

Relationship Between Halitosis Level and Oral Hygiene in High School Student

Suci Erawati^{1*}, Idamawati Nababan¹, Hans Wijaya²

¹Public Health Department, University of Prima Indonesia, Medan, Indonesia.

²Faculty of Dentistry, University of Prima Indonesia, Medan, Indonesia.

Received: October 30, 2023

Revised: November 29, 2023

Accepted: December 25, 2023

Published: December 31, 2023

Corresponding Author:

Suci Erawati

esuci64@gmail.com

DOI: [10.29303/jppipa.v9iSpecialIssue.6348](https://doi.org/10.29303/jppipa.v9iSpecialIssue.6348)

© 2023 The Authors. This open access article is distributed under a (CC-BY License)



Abstract: Halitosis, known as bad breath, is a condition in which many patients complain about that cause unpleasant odor that comes from the mouth, which can affect the quality of life both psychologically and social life. Knowledge of maintaining oral health plays an important role in oral health conditions. This research to discover whether there is correlation between halitosis and the level of oral hygiene in high school students at Letjen S.Parman school in Medan. Researcher used a descriptive observational method which then analyzed the data using SPSS bivariate analysis with Pearson measuring to analyze the correlation between halitosis and oral hygiene. Shapiro-Wilk test found sig.value amounting to 0.180 on the questionnaire score and 0.068 on the OHIS, both results are greater than 0.05 indicates the datas are normally distributed. Then bivariate analysis was carried out and the Pearson results obtained showed Sig (2 tailed) value of 0.421, where the significance value was Sig.(2 tailed) 0.004<0.05, so can be affirmed that there is a relation between halitosis and the level of oral hygiene. H1 is accepted, which defines that there is an association between halitosis and the level oral hygiene of high school teenagers at Letjen S. Parman Medan school.

Keywords: Halitosis; High School Student; Oral Hygiene

Introduction

Halitosis or what is usually called bad breath is a condition that many patients complain about because the unpleasant odor that comes out of the mouth can affect a person's quality of life both psychologically and in their social life (Bicak, 2018). Based on data collected by Nazir et al (2017), an evaluation of the prevalence of halitosis was carried out in a number of residents in Lahore, Pakistan and it was found that 75.1% of residents were aware that they had bad breath. In Japan itself, a group of researchers conducted research on the prevalence of bad breath in Japanese schools among elementary to high school students, and found that 44.9% of subjects experienced halitosis with a proportion of 43.6% male and 46.6% female (Ueno. et al, 2018).

Halitosis itself can be classified into 2 large department, namely true halitosis and delusional

halitosis (Murata, 2002). True halitosis can also be divided again become physiological and pathological halitosis, physiological halitosis is caused by hyposalivation while a person sleeps and is related to the use of dentures, orthodontic devices, and smoking habits. Meanwhile, pathological halitosis is caused by intraoral factors such as: periodontal infections, xerostomia, mucosal lesions, as well as odontogenic infections and extraoral factors such as diabetes mellitus, GERD, leukemia, kidney failure, liver failure and so on (Kapoor et al. 2016).

Delusional halitosis is divided into 2 types, namely pseudohalitosis and halitophobia, where pseudohalitosis is a condition when the patient complains of bad breath but when examined no halitosis is found, whereas halitophobia is a condition where sufferers feel anxious and believe that they have bad breath but in reality they don't (Uguru et al, 2014).

How to Cite:

Erawati, S., Idamawati, I., & Wijaya, H. (2023). Relationship Between Halitosis Level and Oral Hygiene in High School Student. *Jurnal Penelitian Pendidikan IPA*, 9(SpecialIssue), 1083–1088. <https://doi.org/10.29303/jppipa.v9iSpecialIssue.6348>

Volatile Sulfur Compound (VSC's) is the main cause of halitosis and bacteria in oral cavity play a role in occurrence of halitosis (Lee & Hong, 2023). VSC is a compound produced from protein then processed and broken down by anaerobic bacteria, especially on the surface of the tongue surface. Surface of the tongue there's a covering layer in which there are live bacteria such as Actinomyces and Fusobacterium, which is the main cause of bad breath or halitosis. Apart of that, buildup of bacteria in the oral cavity and a pH that is above normal will encourage the growth of negative Granstorm germs which produce an unpleasant odor and cause halitosis (Ratmini, 2017).

The impact of halitosis itself is very disruptive to a person's life, especially today's teenagers who need self-actualization and a good appearance that can caused extremely bad psychological in their life (Mento et al., 2021). With bad breath experienced, teenagers will lose self-confidence, become stressed, anxiety, having a difficulty in communicating, feel embarrassed, and are reluctant to socialize with friends around them (Cahyamirani, 2013). This is of course a concern for teenagers, so education and action in maintaining oral health and hygiene is very necessary for every individual (Yulimatussa'diyah, 2016).

There are various causes of halitosis (bad breath) which can start from a lack of knowledge about maintaining oral hygiene, lack of action in maintaining oral hygiene, certain foods such as garlic, shallots, onions, curry and so on, smoking, drinking alcohol, (Scully et al, 1994). then it can also result from gingival inflammation, gingival recession, dental caries, abscesses, tooth impaction. It can also originate from a person's systemic conditions such as diabetes mellitus, kidney failure, liver failure, sinusitis, digestive disorders and others. Apart from what has been mentioned, halitosis can also come from psychogenic factors in someone who feels they have bad breath but in reality they don't (Wiyatmi, 2014).

According to Be (1987), oral hygiene is a must in every individual that shows in a person oral cavity free from plaque and calculus. The level of knowledge about maintaining dental health plays an important role in the condition of dental and oral health. Knowledge of maintaining oral hygiene alone is not enough without action in cleaning teeth, both must work in balance. There are various outcomes when a person did not taking care of their oral hygiene such as caries, periodontal disease, plaque, halitosis, gingivitis, and others more (Manurung, 2017).

Teeth and tongue will help process incoming food and with the help of saliva to help clean the oral cavity mechanically, however, if oral hygiene is not maintained then it is inevitable that oral problems will arise (Budi, 2017). Moreover, during the Covid-19 pandemic, it has

had an impact on people's dental and oral health (Kamelia et al, 2021), this is supported by data from Kemenkes RI Dirjen P2P (2021), where 31% of people have the habit of brushing their teeth, 20% have the habit of using mouthwash, and 11 % of children only brush their teeth once or don't brush their teeth once a day.

Various treatments for halitosis already exist in the community, such as the use of mouthwash and tongue scrapers which have been proven to be effective in helping reduce halitosis. Based on research conducted at RSGM Prof. University. DR Moestopo, the group that was tested for brushing their teeth using a tongue scraper had a lower halitosis score than the group that brushed their teeth without using a tongue scraper (Widyastuti, 2021). Currently, a mouthwash made from cardamom essential oil with a concentration of 0.5% has also been tested and it was found that gargling with cardamom essential oil twice a day for 5 consecutive days has been proven to reduce the activity of gas-causing bacteria volatile sulfur compounds (Erawati, 2022).

From field surveys, many students at Letjen S. Parman High School complained about the poor condition of their mouths, such as cavities or tooth caries, bad breath when waking up or when talking to friends, which ultimately disrupted their quality of life, especially during the pandemic. COVID-19 where education and counseling on maintaining oral health is lacking. Based on the explanation above, this research was conducted to see the relationship between halitosis and the oral hygiene status of high school students at the Letjen S.Parman school.

Method

Research design

Used a descriptive observational method by checking the oral hygiene index in children teeth and the score from the questionnaire, which then analyzed the data using SPSS bivariate analysis with Pearson measurements to analyze the relationship between halitosis and oral hygiene.

Time and Place

All data collected in Letjen S.Parman school dan this research was being conducted in March 2023

Population and Sample

In this research we used total sampling (Sugiyono, 2007) means that all population from senior high school grade in Letjen S. Parman school where there are 44 total respondents in this school

Tools and Materials

Tools that been used in this research such as pen, mouth mirror, sonde, SPSS Statistic 2.0. Then for the material we used questionnaire

Collecting Data

First, every student will receive a form of questionnaire for them to answer each question given in them based on ther knowledge, experience, behaviour, and things that can worsen a person to have halitosis, then after finishing the questionnaire, student will go through intraoral examination the check their oral hygien level with Oral Hygien Index Simplified formula below this (Greene and Vermillion, 1964). There are 6 teeth that being check such as (Sari & Made, 2018), Labial surface of 11 teeth, Buccal surface of 16 teeth, Buccal surface of 26 teeth, Labial surface of 31 teeth, Lingual surface of 36 teeth, and Lingual surface of 46 teeth.

If during the examination the teeth mentioned above are not present in the patient's mouth, then the adjacent tooth can be replaced with the same element or the region of the tooth can be replaced, for example if the patient does not have tooth 11, it can be replaced with tooth 21, but if the patient does not have both then there is no assessment for these teeth, this applies the same to molar teeth, if the first molar is not present, then an assessment can be carried out on the second molar, and if the first and second molars are not present, then an assessment is carried out on the third molar, but if the molar first, second, and third are absent, so there is no assessment for the tooth (Green & Vermillion, 1964).

Analyzed Data

Inferential data analysis is used to determine the relationship between 2 variables (Sugiyono, 2019) which aims to determine the relationship between the level of oral hygiene and halitosis in high school students at the Letjen S.Parman school and normalty test is used to see whether the data is distributed normal or not (Mishra et al, 2019) are presented in the form of a distribution and percentage table.

Result and Discussion

Dental hygiene will certainly affect a person's quality of life in daily activities, especially in terms of communication, if a person has or suffers from bad breath, also known as halitosis (Briceag, 2023), Halitosis can be interpreted as an unpleasant odor caused by various factors and also psychologically from the sufferer, where the compounds most often found are VSCs (Volatile Sulfur Compunds). This will make the person you are talking to feel disturbed and again the sufferer will feel embarrassed when reprimanded, which will later disturb the person's psychology.

Likewise, this has been expressed in the paper written by Azodo, et al about the Psychological and Social Impact of Halitosis: A Review which explains the negative effects of halitosis which can affect all aspects of a person's life such as family, love, friendships in the work environment or at school. which give significant negative impact on a human being social and psychological well-being.

Research was conducted with a total 44 respondents and each of them had answered the quisionnaire given and being scored based on their answer in each question, and also taken and oral hygiene examination by the researcher, in which the result of those variables are seen in Figure 1 and Figure 2.

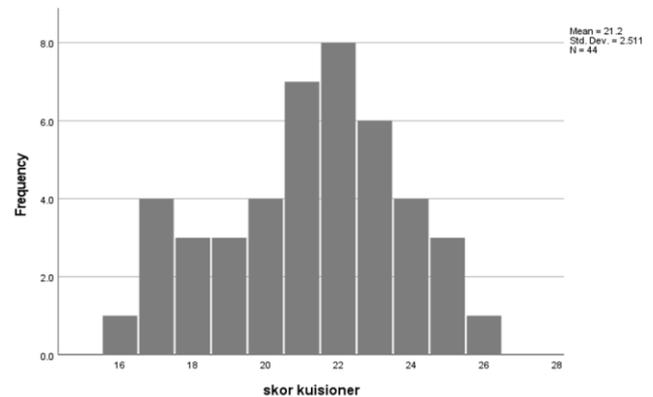


Figure. 1 Result Questionnaire Completion By Students

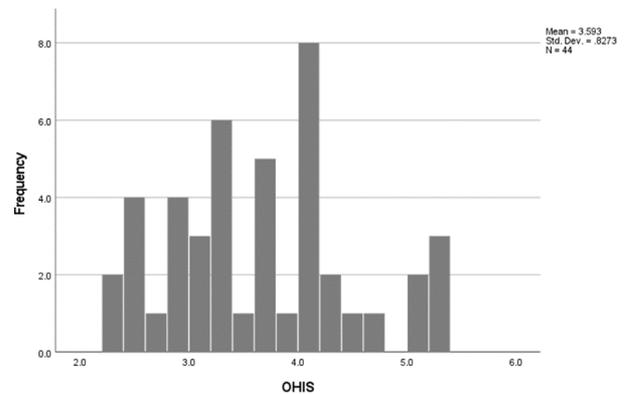


Figure. 2 Result of OHI-S Examination

From the intraoral examination carried out to measure the degree of good or bad oral hygiene in students using the OHIS (Oral Hygiene Index Simplified) assessment system, it was found that the average score of the 44 respondents was 3.59 which can be categorized as bad, this is of course can have a negative impact on dental and oral health which can lead to various disease problems in the future. So when this research was carried out, researchers also provided outreach to students about the importance of maintaining healthy teeth, how to care for and maintain dental hygiene, as well as the best time to visit the dentist

for regular check-ups, so that in the future every student can avoid dental problems. which can interfere with his quality of life.

As well being know that the main bacteria that causes dental caries is *Streptococcus mutans*. These bacteria are cariogenic, which means they have the ability to cause caries, and are acidogenic, which means they are able to produce acid from carbohydrates that enter the mouth, and are aciduric, which allows these bacteria to survive at low pH (Lemos, 2013).

Then a questionnaire form was given to students to answer each question listed which was intended to measure bad breath by looking at students' patterns of behavior and thinking in maintaining oral health, their knowledge, and habits carried out by students that could lead to or cause bad breath. And from the results of filling out the questionnaire, it was found that the overall average was 21.2 with a score range between 10-30 from good to bad, so it can be seen that the results of the questionnaire for Letjen S.Parman High School students had a fairly high impact on the condition of bad breath. what they feel or cause.

Furthermore, those datas going through test of normality using shapiro-wilk used to see whether the data is being distributed normal or not and it was found that the datas is being distributed normally with score of p or Sig. > 0,05 that can be seen in Table 1.

Table 1. Test of Normality Shapiro-Wilk

	Shapiro-Wilk		
	Statistic	Df	Sig.
skor kuisisioner	.964	44	.180
OHIS	.952	44	.068

Table 2. SPSS bivariate analysis with the Pearson measuring instrument

		OHIS	skor kuisisioner
OHIS	Pearson Correlation	1	-.421**
	Sig. (2-tailed)		.004
	N	44	44
skor kuisisioner	Pearson Correlation	-.421**	1
	Sig. (2-tailed)	.004	
	N	44	44

And lastly, as the aim of this reasearch being done is to know whether there is a correlation between halitosis and level of oral hygiene, therefore a comparison was carried out using SPSS with bivariate analysis using the Pearson measuring instrument. And we can find out that Pearson's results showed a Sig(2 tailed) value of 0.421, where the significance value was Sig.(2 tailed)0.004<0.05 which the data shown in Table 2. So it can be interpreted or concluded that Ho is rejected and H1 is accepted, which means that there is a relationship between halitosis and the level of oral

hygiene of high school teenagers at the Letjen S. Parman Medan school. This research shows that the higher the level of oral hygiene, the higher the influence on bad breath felt by students.

This can also be strengthened by research conducted by Setia, et al (2004) which reports that people who have a habit of smoking and also have dry mouth (xerostomia) have a significant level or correlation with halitosis, where 8 out of 10 respondents who smoke have halitosis. and 30 of the 44 respondents who had dry mouth also had bad breath. Apart from that, dental caries can also be an impact of halitosis, where it was reported that 62 respondents out of 120 people who had dental caries also had bad breath. Setia, et al's research was aligned with experiment conducted by Kauss, et al (2022) which examined the comparison between active smokers and non-smokers with the tendency to experience halitosis, and from their research it was concluded that active smokers had a higher prevalence rate of halitosis compared to people who did not. smoke

Conclusion

Halitosis can occur in children not only in adults, due to bad habits or poor oral hygiene. Judging from the Pearson results with sig. (2 tailed) has a value of 0.004, so it is proven that there is a relationship between halitosis and the level of oral hygiene in high school teenagers at the Letjen S Parman School.

Acknowledgments

In this articles, we would like to thank all people that had contributed in the process of the research and to parents and friend that had supported and prayed to accomplished this article.

Author Contributions

Suci Erawati conceptualized the idea of this research, Idamawati Nababan designed methodology, and Hans Wijaya analyzed the data, conducted the research and process, literature review. All authors read and approved the final version of the manuscript

Funding

This research received no external funding

Conflicts of Interest

The authors declare no conflict of interest

References

Bicak, D.A. (2018). A Current Approach to Halitosis and Oral Malodor- A Mini Review. *The Open Dentistry Journal*, [online] 12(1), pp.322-330. <https://doi.org/10.2174/1874210601812010322>.

- Ratmini, N.K. (2017). Bau Mulut (Halitosis). *Jurnal Kesehatan Gigi (Dental Health Journal)*, 5(1), pp.25–29 <https://doi.org/10.33992/jkg.v5i1.954>.
- Nazir, M.A., Almas, K. and Majeed, M.I. (2017). The prevalence of halitosis (oral malodor) and associated factors among dental students and interns, Lahore, Pakistan. *ResearchGate*. https://doi.org/10.4103/ejd.ejd_142_17
- Ueno, M., et al. (2018). Prevalence of halitosis and risk factors in Japanese school children. *ResearchGate*. Retrieved from: https://www.researchgate.net/publication/323987792_Prevalence_of_halitosis_and_risk_factors_in_Japanese_school_children
- Kapoor, U., et al. (2016). Halitosis: Current concepts on etiology, diagnosis and management. *European Journal of Dentistry*, 10(02), pp.292–300. <https://doi.org/10.4103/1305-7456.178294>.
- Mento, C., et al. (2021). Adolescence, Adulthood and Self-Perceived Halitosis: A Role of Psychological Factors. *Medicina-Lithuania*, 57(6), 614–614. <https://doi.org/10.3390/medicina57060614>
- Uguru, C. (2014). The delusion of halitosis: experience at an eastern Nigerian tertiary hospital. *Nigerian Journal of Medicine : Journal of the National Association of Resident Doctors of Nigeria*, 20(2). Retrieved from <https://pubmed.ncbi.nlm.nih.gov/21970235/>
- Cahyamirani, W.H. (2013). Hubungan Antara Pengetahuan Dengan Sikap Dan Perilaku Terhadap Halitosis. *Ugm.ac.id*. Retrieved from: http://etd.repository.ugm.ac.id/home/detail_pencarian/64706.
- Widyastuti, R. (2021). Perbedaan Antara Menyikat Gigi Dengan Menyikat Gigi Disertai Penggunaan Tongue Scraper Pada Pasien Halitosis. *Jurnal Ilmiah dan Teknologi Kedokteran Gigi*, 17(1), pp.35–42. <https://doi.org/10.32509/jitek.v17i1.1310>.
- Yulimatussa'diyah, A., dkk (2016). Pengetahuan Penanganan Halitosis Dalam Masalah Kesehatan Mulut. *Jurnal Farmasi Komunitas*, 3(2), pp.85–89. Retrieved from: <http://journal.unair.ac.id/download-fullpapers-jfkbc998a2849full.pdf>
- Wiyatmi, H. (2014). *penyebab halitosis dan penanganannya di rumah sakit jiwa grhasia propinsi DIY*. [online] Retrieved from: https://grhasia.jogjaprov.go.id/assets/content_upload/files/HALITOSIS.pdf
- Kamelia, E., Taftazani, RZ., dan Ambarwati, T. (2021). Pengetahuan Menjaga Kesehatan Gigi Dan Mulut Di Masa Pandemi Covid 19 Pada Masyarakat Kepanjen Kabupaten Malang. [online] 1(2) *Poltekkes Kemenkes Tasikmalaya*. Available at: <https://ejournal.poltekkestasikmalaya.ac.id/index.php/Pengmas/article/view/812>
- Kemenkes RI Dirjen P2P (2021). Survey Menunjukkan Kebiasaan Gosok Gigi Menurun Saat Pandemi COVID-19. *Kementerian Kesehatan RI*, 5(1), p. 1. Available at: <https://www.kemkes.go.id/article/view/>
- Be K, N., 1987. *Preventive Dentistry*. Bandung: Yayasan Kesehatan Gigi Indonesia.
- Budi, D.P. (2017). Hubungan Perilaku Perawatan Gigi Dengan Kejadian Karies Gigi Pada Anak Usia 6-9 Tahun Di Sdn Pregaan Laok 1 Sumenep. *Umsurabaya.ac.id*. Retrieved from: <http://repository.um-surabaya.ac.id/156/1/Pendahuluan.pdf>.
- Lee, Y. H., & Hong, J. Y. (2023). Oral microbiome as a co-mediator of halitosis and periodontitis: a narrative review. *Frontiers in Oral Health*, 4. <https://doi.org/10.3389/froh.2023.1229145>
- Murata, T. (2002). Classification and examination of halitosis. *International Dental Journal*, 52(5), 181–186. <https://doi.org/10.1002/j.1875-595x.2002.tb00921.x>
- Sugiyono, (2007). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta
- Lemos, et al. (2013). Streptococcus mutans: A new Gram-positive paradigm?. *Microbiology*, 159(3). <https://doi.org/10.1099/mic.0.066134-0>.
- Greene, J.G. and Vermillion, J.R. (1964). The Simplified Oral Hygiene Index. *The Journal of the American Dental Association*, [online] 68(1), pp.7–13. <https://doi.org/10.14219/jada.archive.1964.0034>.
- Azodo, C. C., Peters, N. O., & Omili, M. (2010). Psychological and Social impact of halitosis: A review. *Journal of Soc & Psy Sci*. 3(1), pp.74-91. Retrieved from: https://www.researchgate.net/publication/339229281_Psychological_and_Social_impact_of_halitosis_A_review
- Kauss, et al. (2022). Influence of tobacco smoking on the development of halitosis. *Toxicology Reports*, 9, 316–322. Retrieved from: <https://doi.org/10.1016/j.toxrep.2022.02.012>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif Dan R&D*. Cetakan 2. Bandung: Cv Alfabeta
- Erawati, S. (2022). *Pencegahan Halitosis Dengan Obat Kumur Buah Kapulaga*. [online] PUBLISH BUKU UNPRI PRESS ISBN. 1(1). Available at: <http://jurnal.unprimdn.ac.id/index.php/ISBN/article/download/2727/>
- Setia, S. (2014). Correlation of oral hygiene practices, smoking and oral health conditions with self perceived halitosis amongst undergraduate dental students. *Journal of Natural Science, Biology, and Medicine*, 5(1), 67–67. <https://doi.org/10.4103/0976-9668.127291>

- Scully, C., Porter, S. and Greenman, J. (1994). What to do about halitosis. *BMJ*, [online] 308(6923), pp.217-218. doi:10.1136/bmj.308.6923.217.
- Sari, I. P., & Made, N. (2018). Gambaran Ohi-S Serta Tingkat Pengetahuan Tentang Kebersihan Gigi Dan Mulut Pada Siswa Kelas Iv Dan V Sdn 4 Sibang Kaja (Study dilakukan di Desa Sibang Kaja Kecamatan Abiansemal) - Repository Politeknik Kesehatan Denpasar. *Poltekkes-Denpasar.ac.id*.
<http://repository.poltekkes-denpasar.ac.id/564/1/BAB%20I.pdf>
- Manurung, N. (2017). Hubungan Pelaksanaan Oral Hygiene Dengan Kejadian Infeksi Rongga Mulut Pada Pasien Dengan Penurunan Kesadaran Di Rsu Imelda Pekerja Indonesia Medan. *Jurnal Ilmiah Keperawatan Imelda*, 3(2), 105-114.
<https://doi.org/10.2411/jikeperawatan.v3i2.264>
- Mishra, P., et al (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67-67.
https://doi.org/10.4103/aca.aca_157_18
- Briceag, R., et al(2023). Emotional and Social Impact of Halitosis on Adolescents and Young Adults: A Systematic Review. *Medicina-Lithuania*, 59(3), 564-564. <https://doi.org/10.3390/medicina59030564>