# Dental And Oral Health Knowledge Regarding Tooth Loss In The Elderly At Dr. Ramelan Hospital, Surabaya

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***Abstract.***
*Tooth loss in the elderly remains a health problem that can reduce chewing function, nutritional status, and quality of life. Low knowledge about dental and oral health is thought to contribute to the high incidence of tooth loss in the elderly group. This study aims to analyze the relationship between dental and oral health knowledge and tooth loss in the elderly in the Dental and Oral Department of Dr. Ramelan Hospital, Surabaya. The study used a quantitative approach with a cross-sectional design. The study population was all elderly patients aged ≥60 years who visited from March to April 2026, with a sample selected using an accidental sampling technique of 37 respondents. The research instruments were a dental and oral health knowledge questionnaire and a tooth loss examination sheet. Data analysis was carried out descriptively and Chi Square test with a significance level of p <0.05. The results showed that 43.2% of respondents had insufficient knowledge, 75.7% had fewer than 20 functioning teeth, and there was a significant relationship between dental and oral health knowledge and tooth loss (p = 0.002) with a moderate strength of relationship (C = 0.497). This study concludes that increasing knowledge of dental and oral health plays an important role in supporting the maintenance of the number of functioning teeth in the elderly, so it needs to be strengthened through promotive and preventive programs.*
***Keywords:*** *Cross-Sectional Study, Elderly, Oral Health Knowledge, Oral Health and Tooth Loss.*

## I. INTRODUCTION

Oral and dental health is a crucial part of overall health because teeth play a role in the chewing process, so proper hygiene is crucial (Pontoluli, 2021). The elderly are particularly vulnerable to oral health problems due to the increased risk of caries and periodontal disease with age. This condition is the leading cause of permanent tooth loss, which is common among the elderly in Indonesia (Febrianti et al., 2022).

Tooth loss in the elderly not only impairs chewing function but also impacts digestion, nutritional status, and quality of life. Conversely, older adults who retain functioning teeth tend to have a better quality of life and nutritional status (Febrianti et al., 2022; Ramadhana et al., 2024).

Knowledge of oral health is a crucial factor in shaping health-care behaviors. Poor knowledge can increase the risk of caries, periodontal disease, and even tooth loss, while cognitive decline in older age can also impact an older adult's ability to understand health information (Sijabat et al., 2020; Aziza et al., 2021; Riffo et al., 2024).

In addition to knowledge, tooth loss in the elderly is influenced by environmental and behavioral factors, such as low education, socioeconomic status, limited access to healthcare, and a lack of dental hygiene habits and regular dental checkups. These conditions increase the risk of dental disease, which can lead to tooth loss (Notoatmodjo, 2018).

Data from the 2023 Indonesian Health Survey shows that 46.5% of elderly people experience tooth loss, but only 2.1% use dentures, and approximately 91.0% have never visited a dentist. Initial survey results from the Dental and Oral Department of Dr. Ramelan Hospital, Surabaya, also showed that most elderly people have fewer teeth than the WHO minimum standard. These findings indicate a high prevalence of tooth loss in the elderly, necessitating an examination of its relationship to oral health knowledge.

Based on these conditions, this study aims to analyze the relationship between dental and oral health knowledge and tooth loss in the elderly in the Department of Dentistry and Oral Health, Dr. Ramelan Hospital, Surabaya. This research is important to conduct as a basis for developing promotive and preventive

efforts to improve the dental and oral health of the elderly, with the novelty of the study being the assessment of the relationship between the two variables in the elderly at the study location.

## II. METHODOLOGY

This study used a quantitative approach with a cross-sectional design, namely data collection on the independent variable in the form of dental and oral health knowledge and the dependent variable in the form of tooth loss was carried out simultaneously in one observation period. This design was chosen to analyze the relationship between dental and oral health knowledge and tooth loss in the elderly in the Department of Dentistry and Oral Health, Dr. Ramelan Hospital, Surabaya. The study was conducted at the Department of Dentistry and Oral Health, Dr. Ramelan Hospital, Surabaya from March to April 2026.

The study population was all elderly patients aged 60 years and above who visited the Dental and Oral Department of Dr. Ramelan Hospital Surabaya during the study period. The sample was selected using an accidental sampling technique with inclusion criteria including elderly aged 60 years or above, willing to be respondents by completing the consent form and questionnaire, able to communicate normally, and cooperative during the examination. The exclusion criteria included elderly who were unwilling to complete the questionnaire and respondents who were uncooperative during data collection.

The research instrument consisted of a questionnaire to measure the level of knowledge of oral health, covering understanding, oral health problems, and oral health maintenance. Knowledge levels were categorized as good, adequate, and poor based on Nursalam's (2020) criteria. Tooth loss was measured through direct oral examination of respondents and recorded on an examination sheet. The examination results were then classified into categories of having at least 20 functioning teeth and less than 20 functioning teeth, as per WHO (2013) criteria.

The research procedure began with obtaining permission from the Dr. Ramelan Hospital in Surabaya and coordinating with the Department of Dental and Oral Health before conducting the study. Next, respondents who met the criteria were asked to sign a consent form, then underwent an examination of the number of missing teeth and completed a questionnaire on dental and oral health knowledge. The data obtained were then tabulated, scored, and analyzed descriptively to describe the distribution of knowledge levels and the number of missing teeth. The relationship between dental and oral health knowledge and tooth loss was analyzed using the Chi-Square test using the SPSS version 21 application with a significance level of $p < 0.05$.

## III. RESULTS AND DISCUSSIONS

### Characteristics of research subjects

**Table 1 Frequency Distribution of Characteristics of Elderly Patients in 2026 in the Department of Dentistry and Oral Medicine, Dr. Ramelan Hospital, Surabaya.**

| Characteristics | f | % |
|---|---|---|
| Age Frequency Distribution | | |
| 60-69 years | 21 | 56.8 |
| 70-79 years | 12 | 32.4 |
| 80-89 years | 4 | 10.8 |
| Gender Frequency Distribution | | |
| Man | 17 | 45.9 |
| Woman | 20 | 54.1 |
| Frequency Distribution of Education | | |
| Elementary School | 14 | 37.8 |
| JUNIOR HIGH SCHOOL | 11 | 29.7 |
| SENIOR HIGH SCHOOL | 9 | 24.3 |
| College | 3 | 8.1 |

The findings above show that 21 respondents, or 56.8%, were aged 60-69. Females dominated, representing 54.1% of the respondents, or 20 elderly. Fourteen respondents, or 37.8%, had a primary school education.

**Research result**

**Table 2 Frequency Distribution of Dental and Oral Health Knowledge in the Elderly in the Dental and Oral Department of Dr. Ramelan Hospital, Surabaya, 2026**

| Knowledge | f | % |
|---|---|---|
| Good | 10 | 27 |
| Enough | 11 | 29.7 |
| Not enough | 16 | 43.2 |
| Total | 37 | 100 |

The coverage found was seen directly through the 37 elderly people studied, many of whom still had low knowledge regarding dental and oral health, as evidenced by only 16 or 43.2% of respondents.

**Table 3 Frequency Distribution of Tooth Loss in the Elderly in the Department of Dentistry and Oral Medicine, Dr. Ramelan Hospital, Surabaya, in 2026**

| Tooth Loss | f | % |
|---|---|---|
| Functioning teeth ≥ 20 | 9 | 24.3 |
| Functioning teeth < 20 | 28 | 75.7 |
| Total | 37 | 100 |

According to the findings above, it shows that of the respondents analyzed, there were 28 respondents, which is the same as 75.7%, who had less than 20 teeth.

**Data Analysis Results**

**Table 4 Results of Cross-tabulation Analysis of the Relationship between Dental and Oral Health Knowledge and Tooth Loss in Elderly Patients.**

| Level of Knowledge | Number of Tooth Loss | | Total |
|---|---|---|---|
| | Functioning teeth ≥ 20 | Toothfunctioning< 20 | |
| Good | 6 | 4 | 10 |
| Enough | 3 | 8 | 11 |
| Not enough | 0 | 16 | 16 |
| Total | 9 | 28 | 37 |

In line with the findings shown, it was found that the respondents' knowledge was relatively good, showing that 6 elderly people had dental function above 20 which was still good. Meanwhile, 16 respondents still do not have fully functional teeth.

**Table 5 Chi-Square Test Results of the Relationship Between Dental and Oral Health in the Elderly and Tooth Loss**

| | Mark | Asymptotic Significance (2-sided) | Contingency Coefficient |
|---|---|---|---|
| *Pearson Chi-Square* | 12.109a | 0.002 | 0.497 |
| *N of Valid Cases* | 37 | | |

Based on the total coverage obtained through SPSS calculations involving the Chi-Square data analysis technique, the p-value is 0.002, which is smaller than the 0.05 requirement for significance. Thus, there is a relationship between dental and oral health knowledge involving tooth loss in the elderly. Therefore, the hypothesis of H0 is rejected while H1 is accepted. Based on the contingency coefficient, it is at 0.497, which indicates the strength of the relationship between the two variables, which is included in the moderate group, occupying a value range of 0.400 to 0.590.

**Discussion**

1. Dental and Oral Health Knowledge in the Elderly in the Dental and Oral Department of Dr. Ramelan Hospital, Surabaya in 2026.

Referring to findings that focus on the highest frequency of elderly knowledge regarding their dental and oral health in the dental and oral department of the elderly in the dental and oral department of Dr. Ramelan Naval Hospital, it is categorized as lacking. Most elderly do not undergo routine check-ups at dental health care facilities. Awareness of checking themselves every 6 months is still very low among the elderly, where visits are usually only made when unbearable pain occurs. In fact, routine check-ups function as an early detection effort for caries and periodontal disease, which are the main causes of tooth loss.

Besides frequency, the length of time brushing your teeth is also crucial. Most respondents with less knowledge had not yet implemented an effective brushing time (at least 2 minutes). Too short a time results in inadequate plaque removal, which in the long term can lead to damage to the tooth structure and its supporting structures, contributing to the high number of respondents with fewer than 20 teeth.

The respondents' low level of knowledge regarding the study topic aligns with Notoatmodjo's (2020) theory, which explains that knowledge is the result of sensory processing influenced by various factors, including exposure to information. This lack of knowledge impacts elderly people's low awareness of routine checkups and proper denture cleaning, thus contributing to the high rate of tooth loss.

In line with findings that include several elderly respondents facing the problem of missing teeth, the appropriate solution is to use dentures as a replacement. However, a lack of knowledge is directly proportional to errors in denture care. Some elderly still neglect to remove their dentures before bed, or do not clean them properly, which can trigger soft tissue inflammation (denture stomatitis) and worsen the condition of the remaining natural teeth. According to Sarwati et al. (2021), the risk of inflammation is higher due to the use of dentures, which can become a place for microbial colonization if not properly cared for. This condition is exacerbated by the decrease in saliva production (xerostomia) that naturally occurs in old age, making the mucosa more fragile, sensitive to mechanical trauma, and susceptible to secondary infections (Molek et al., 2022).

Regarding elderly respondents' knowledge regarding healthy teeth and mouth, only 18 respondents correctly answered that dental health for the elderly is the condition of the mouth, gums, and teeth that are free from pain, infection, and disease. This low achievement is in line with the frequency distribution, which shows that elderly people's understanding of healthy teeth and mouth is still relatively poor. This lack of knowledge can impact oral health, as individuals still lack an understanding of the urgency of caring for their teeth and mouth. This contributes to an increased risk of disease, highlighting the existence of caries and periodontal disease as the basis for triggering tooth loss in the elderly. Thus, if not properly managed, it can further affect masticatory function, nutritional status, and overall quality of life. Therefore, good knowledge regarding healthy teeth and a clean mouth is crucial to prevent tooth loss in the elderly.

Referring to the level of understanding of this issue among the elderly, particularly regarding the impact of saliva deficiency and the problems that arise when wearing dentures, most answered incorrectly. Lack of understanding regarding the impact of xerostomia (dry mouth), which can trigger caries and fungal infections, indicates that respondents are not yet aware of the physiological changes of old age related to the protective function of saliva. This is in line with the study by Molek et al. (2022), which shows that decreased salivary secretion in the elderly is a major risk factor for oral candidiasis and gingivitis, which is often overlooked by the public. This condition is exacerbated by the fact that the majority of respondents in this study had insufficient knowledge, which prevented them from recognizing the early symptoms of soft tissue damage in the oral cavity.

Respondents' knowledge in identifying problems that arise when wearing dentures, such as red gums and sores, reflects a lack of education regarding prosthetic device maintenance. Most respondents have experienced multiple tooth loss. This misperception risks chronic inflammation, which can reduce the quality of life of older adults, particularly in terms of chewing and speech comfort. As explained in the National Report of the Indonesian Health Survey (Ministry of Health, 2023), tooth loss without proper care and knowledge about oral rehabilitation can worsen the general health status of older adults.

Therefore, this can be understood from previous studies, which viewed low knowledge as a trigger for declining dental health in the elderly. This is reinforced by the study by Sarwati et al. (2021), which stated that a lack of knowledge and poor denture hygiene is associated with an increased risk of denture

stomatitis. Furthermore, Molek et al. (2022) also reported that xerostomia in the elderly can increase the risk of oral cavity infections due to decreased salivary protective function. Another finding by McReynolds et al. (2023) provides insight into inappropriate denture care behaviors, including leaving teeth removed before bed, which can exacerbate inflammation of the oral soft tissue. Therefore, the results of this study further emphasize the importance of improving education and promoting dental and oral health, especially in the elderly, to prevent further complications.

2. Tooth Loss in the Elderly in the Department of Dentistry and Oral Medicine, Dr. Ramelan Hospital, Surabaya in 2026.

Continuing with these findings, several respondents were found to be experiencing tooth loss, indicating that the number of teeth below 20 was reduced in function. Only a small number of respondents still had 20 or more functioning teeth, which is the ideal number for proper chewing. This high rate of tooth loss indicates that the dental and oral health of older adults is not yet optimal and cannot be considered healthy in line with expectations. This condition can impact the ability to chew food, consume nutrients, and maintain a healthy lifestyle overall.

The tooth loss assessment category is in accordance with the World Health Organization (WHO, 2013) target, which stipulates that older adults should have at least 20 functioning natural teeth to maintain adequate chewing, speech, and aesthetic functions without the aid of complex prostheses. The tooth loss experienced by the respondents in this study indicates an accumulation of untreated dental diseases, such as dental caries and periodontal disease, that have persisted for years.

Further analysis showed that the correlation between knowledge level and the number of functional teeth was at p-value 0.002. This clearly shows that many respondents still have minimal knowledge, with fewer than 20 teeth. This is consistent with a study by Anggraeni et al. (2022) which found that the elderly's low knowledge of healthy teeth and mouths is correlated with declining tooth function, due to a lack of knowledge regarding optimal dental care patterns, thus increasing the risk of tooth loss. The elderly will continue to lose teeth until they fall below the minimum functional limit set by the WHO, which ultimately reduces their quality of life in old age.

Tooth loss in the elderly is a condition that occurs with age and is generally influenced by various factors such as periodontal disease, untreated caries, poor oral hygiene, and systemic factors that weaken the supporting tissues of the teeth. This condition not only impacts the number of remaining teeth but also affects the ability to chew, speak, and facial aesthetics. In elderly individuals with significant tooth loss, masticatory function is less than optimal, thus limiting food consumption, potentially reducing nutritional intake. Furthermore, tooth loss can also affect self-confidence and overall quality of life. Therefore, early dental health care is crucial to minimizing the risk of tooth loss in the elderly.

3. The Relationship Between Dental and Oral Health Knowledge and Tooth Loss in the Elderly in the Dental and Oral Department of Dr. Ramelan Hospital, Surabaya in 2026.

In line with the analysis process that has been carried out, a significant correlation with moderate strength was obtained, focusing on elderly knowledge of dental and oral health, highlighting tooth loss. Therefore, the study proves that, in terms of level, dental health refers to a crucial factor that can support a healthier oral cavity in old age. Regarding the correlation between knowledge regarding dental and oral health, referring to tooth loss in the elderly, knowledge influences oral care behavior. In this case, if elderly people have knowledge regarding dental health, it is evident in their behavior in following recommendations for regular toothbrushing, undergoing dental checkups, and preventing dental disease early. Conversely, low knowledge leads to suboptimal dental care, which focuses on the existence of caries and periodontal problems that are more likely to develop and ultimately lead to tooth loss.

Based on the study by Anggraeni et al. (2022), it was proven that there is indeed a significant relationship between the level of individual knowledge regarding dental and oral health and the total number of functioning teeth in the elderly. Low knowledge increases the risk of tooth loss due to a lack of preventive behavior and proper dental care. Furthermore, research by Annisa et al. (2023) also showed that elderly with low levels of knowledge experience more tooth loss compared to elderly with good knowledge, due to a lack

of awareness about routine dental care and choosing conservative measures. Thus, this effort supports the maintenance of the number of functional teeth in the elderly.

Respondents' lack of knowledge regarding important aspects such as the impact of saliva deficiency and signs of inflammation due to dentures suggests that most respondents have fewer than 20 teeth. Based on Nursalam's (2020) criteria, respondents who failed to achieve a correct answer score were categorized as having insufficient knowledge. This condition has been statistically proven to be associated with tooth loss, with all elderly people with insufficient knowledge experiencing massive tooth loss. This low level of knowledge often leads to the elderly being unaware that periodontal disease is a major cause of tooth attachment loss, as explained by Atmojo et al. (2025) who showed that low dental health knowledge is associated with an increased incidence of periodontitis in the elderly. Furthermore, research by Sumbayak et al. (2023) explains that periodontitis is a chronic inflammatory problem that can disrupt the tissue supporting the teeth and can lead to tooth loss if not properly treated.

The high rate of tooth loss in the elderly population in this study indicates that global health targets have not been fully achieved. According to Kwon et al. (2021), older adults who lack adequate knowledge about the relationship between oral health and systemic diseases such as diabetes tend to have low motivation to care for their remaining teeth. Maintaining a minimum of 20 natural teeth is the standard set by global health authorities to ensure seniors maintain a good quality of life and optimal nutritional function through effective chewing.

The study results indicate that a lack of knowledge about dental and oral health among elderly people in the Department of Dentistry and Oral Health at Dr. Ramelan Naval Hospital is associated with a high incidence of tooth loss, with the strength of the relationship being moderate. This lack of knowledge, including the urgency of proper dental and oral care, can lead to older adults not having regular dental checkups and treatments. Elderly individuals with tooth loss, due to a lack of understanding about healthy teeth and mouths, can experience a decline in productivity. Tooth loss makes it difficult to chew food, resulting in reduced nutritional intake and increased susceptibility to weakness or illness. Furthermore, this condition can also reduce self-confidence when speaking or interacting with others.

## IV. CONCLUSION

This study shows that most elderly people in the Department of Dentistry and Oral Medicine, Dr. Ramelan Hospital, Surabaya, have a low level of knowledge about dental and oral health, and the majority have fewer than 20 functioning teeth. The results of the Chi-Square test prove a significant relationship between dental and oral health knowledge and tooth loss in the elderly, with the strength of the relationship being in the moderate category. This finding indicates that the better the elderly's knowledge about dental and oral health, the greater the chance of maintaining the number of functioning teeth. The results of this study provide practical implications that dental and oral health education needs to be improved through promotive and preventive activities, including counseling and regular dental check-ups, so that tooth loss in the elderly can be minimized and their quality of life can be maintained.

This study has limitations due to its cross-sectional design, which can only describe the relationship between variables at a single observation point and cannot explain causality. Furthermore, the study was conducted at a single healthcare facility using an accidental sampling technique, so the results cannot be generalized to the entire elderly population. Therefore, further research is recommended involving a larger number of respondents, covering a wider range of locations, and using a research design that can evaluate the relationship in more depth. Future research is also expected to expand the study of other factors related to tooth loss in the elderly as a basis for developing more effective oral health promotion programs.

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