

RESEARCH ARTICLE

OPEN ACCESS

Manuscript received June 11, 2024; revised June 17, 2024; accepted June 17, 2024; date of publication August 30, 2024

Digital Object Identifier (DOI): <https://doi.org/10.35882/ijahst.v4i3.348>

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How to cite: Larasati Sekar Nagari, Ida Chairanna Mahirawatie, and Ratih Larasati, "The Relationship between Dental and Oral Health Maintenance in Elders with Periodontitis at Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya", International Journal of Advanced Health Science and Technology, vol. 4, no. 4, pp. 160 - 167, August, 2024

The Relationship between Dental and Oral Health Maintenance in Elders with Periodontitis at Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya

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ABSTRACT Periodontitis is one of the most common periodontal diseases with an incidence of approximately 10% of adults worldwide. Periodontitis can lead to tooth loss, which has negative impact on chewing function, aesthetics and can affect the quality of life of the sufferer. This study provide additional information for readers who need it, serving as a guide and input to achieve optimal oral health in the elderly by focusing on their specific oral health conditions, particularly in maintaining oral health. The problem in this study is the high occurrence of periodontitis in the elderly at the Posyandu Lansia. The aim of the research was to determine the relationship between oral health maintenance of the elderly and the incidence of periodontitis in the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya. The type of research conducted was analytical research with a cross sectional method, with a sample of 35 elderly people at the RW 07 Posyandu Lansia, Gunung Anyar Tambak Village, Surabaya. The data collection instrument used is a questionnaire used to measure oral health maintenance and an examination sheet to identify periodontitis. The data analysis techniques using Spearman's rho. Conclusion : The average maintenance of oral health of the elderly in answering the research questionnaire was categorized as sufficient at 70.8%. Elderly people who experience periodontitis are 65.72%. There is a strong relationship between oral health maintenance and periodontitis.

KEYWORDS Oral health care, Periodontitis, Elderly

I. INTRODUCTION

Periodontitis is one of the most common periodontal diseases with an incidence of approximately 10% of adults worldwide. Periodontitis can result in tooth loss, impacting chewing function, aesthetics, as well as affecting the patient's quality of life. It is a leading cause of tooth loss and chewing impairment, and leads to significant dental costs [1]. Periodontitis is a serious public health problem worldwide. In 2010, severe periodontitis ranked sixth among the most widespread health issues worldwide. The highest occurrence of severe periodontitis is observed among individuals aged 60 to 64 years. By 2017, the global age-adjusted prevalence of severe periodontitis was 9.8%, with a margin of uncertainty ranging from 8.2% to 11.4% [2].

Based on the 2018 Riskesdas report, 57.6% of the population experienced oral health problems, while the percentage of tooth loss in the 35-44 age group reached 17.5% and increased to 30.6% in the 65 years and over age group [3].

Tooth loss is a condition in which one or more teeth are dislodged from their sockets due to disease of the periodontal tissues [4]. The main causes of tooth loss are caries and periodontal disease. In the elderly, tooth loss is commonly caused by periodontal disease [5].

As a result of ageing, teeth will begin to wear down or fall out gradually. Incomplete teeth can certainly reduce eating comfort and can limit the food consumed. Oral diseases in the elderly can affect their overall health and quality of life. Common oral health issues frequently seen in older adults include problems like tooth loss, gum disease, dry mouth (xerostomia), and periodontitis [6].

Based on Presidential Regulation No. 88 of 2021 regarding the National Strategy for Elderly People (SNK), elderly people are individuals who have reached the age of 60 years or more. Currently, the number of elderly people in Indonesia reaches around 27.08 million people (around 10% of the total population) and is expected to increase to 30.69 million people (11.8%) by 2025, with the number continuing to grow every year [5].

There are many factors that can trigger or worsen periodontitis, such as plaque buildup, tartar, as well as systemic conditions or general health. Damage in the periodontal tissues causes the gums to no longer adhere to the teeth, resulting in bone deterioration and eventual loosening of the teeth. Although many people don't realize it, the number of cases of periodontal disease in society is high and it is the leading cause of tooth loss in adults [7].

In elders, degenerative processes occur at various levels and can result in impaired organ function. This loss of function makes the elderly more susceptible to various diseases and consequently weakens the resistance of periodontal tissues to various irritants, especially plaque bacteria [8].

A severe periodontitis, which is a leading cause of tooth loss in adults, is usually complicated by the presence of shifting and loosening of teeth, which ultimately results in impaired bite function in the affected individual. In addition, periodontal disease and tooth loss are thought to be

associated with a variety of chronic diseases and conditions that affect general health [9].

Oral health is crucial for elderly individuals as it significantly impacts their overall health. According to Ministerial Regulation Number 89 of 2015 concerning Dental and Oral Health Efforts, oral health refers not only to the healthy state of hard and soft dental tissues, but also a person's ability to eat, speak, communicate socially without any aesthetic disturbances caused by diseases of the oral cavity or the healthy state of elements related to the oral cavity [10].

It is important to maintain dental health in the elderly, one of which is by providing education about personal hygiene to them. The goal is for the elderly to pay more attention to personal hygiene habits for health and comfort. It is hoped that the elderly can take good care of their oral hygiene, so that they can improve their health and enjoy a healthy, happy and productive old age [11].

The initial survey results at Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya showed that 8 out of 10 or 80% of the elderly were affected by periodontitis with CPITN scores of 3 and 4, the healthy tissue category has a CPITN assessment score of 0 or healthy [12].

II. METHODS

The research was conducted at Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Gunung Anyar Subdistrict, Surabaya, from September 2023 to March 2024. The population of this study was a group of 38 elderly people at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya. The research sample consisted of elderly people at the Posyandu Lansia RW 07 with inclusion criteria such as being cooperative, having at least two index teeth per sextant, having no communication disorders, and being healthy. Exclusion criteria included being uncooperative, having no teeth (toothless), having communication disorders, and being sick. Determination of sample size using the Slovin formula with the results of 35 respondents, and the sampling technique was carried out by random sampling method. This type of research is analytical research with a cross-sectional method, which aims to test hypotheses and analyze the relationship between variables. Cross-sectional research is conducted with an observation or data collection approach at one time, so that each research subject is only observed once and its status is measured at that time.

The variables studied were oral health maintenance of the elderly, with data collected using questionnaires and direct examination. The research instruments included informed consent sheets, questionnaire sheets for dental health maintenance data, as well as examination sheets, mouth glasses, and probes for periodontitis data.

The first data collection technique involved the elderly gathering at the Posyandu, giving questionnaires, explaining how to fill in, and collecting questionnaires after completion. Assessment of the questionnaire sheet by giving a score of 5 for each correct answer and then multiplying it by the total of 20 questions. The next step, examination of the oral cavity to

determine the presence of periodontitis was carried out one by one on the respondent using a mouth glass and probe, and the results were recorded on the examination sheet. All stages of data collection were collected once. Assessment of periodontitis using CPITN with the following score code:

0: healthy

1: bleeding on probing

2: calculus

3: shallow pockets (between 4 mm - 5 mm)

4: deep pockets > 6 mm (probe markers are no longer visible) [13].

(Periodontitis was defined by scores of 3 and 4)

Gingiva was then re-categorized using a score of 0 for healthy gingiva (no periodontitis) in CPITN categories 0, 1, and 2 and scored 1 for periodontitis in CPITN categories 3 and 4.

Data analysis used the Spearman's rho statistical test to determine the correlation between variables. Decision making based on the value of Asymp. Sig. (2-sided) <0.05, which indicates a relationship between oral health maintenance of the elderly and periodontitis. The level of relationship strength is determined by the correlation coefficient value, with the interpretation of the relationship ranging from very weak to perfect.

When determining how strongly variables are related, we use the correlation coefficient value from SPSS results, which can be interpreted as follows:

1. A value between 0.05 and 0.25 indicates a very weak relationship.
2. A value between 0.26 and 0.50 suggests a moderate relationship.
3. A value between 0.51 and 0.75 indicates a strong relationship.
4. A value between 0.76 and 0.99 indicates a very strong relationship.
5. A value of 1.00 indicates a perfect relationship between the variables. [14]

III. RESULTS

A. RESPONDENT CHARACTERISTIC

TABLE 1
Frequency Distribution of Elderly Characteristics at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya 2024

No.	Responden Characteristics	Frequency	Percentage (%)
1. Frequency Distribution of Elderly Age			
	60-65	20	57,14
	66-70	8	22,86
	71-75	5	14,29
	76-80	2	5,71
2. Elderly Education Frequency Distribution			
	No in school	0	0
	Elementary School	3	8,58
	Junior High School	6	17,14
	Senior High School	16	45,71

	College	10	28,57
3. Elderly Work Frequency Distribution			
	Not Employed	21	60
	Private	2	5,71
	Self-employed	2	5,71
	Civil Servant	3	8,58
	Retired	7	20
4. Elderly Gender Frequency Distribution			
	Man	20	57,14
	Women	15	42,86

Based on Table 1, it is known that most of the elderly in this study are aged 60-65 years with 20 elderly people (57.14%), most of the elderly education is high school graduates, which are 16 elderly people (45.71%), most of the elderly work is not working or housewives with 21 elderly people (60%), and most of the elderly are male with a total of 20 elderly people (57.14%).

B. DATA COLLECTION RESULTS

TABLE 2
Summary of Elderly Dental and Oral Health Maintenance Data at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya 2024

No.	Question	Correct Answer		Wrong Answer	
		N	%	N	%
1.	Knowledge of tooth brushing	32	91,42	3	8,58
2.	Knowledge of frequency and timing of tooth brushing	19,75	56,43	15,25	43,57
3.	Knowledge on how to brush teeth properly	22,5	64,29	12,5	35,71
4.	Knowledge of the selection on tools and materials for brushing teeth	13	37,14	22	62,86
5.	Knowledge of toothbrush maintenance	26,5	75,71	8,5	24,29
6.	Knowledge of dietary foods	35	100	0	0
7.	Knowledge of oral health check-ups	25,5	72,86	9,5	27,14
8.	Knowledge on periodontitis	24	68,57	11	31,43
Average		24,78	70,8	10,21	29,2

Based on table 2, it is known that the level of maintenance of oral and dental health of the elderly at the Posyandu Lansia RW 07 Gunung Anyar Tambak, Surabaya in 2024 (70.8%) is included in the moderate category. The value is obtained based on the average correct answer, covering 8 aspects, namely knowledge of brushing teeth, knowledge of the frequency and timing of brushing teeth, knowledge of how to brush teeth properly and correctly, knowledge of selecting tools and materials for brushing teeth, knowledge of toothbrush maintenance, knowledge of food diet, knowledge of oral health checks, and knowledge of periodontitis.

Table 3

Frequency Distribution of Periodontitis Status (CPITN) and Periodontitis Category in the Elderly at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya 2024

Based on table 3, it is known that the status of periodontitis (CPITN) in the elderly with score 1 (bleeding) was 4 people (11.42%), score 2 (calculus) was 8 people (22.86%) who were categorized as having no periodontitis with a total of 12 people (34.28%). It is also known that score 3 (shallow pockets) was 9 people (25.72%) and score 4 (deep pockets) was 14 people (40%). Most of the elderly experienced periodontitis as many as 23 people (65.72%).

C. DATA ANALYSIS

Table 4

Results of Spearman's rho Test Analysis of the Relationship between Dental and Oral Health Maintenance of the Elderly with the Occurrence of Periodontitis at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya 2024

Correlation Test	Variable	α	P value	Correlation Coefficient
Spearman rho's	Oral Health Maintenance in the Elderly	0,05	0.000	0,676
	Periodontitis			

Based on table 4, it is known that the oral health maintenance variable on the periodontitis variable has an Asymp. Sig. (2-sided) with a total of 35 is 0.000 smaller than 0.05, which means that there is a relationship between maintenance of oral and dental health of the elderly and periodontitis in the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya, so that H_0 is rejected and H_a is accepted.

It's been found that the output resulted in a correlation coefficient of 0.676. This indicates a strong relationship between the variables of elderly oral health maintenance and periodontitis, showing a significant level of correlation.

IV. DISCUSSION

A. ORAL HEALTH MAINTENANCE IN THE ELDERLY

Based on the results of research on respondents regarding oral health maintenance variables in the elderly, it is known

that respondents belong to the category of moderate oral health maintenance. Previous studies found that most of the elderly have sufficient knowledge in terms of maintaining oral health[15]. These results can be caused by the lack of adequate education related to oral health maintenance received by respondents. Knowledge has a major influence on oral health maintenance which can shape behavior. The better the knowledge possessed will make someone maintain their oral health properly and correctly.

Based on the results of respondents' answers on tooth brushing knowledge, it is known that the majority of elderly people show a fairly good understanding of the tooth brushing knowledge part of the questionnaire. However, there were a small number of respondents who answered incorrectly. Regarding the importance of maintaining oral health. Most

No.	CPITN Criteria	Periodontitis Category			
		None		Exist	
		N	%	N	%
1.	0 = healthy	0	0	0	0
2.	1 = bleeding	4	11,42	0	0
3.	2 = calculus	8	22,86	0	0
4.	3 = shallow pockets (4 mm - 5 mm)	0	0	9	25,72
5.	4 = deep pockets (>6 mm)	0	0	14	40
Total		12	34,28	23	65,72

elderly respondents have good knowledge about brushing their teeth in general, but there are still those who do not understand it well [16]. Respondents' knowledge of tooth brushing knowledge can be caused by experience. Although the level of tooth brushing knowledge of the majority of respondents is good, increased education is still needed so that all elderly people can brush their teeth properly and regularly.

Based on the results of the research conducted by the researcher, it was found that more than half of the respondents did not know about the knowledge of frequency, time, and the right way to brush their teeth. Most of the elderly experience oral and dental problems because the elderly do not understand the right technique and time to brush their teeth and maintain dental health[17]. This finding is reinforced by Riskesdas (2018) which states that only 71% of elderly people brush their teeth every day and only 2.9% of elderly people brush their teeth at the right time. It is seen that respondents' understanding of the frequency of brushing is quite good, but there are still significant shortcomings in understanding the right time and duration of brushing. Significant deficiencies in the understanding of the correct time and duration of brushing may be due to the lack of practical experience and hands-on guidance.

Based on the results of the questionnaire answers on knowledge of how to brush teeth properly and correctly, it shows that elderly respondents generally understand the basic

way of brushing teeth, but the majority of respondents answered incorrectly on the technique of brushing certain parts of the teeth such as the inner teeth. Accordance with research which shows that the majority of elderly respondents have insufficient knowledge in terms of how to brush their teeth properly[15]. Most oral health education programs may emphasize the frequency and importance of brushing, but lack in providing details about the correct technique for certain parts. In addition, physical changes and limited mobility in the elderly can also affect their ability to follow proper brushing techniques, especially in hard-to-reach parts of the teeth.

The research findings indicate that most elderly people have a limited understanding of selecting appropriate tools and materials for brushing teeth, particularly regarding the shape of the brush head and overcoming physical difficulties. However, the majority correctly identified the right toothpaste content. Previous studies [16] have also found low knowledge among the elderly about suitable brushing tools and materials. This lack of knowledge may stem from oral health education programs that do not emphasize these details, focusing instead on general brushing importance. Additionally, physical challenges such as joint stiffness or vision problems may hinder the elderly in choosing suitable tools and materials.

Based on the results of questionnaire answers about dietary knowledge, respondents have a very good understanding of a diet that supports oral health. This excellent knowledge may be due to effective and continuous education on the importance of proper nutrition to maintain oral health. Extension programs conducted by the posyandu seem to be successful in conveying information about the benefits of vegetables and fruits and other foods that support oral health.

The survey findings show that the majority of older adults are knowledgeable about the importance of and reasons behind oral health check-ups. Previous research [18], showing that all elderly respondents recognized the need to maintain oral health. This knowledge likely comes from receiving adequate information on the significance and timing of these check-ups. However, a small number of respondents still answered incorrectly, highlighting the need for more education. Emphasizing the schedules and reasons for regular check-ups can help ensure that all older adults fully grasp the importance of these examinations.

The results of the questionnaire answers about the knowledge of elderly periodontitis showed that respondents understand the causes of inflamed gums, with nearly all answering correctly. However, their knowledge of the characteristics and impact of gum inflammation on oral health needs improvement. This aligns with previous research [19] indicating that while many understand gum inflammation, some still struggle with specifics. The education provided may not have consistently emphasized these aspects. Simplifying and clarifying complex information is essential, as older adults might have limited access to additional health information and may prioritize different health concerns. Thus, periodontitis education should be more focused and accessible.

The data from the questionnaire indicate that respondents fall into the moderate category of knowledge. They show relatively high understanding in areas such as dietary knowledge, tooth brushing, and toothbrush maintenance. However, there are still significant gaps in their overall understanding. These findings align with previous research [20] showing that while elderly respondents generally have sufficient knowledge of oral health maintenance, some areas still need improvement. Emphasizing education and effective approaches to oral health programs at the Posyandu Lansia RW 07 in Gunung Anyar Tambak Village, Surabaya, can help address these gaps and enhance their understanding further.

B. PERIODONTITIS

Based on the results of research conducted by researchers, it was found that more than half of the respondents experienced periodontitis with deep pockets often occurring. This is supported by research done [21] which states that in the elderly there is a degeneration process at various levels which can cause a decrease in the function of organs. This decrease in function results in the elderly becoming vulnerable to various diseases, which results in weak resistance of periodontal tissues to various irritants, especially plaque bacteria.

Periodontal tissue damage will increase with age. As they age, the elderly will experience several changes that can affect their health. These findings align with previous research [22] which states that elderly periodontal tissues undergo many changes that make them more susceptible to disease and even experience various irritations, especially bacterial plaque. Physiological changes in saliva or the opening of the cementum tissue with a rough surface, which facilitates the formation of dental plaque due to the consumption of the elderly in a soft diet, reduced oral activity, and more incidence of xerostomia, the formation of dental plaque in the elderly is faster than at a young age. Most people believe that dental plaque is the main cause of periodontal tissue damage.

In this study, an equal examination was performed on elderly respondents who were male and female to determine the presence or absence of periodontitis in their periodontal tissues. Increased alveolar bone resorption, loss of periodontium junction attachment, and increased frequency of periodontal disease are associated with decreased estrogen levels in elderly women, which can lead to periodontitis. Oral hygiene as well as oral health care concerns may also contribute to the occurrence of periodontitis. In addition, a combination of bad habits, hormonal differences, genetic factors, and differences in health care habits contribute to the higher prevalence and severity of periodontitis in men compared to women.

The results of this study also showed that most respondents were within the CPITN criteria with a score of 3 (shallow pockets) and a score of 4 (deep pockets). Previous studies [23], states that in score 3 (shallow pockets) and score 4 (deep pockets) in the elderly due to an increase in periodontal disease that is getting worse due to the accumulation of debris and calculus, this can even be accompanied by the loss of several

teeth. This also can be caused by several factors including lack of knowledge, habits to attitudes that are less concerned about oral hygiene.

C. RELATIONSHIP BETWEEN DENTAL AND ORAL HEALTH MAINTENANCE IN THE ELDERLY WITH THE OCCURANCE PERIODONTITIS

The results of Spearman rho's analysis reveal a strong relationship between the oral health maintenance of the elderly and periodontitis at Posyandu Lansia RW 07 in Gunung Anyar Tambak Village, Surabaya. This finding is consistent with previous research [24], which also found a strong link between dental health maintenance knowledge and periodontitis. Similarly, research by [25] indicated that elderly individuals with better knowledge of oral health maintenance are less likely to experience dental diseases like periodontitis. This is because informed elderly individuals are better equipped to maintain and improve their oral health, leading to better overall dental health.

Even respondents with good knowledge of oral health were found to have periodontitis, which may be due to various factors such as bad habits, hormonal differences, genetics, and varying health care practices. Previous studies [26] have identified multiple risk factors contributing to the development and progression of periodontal diseases. These factors include age, gender, how well a person takes care of their oral health, how often they visit the dentist, income, education, residence, smoking habits, diabetes, ethnicity, microbial and genetic influences, immune response, social behavior, and psychological well-being.

The results of several aspects of oral health maintenance knowledge showed that there were respondents who did not know these aspects, one of which was knowledge about the frequency and timing of brushing with low results. Lack of knowledge related to knowledge of the frequency and timing of brushing teeth can be a cause of periodontitis in respondents. The recommended frequency of brushing teeth is twice a day, once after breakfast and after eating at night or before bed. This is to maximally remove bacterial plaque and food debris [27].

These findings provide additional information for readers who need it, serving as a guide and input to achieve optimal oral health in the elderly by focusing on their specific oral health conditions, particularly in maintaining oral health.

Improving dental care for the elderly can be approached through various methods. One approach is a public health campaign emphasizing the importance of oral health among seniors. Another involves forming a coalition of professionals from legislative and executive branches to implement dental care programs. Additionally, offering financial options that include essential benefits and support quality care can help reduce costs. Private-sector insurers should also be engaged to analyze the benefits of dental programs, particularly the relationship between disease severity and healthcare costs. Furthermore, innovative models for dental care delivery, such as mobile technology, tele-dentistry, the adoption of oral

health teams, and integration with geriatric and primary care, present valuable opportunities [28].

V. CONCLUSION

Based on the results of data analysis and discussion, the researcher concluded that the knowledge of oral health maintenance of the elderly at the Posyandu Lansia RW 07 Gunung Anyar Tambak Village, Surabaya was in the moderate category. Most elderly individuals experience periodontitis, and there is a significant relationship between their oral health maintenance and the incidence of periodontitis. This is evidenced by an Asymp. Sig. (2-sided) value of 0.000 ($n=35$), which is less than 0.05, resulting in a correlation coefficient of 0.676.

Good oral hygiene practices are essential for improving oral health and preventing periodontal disease. However, many older adults struggle with maintaining proper oral hygiene. For example, those with rheumatoid arthritis may have difficulty gripping a toothbrush due to deformed hand joints. To assist them, modifying a toothbrush with a foam handle can provide a better grip, allowing for more effective brushing. Alternatively, using electric toothbrushes can be recommended. For interdental cleaning, water flossers and modified interdental brushes can be used as substitutes for dental floss [29]. Also elders can look for additional sources of information related to good and correct oral health maintenance with the help of family or care-givers to get information on oral health maintenance through social media, the internet, newspapers, and other information media not only from health workers in health services.

Dental health workers can hold a dental examination program during posyandu and provide dental health education or counseling with various media to the elderly regarding the importance of maintaining oral health in the elderly and risk factors that can cause problems with teeth and mouth so that they can affect the health status of the elderly.

Future researchers can conduct research on other possible causes or examine variables related to oral health maintenance and/or affect periodontitis with a larger number of respondents so that it can be known that there is a relationship or other influences that exist, as well as providing interventions during the study by providing counseling to increase the knowledge of the elderly regarding oral health.

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