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SELF-REPORTED HALITOSIS AND ASSOCIATED FACTORS AMONG THE ELDERLY

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ABSTRACT

Background. Halitosis is a common complaint in society. Studies report that about 30% to 50% of the population has experienced halitosis problems. Halitosis is a disturbing problem for many people around the world that affects people's social interactions in everyday life by causing personal discomfort and emotional stress. Caries, periodontal disease, and xerostomia, which are factors associated with halitosis, are common diseases found in the elderly. This study aims to analysis of self-reported halitosis and associated factors among the elderly. **Methods.** This research is a quanitative research. The type of data used is primary data obtained from the results of filling out questionnaires on the elderly and halitosis examinations using organoleptic methods on 35 subjects. The collected data was then analyzed using the t-test and chi-square. **Results**. The results showed that Halitosis with moderate to very strong odor is experienced by 91.5% of elderly. Factors related to halitosis are still many root remains, cavities, plaque disease, calculus, gingivitis, disease, hyposalivation periodontal tissue, coated tongue. There is no significant relationship between gender, calculus, periodontal disease, hyposalivation, and coated tongue with the degree of halitosis. **Conclusion.** It can be concluded that the personal perception of the elderly regarding the halitosis they experience is still low, even though they suffer from halitosis moderate to very strong odor.
Keywords: Self-reported., Halitosis., Elderly., Factors related

INTRODUCTION

The number and proportion of elderly people in the population are increasing. In 2020, the number of people aged 60 years and over in the world was 1.4 billion people and is expected to increase to 2.1 billion by 2050. Since 2021, Indonesia has entered an aging population structure, where around 10.82% or 1 in 10 people are elderly.[1] The aging population phenomenon could be a second demographic bonus, namely when the proportion of elderly people increases but is still productive and can contribute to the country's economy.[2] Based on data from the Central Statistics Agency (BPS) in 2022, the percentage of elderly people in Aceh Province was 8.55%.[1] Health care efforts for the elderly have become an important concern for health service providers and government institutions in Indonesia, so that the elderly remain healthy and productive both socially and economically.[3] Elderly people experience a number of changes in their bodies, both morphologically and physiologically, over time. 4 Changes that occur due to the aging process are influenced by various factors, such as lifestyle, environment, and genetics. 5,6 Like other parts of the body, these changes also occur in the oral cavity, making it more susceptible to cavities (caries), tooth wear, periodontal disease, dry mouth (xerostomia), halitosis, and tooth loss.[3–5] Tooth loss that results in edentulousness can affect nutritional intake and pose 21% risk of malnutrition.[7]

Halitosis or bad breath is an oral health problem characterized by an unpleasant odor coming from the oral cavity.[8] The prevalence of halitosis worldwide ranges from 22% to 50%.[9] Thirty percent of the population considers halitosis a problem for both women and men of all ages, including the elderly.[10,11] Halitosis is one of the most common complaints from patients to dentists after dental caries and periodontal disease.[12]

The cause of halitosis in 90% of patients is associated with factors originating from the oral cavity, the remaining 9% originate from outside the oral cavity including the respiratory system, digestive system, metabolic disorders such as diabetes mellitus, kidney disease, and liver disease, and the other 1% is caused by diet or drug consumption.[13] The main causes of halitosis originating from the oral cavity include deep caries, tooth root remains, periodontal disease, coated tongue, dental plaque, calculus, food impaction, poor oral hygiene, dentures that are not cleaned properly and reduced saliva.[8,13] Caries, periodontal disease, and xerostomia which are factors associated with halitosis are common diseases found in the elderly.[14]

Halitosis is associated with psychological and social impacts. Halitosis can cause anxiety, reduced self-confidence, misunderstanding of other people's attitudes, embarrassment and discomfort in communication, and social isolation. This condition certainly affects the quality of life of sufferers.[8,15] However, based on several studies, halitosis often goes unnoticed because people are generally not aware of the quality of their bad breath.[10] When asked to assess their own bad breath, only a small group perceived that they had halitosis. This is because the majority of sufferers are not aware of it or are embarrassed to report their condition which will affect the sufferer's decision to seek treatment.[16] Based on this background, this study aims to analysis of self-reported halitosis and associated factors among the elderly.

MATERIALS AND METHOD

This research is an analytical research with cross sectional design. The population in this study were all elderly people in the Ulee Kareng sub-district, totaling 730 people. The subjects in this survey were elderly people aged ≥60 years who visited the Ulee Kareng Health Center on December 1-6, 2023. The sampling method used the convenience/accidental sampling technique, namely sampling including any elderly person who was available at the time the survey was conducted, a total of 35 people.The inclusion criteria for this study were elderly people who visited the Ulee Kareng Health Center when the survey was conducted; willing to be survey subjects; elderly people with a history of systemic disease and drug consumption were still included. The type of data used in this survey is primary data obtained from the results of filling out questionnaires and measuring bad breath on respondents directly by researchers. Previously, informed consent was given and signed by respondents.

Subjects were asked to fill out a questionnaire consisting of 4 parts, namely self-perception of halitosis, oral hygiene behavior, when the mouth smells the most, and medical history. After completing the questionnaire, the subject will be examined for halitosis using the organoleptic method. In a sitting position, the subject is asked to open their mouth and hold their breath. The examiner will bring their nose close to the subject's mouth opening at a distance of approximately 10 cm and try to smell the odor coming out of the subject's oral cavity. The examiner gives a score to the odor that is smelled on a scale of 0-5.The validity test results for each questionnaire question have a calculated r value > from r table, 0.4595> 0.2973 so it is concluded that all questions are valid, while the reliability test of the questionnaire obtained an r-calculated value > 0.60 so this questionnaire has a level of reliability. The data has been collected and continue to statistical analysis using t-test and chi-square test.

RESULT

Univariate analysis was carried out to obtain a description (descriptive) of each variable, including respondent demographics (age, gender, employment and medical history).

Table 1. Characteristics of Research Subjects based on education, age, gender, employment and medical history

Characteristics	N	%
Age		
60 – 69	25	71.4%
70 – 79	7	20.0%
≥ 80	3	8.6%
Total	**35**	**100%**
Gender		
Male	20	57%
Female	15	43%
Total	**35**	**100%**
Employment		
Housewife	12	34.3%
Working	6	17.1%
Unworking	2	5.7%
Retiree	15	42.9%
Total	**35**	**100%**
Medical History		
Diabetes	7	20%
Kidney Disease	0	0%
Lung Disease	0	0%
Liver Disease	0	0%
Digestive Tract Disease	12	34.3%
Total	**19**	**54.3%**

Table 1 shows the distribution of research subjects based on age, the majority of subjects were aged 60-69 years, totaling 25 people (71.4%), male subjects totaling 20 people (57%) and female subjects totaling 15 people (43%). Based on occupation, the most subjects were retirees, namely 15 people (42%). Based on medical history, the majority of subjects had a history of digestive tract disease, namely 12 people (34%).

Based on table 2. shows self-perception of halitosis where subjects who felt they had bad breath numbered 5 people (14%) and 30 others did not feel bad breath (86%). Subjects who had been told by friends and family had bad breath numbered 5 people (14%). Regarding oral hygiene behavior, subjects who brushed their teeth in the morning after breakfast and at night before going to bed were 9 people (25%), subjects who brushed their tongue were only 1 person (2%) and no subjects used dental floss and mouthwash.

Table 2. Frequency Distribution of Halitosis Based on Self-Perception in Subjects

Item	**Yes** (%)	**No** (%)
Self-Perception		
Feels Bad Breath	5 (14%)	30 (86%)
Ever told by friends or other people that bad breath	5 (14%)	30 (86%)
Ever received treatment for bad breath	0 (0%)	35 (100%)
Bad breath interferes with social life	0 (0%)	35 (100%)
Oral Hygiene Behavior		
Brush your teeth in the morning after breakfast and at night before bed	9 (25%)	26 (75%)
Brushing the tongue	1 (2%)	34 (98%)
Using dental floss	0 (0%)	35 (100%)
Using mouthwash	0 (0%)	35 (100%)
When Your Mouth Feels the Most Smelly		
After Waking up	29 (82%)	6 (18%)
When hungry	3 (8.6%)	32 (91.4%)
When thirsty	3 (8.6%)	32 (91.4%)
When talking to others	0 (0%)	35 (100%)

Table 3. Frequency Distribution of Halitosis Based on Remaining tooth roots and Number of teeth

	$\bar{X}$	Degree of Halitosis		*P-Value*+
		0-2	3-5	
Age	66	73 (8.57%)	65 (91.43%)	0.086
Caries	1.7	1.3 (12%)	1.7 (88%)	0.761
Root Residu	3.14	7 (10%)	2.8 (90%)	0.526
Total of Teeth	18	18.7 (10.3%)	18.3 (89.7%))	0.948

Note: +T-test, Sig. P < 0.05
Grades 0-2: No to slight odor
Grades 3-5: Moderate to very strong odor

Table 4. Clinical Examination Status of Halitosis and Oral Cavity

Halitosis	**N (%)**		
Degree 0 = No Smell	0 (0%)		
Degree 1 = Smell almost invisible	2 (5.7%)		
Degree 2 = little smell, detectable	1 (2.8%)		
Degree 3 = medium smell	10 (28.5%)		
Degree 4 = sharp smell	13 (37.1%)		
Degree 5 = very strong	9 (25.7%)		
Status of Oral Health	**N (%)**	**N of teeth**	
		$\bar{X}$	**Range**
Teeth	29 (83%)	18	1-32
Caries/Cavity of Teeth	25 (71%)	1.7	1-6
Remaining Tooth Root	20 (57%)	3.14	1-15
Plague	29 (83%)	10.4	1-32
Gingivitis	29 (83%)	9.8	1-32
Fixed Denture	0 (0%)		
Removeble Denture/ Part Denture	10 (29%)		
Calkulus			
0 = none	8 (22.8%)		
1 = moderate	11 (31.4%)		
2 = high	16 (45.7%)		
Penyakit Periodontal			
0 = none/normal	9 (25.7%)		
1 = moderate	16 (45.7%)		
2 = heavy	10 (28.5%)		
Hiposalivasi			
0 = none	6 (17.1%)		
1 = moderate	26 (74.2%)		
2 = heavy	3 (8.6%)		
Oated Tongue			
None	0 (0%)		
1/3 posterior	4 (11.4%)		
1/3 posterior & 1/3 middle	15 (42.8%)		
All of survace	16 (45.7%)		

Table 3 shows the average number of caries and the number of teeth of the subjects did not differ much between the 2 groups. Subjects with grade 0-2 halitosis had more remaining roots with an average of 7 teeth compared to subjects with grade 4-5 with an average of 3 teeth. The results of the t-test showed that there was no difference in

halitosis between respondents of different ages (p-value> 0.05). Likewise, the variables for the number of remaining roots and teeth, and the number of caries.

Table 4 shows the results of halitosis examination based on organoleptic test where the most subjects experienced grade 4 halitosis, which was 37.1%. Grade 5 halitosis was also detected in quite a number of subjects (25.7%). Based on the hyposalivation condition, 74.2% of subjects experienced moderate hyposalivation (grade 2) and 8.6% were severe (grade 3). All subjects experienced coated tongue where 45.7% of subjects had coated on the entire surface of their tongue.

DISCUSSION

The purpose of this survey was to assess the prevalence of halitosis based on personal perception and organoleptic examination and factors related to halitosis in the elderly aged 60 years and over in the Ulee Kareng District. Evaluation of halitosis is important because of the high prevalence of this condition in various regions based on several studies and its impact on social interaction and quality of life, as well as its possible relationship with systemic diseases.[4]

Based on table 1, it shows that most of the elderly in Ulee Kareng District are young elderly with an age range of 60-69 years with a greater proportion of men than women.[1] The average elderly subject in this survey was a retiree and a housewife and only 17.1% of subjects were still working. Based on the history of systemic diseases that are related to halitosis, the diseases found in the survey subjects were diabetes and digestive tract diseases.

The elderly's perception of halitosis in themselves is shown in table 2 only 14% of the elderly felt they had bad breath and 14% of the elderly had been told by friends or family that they had bad breath. No elderly had ever received treatment for their bad breath. This low personal perception of the elderly is in line with the study of Aguiar, et al. (2017) on the elderly aged ≥ 60 years in Brazil where only 13% of the elderly perceived themselves as having halitosis problems.[11] Several previous studies showed the percentage of halitosis based on the perception of the elderly aged ≥ 60 years of 35.5% and 28.3% in the elderly ≥ 55 years.[4,35] Most of the elderly in this survey felt that their mouths were the most smelly when they woke up and some elderly felt it when they were hungry and thirsty. This is because in conditions of sleep, hunger, and thirst, saliva flow can decrease and increase the growth of anaerobic bacteria that can contribute to bad breath.[36,37] Bad breath in the morning is considered non-pathological halitosis which will disappear immediately after oral hygiene measures are taken.[38]

The prevalence of halitosis based on organoleptic tests in this study where halitosis was assessed through the examiner's sense of smell on 91.5% of the elderly were found to have halitosis with a moderate to very pungent odor. The elderly were most often diagnosed with halitosis with a sharp odor (grade 4) which was 37.1%. Zellmer's (2016) study on the elderly in nursing homes in Sweden found a lower prevalence of halitosis of 54% when using organoleptic tests as well as Aguiar's (2017) study on the elderly in Brazil showing a percentage of 26.1%.[11,44] This is because the condition of the oral cavity in the elderly from both studies was better than the elderly in Ulee Kareng.[11,44] The results of the organoleptic examination in this study showed a significant difference with the halitosis assessed by the elderly themselves. Several studies have reported a weak relationship between halitosis based on self-perception and organoleptic examination.[36,45] Dudzik (2014) said that there is a paradox related to halitosis that may explain why self-perception of halitosis and organoleptic tests are often not in line, someone who suffers from halitosis is often not aware of their bad breath, besides that there are also other groups who believe they have halitosis even though in fact there are no symptoms of halitosis.[46] In individuals who are accustomed to their own bad breath, they tend to rate their bad breath as milder than that assessed by others. This is due to the process of adaptation or dulling of the senses after being continuously exposed to the same stimulus so that over time the sufferer becomes accustomed to their own bad breath.[47] Based on the status of the oral cavity condition as shown in table 4. it appears that oral cavity problems include tooth loss, caries, root remains, gingivitis, calculus, severe periodontal disease, moderate to severe hyposalivation, and coated tongue are commonly observed in elderly subjects.

The results of this study indicate that based on the T-test there is no significant difference in halitosis based on different elderly ages, remaining teeth in the oral cavity, the number of caries and remaining roots. This result is in line with Zellmer's (2016) study which showed no significant difference in halitosis based on age, number of teeth, number of caries, and remaining roots in the elderly.[44] The results of Aguiar's (2017) study also showed no difference in halitosis based on age by comparing the 60-79 age group with those over 80 years of age.[11]

Based on the Chi-square test, this study showed no significant relationship between gender, calculus, periodontal disease, hyposalivation, and coated tongue with the degree of halitosis. Zellmer's (2016) study also showed no significant relationship between halitosis and gender but there was a significant relationship between calculus, periodontal disease, and hyposalivation with halitosis. A study in Sweden observed that calculus correlated significantly with severe halitosis.[48] In this study, if viewed univariately in the data in table 4, grade 3-5 halitosis was highest in subjects who had a lot of calculus, although statistically the relationship was not significant. Related to coated tongue, several studies reported a significant relationship with halitosis.[11,48,49] In this study, table 4 shows that grade 3-5 halitosis was most common in the elderly who experienced coated tongue on the entire surface of their

tongue, although statistically there was also no significant relationship.

The formation of behavior is also influenced by the environment, one of which is social support.[37] The most influential support besides family is work friends.[38] The influence of co-workers is a social factor that can also influence the choice of snacks which are directly related to energy intake.[39] This change in knowledge will be followed by a change in intention and will ultimately be able to change behavior to form a new behavior that is better in line with the initial goal of providing nutrition education.[37]

Previous research by Dewi (2022) showed that there was no difference before and after the intervention in weight loss. With an intervention time of 3 weeks.[40] However, the group's body weight before being given the intervention was higher than after being given the intervention.

The formation of new behavior in a person begins with the cognitive domain, meaning that the subject has knowledge of an object due to stimulation in the form of external material which then triggers stimulation that is fully realized, giving rise to a further response in the form of a new action to the stimulation it receives.[20] Then the research time limitations were still too short, namely 3 weeks (21 days), so we could not see significant changes in actions. There was no difference in body weight due to limited intervention time. Even though there is weight loss, it is still not significant.

CONCLUSION

From the results of research on the Ulee Kareng community regarding personal perceptions of halitosis and related factors, it can be concluded that halitosis with moderate to very pungent odors is experienced by 91.5% of the elderly. Based on organoleptic tests, the elderly's personal perception of the halitosis they experience is still low. Factors related to halitosis such as root remains, cavities, plaque disease, calculus, gingivitis, disease, hyposalivation periodontal tissue, coated tongue have a high prevalence in the elderly.

SUGGESTION

Further research is recommended with a larger number of subjects and accompanied by the results of clinical examinations of the systemic diseases suffered so that their influence on halitosis can be determined.

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