

## Self-Perception, Knowledge and Awareness of Halitosis among Students of Higher Learning Institutions of Chitwan

Saroj Balami<sup>1</sup>, Erika Shrestha<sup>2</sup>, Arun Dhungana<sup>3</sup>, Ayam Chhatkuli<sup>1</sup>, Manish Shrestha<sup>1</sup>, Rajib Chaulagain<sup>4\*</sup>

<sup>1</sup>General Dental Practitioners, Bharatpur, Nepal

<sup>2</sup>Department of Periodontics, Chitwan Medical College, Bharatpur, Nepal

<sup>3</sup>Department of Biochemistry, Kathmandu Medical College Teaching Hospital, Bhaktapur, Nepal

<sup>4</sup>Department of Oral Pathology, Chitwan Medical College, Bharatpur, Nepal

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#### \*Correspondence:

Dr Rajib Chaulagain,  
Department of Oral Pathology,  
Chitwan Medical College,  
Bharatpur, Nepal.

#### E-mail:

[drajibchaulagain@gmail.com](mailto:drajibchaulagain@gmail.com)

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### ABSTRACT

**INTRODUCTION:** Halitosis is production of offensive odour coming out from oral cavity which most people try to avoid. It also leads to anxiety and social embarrassment. The people having halitosis have compromised quality of life. Hence this study was planned to assess the self-perception, knowledge and awareness of halitosis among students of higher learning institutions of Chitwan. **MATERIALS AND METHODS:** This was a descriptive cross-sectional study conducted among 280 students of higher secondary schools and colleges of Chitwan. The data collection was done from August 2021 to October 2021. A self-administered questionnaire was used. The results obtained were entered into Microsoft Excel 2019 and then transferred into Statistical Package for Social Science (SPSS) version 16. Descriptive statistical analysis was done. The study was analysed using frequency, percentages, mean and standard deviation. **RESULTS:** In this study, the mean age of the participants was 23.75 years. More than 90% of the participants belonged to 20-29 age group. Among the participants 44.3% reported of bad breath, while only 15.4% visited doctor and received treatment. Around 41.1% believed oral check-up as common diagnostic measures for halitosis and 40.4% had an opinion of consulting dentist for bad breath. The bad breath affected their social life behaviour, ended up friendship, stayed separate and away from friends and family. Around 64.5% were isolated from society. **CONCLUSIONS:** From our study we can conclude that halitosis is common problem in developing and developed nation. In the present study self-reported halitosis was present. The proper oral hygiene methods were lagging. Proper need of oral hygiene education and awareness campaign is therefore necessary.

**Keywords:** Awareness, Diagnosis, Habits, Halitosis, Perception.

### INTRODUCTION

The term halitosis was coined from the merger of two words; Latin- 'halitus' (breath), and Greek- 'nosos' (disease). Halitosis is a general term used to define any unpleasant odor coming while breathing where, origin of the odor could be from either oral or non-oral sources [1,2]. It has been classified as Genuine halitosis, pseudo halitosis while, Seemann et al has further classified as intra-oral and extra-oral halitosis [3].

Intra-oral halitosis is a bad breath coming from the oral cavity due to bacterial degradation of proteins or production of volatile Sulphur compounds such as Hydrogen Sulphide and methyl mercaptan [3]. The hydrogen Sulphide has a rotten egg smell while, methyl mercaptan have cooked cabbage

smell [4]. Halitosis may occur due to other disease conditions such as chronic sinusitis, pneumonia, liver disease and also correlated with diabetic acidosis, metabolic disorders, and medications [3,5-8]. It can be identified by various methods like organoleptic method, gas chromatography and Sulphide monitoring. Apart from this, other test such as BANA test, chemical sensors, salivary incubation test and ninhydrin test are also available [3].

Prevalence of halitosis was observed to be high in various studies [5,6,9]. Basically, it disrupts the quality of life and decreases the social mingling. In many cases people lose their confidence in their daily activities. It is often neglected by educated

individuals. So, aim of our study was to assess the self-perception, knowledge and awareness of halitosis among students of higher learning institutions of Chitwan.

## MATERIALS AND METHODS

### Study design and setting

A descriptive cross-sectional study was carried out among the students of higher secondary schools and colleges of Chitwan. The data collection was done from August 2021 to October 2021. Chitwan is located in the southwestern part of Nepal and is one of the 77 districts of Nepal. The participants of the study constituted higher secondary and college students comprising Classes XI-XII, bachelor level students and post graduate students.

### Participants and procedures

The sample size was calculated based on the study of Al Sadhan et al. where prevalence was 22.8 [10]. The formula used was  $n = Z^2pq/d^2$  keeping  $d$  (allowable error) at 5%. The calculated sample size was 270.47. However, two hundred and eighty students were included in the study. Students studying in the 11, 12 classes, bachelors and post-graduation were included in the study. Those who were unwilling to participate were excluded.

The research tool included a self-administered questionnaire which was prepared after reviewing relevant literatures [10-12]. At first the questionnaire was developed in English. It was translated in Nepal by two experts who were unknown to the study area. The translated Nepali version was back translated into English language by two English language experts. The prefinal questions were pretested among the group of 20 people whose data was not included in the study. Minor corrections were done and then the final questionnaires were obtained for the study. The primary focus of the study was self-perception of halitosis in the students of higher education. The study objectives were first explained to the participants beforehand.

### Statistical analysis and data management

The results were compiled, checked for completeness and then entered onto Microsoft Excel 2019. It was then transferred into Statistical Package for Social Science (SPSS) version 16. Descriptive statistical analysis was done. The study was

analyzed using frequency, percentages, mean and standard deviation. The final results were presented in form of tables.

### Ethical considerations

The study was commenced after the approval was obtained from the Institutional Review Committee of Bharatpur Hospital, Chitwan (Ref No. 077/078-014). A written informed consent was obtained from the students who agreed to participate in the study.

## RESULTS

In this study, the mean age of the participants was 23.75 years. More than 90% of the participants belonged to 20-29 age group. Most of the study participants enrolled were male (162) and religion was Hindu (191) while most of the participants has completed or doing their bachelor degree (249) as shown in table 1.

Variables	Frequency	
Age Group	20-29	258 (92.1)
	30-39	22 (7.9)
Age (years) (Mean $\pm$ SD)	23.75 $\pm$ 3.148	
Gender	Male	162 (57.9)
	Female	118 (42.1)
Religion	Hindu	191 (68.2)
	Buddhist	68 (24.3)
	Christian	18 (6.4)
	Muslim	3 (1.1)
Education	High school	30 (10.7)
	Bachelor	249 (88.9)
	Post-graduate	1 (0.4)

Table 2 showed oral habit of the participants. More than 80% were not suffering from dry mouth. Around 88.6% of participants had a good drinking habit, while 61.1% had the habit of consuming tea among them 55.6% consumes 2 cups of tea in a day. We observed around 75.4% of participants did not practice tongue cleaning and among them who clean the tool was toothbrush. In our study we notice 86.4% of participants were not using mouthwash solution to rinse the mouth. All the participants usage tooth brush but 70.4% have a regular tooth brushing habit in morning, unlike same percentage of participants do not practice regular tooth brushing after meal while 66.1 % practiced only one time. Most of them spend time

on brushing is more than 2 min (64.3%) while all participants used toothpaste during toothbrushing.

Oral habits		Frequency	Percent
Are you currently suffering from dry mouth?	Yes	40	14.3
	No	240	85.7
How much water do you drink per day?	1–2 liters	2	0.7
	2–3 liters	30	10.7
	More than 3 liters	248	88.6
Do you drink coffee/tea?	Yes	171	61.1
	No	109	38.9
If yes, Coffee/tea (number of cups)	1	27	15.8
	2	95	55.6
	3	35	20.5
	4	7	4.1
	More than 4	7	4.1
How often do you clean the tongue?	Never	211	75.4
	Once a month	11	3.9
	Once a week	20	7.1
	Daily	38	13.6
How do you clean the tongue?	Tongue brush	2	0.7
	Tongue scraper	7	2.5
	Toothbrush	59	21.1
	Bamboo twig	1	0.4
Do you use a mouthwash solution?	Yes	38	13.6
	No	242	86.4
If yes, How often?	Daily	7	18.4
	Occasionally	31	81.6
Do you use a tooth brush?	Yes	280	100.0
If yes, How many times a day?	Once	185	66.1
	Twice	90	32.1
	Three times	5	1.8
Regular tooth brushing in the morning?	Yes	197	70.4
	No	83	29.6
Regular tooth brushing after meals?	Yes	83	29.6
	No	197	70.4
Average time use when brushing	<1 min	61	21.8
	1-2 min	39	13.9
	>2 min	180	64.3
Do you use toothpaste?	Yes	280	100
Regular dental flossing	Yes	31	11.1
	No	249	88.9
Do you take alcohol regularly?	Yes	11	3.9
	No	269	96.1
Do you use chew gum every day?	Yes	104	37.1
	No	176	62.9

Table 3 showed the awareness of the participants among which 55.7% has no any complain of bad breath, while 55.7% do not require or visited doctor for any treatment. Around 41.1% believed oral

checkup as common diagnostic measures for halitosis and 40.4% had an opinion of consulting dentist for bad breath. In our study 44.3% of participant has bad breath problem which had

affected their social life behavior, ended up friendship, stayed separate and away from friends and family. Around 64.5% were isolated from society.

**Table 3 | Self-perception of halitosis**

Self-perception of halitosis		Frequency	Percent
Are you currently suffering from bad breath?	Yes	124	44.3
	No	156	55.7
Have you received treatment for your bad breath?	Yes	43	15.4
	No	81	28.9
	I don't have bad breath	156	55.7
Have you visited a doctor for your bad breath?	Yes	43	15.4
	No	81	28.9
	I don't have bad breath	156	55.7
What do you think are the common diagnostic measures for halitosis?	Oral checkup	115	41.1
	Gastric checkup	90	32.1
	Sinus Checkup	25	8.9
	Throat Checkup	50	17.9
Which health professional do you visit for halitosis?	Dentist	113	40.4
	Gastroenterologist	66	23.6
	ENT Specialist	64	22.9
	Physician	33	11.8
	Ayurvedic Doctors	4	1.4
Has your breath interfered with your social life	Yes	124	100.0
Have you ever lost friends at school because of	Yes	124	100.0
Do you ever stay alone to avoid other people	Yes	124	100.0
Has bad breath affects relationship with friends	Yes	124	100.0
If yes, In what ways?	Alienating others	9	7.3
	Isolation from society	80	64.5
	Mishandling	4	3.2
	Reduced career opportunities	31	25.0
Do you have any coating on your tongue?	Yes	60	21.4
	No	220	78.6
Do you experience bleeding from your gums when brushing your teeth?	Yes	106	37.9
	No	174	62.1
Do you have cavities in your teeth?	Yes	177	63.2
	No	103	36.8

## DISCUSSION

Halitosis is a common unpleasant problem that severely affects our personal, social and professional relationships. It has multifactorial etiology which can be either intraoral or extra oral cause. It mainly occurs in association with other diseases such as chronic sinusitis, pneumonia, liver disease, metabolic disorders, and medications.

Generally, it is due to the presence of odoriferous substance produced by bacteria that is exhaled in the air. The people having halitosis have compromised quality of life [13-15]. They have to come across social adjustment problems to phobias and even depression. The educated people are suffering more but they hide the problem due to psychosocial embarrassment [1,16]. They may also have anxiety due to halitosis [9]. Hence this study was planned to study the self-perception,

knowledge and awareness of halitosis among students of higher learning institutions of Chitwan.

Several studies have been conducted to evaluate the self-perception of halitosis. In the present study the self-perception of halitosis was 44.3%. This figure is similar to the results reported by participants in Tamil Nadu [17], Karachi, Pakistan [1], 48.5% in Tanzania [18]. The prevalence of self-reported halitosis was however higher than that reported in Saudi Arabia was 22.8% [10], 29.75 % in Iran [5], and 23.1% in Rwanda [19]. This may be related to the fact that samples of these studies were different. Few of the studies were conducted in dental undergraduates, patients coming for the treatment and in school and college students. The difference may also be due to the type of process the study is done. All the above studies have used questionnaire to assess the halitosis. Results of such studies may be less reliable as there may be chances of information bias. The difference in the way of assessment methods used, culture, habits, lifestyle can also impact the prevalence of halitosis [20]. Few of the studies have also used other methods of assessing halitosis such as using organoleptic test, halimeter [20]. Few of the studies have used combination methods providing more reliable results [5,21]. These all have marked impact. The difference in self-perception may vary but they all point to one theme that there is prevalence of halitosis.

Generally, people with halitosis tend to control or hide the problem either by using home remedies or commercially available products such as chewing gums and mouth rinses [10]. Many of the people also brush the teeth several times a day. These products do relieve the people from halitosis but not permanently. In the present study 104 (37.1%) of the participants had habit of using chewing gums. The use of chewing gums increases salivary secretions due to which halitosis is reduced [13]. They also contain certain compounds such as zinc acetate, magnolia bark, eucalyptus, menthol which reduce the halitosis parameters [22]. Mouth rinses also reduce halitosis. They contain chlorine dioxide and zinc salts which mask halitosis [13]. However, in the present study, only 38 (13.6%) used mouth rinses. It is therefore necessary for dental practitioners to educate the patients to use mouthwash. Cleaning the dorsal surface of the tongue has also been recommended to reduce

halitosis [13]. Feres et al observed that that tongue brushing is more effective in reducing halitosis than scraping, and patients generally prefer to clean the tongue using the toothbrush rather than scrapers [23]. In our study, 75.4 % of the participants reported that they do not clean the tongue.

In the present study, the oral hygiene habits were found to be excellent as all the participants reported that they brush the teeth daily. Since all the participants were from the higher education level and belong to the people of modern civilization, the cent percent result on tooth brushing was anticipated. However, there were variations in tooth brushing and time of tooth brushing habits. One hundred and eighty-five participants brushed their teeth once, while ninety brushed twice a day and remaining five brushed their teeth thrice. However, only 31 participants used dental floss. More than 60% participants used above 2 minutes time to tooth brush. Oral habits can have great impact on halitosis. Regular tooth brushing and flossing of the teeth also effectively reduces halitosis, gingivitis and periodontitis [24].

Although 124 (44.3%) of the participants reported bad breath, only 43 visited doctors and received treatment. Among 124, 81 participants seem to neglect bad breath. Similar to our finding, Saleem et al also reported that most of the participants in their study did not visit doctors for treatment of bad breath [1]. It is often observed that the people with bad breath use flavoring product to mask the halitosis instead of visiting relevant experts. Among the 280 participants, 115 reported that oral checkup was the common diagnostic measure for halitosis, while 90 believed gastric checkup. However, the participants were unaware whom to visit for treatment as 113 believed it was dentist who treats halitosis, 66 reported gastroenterologists. This data also focuses on lack of education and knowledge about halitosis, its causes and management.

In a study conducted by Takashi et al a close relationship between social anxiety disorders and different classes of halitosis was shown [24]. All psychological conditions (depression, anxiety and stress) demonstrated a significant association with subjective halitosis [24]. Bad breath can have distressing effects, as a result of which the affected person may avoid socializing, loose friends. Even people have the habit of putting handkerchief in



mouth, or turn away the heads while talking. These all have very adverse effect on the person with halitosis. In the present study too, participants suffering from bad breath reported that the bad breath interfered their social life, lose friends, stayed alone. The present study also has limitations. The limitations of the study were the use of questionnaire to perceive the bad breath. The clinical examination was not done. Since it was a questionnaire-based study, the issue of recall bias and information bias cannot be ignored. The information bias may be with those participants who were having halitosis but did not state it due to fear of embarrassment.

#### ADDITIONAL INFORMATION AND DECLARATIONS

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#### CONCLUSIONS

From our study we can conclude that halitosis is common problem in developing and developed nation. It is a psychological problem and, in the present study self-reported halitosis was present. It was interesting to know all knew about oral hygiene methods. However, the proper oral hygiene methods were lagging. Proper need of oral hygiene education and awareness campaign is therefore necessary. Education on halitosis was also necessary.

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