



# Insight, Introspection, and Intellectualism of Kashmiri Population about Halitosis and its Treatment Plan: A Randomized Study

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## Abstract

Unpleasant breath smell also known as bad breath, oral malodor, mouth odor and/or factor oris can transform into a troublesome issue impacting individual's social correspondence alongside self-confidence. Besides, it turns into a discomforting issue for people around the impacted individual, as on grounds it is thought of as embarrassing to illuminate the individual in regards to the issue.

**Aim:** this study was designed to evaluate the insight, introspection and intellectualism i.e. self-perception, knowledge and awareness of Kashmiri population about halitosis and its treatment plan.

**Material and Methodology:** a six-month survey was conducted on randomized 200 subjects aged between 13 to 60 years, visiting the private clinic in Srinagar, Kashmir and were asked to fill a self-administered questionnaire form containing 13 questions. The answers were collected and analyzed statistically using SPSS software and chi-square test was done to evaluate the association.

**Results:** the results were tabulated and analyzed statistically. Statistically non-significant results were obtained when parameters asked were correlated with respect to gender with a higher predilection towards females. When correlated with education and socio-economic status statistically significant results were obtained with more awareness among graduates and postgraduates and participants living in middle and upper class.

**Conclusion:** within the limitations of the investigation a low insight, introspection and intellectualism was observed among the male study population regarding halitosis while females were much more aware and intellectual about the cause and treatment plan of the same. Dentists are known to play a major role in informing and educating their patients regarding maintenance of oral hygiene including tongue cleaning.

**Keywords:** Insight; Oral Malodor; Poor Oral Hygiene; Dentists; Tongue Scraping

## Introduction

Halitosis or bad breath or oral malodor is an unpleasant odor of breath which disrupts self-confidence and individual's social as well as professional life [1]. Multifactorial in nature, can have both intraoral and extraoral causes. Intraoral causes include poor oral hygiene, periodontal diseases, unclean dentures, tongue coatings, caries and decreased salivary flow. Surgical wounds formed during extractions, or small stones formed in the tonsils can lead to accumulation of gram negative bacteria which in turn produce volatile sulfur compounds, the main substance responsible for this malodor [2]. Extraoral causes incorporate pathologies related to stomach, lungs, nose, tonsils, psychological factors, many systemic diseases, and even use of drugs [3]. The most commonly identified substances produced from degradation of proteins by various gram negative bacteria include hydrogen sulfide and methyl mercaptan. Associated with dental plaque, tongue coatings and various dental diseases, halitosis can be classified as genuine halitosis, which can be physiological (foul morning breath) or pathological (extra or intraoral causes), pseudohalitosis where patients think about having bad breath even though they actually absent, and halitophobia, a condition in which a person continues to expect awful breath after proper halitosis treatment also [4]. Therapy choices, contingent upon the patient's requirement, may even require a multidisciplinary team approach involving a dentist, a periodontist, ENT surgeons, therapists or psychiatrists. Though a number of preventive measures can be followed including certain oral hygiene procedures, tongue cleaning, toothpaste selection, brushing techniques, and flossing.

The significance of halitosis is vigorously connected with its mental and social effect. Awful breath has been related with mental side effects like depressions, phobias, considerable worries and changes in behavior and can antagonistically influence confidence, self-assurance, and social participation [5]. To quantify Halitosis, three strategies are as of now accessible - organoleptic estimation, which is a standard strategy, gas chromatography and sulfide monitoring. The treatment is essentially centered on decrease of intra oral bacterial burden and transformation of unpredictable sulfur compounds to nonvolatile substrates [2]. Halitosis is seldom dangerous and furthermore it has a good prognosis. The most ideal way to diminish awful breath is by treating the root cause and should remain hydrated. Chewing gum which contains sucrose was found to decrease the volatile sulfur compounds and organoleptic score which is additionally considered as one of the halitosis management techniques. As an elective treatment, anti halitosis products having Zinc, chlorhexidine and cetylpyridinium chloride can be consumed. Natural home remedies such as salt-water rinse, cloves, apple cider vinegar, intake of fruits and veggies are

also effective in treating halitosis [6]. People with halitosis are generally depressed, anxious comparatively and also affect their psychosocial relationship. In order to evaluate the insight, introspection and intellectualism of patients about halitosis and its treatment plan a six month survey was conducted on Kashmiri population in order to find analyze their visualization regarding the same.

## Material and Methodology

randomized 200 subjects aged between 13-60 years visiting the private clinic of Srinagar, Jammu and Kashmir for different dental treatments were selected. A short discussion about the need and outcome for the purpose of the study was done before handing the questionnaire form. A self-administered form containing 13 questions were handed to the study participants. The questionnaire was formed in both Urdu and English and handed to them according to their preferred language. Measures were taken to avoid answering bias and all form of telecommunications was switched off. The study took 6 months to complete the required sample size.

All the records in the form were tabulated and recorded in Microsoft excel sheet and further analyzed using SPSS software version 20.0. Chi square test was used to analyze the association between the required parameters and a p-value of equal to or less than 0.05 was considered to be statistically significant.

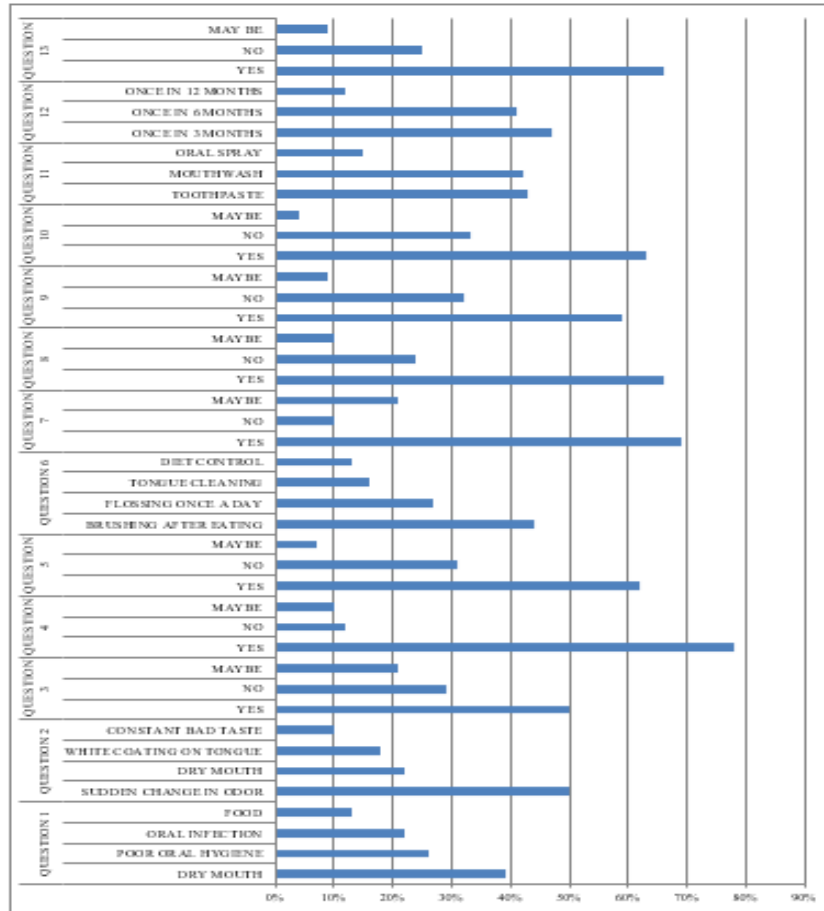
## Results

The study population included 200 participants aged between 13 to 60 years of age. All (100%) of the participants actively participated in the study irrespective of gender and age group. Local language Urdu along with English was used in the form for easy understanding of the questions. Table 1 represented the socio-demographic parameters of the study population where out of total 200 participants 78% were females and 22% were males. The study included participants which were in the age group of 13-28 years (24%), 29-44 years (75%) and 45-60 years (1%). 2% of them completed their education from primary-middle school, 6% had done their education from either high or higher secondary while 81.5% and 10.5% were graduates or post-graduates. Lower class consisted of 2% of the study population; middle class had 83.5% of the participants while 14.5% were from the upper class.

Table 2 & Figure 1 represented the frequency and percentage of the choices made in the questionnaire by the study population. 39% considered dry mouth, 26% poor oral hygiene, 22% oral infection, and 13% considered food as the cause for halitosis. 50% considered sudden change in oral cavity as the common symptom of halitosis, while 22%

considered dry mouth, 18% coating on tongue and 10% as constant bad taste in the mouth. 50% of the total participants considered halitosis as a reversible condition, while 21% were either not sure or considered it as irreversible. 44% of the total participant considered brushing as the best and effective way of reducing halitosis, while only 27% considered

flossing as the best way, 16% and 13% were of the view about tongue cleaning and diet control respectively. Tables 3-5 represented the correlation between gender, education and socio-economic status of the study population with that of the various parameters asked in the questionnaire.



**Figure 1:** Representing the choices made by the study participants regarding the questions asked.

Parameters		Frequency	Percentage
Age	13-28	48	24%
	29-44	150	75%
	45-60	2	1%
	<b>Total</b>	<b>200</b>	<b>100%</b>
Gender	Male	44	22%
	Females	156	78%
	<b>Total</b>	<b>200</b>	<b>100%</b>

<b>Education</b>	Primary-Middle School (1)	4	2%
	High-Higher Secondary (2)	12	6%
	Graduate (3)	163	81.50%
	Postgraduates (4)	21	10.50%
	<b>Total</b>	<b>200</b>	<b>100%</b>
<b>Socio-Economic Status</b>	Lower+ Upper Lower (1)	4	2%
	Lower Middle+ Upper Middle (2)	167	83.50%
	Upper Class (3)	29	14.50%
	<b>Total</b>	<b>200</b>	<b>100%</b>

**Table 1:** Representing the Socio-Demographic Parameters of the Study Subjects.

S.No	Questions	Choices	Frequency	Percentage
1.	What Do You Think is the Main Cause of Bad Breath?	Dry Mouth	78	39%
		Poor Oral Hygiene	52	26%
		Oral Infection	44	22%
		Food	26	13%
2.	What is the Most Common Symptom?	Sudden Change in Odor	100	50%
		Dry Mouth	44	22%
		White Coating on Tongue	36	18%
		Constant Bad Taste	20	10%
3.	Do You Think Halitosis is Reversible?	Yes	100	50%
		No	58	29%
		Maybe	40	21%
4.	Do You Think it is Normal to have Halitosis?	Yes	156	78%
		No	24	12%
		Maybe	20	10%
5.	Do Home Remedies Help in Getting Rid of Halitosis?	Yes	124	62%
		No	62	31%
		Maybe	14	7%
6.	What According to You is the Best Way to Get Rid of Halitosis?	Brushing After Eating	88	44%
		Flossing Once A Day	54	27%
		Tongue Cleaning	32	16%
		Diet Control	26	13%
7.	Does Halitosis Decrease Self Esteem?	Yes	138	69%
		No	20	10%
		Maybe	42	21%
8.	Does Chewing/Smoking Tobacco Cause Halitosis?	Yes	132	66%
		No	48	24%
		Maybe	20	10%

9.	Do You Think Onion/Garlic Intake Cause Halitosis?	Yes	118	59%
		No	64	32%
		Maybe	18	9%
10.	Are People Suffering from Halitosis Psychologically Depressed?	Yes	126	63%
		No	66	33%
		Maybe	8	4%
11.	What According to You is the Best Method to Prevent Halitosis?	Toothpaste	86	43%
		Mouthwash	84	42%
		Oral Spray	30	15%
12.	How often Do you Feel it is Necessary to Visit a Dentist?	Once in 3 Months	94	47%
		Once in 6 Months	82	41%
		Once in 12 Months	24	12%
13.	Do You Think Other Systemic Health Problems Can Cause Bad Breath	Yes	132	66%
		No	50	25%
		May Be	18	9%

**Table 2:** Representing the Frequency of the Choices Made in the Questionnaire.

Questions Asked			Gender		X <sub>2</sub> Value (Chi-Square)	P-Value	Significance
			Female	Male			
Tobacco	Yes	132	107	25	0.112	0.846	Non-Significant
	No	48	37	11			
	Maybe	20	12	8			
Avoiding Food	Yes	118	91	27	3.021	0.21	Non-Significant
	No	64	52	12			
	Maybe	18	13	5			
Systemic Disease	Yes	126	105	27	0.91	0.535	Non-Significant
	No	66	33	15			
	Maybe	8	16	2			
Cause	Dry Mouth	78	55	23	14.14	0.002	Significant
	Poor Oral Hygiene	52	36	16			
	Oral Infection	44	40	4			
	Food	26	25	1			
Common Symptom	Change in Odor	100	78	22	1.421	0.7	Non-Significant
	Dry Mouth	44	32	12			
	White Coating on Tongue	36	29	7			
	Constant Bad Taste	20	17	3			

<b>Home Remedies</b>	Yes	124	96	28	0.629	0.729	Non-Significant
	No	62	50	12			
	Maybe	14	10	4			
<b>How to Rid Halitosis</b>	Brushing	88	70	18	0.923	0.819	Non-Significant
	After Eating						
	Flossing	54	43	11			
	Tongue Cleaner	32	23	9			
	Diet Control	26	20	6			
<b>Self Esteem</b>	Yes	138	133	5	113.66	0	Highly Significant
	No	20	17	37			
	Maybe	42	40	2			
<b>Psychologically Depressed</b>	Yes	126	123	3	81.21	0	Highly Significant
	No	66	27	39			
	Maybe	8	6	2			
<b>Prevention</b>	Toothpaste	86	74	12	7.238	0.026	Significant
	Mouthwash	84	58	26			
	Oral Spray	30	24	6			
<b>Visit Dentist</b>	Once in 3months	94	84	10	30.077	0	Highly Significant
	6 Months	82	63	19			
	12 Months	24	9	15			

**Table 3:** Representing the Correlations between Gender and Parameters asked in Questions.

Questions Asked			Education				X <sub>2</sub> Value (Chi-Square)	P-Value	Significance
			1	2	3	4			
			4	12	163	21			
<b>Tobacco</b>	Yes	132	2	6	112	12	5.927	0.431	Non-Significant
	No	48	1	3	38	6			
	Maybe	20	1	3	13	3			
<b>Avoiding Food</b>	Yes	118	1	7	95	15	8.39	0.21	Non-Significant
	No	64	2	2	55	5			
	Maybe	18	1	3	13	1			
<b>Systemic Disease</b>	Yes	126	0	2	105	19	45.81	0	Highly Significant
	No	66	2	6	56	2			
	Maybe	8	2	4	2	0			
<b>Cause</b>	Dry Mouth	78	1	1	71	5	37.6	0	Highly Significant
	Poor Oral Hygiene	52	1	10	28	13			
	Oral Infection	44	1	1	41	1			
	Food	26	1	0	23	2			

<b>Common Symptom</b>	Change in Odor	100	2	3	90	5	16.823	0.051	Non-Significant
	Dry Mouth	44	1	4	30	9			
	White Coating on Tongue	36	1	4	25	6			
	Constant Bad Taste	20	0	1	18	1			
<b>Home Remedies</b>	Yes	124	2	9	109	4	21.333	0.001	Significant
	No	62	1	2	46	13			
	Maybe	14	1	1	9	4			
<b>How to Rid Halitosis</b>	Brushing	88	3	10	67	8	38.206	0	Highly Significant
	After Eating								
	Flossing	54	1	0	45	9			
	Tongue Cleaner	32	0	2	26	4			
	Diet Control	26	0	0	26	0			
<b>Self Esteem</b>	Yes	138	1	3	119	15	45.92	0	Highly Significant
	No	20	3	6	6	5			
	Maybe	42	0	3	38	1			
<b>Psychologically Depressed</b>	Yes	126	1	2	103	20	74.657	0	Highly Significant
	No	66	0	5	61	0			
	Maybe	8	3	5	0	1			
<b>Prevention</b>	Toothpaste	86	3	8	57	18	23.2	0	Highly Significant
	Mouthwash	84	1	4	76	3			
	Oral Spray	30	0	0	30	0			
<b>Visit Dentist</b>	Once In 3months	94	0	2	80	12	39.55	0	Highly Significant
	6 Months	82	1	3	70	8			
	12 Months	24	3	7	13	1			

**Table 4:** Representing the Correlations between Education and Parameters Asked in Questions.

Questions Asked	Socio-Economic Status					X <sub>2</sub> Value (Chi-Square)	P-Value	Significance
	1	2	3					
	4	167	29					
<b>Tobacco</b>	Yes	132	2	103	27	12.08	0.016	Significant
	No	48	1	46	1			
	Maybe	20	1	18	1			
<b>Avoiding Food</b>	Yes	118	1	94	23	5.779	0.216	Non-Significant
	No	64	1	57	6			
	Maybe	18	2	16	0			
<b>Systemic Disease</b>	Yes	126	0	102	24	63.99	0	Highly Significant
	No	66	1	64	1			
	Maybe	8	3	1	4			

<b>Cause</b>	Dry Mouth	78	0	78	0	82.371	0	Highly Significant
	Poor Oral Hygiene	52	2	22	28			
	Oral Infection	44	2	41	1			
	Food	26	0	26	0			
<b>Common Symptom</b>	Change in Odor	100	0	98	2	64.321	0	Highly Significant
	Dry Mouth	44	1	31	12			
	White Coating on Tongue	36	3	16	17			
	Constant Bad Taste	20	0	20	0			
<b>Home Remedies</b>	Yes	124	3	119	2	51.35	0	Highly Significant
	No	62	1	36	25			
	Maybe	14	0	12	2			
<b>How to Rid Halitosis</b>	Brushing	88	2	71	15	7.44	0.282	Highly Significant
	After Eating							
	Flossing	54	0	49	5			
	Tongue Cleaner	32	2	21	9			
	Diet Control	26	0	21	5			
<b>Self Esteem</b>	Yes	138	1	111	26	6.968	0.137	Non- Significant
	No	20	3	17	0			
	Maybe	42	0	39	3			
<b>Psychologically Depressed</b>	Yes	126	0	99	27	17.06	0.001	Significant
	No	66	3	63	0			
	Maybe	8	1	5	2			
<b>Prevention</b>	Toothpaste	86	3	59	24	23.31	0	Highly Significant
	Mouthwash	84	1	78	5			
	Oral Spray	30	0	30	0			
<b>Visit Dentist</b>	Once in 3months	94	0	81	13	3.93	0.414	Non- Significant
	6 Months	82	3	64	15			
	12 Months	24	1	22	1			

**Table 5:** Representing the Correlations between Education and Parameters Asked in Questions.

## Discussion

Bad breath is a typical worldwide issue with significant mental and social ramifications, including an adverse consequence for personal, professional as well as social effects [7]. The overall prevalence of halitosis has been deep rooted in numerous studies with a perceivance of 8 to 50% in the developed world [8]. The prevalence of halitosis has been revealed in literature and accounts for around 50% in USA, 27.5% in China and 22% in France [9-11]. Clinically, the presence of various bacterial species alongside temperature and humid conditions in the oral

cavity can produce foul compounds [8,12]. Its discoveries are significant in light of the fact that halitosis is one of the most unattractive part of social interaction [13]. The presence or absence of halitosis is frequently observed by people all alone. The etiology could be either of intraoral or extraoral origin. The diagnosis is typically subjective as there are no standard rules to characterize a patient with halitosis [14]. The results of our study showed a higher self-perception of halitosis among females with highly significant results (Table 3). Research has shown that inescapability and frequency proportions between the males and the females are same; however females tend to seek more treatment frequently



than men just due to the social and self pervasiveness. Similar results were obtained in previous studies conducted by Al-Ansari JM, et al. [15] and Bosy A, et al. [16] in the year 2006 and 1997 respectively. Self-perception of bad breath is sometimes a feature of psycho-physiological issue with multifactorial etiology firmly connected with every individual's psychopathological profile [17]. In the current study statistically significant results were obtained when asked about the correlation of halitosis and the affected person being psychologically depressed. Females were more towards having a positive response when compared with males Table 3, graduates and postgraduates Table 4 and patients living in upper middle and high class Table 5 were more inclined towards a positive response regarding the same. Similar results were obtained by various studies conducted by Eli I, et al. [17] and Rosenberg ME [18].

In the ongoing study, alongside good oral hygiene practices with significant results among educated (Table 4) and middle and upper-class patients Table 5 still there was an advancement of halitosis, which could be because of other perplexing factors. This proclamation was upheld by different investigations done by Al Atrooshi BA, et al. [19], Aylikci BU, et al [20] and Murata T, et al. [21] which expressed that variables could be related with various systemic diseases, drugs, extraneous behavioral cause (smoking) and various food items [19-21]. The results were similar with significant results in cases with higher education and living standards (Tables 4 & 5), where subjects were well versed with the causes being either tobacco usage in any form along with systemic diseases as one of the cause. Non-significant results were observed when correlated with gender (Table 3). In spite of number of modes of awareness about the prevention and reduction of oral halitosis only 27% of the total population were aware about flossing of teeth while a mere 16% of the all cleaned their tongue (Table 2). In contrast, a higher percentage of subjects using dental floss were found in north eastern Ontario by Hamilton ME, et al. [22]. The justification for this might be the instructive programs, reliably done in Canada and various other parts, where oral health instructions are incorporated in every sector of profession, class teachings and various camps are organized at root level by specially trained dental professions on oral health principles and prevention of various dental issues which lack in our general public [23].

In maximum of the earlier studies conducted around 85% of them considered oral cavity as the origin of halitosis. Studies conducted by Quirynen M, et al. [24] and Gothai S, et al [25] showed that tongue coatings (43%) and gingivitis/periodontitis (11%) or a combination of the two (18%) was found to be the main cause of halitosis [24,25]. Similar results were found in our survey where around 26% considered poor

oral hygiene as the cause of halitosis. On statistical evaluation, non-significant results were observed with no predilection of gender and education status of the study population while a significant result was obtained with socio-economic status. Statistical results were obtained when asked about regular dental visits. Female predilection along with higher educated subjects prefers visiting a dental professional after every 3 months. Our study was in consistent with the studies conducted by Penmetsa GS, et al. [23], Behbehani JM, et al. [26], Petersen PE, et al. [27], Al-Hussaini R, et al. [28] and Johani HA [29] The principal factor while prescribing a plan to battle oral malodor is the patient's diet alongside a guidance to stop smoking, use of tobacco items and dentifrices [30,31]. In this study, 62% of respondents opted home cures to get rid of oral halitosis while 31% were not of the opinion. In an examination done by Haghgoo R, et al. [32] they revealed that the utilization of concealing agents like mouthwash, oral sprays, fluoride containing toothpaste, chewing gums or mint tablets can be used to conceal and sometimes fight with the cause of halitosis but all these were found to have a short-term impact [32]. In our study, 42% of the respondents used mouthwash for removing or concealing the effect of halitosis, while 43% and 15% considered toothpaste and oral sprays as the best medicated option for the same. An essential job in the control of halitosis is the mechanical removal of tongue biofilm which is accomplished by either tongue scraper or tongue brushing [33,34]. In our study, 44% respondents felt cleaning teeth after eating will help in diminishing halitosis, while 27% considered flossing once a day can reduce bad breath, 16% tongue cleaning and 13% considered changing eating regimen can help in reducing halitosis. The majority of the outcomes from past writing are more or less similar to the results evaluated in our study.

The current study was the first kind of study to be held on Kashmiri population just to check their level of mindfulness and awareness about the cause, its effects and percentage of population putting efforts in getting any sort of professional help to remove the root cause.

### Limitations

The main limitation of the study was sample size. The study should have been conducted on a larger scale to evaluate the much better insight and perception about halitosis. Another limitation was inappropriate gender related data as a higher sample size was of females.

### Conclusion

All oral malodor is by and larger ineffectively understood in all of its features. Therefore, it is important to promote much more general awareness and education. To reduce this issue, standard visits to dental specialists and other medical care suppliers ought to be advanced. It ought to be focused

on that dental specialists have an obligation to teach and exhort their patients about oral malodour, and dentist ought to get sufficient preparation in taking care of this issue by coordinating dental camps and talks.

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