



THE RELATIONSHIP BETWEEN TOOTH LOSS STATUS AND MASTICATORY FUNCTION QUALITY AMONG THE ELDERLY AT THE SETIANEGARA SUBDISTRICT HEALTH POST

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ABSTRACT

The elderly are someone who has passed adulthood and is more than 60 years old. When an individual enters the old age, they can experience various changes in the form of a decline in physical, psychological and social function. This aging process occurs in all parts of the human body, including in the oral cavity, namely in its structure and function. Problems that often occur in the oral cavity of the elderly, one of which is tooth loss. Tooth loss can lead to impaired activity and normal function in the oral cavity. Loss of a large number of teeth leads to a decrease in the quality of chewing function, especially the missing teeth are the posterior teeth. Objective: to determine the relationship between the status of tooth loss and the quality of chewing function in the elderly age group (>60 years) in Setianegara Village, Tasikmalaya City. Methods: Analytical observational research with cross-sectional research design. The study was conducted on 30 elderly people in Setianegara sub-district, Tasikmalaya City, who were selected by consecutive sampling. The status of tooth loss is measured by counting the number of teeth that remain, the remaining roots are grouped into the missing teeth. The quality of chewing function was measured using a self-assessment questionnaire regarding xerostomia complaints, difficulty chewing daily food, difficulty chewing hard and soft foods, and avoiding certain types of food. The statistical test uses the spearman correlation test. Results: 30 elderly respondents, a significant relationship was found between tooth loss and the quality of chewing function ($r_s = -0.742$; $p = 0.000$). The more teeth are lost, the more often the elderly experience impaired chewing function. Conclusion: tooth loss has a negative effect on the chewing function of the elderly, so efforts to prevent tooth loss and the use of dentures are needed to maintain quality of life.

Keywords: Tooth loss status; Masticatory function; Older adults

Introduction

An elderly person is someone who has passed adulthood and is more than 60 years old¹. The number of elderly people will continue to increase along with the development of the times due to improvements in various areas of life so that life expectancy increases and mortality rates decrease. When an individual enters the old age, they can experience various changes in the form

of decreased physical, psychological and social functions². The change in body function occurs slowly with age due to the aging process that occurs throughout human life³. This aging process occurs in all parts of the human body, including in the oral cavity, namely in its structure and function. Problems that often occur in the oral cavity of the elderly, one of which is tooth loss³.

Tooth loss is a condition in which one or more teeth are detached from their place in the tooth curve⁴. Common changes in the oral cavity of the elderly can include damaged teeth or caries, loose teeth, bad breath, gingival inflammation, gingival recession, loss of attachment to the periodontal and alveolar bones. These problems, if not handled properly, can result in tooth shaking, which can lead to loose teeth. Research conducted states that as many as 70% of the elderly experience tooth loss with more than 10 teeth⁵. Tooth loss can lead to impaired activity and normal function within the oral cavity. Loss of a large number of teeth can lead to a decrease in the quality of chewing function, especially if the missing tooth is the posterior tooth⁶. In a study conducted, it was stated that respondents consisting of the elderly, they stated that they experienced difficulty in chewing because they experienced a lot of tooth loss, especially the loss of posterior teeth⁷.

The mastication process under normal circumstances can help maintain and improve general health. If there is a disturbance in chewing function, this can have an effect on an individual's general health.⁵ Although the association between tooth loss and decreased chewing function in the elderly has been reported in some studies, most studies have been conducted in clinical care facilities and in large cities, so they do not reflect the condition of the elderly in rural and semi-urban communities. Local data on this condition, especially in the Tasikmalaya City area, is still very limited. In addition, there have not been many studies conducted in the context of Posbindu as a community setting, even though Posbindu is the main forum for elderly health development in Indonesia that reaches the elderly who are not actively seeking formal health services. This study aims to fill the gap by presenting local epidemiological data and evaluating the relationship between tooth loss and the quality of chewing function subjectively in the elderly in the community of Setianegara Village, Tasikmalaya City.

Special Research Objectives: To see an overview of the status of tooth loss in the elderly age group (>60 years) and to see an overview of the quality of the chewing function of the elderly age group (>60 years) in Setianegara Village.

Research urgency: This study was carried out considering that the elderly are a vulnerable group to dental and oral diseases.

Methods

This study is an analytical observational research with a cross-sectional research design. The population of this study is all elderly people who are actively registered at the Posbindu of Setianegara Village, Tasikmalaya City, totaling 30 people. The sample was selected using total sampling, i.e. all members of the population who met the criteria were included as respondents. The inclusion criteria include: (1) ≥ 60 years old, (2) actively registered at the Setianegara Village Posbindu, (3) present at the time of data collection, and (4) willing to be a respondent after getting an explanation and signing an informed consent. Exclusion criteria include: (1) the elderly with severe cognitive impairment who are unable to answer the questionnaire independently, and (2) the elderly who refuse the oral cavity examination. This research was carried out by paying attention to the ethical principles of health research, including the confidentiality of respondent data and obtaining written consent before data collection.

The independent variable in this study was tooth loss status, which was measured by calculating the number of teeth remaining in the tooth curve. Leftover roots that cannot function are categorized as missing teeth. Tooth loss status is categorized into: no teeth left (0 teeth), loss of many teeth (remaining 1–10 teeth), partial loss (remaining 11–20 teeth), and almost complete (remaining >20 teeth). The bound variable was the quality of the chewing function, which was measured using a 5-point Likert scale-based self-assessment questionnaire (1 = never to 5 = very frequent). The questionnaire covered four domains: (1) xerostomia complaints, (2) difficulty chewing daily food, (3) difficulty chewing hard and soft foods, and (4) tendency to avoid certain types of food.

Data analysis using the help of SPSS software. The Spearman correlation test is used to explain the strength and direction of the relationship between tooth loss status and the quality of mastic function. Data is

considered statistically meaningful when the $p < 0.05$ with a 95% confidence level.

Results and Discussion

A study on the relationship between tooth loss status and the quality of masticatory function among the elderly at the Posbindu in Setianegara Village, Tasikmalaya City, was conducted in July 2025. The sample for this study consisted of 30 respondents.

Table 1. Univariate Analysis of Respondent Characteristics

Variable	n	%
Age		
60 -70 Years	15	50
71- 80 Years	15	50
Gender		
Male	15	50
Female	15	50
Tooth Loss Status (Remaining Teeth)		
0 teeth	9	30
1 – 10 teeth	9	30
11 – 20 teeth	7	23,3
>20	5	16,7
The Use of Dentures		
Yes	16	53,3
No	14	46,7
Chewing Function Quality		
Never	3	10
Very rarely	6	20
Sometimes	7	23,3
Often	6	20
Very often	8	26,7

Table 1. The results show that 15 respondents (50%) were aged 60–70, 15 respondents (50%) were aged 71–80, 15 respondents (50%) were male, and 15 respondents (50%) were female. There were 9 respondents (30%) with 1–10 teeth, 7 respondents (23.3%) with 11–20 teeth, 5 respondents (16.7%) with more than 20 teeth, and 9 respondents (30%) with no teeth. There were 16 respondents (53.3%) who used dentures and 14 (46.7%) who did not. Three respondents (10%) reported never having complaints related to chewing function, 6 (20%) very rarely, 7 (23.3%) sometimes, 6 (20%) often, and 8 respondents (26.7%) reported very frequently having complaints related to chewing function.

Table 2. Analysis of the Relationship Between Tooth Loss Status and Masticatory Function Quality

Variable	<i>p</i> -value	Correlation Coefficient (<i>rs</i>)
Tooth Loss Status Chewing Function	0,000	-0.742

Table 2. It showed that the results of bivariate analysis of the relationship between tooth loss status and the quality of chewing function using the spearman rank test with a p -value of < 0.05 (0.000), there was a significant relationship between tooth loss status and the quality of chewing function in the elderly with a strong and significant negative relationship between tooth loss status and the quality of chewing function in the elderly ($rs = -0.742$, $p = 0.000$). The more teeth are lost (the less teeth are left), the more often the elderly experience impaired chewing function.

Discussion

This study confirms the existence of a significant and strong relationship between tooth loss status and the quality of chewing function in the elderly in the Posbindu community, with a Spearman correlation coefficient of $rs = -0.742$ ($p = 0.000$). This negative correlation value means that the fewer teeth remain, the higher the frequency and severity of chewing disorders reported by respondents.

The strong correlation found can be explained through several biological and functional mechanisms. Biomechanically, teeth, especially the posterior teeth (molar and premolar) act as the main destroying unit of the food bolus before ingesting. Posterior tooth loss leads to a reduction in the occlusal surface area available for the chewing process, so that the efficiency of food destruction decreases proportionally. In the elderly, there is a physiological decline in the mastication muscles—especially the masseter and temporal muscles—in the form of type II muscle fiber atrophy due to the process of sarcopenia which is accelerated by the lack of mechanical stimulation from dental occlusion. This condition is exacerbated by reduced saliva production (xerostomia) with age and the side effects of various drugs commonly consumed by the elderly, which further hinders the lubrication process and the formation of a cohesive food

bolus. The combination of these factors creates a negative cycle: tooth loss → decreased muscle stimulation → mastication muscle atrophy → decreased bite strength → worsening chewing difficulties⁸.

The study's findings are in line with and reinforced by a number of longitudinal studies in Japan of 1,800 elderly people finding that tooth loss is associated not only with decreased chewing function, but also with an increased risk of malnutrition, decreased cognitive function, and early mortality⁹. Their systematic review found that the elderly with a <20 number of teeth had a 1.5 to 2 times higher risk of malnutrition than those with more complete teeth¹⁰. In Indonesia, it was confirmed that tooth loss in the elderly with dementia correlates with a simultaneous decline in chewing and cognitive ability, confirming that the impact of tooth loss is systemic, not solely local in the oral cavity¹¹.

In this study, 53.3% of respondents used dentures, but a strong correlation ($r_s = -0.742$) was found even though a large portion of the population had used prosthetics. This indicates that the dentures used by respondents—most likely conventional removable dentures—have not fully restored mastication function to a level equivalent to natural teeth. This is in accordance with the findings of Kapur et al. which show that the chewing efficiency of full denture users only reaches 20–25% compared to individuals with full teeth. In contrast to implant-based dentures that can restore function by up to 80–90%, conventional removable dentures often experience retention and stability problems, especially in the elderly with advanced alveolar bone resorption. The quality of dentures and compliance with their use are decisive factors in how much dentures can compensate for the loss of natural teeth in terms of chewing function¹².

From the perspective of clinical implications and health policy, the findings of this study have significant relevance for Indonesia's primary health system. First, the high proportion of elderly people who have lost all their teeth (30%) and who have very few remaining teeth (30% with 1–10 teeth) in the Setianegara Village Posbindu reflects the heavy burden of dental disease at the community level, which is likely not to be optimally handled. Second, given that Posbindu is the forefront of

elderly health services in Indonesia, the integration of dental health screening—including the examination of the number of functional teeth and the assessment of the chewing function—into the Posbindu service standards needs to be seriously considered by the Ministry of Health. This is in line with the WHO's recommendations in the Global Oral Health Action Plan 2023–2030 document which emphasizes the importance of a community-based approach in addressing dental health disparities in the elderly population. Third, the national health insurance policy (JKN) needs to be reviewed regarding the coverage of denture services for the elderly, especially in Setianegara Village to ensure that the elderly who have lost their teeth get adequate access to denture rehabilitation¹³.

Conclusion

This study demonstrates a significant association between tooth loss status and the quality of masticatory function among the elderly at the Posbindu in Setianegara Village, Tasikmalaya City. The results of the analysis using Spearman's rank correlation test yielded a p-value of 0.000 with a strong negative correlation coefficient ($r_s = -0.742$), indicating that the greater the number of missing teeth, the lower the quality of masticatory function.

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