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## Tooth Loss In Elderly With Cognitive Function Based On Gender At Posyandu Elderly In Manggis Village, Panggul, Trenggalek District

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### ABSTRACT

Tooth loss is one of the problems that often occurs in the elderly and has an adverse impact starting with a decrease in speech, chewing and decreased cognitive function. Impaired cognitive function of the elderly is due to difficulties in the process of chewing food, as well as the initial procedure for digesting it where there is an expulsion into a bolus to support the swallowing stage. Initial survey findings in August 2023 found a high percentage of the elderly population as much as (60%) of the elderly who have <20 teeth functioning at the Posyandu Lansia Desa Manggis, Panggul, Trenggalek Regency. The objectives of this study are to determine the relationship between tooth loss and cognitive function in older adults based on gender at the Manggis Village Elderly Posyandu, Panggul, Trenggalek District. This type of research is analytic quantitative observational. Using a survey method with a Cross Sectional approach. The population in this study were elderly people aged 60 years and over at the Manggis Village Elderly Posyandu, Panggul, Trenggalek Regency with a total of 40 elderly people. The data collection instruments used were MMSE questionnaire examination sheets and dental examination observation sheets. The data analysis technique used was the Spearman correlation test. The results of this study are cognitive function based on gender has a normal cognitive function. The level of tooth loss in the elderly based on gender has a high category which means that the level of tooth loss in elderly men and women has a number of functioning teeth <20 teeth. The conclusion is that tooth loss is related to cognitive function in the elderly at Posyandu Lansia Desa Manggis, Panggul, Trenggalek Regency.

Keywords: Elderly tooth loss; Cognitive function; and Elderly.

### Introduction

A body part whose role is crucial is oral health. Teeth are an important part that plays a role when processing chewing, speaking and to beautify the appearance. Not maintaining the health and cleanliness of teeth will cause caries, diseases of the periodontal tissue, and tooth fractures due to trauma due to the entrance of bacteria and germs through the oral cavity which, if ignored, can potentially experience tooth loss [1].

The elderly are people who are more than 60 years old and their physical appearance contrasts with those of a young age [2]. Based on Indonesian Law No. 13 article 1 paragraph 2 of 1998 regarding

“elderly welfare” or the elderly are individuals whose age is 60 years or more [3]. The 2018 “Basic Health Research” data shows that around 57.6% of the Indonesian population suffers from problems with their teeth and mouth. Those aged 65 years and half of 54.2% found problems with their teeth and mouth. The distribution of tooth loss problems due to extraction in Indonesia averages 19%. Individuals who do not understand the importance of maintaining their oral health are the source of the problem [4].

The condition of one's mouth and teeth is an indicator of overall health, as poor oral health can be interpreted as a sign of overall illness. When such hygiene is neglected, the oral cavity is capable of

developing a number of problems [5]. A common problem for the elderly is tooth loss, which can negatively impact their health and overall quality of life, in addition to worsening speech and chewing difficulties. As people go through the aging process, tooth loss often affects them. Foods that are easy to chew or soft are usually preferred by the elderly. Nutritional fulfillment will be affected by this [6].

Cognitive function is a person's mental procedural including his attention, thought process, perception, knowledge and memory. The indicators that result in the cognitive function of the elderly are age, health conditions, gender, educational status, occupation and activity [7]. Impaired cognitive function in the elderly can be caused by difficulties in the process of chewing their food, and is the initial procedure for digesting it where there is a pulverization, namely into a bolus to support the swallowing stage in the elderly. [8]. A person's cognitive ability, which relates to intelligence and involves problem-solving skills, is the capacity in the brain that enables them to understand and apply skills such as speaking, arithmetic, and information reception. [9].

The number of elderly people who have lost their teeth results in a loss of cognitive function, where the elderly will have difficulty in various things such as the ability to solve problems, design decisions, and memory [8]. There are 121 million elderly people in Indonesia who experience cognitive impairment; 5.8% of them are men and 9.5% are women [10]. In general, reduced oxygen delivery to the brain, age and degeneration, "Alzheimer's" disease, as well as lack of time, space, location, and difficulty accepting new ideas or things, are some of the problems of the elderly when they experience mental changes and decreased focus [11]. The purpose of this study was to determine the relationship between tooth loss in the elderly with cognitive function at Posyandu Lansia, Manggis Village, Panggul, Trenggalek Regency.

The findings of the baseline survey on August 5, 2023, featured a number of elderly people in Manggis Village, Panggul, Trenggalek Regency, whose ages ranged from 60 to 83 years old, having their teeth examined. Four respondents (40%) were found to have more than equal to twenty functioning teeth, and six respondents (60%) were found to have less than twenty functioning teeth, based on the examination results. The problem found is the high percentage of the elderly population who have less than 20 functioning teeth as much as 60% in the elderly at the Posyandu Lansia Desa Manggis,

Panggul, Trenggalek Regency, while the WHO 2012 standard of 90% elderly has a minimum of 20 functioning teeth provided that the posterior teeth are still functioning. Based on the results of the survey, it is necessary to conduct research on tooth loss in the elderly with cognitive function based on gender at the Elderly Posyandu Manggis Village, Panggul, Trenggalek Regency.

## Methods

The type of research used is quantitative analytical observational research through the application of a "cross-sectional" survey strategy. This research was conducted at the Manggis Village Hall (Posyandu Lansia) Krajan Hamlet, Panggul, Trenggalek Regency. The time required when researching is from January to March 2024. The population used is the elderly whose age is 60 years and over with a total of 40 elderly. Data on cognitive function of the elderly were taken using the MMSE questionnaire sheet. Data on tooth loss in the elderly were taken using a dental examination observation sheet and the results of interviews with assessments, the level of tooth loss has 2 categories, namely if in the oral cavity there are still  $\geq 20$  teeth functioning = Low level of tooth loss. If in the oral cavity there are still  $< 20$  functioning teeth = high level of tooth loss [12]. This research was declared ethically feasible by the Ethics Commission of Poltekkes Kemenkes Surabaya with No.EA/2176/KEPK-Poltekkes\_Sby/V/2024.

## Result and Duscussion

**Table 1. Distribution of Research Subjects Based on Gender in the Elderly at the Elderly Posyandu Manggis Village, Panggul, Trenggalek Regency in 2024.**

Gender	Frequency	%
Male	20	50
Female	20	50
Total	40	100

Based on table 1, the application of 40 elderly group respondents selected from their gender, the number of research samples whose gender is male and female is equal.

**Table 2 Distribution of Research Subjects Based on Age in the Elderly at the Elderly**

**Posyandu Manggis Village, Panggul, Trenggalek Regency in 2024.**

Age	Frequency	%
60-70 years old	23	57,5
71-82 years old	17	42,5
Total	40	100

Age is an indicator that results in tooth loss. The correlation of tooth loss with increasing age is due to indicators such as “caries” and “periodontal disease” [13]. With age tooth loss increases due to the cumulative effects of caries, trauma and periodontal disease [14]. As for the middle age will face the “aging process” [8]. The results show that the highest number of respondents whose age is 60-70 years old.

**Table 3 Frequency Distribution of Level of Tooth Loss in Elderly Male at the Elderly Posyandu in Manggis Village, Panggul, Trenggalek Regency in 2024.**

Category Level Tooth Loss	Frequency	%
High	13	65
Low	7	35
Total	20	100

**Table 4 Frequency Distribution of Level of Tooth Loss in Female Elderly at the Elderly Posyandu in Manggis Village, Panggul, Trenggalek Regency in 2024.**

Category Level Tooth Loss	Frequency	%
High	13	65
Low	7	35
Total	20	100

Shown in tables 3 and 4 the frequency distribution of the level of tooth loss in elderly men and women at the Posyandu Lansia Desa Manggis, Panggul, Trenggalek Regency tends to be high. In this study, tooth loss was based on the gender of the respondents whose sample size was similar. The state of the oral cavity in the elderly at the Manggis Village Elderly Posyandu, Panggul, Trenggalek Regency on average is found to have caries, tartar, tooth loss and bad breath. The level of tooth loss in elderly men and women has a high category, meaning that the level of tooth loss in elderly men

and women both have a number of functioning teeth, namely less than 20 teeth.

The habit of the elderly population of Manggis Village, Panggul Trenggalek when experiencing toothache is not immediately checked to the nearest health services such as health centers, dental clinics, or hospitals. This habit can result in unhealthy dental and oral health conditions for the elderly, such as experiencing caries, bad breath, a lot of tartar to experience tooth loss due to neglected caries. A small number of elderly people already understand the importance of caring for their oral health, such as conducting routine examinations to the dentist at the nearest health service, namely the independent clinic. This is evident in the fact that there are three elderly people who have used dentures to help chew food.

This research contrasts with [13] showing a higher number of tooth loss in women, they generally tend to be more afraid of going to the dentist and are found to have presumed caries resulting in tooth loss. Based on the opinion of [8] explained the same thing. In both genders, similar numbers were found but the lifestyle of women tended to be less healthy due to their habit of eating sugary foods. This can result in unhealthy teeth as well as contrasting hormonal indicators between the two.

**Table 5 Frequency Distribution of Cognitive Function in Male Elderly in the Elderly Posyandu of Manggis Village, Panggul, Trenggalek Regency in 2024.**

Category Cognitive Function	Frequency	%
Normal	12	60
Mild Dementia	7	35
Moderate Dementia	1	5
Severe Dementia	0	0
Total	20	100

**Tabel 6 Frequency Distribution of Cognitive Function in Female Elderly in the Elderly Posyandu of Manggis Village, Panggul, Trenggalek Regency in 2024.**

Category Cognitive Function	Frequency	%
Normal	11	55
Mild Dementia	7	35
Moderate Dementia	1	5
Severe Dementia	1	5
Total	20	100

The “MMSE” test is the most frequently applied test to assess cognitive abilities and mental processes, able to track changes in cognitive function over time [15]. The “MMSE” test is a 10-minute test that includes memory, calculation, and language [16]. Shown in tables 5 and 6 the frequency distribution of cognitive function using the MMSE questionnaire sheet can be concluded that most of the elderly with male and female gender in Posyandu Elderly Manggis Village, Panggul Trenggalek Regency have normal cognitive function. Seen in the results of the analysis above the normal category is more than the mild, moderate and severe categories. If someone gets an MMSE score below 24, it means that there is a presumption that the individual is suffering from “dementia” or reduced cognitive function. [16].

From the orientation aspect, most of the elderly get good scores, namely an average score of 8-10, which means that the elderly in Manggis Village, Panggul, Trenggalek Regency are good at mentioning place and time. In the aspect of registration, the elderly are good at mentioning the objects asked by researchers with perfect scores, but there are a small number who cannot mention the objects asked by researchers. Aspects of attention and calculation there are some elderly who have difficulty in counting and spelling words. The elderly of Manggis Village, Panggul, Trenggalek Regency have a fairly good memory, as evidenced when the elderly are asked to mention the object at the registration point again. In terms of language aspects, the elderly tend to have difficulty if asked to write one sentence. The elderly of Manggis Village, Panggul, Trenggalek Regency have an educational background of finishing elementary school and even not finishing elementary school, so most of the elderly have difficulty writing to compose one sentence.

This research contrasts with [13] that the majority of the 21-32 tooth loss group in the elderly aged 60-78 years experienced moderate cognitive dysfunction. Cognitive function includes aspects of registration, orientation, memory, “visuospatial”, attention and language [17].

**Table 7 Spearman Correlation Test Analysis Results Tooth Loss with Cognitive Function in Male Elderly at the Elderly Posyandu Manggis Village, Panggul, Trenggalek Regency in 2024.**

	Male Tooth Loss Score
Cognitive Function Score Male	r = 0,105 p = 0,658 (>0,05) n = 20

The results of the Spearman correlation test analysis in table 7 obtained a correlation coefficient value of 0.105 and a significant value between tooth loss and cognitive function, namely 0.658 (>0.05), meaning that there is no significance of tooth loss with cognitive function in the elderly with male gender in the Elderly Posyandu Manggis Village, Panggul, Trenggalek Regency.

**Table 8 Spearman Correlation Test Analysis Result Tooth Loss with Cognitive Function in Female Elderly in the Elderly Posyandu Manggis Village, Panggul, Trenggalek Regency in 2024.**

	Female Tooth Loss Score
Cognitive Function Score Female	r = 0,459 p = 0,042 (<0,05) n = 20

The results of the Spearman correlation test analysis in table 8 obtained a correlation coefficient value of 0.495 and a significant value between tooth loss and cognitive function, namely 0.042 (<0.05), meaning that there is a significance of tooth loss with cognitive function in the elderly with female gender at Posyandu Elderly Manggis Village, Panggul, Trenggalek Regency.

Tooth loss can lead to reduced chewing ability in the elderly and this can result in reduced cerebral blood flow which can then impair cognitive function as well as the motor skills required for balanced standing and walking [18]. There are several studies that link tooth loss to cognitive dysfunction in the elderly who have the disease “dementia” [13]. A study in elderly people aged 60 to 79 years in Germany to examine “tooth loss” caused by “chronic periodontitis” and its associated poor cognitive function, the MMSE was applied to

examine the correlation of tooth loss with reduced cognitive function and was able to interpret the correlation in women only [19] .

The results are in line with research [20] that there is a significance of tooth loss with cognitive function in Saudi women. According to research conducted [19] in elderly male subjects, tooth loss and “periodontal disease” progressively carried out during adulthood can result in reduced cognitive function, so the onset of “caries” can support poor test results. The risk of reduced cognitive function in elderly men will increase in line with tooth loss, disruption of the “mastication” process. This study is in line with [8] i.e. the elderly can describe in order to reason about sensory information, cognitive function involves the correct processing, storage and use of all forms of sensory data, including tactile, auditory and visual input.

### Conclusion

Based on the results of research on “Tooth Loss in the elderly with cognitive function based on gender at Posyandu Lansia Desa Manggis, Panggul, Trenggalek Regency” it can be concluded that cognitive function in the elderly based on gender mostly has normal cognitive function. The level of tooth loss in the elderly based on gender both have a high category which means the number of functioning teeth is less than 20 teeth. The correlation result is that tooth loss is related to cognitive function in the elderly at the Elderly Posyandu in Manggis Village, Panggul, Trenggalek Regency.

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