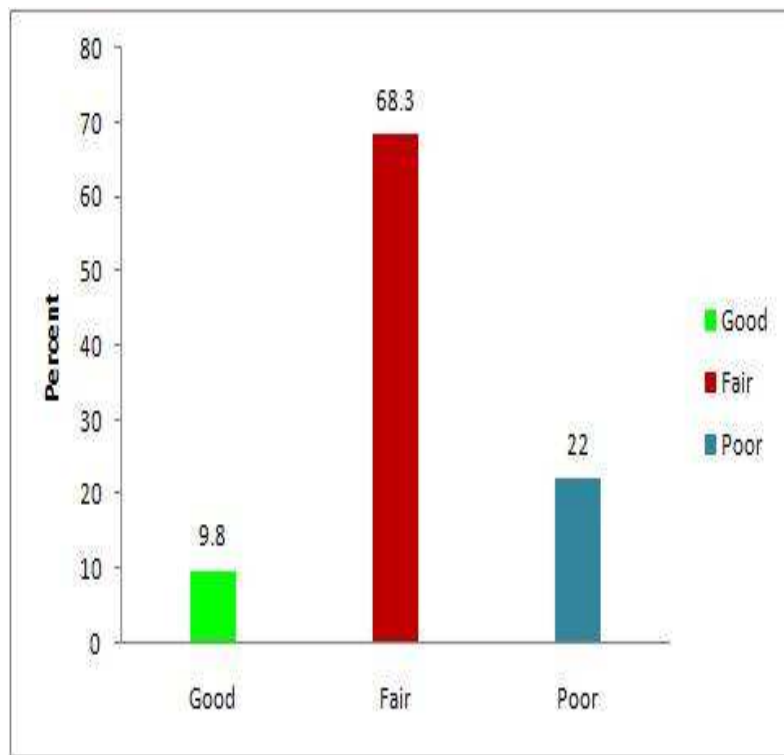
**TABLE 6: RETENTION INDEX**

Retention Index	Frequency	Percent
0	3	7.3
1	8	19.5
2	12	29.3
3	18	43.9
<b>Total</b>	<b>41</b>	<b>100</b>

## Discussion

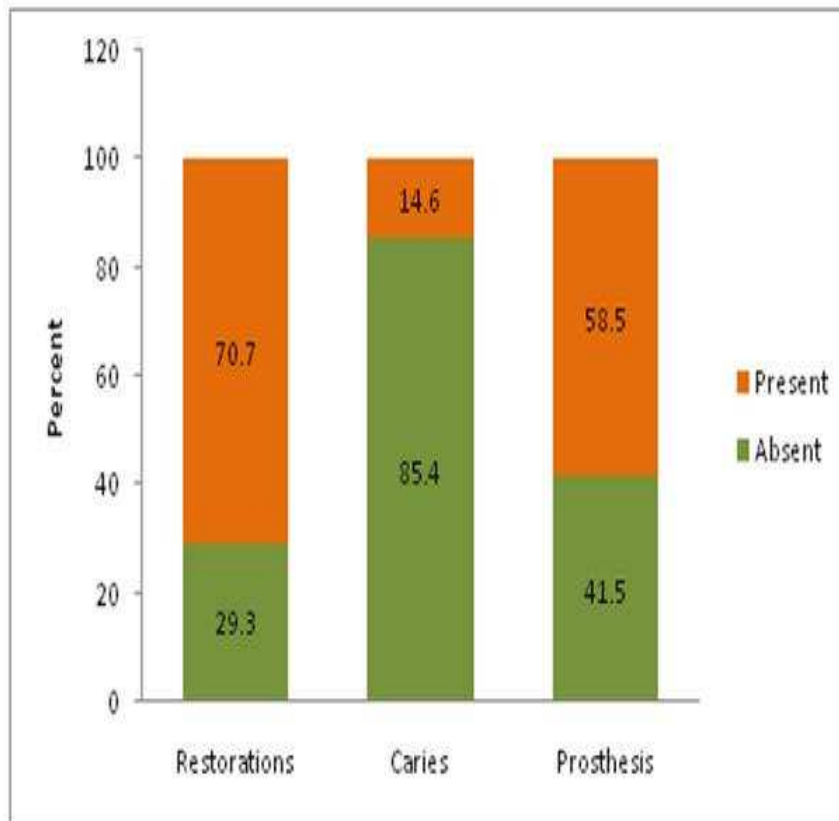
Halitosis is an extremely common affliction without any limitations to age, sex, race, or socioeconomic levels. In this present study, data revealed that more female than male, seek care for halitosis. This is contrary to findings of clinical evaluation of 222 Iranian patients with halitosis which revealed 46.4% as female and 53.6% as male<sup>11</sup>, and University Hospital Leuven, Belgium halitosis study of 491 patients which revealed equal males and females ratio<sup>12</sup>.

Halitosis is more common in the elderly<sup>13</sup>. In this study, there was an increase in prevalence of halitosis with ageing; the climax was at 60-69 year age group and subsequent decline. This is consistent with the findings from a clinical study in Ibadan Nigeria in which 36% of the subjects were over 60 years<sup>14</sup> but differed from a study in which majority of sufferer were between 20-50 years of age<sup>12</sup>.



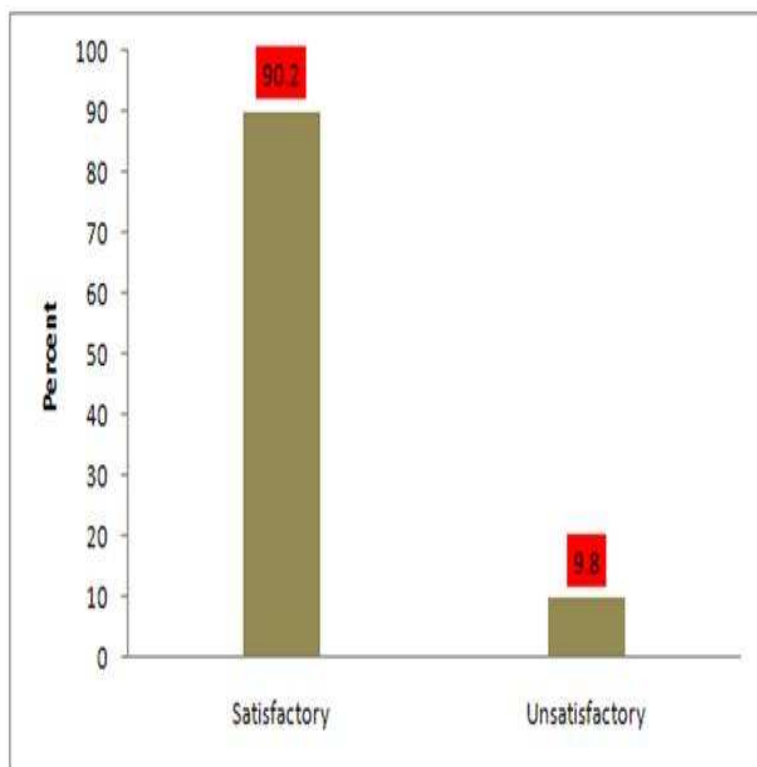
- Poor=22%, Fair= 68.3 and Good= 9.8%

**FIGURE 2: SIMPLIFIED ORAL HYGIENE INDEX (Greene and Vermillion) OF THE PATIENTS**



- Restoration: Present =70.7% (Amalgam 65.9%, composite 4.9%) Absent =29.3%
- Dental caries: Present =85.4 and Absent =14.6%
- Prosthesis: Present =58.5% (P.D 56.1%, bridge 2.4%) and Absent =41.5

**FIGURE 3: INTRAORAL FEATURES OF THE PATIENTS**



Satisfactory = 90.2% and Unsatisfactory = 9.8%

**Cause of Unsatisfactory outcome:** Delusional= 75% and Genuine= 25%

**FIGURE 4: OUTCOME OF TREATMENT**

The unfortunate fact is that most halitosis sufferers have no idea that they have a breath problem unless somebody directly informs them. Iwakura et al, (1994) classified halitosis sufferer into three groups; Type 1, self-conscious; Type 2, conscious by the indication of others; and Type 3, conscious by presumptions from the attitude of others<sup>15</sup>. This study showed that 31.7% and 24.4% were informed of symptoms by friends and spouse respectively, and only 43.9% were self conscious patients. More than half (56.1%) were informed of symptom by a second person confirming that smelling one's own breathe odor is often difficult due to habituation.

Housewives (19.5%), students (19.5%) and pensioners (14.6%) were the predominant groups. These groups are not financially empowered and are classified as dependents. Halitosis has been associated with social class<sup>14</sup> although social economic status has not been shown to contribute to the level of volatile sulphur compound<sup>16</sup>.

With this awareness, people pay higher attention to the disease, and those who are affected try to get rid of it. In this study about one third (34.1%) of the patient have lived with halitosis for 24-35 months. Seven-tenth (70.7%) had the symptoms for < 5 years. It could be explained by the fact the vast majority of patients first look for help in traditional medicine, chewing gum and non-medical advice, which are not successful strategies. Evidence shows very poor results using these strategies.

Bad breath in patients, not detectable by others is termed delusional halitosis. These patients are sure that they have bad breath although many have not asked anyone for an objective opinion. This study showed delusional halitosis accounting for 7.3% of the cases. Findings in this study is higher than 5% reported in a cross-sectional study of 491 people in University Hospital Leuven, Belgium multidisciplinary halitosis clinic<sup>12</sup> and lower than 12.5% recorded among 144 patients at the University of Basle Halitosis-Consultation centre<sup>9</sup>.

In 65-85% of the cases of halitosis, the causes were found in the periodontium and/or tongue<sup>17</sup>. Location that contribute to halitosis in descending prevalence order: inter-dental and sub-gingival niches, faulty dental work, food-impaction areas in-between the teeth, abscesses and unclean dentures<sup>18</sup>. In this study, oral hygiene was poor in 22%, fair in 68.3% and good in 9.8%. Studies have shown that halitosis was correlated to oral hygiene status, calculus and plaque<sup>19,14</sup>. More than half of participant (58.5%) had prosthesis (PD 56.1% and bridge 2.4%). Dentures are another

important cause of halitosis, particularly if they are worn overnight<sup>20</sup>. The nature, origin and extent of malodour in denture wearers is ill-defined, but many species capable of producing malodorous compounds are present<sup>21</sup>. Majority (70.3%) had restorations with amalgam as 65.9% and composite 4.9%. Caries is one of the main causes of bad breath. The lesion should be excised and the resulting defect filled with an appropriate material by a dentist. In this study, 86.4% had caries with 43.9% having one carious tooth and remaining having more than one carious tooth.

Professional advice should be given on oral hygiene and diet, and treatments should include scaling and root planing of the associated periodontal pockets to reduce the bacterial load and/or instruction of a perfect oral hygiene will be sufficient to most halitosis emanating from oral source<sup>4</sup>. In this study, about half of the patients (51.2%) had scaling and polishing, replacement and restoration as the treatment modality. Scaling and polishing and restoration were done in 36.6%. This reemphasizes the dominant intra-oral problems in halitosis.

The treatment outcome was satisfactory for 90.2% and unsatisfactory 9.8% in this study. It is comparable to the treatment outcome in halitosis-consultation centre of University of Basle which recorded positive results of 91.9% (objective) and 96.9% (subjective)<sup>9</sup>. This contrasted well with the outcome of a Belgium multidisciplinary breath odor clinic of 406 patients which revealed that about 50% satisfactory, while no improvement was reported by 17%<sup>22</sup>.

### Conclusion

This study revealed that the majority of patients with a primary complaint of halitosis were elderly females, with less than optimal oral hygiene status. Also most of our patients had satisfactory treatment outcome. Majority of those with unsatisfactory outcome had delusional halitosis.

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