

# The Relationship of Oral Hygiene Habit with Halitosis Perception Among the Users of The Fixed Orthodontic

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## ABSTRACT

**Background:** Fixed orthodontic users who have bad oral hygiene habits are possible to have the perception of halitosis or bad breath. Based on research conducted by Bollen & Beikler in 2012, 25% of the world's population experiences halitosis. Based on data from the Ministry of Health Riskesdas in 2018, the prevalence of orthodontic users is 0.3%. The existing treatment for the problem of halitosis in fixed orthodontic users is proper tooth-brushing techniques, a "healthy teeth" diet, and routine appointments to follow up with the dentist, however, modification of existing dietary and oral hygiene habits is not easy to achieve and requires special efforts. On the part of dentists and patients, as well as the lack of discipline of fixed orthodontic users to maintain oral hygiene properly, can make some users experience halitosis. Therefore, further surveys are needed regarding the relationship between oral hygiene habits with the perception of halitosis in fixed orthodontic users to prevent halitosis.

**Objective:** To analyze the correlation between oral hygiene habits and the perception of halitosis in fixed orthodontic users.

**Methods:** Data were collected from distributing questionnaires toward fixed orthodontic users. Then, the normality test was done using Shapiro-Wilk and then the Spearman analysis test was also performed.

**Results:** The percentage of respondents who had good oral hygiene habits was 48% while the bad ones were 52%. The percentage of respondents who had positive halitosis perceptions was 64.7% while the negative was 35.3%. The correlation coefficient of the two variables showed a weak correlation.

**Conclusion:** There was a correlation between oral hygiene habits with the perception of halitosis.

**Keywords:** Perception of halitosis, fixed orthodontic, oral hygiene habit

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## INTRODUCTION

Halitosis or bad breath is a problem that often occurs in the community. Based on research conducted, 25% of the world's population experiences halitosis and are usually unaware of the condition [1,2]. The prevalence of the Indonesian population using orthodontic treatment is 0.3% [3]. For fixed orthodontic users who have bad oral hygiene habits are possible of having a perception of halitosis. The 90% factor causing halitosis is lack of oral hygiene [4]. While in Indonesia there are 57.6% of the population who have dental and oral health problems, and around 10.2% have received treatment and care from dental medical personnel [3,5].

Causes of halitosis in fixed orthodontic users are specific changes in the oral cavity, changes in the oral cavity environment, an increase in the number of bacteria due to the formation of plaque retention sites around the bracket, changes in salivary buffer capacity, degree of acidity, and salivary flow rate [6,7]. The existing measure related to the problem of halitosis in patients with fixed orthodontic user include correct tooth-brushing techniques, a "healthy teeth" diet, and routine follow-up appointments with the dentist, these are essential for the long-term success of orthodontic therapy. However, modification of dietary habits and oral hygiene is easy to achieve and requires special efforts on the part of the dentist and patient. Also, the lack of discipline of the fixed orthodontic users to maintain oral hygiene properly will trigger the symptom of halitosis. Therefore, further

surveys are needed regarding the relationship between oral hygiene habits with the perception of halitosis in fixed orthodontic users to prevent halitosis.

## METHODOLOGY

This study was a cross-sectional observational analytic study with a questionnaire containing fifteen questions about oral hygiene habits as independent variables and eight questions about the perception of halitosis as dependent variables. The sample used was 100 respondents who used fixed orthodontic Respondents filled out the questionnaires following their respective circumstances. Previously, the questionnaire was subjected to an ethical test and respondents were asked to approve the informed consent given. Analysis of the data used in this study was a Bivariate correlation analysis with the Spearman correlation test and a p-value <0.05. Indicator of oral hygiene habit was said to be good if the total score was 23-30 if the total score was 15-22 then oral hygiene habit was said to be bad. The indicator of halitosis perception was said to be positive if the total score was 12-16 if the total score was 16-22 then the perception of halitosis was positive.

## RESEARCH RESULT

From the results of the questionnaire that was filled out by respondents, scoring and data processing were also conducted to determine indicators of oral hygiene habits and halitosis perceptions.

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**Table 1.** Sociodemographic description of respondents

View of Sosiodemografis		Number of Respondents	Percentage
Gender	Male	9	8,82%
	Female	93	91,17%
Occupation	Doctor/ Dentist	2	1,96%
	College student	100	98,03 %
Age	17 years	4	3,92%
	18 years	26	25,49%
	19 years	36	35,29%
	20 years	19	18,62%
	21 years	7	6,86%
	22 years	5	4,9%
	23 years	2	1,96%
	24 years	1	0,98%
25 years	1	0,98%	

**Table 2.** Results of oral hygiene habit distribution and perception of halitosis

	Oral Hygiene Habit		Halitosis Perception	
	Good	Bad	Positive	Negative
Number of Respondents	49	53	66	36
Percentage	48%	52%	64,7%	35,3%

Based on the results of scoring, the percentage of respondents who had good oral hygiene habits was 48% while the bad oral hygiene habits were 52%. The

percentage of respondents who had positive halitosis perceptions was 64.7% while the negative was 35.3%.

**Table 3.** The Normality Data Test

Tests of Normality	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
	c			c		
Oral Hygiene Habit	,104	102	,009	,977	102	,071
Halitosis Perception	,134	102	,000	,950	102	,001

The normality test was done by using the Shapiro-Wilk test to find out whether the data is normally distributed. The results of the normality test showed that the data were normally distributed with a value of 0.71 because the significance value was more than 0.05. Whereas the

halitosis perception variable using the Shapiro-Wilk test showed that the data were not normally distributed with a significance value of 0.01 because the significance value was less than 0.05.

**Table 4.** Spearman Correlation Test

Correlations			Ohh	persepsi_halitosis
Spearman's rho	Ohh	Correlation Coefficient	1,000	,240*
		Sig. (2-tailed)	.	,015
		N	102	102
	persepsi_halitosis	Correlation Coefficient	,240*	1,000
		Sig. (2-tailed)	,015	.
		N	102	102

\*. Correlation is significant at the 0.05 level (2-tailed).

One of the variables was not normally distributed, then the correlation test was performed with the Spearman Bivariate correlation test. Correlation test showed that oral hygiene habits and perception of halitosis had a relationship because the sigma value was less than 0.05 i.e. 0.015 so that H0 was rejected and H1 was accepted. The correlation coefficient value of the two variables was

0.240, which showed a positive relationship. If the respondent had a bad oral hygiene habit, the more realistic perception of halitosis they would have. Conversely, the better the oral hygiene habit, the less feeling of halitosis would be. The strength of the correlation between the two variables was weak because the correlation coefficient was close to zero.

**Table 5.** Percentage of the Result of the Study

	Percentage	
	Yes	No
Brushing teeth twice a day	96,07%	3,93%
Brushing teeth for two minutes	61,81%	40,19%
Using Mouthwash	11,77%	88,23%
Cleaning the tongue	48,04%	51,96%
Feeling bad breath in the morning	68,62%	31,38%
Feeling bad breath when stressed	16,67%	83,33%
Feeling bad breath when fasting	76,47%	23,53%
Feel bad breath affects social life	29,41%	70,59%
Feeling having a dry mouth	34,31%	65,69%
Experiencing bleeding gums	17,64%	82,36%

In this study, it was found that the percentage of respondents who did not brush their teeth twice a day was 3.93% and did not brush their teeth for two minutes was 40.19%. The percentage of respondents who did not use mouthwash was 88.23% and those who did not clean their tongue were around 51.96%.

This study also found that 68.62% of the total respondents felt they had halitosis in the morning, 16.67% felt they suffered from halitosis when they were stressed, and 76.47% when fasting. Of the total respondents who experienced halitosis perceptions, 34.31% of them felt that they had dry mouth, 17.64% had bleeding gums, and 29.41% felt that their bad breath had affected their social life.

## DISCUSSION

This research was a survey based on knowledge, attitudes, and practices conducted in the area of the Faculty of Dentistry, Airlangga University regarding self-perception of halitosis. The purpose of this study was to analyze the relationship between oral hygiene habits with the perception of halitosis in fixed orthodontic users. This study also aims to link various factors such as gender and age tendencies, occupation, physiological factors, tongue lining, psychological factors, habits, and halitosis. The use of products such as mouthwash was common to cover up halitosis. Questions related to the topics mentioned above were included to link halitosis with these factors.

This study showed that there was a lack of respondents' knowledge regarding halitosis and overall oral hygiene. Based on the data show that as we get older and social

interaction, knowledge and self-perception about halitosis will automatically increase [8,9].

Based on data, the respondents had a positive perception of halitosis (64.7%). This was due to the lack of social awareness about maintaining oral hygiene such as not brushing teeth twice a day for at least 2 minutes, not using dental floss, not gargling using mouthwash, not cleaning the tongue, and having poor eating habits.

In this study, respondents who used fixed orthodontic were dominated by women (91.17%) compared to men (8.82%). This is because women tend to pay more attention to aesthetics than men. Halitosis was less common in men. It seems that women were more worried than men about their bad breath [10,11]. Volatile Sulfur Compound (VSC) was higher and the salivary flow rate was lower in the menstrual and premenstrual phases when compared to the follicular phase.

It can be seen in this study that 68.62% of the total respondents felt they had halitosis in the morning. The reason for this was a reduction in salivary flow rate, increased salivary viscosity, the decay of food particles, and bacterial accumulation at night on the dorsum of the tongue. Reduced salivary flow during sleep supported the increased activity of anaerobic bacteria, giving rise to what was called "morning-breath" [12,13].

In this study, it was found that 16.67% of the respondents felt they suffered from halitosis when they were stressed and 76.47% of respondents felt it when fasting. During stress, the sympathetic system was activated to reduce the flow of saliva relating to halitosis [14]. It was also found that anxious situations could increase VSC concentration and triggering the forming of halitosis

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perception [15]. In conditions of starvation or fasting, the mechanical movement of the tongue was reduced and caused a reduction in the oral cavity action and the rate of salivary flow decreased [16].

Of the total respondents who experienced halitosis, 34.31% of them felt they had dry mouth. Dry mouth was another important cause of halitosis. The reduced amount of saliva contributed to the increase of plaque accumulation, microbial load, and the release of VSC compounds as gases when the mouth was dried [17]. Respondents with dry mouth showed an increase in plaque volume [18,19]. Lack of salivary flow causes loss of salivary antimicrobial activity which in turn caused accumulation of Gram-positive bacteria into Gram-negative species [20].

This study found that of the respondents suffering from halitosis, 17.64% of them had bleeding gums. There was a positive correlation between bad breath and periodontitis because it had the same microbes. Pocket depth was correlated with VSC concentration in the mouth [8].

In this study, 29.41% of people suffering from halitosis felt that their bad breath had affected their social life. Halitosis was considered a socio-phobic disease [8]. Specifically, a form of halitosis known as halitophobia was recognized as a psychiatric condition. Halitosis was always being considered a social obstacle.

This study showed inadequate use of basic oral hygiene habits such as not brushing teeth twice a day 3.93% and brushing teeth for two minutes 40.19%. This result showed that even though brushing teeth twice a day did not ensure the respondents for having any perception of halitosis, because what affected was the technique and time of brushing.

In this study, those who did not use mouthwash 88.23% and who did not clean their tongue around 51.96%. Halitosis was a reflection of poor oral health. Lack of oral hygiene resulted in the accumulation of plaque bacteria and the growth of microorganisms ultimately leading to halitosis. It had also been reported, alcohol-free mouthwash had been shown to have better action against halitosis because alcohol caused dehydration which aggravated halitosis [21]. Studies had shown that brushing the teeth without rinsing with mouthwash or tongue cleaning did not have a significant effect on VSC concentrations [22].

### CONCLUSION

In fixed orthodontic users if they do not maintain oral hygiene habits properly such as brushing teeth twice a day for two minutes, using dental floss, cleaning the tongue, using mouthwash, and maintaining a diet will be possible to have an impact on the perception of halitosis. If oral hygiene habits are bad, then the perception of halitosis in fixed orthodontic users will become more apparent.

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