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## Analysis of Tooth Loss in Lokbaintan Village, Banjar Regency

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### Abstract

*Banjar Regency is one of the districts in South Kalimantan Province that suffers from dental and oral health issues, particularly tooth loss. The prevalence of tooth loss in Banjar Regency was 15.94%. Tooth loss can be caused by a variety of circumstances, including advancing age and poor nutritional status. Objectives: This research is to analyse the incidence of tooth loss based on age and nutritional status. Methods: The incidence of tooth loss in Lokbaintan Village was assessed using a cross-sectional study. The research sample included 42 respondents that were chosen at random. Direct examination of the respondent's oral cavity with a disposable mouth mirror was used to measure tooth loss, which was documented on an odontogram sheet. Body mass index is calculated using the results of measuring body weight with scales and height with a microtoise. The Pearson correlation test and the linear regression test were used to assess the data. Results: The average tooth loss was 5.10, with a body mass index of 25.14 and an average age of 40.79. The amount of tooth loss is unrelated to body mass index ( $r = -0,854$ ,  $p\text{-value} < 0,644$ ), However, age is related to the amount of tooth loss ( $r = 0,491$ ,  $p\text{-value} < 0,004$ ). Regression analysis showed that age was a predictor of the number of teeth lost. ( $\beta$ : 0,080;  $R^2$ : 0, 241;  $p < 0,004$ ). Conclusion: In Lokbaintan Village, Banjar Regency, ageing is the primary cause of tooth loss, so as people age, more attention needs to be given to their dental and oral health.*

**Key words:** age, body mass index, tooth loss

### Introduction

Globally, tooth loss is a problem for public health, particularly in low- and middle-income nations. This issue is regarded as a potential risk factor for cardiovascular disease and has been connected to widespread health issues like excessive blood pressure, obesity, and malnutrition.<sup>1,2</sup> In addition, this illness impairs daily tasks including chewing, swallowing, pronouncing words correctly, looking well, and participating in social events. Severe tooth loss ranks 36th out of 100 chronic disorders that have an impact on life expectancy, which highlights the significance of this condition for both oral and general health, according to Marcenes et al.<sup>2</sup>

Basic health research in 2018 reported that the tooth loss index in Indonesia was still relatively high, namely 19%. South Kalimantan Province is one of the provinces with a high rate of tooth loss, namely 17.84%. Banjar Regency is one of the districts in South Kalimantan Province that has dental and oral health problems, especially cases of tooth loss. Cases of tooth loss in Banjar Regency were 15.94%.<sup>3</sup>

The high rate of tooth loss in Banjar Regency is influenced by several factors, one of which is

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that proper tooth brushing behavior in Banjar Regency is still very low. The results of the 2018 Basic Health Research Report reported that only 5.92% of the people of Banjar Regency brushed their teeth at the correct time, even though 96.98% of the people of Banjar Regency brushed their teeth every day.<sup>4</sup> Age is another significant risk factor for tooth loss, in addition to brushing habits. Age affects how likely it is that someone will lose their teeth. Age has significant effects on tooth loss, according to studies by Ando et al.<sup>5</sup>

According to the research of Ando et al., middle-aged people's tooth loss was also associated with getting older and having poor diet.<sup>6</sup> It is crucial to understand how tooth loss and dietary intake are related. Nutritional status is influenced by dietary choices; poor nutritional choices are risk factors for poor oral health, which is one of the factors contributing to a high incidence of tooth loss.<sup>5</sup> This study's objective was to evaluate the prevalence of tooth loss in Lokbaintan Village, Banjar Regency, according to age and nutritional status.

## **Methods**

### **Study Design and Sampling**

This study has a cross-sectional study design and is a type of analytical observational research. The Lokbaintan Village community served as the study's sample, with a total of 42 respondents. Simple random sampling was the method used for sampling. People living in Lokbaintan Village, aged 36 to 55, and having lost at least one tooth, are the inclusion criteria for this study. The following respondents were excluded from this study: those who were ill at the time the research was conducted; those who declined to have their oral cavities examined; and those who did not finish the whole study.

### **Research Tools**

Tooth loss was measured by direct examination of the respondent's oral cavity with a disposable mouth mirror and recorded on an odontogram sheet. The identification of body mass index is assessed based on the results of measuring body weight using a weight scale and height using a microtoise.

Data analysis in this study used the Pearson correlation test to determine the correlation between age and BMI on tooth loss. Linear regression analysis was used to determine the prediction model for the number of tooth losses based on age and BMI.

### **Data Collection**

The research began by identifying people in Lokbaintan Village who experienced tooth loss. The entire population that experienced tooth loss was then randomised to become respondents. Data collection began by asking respondents for written consent to participate in the research. After receiving written consent, all 42 respondents filled out a respondent identity form, after which the number of missing teeth was checked using a disposable mouth mirror and recorded on an odontogram sheet, and weight and height were measured.

### **Data Analysis**

The data were analysed using SPSS version 25. Descriptive statistics were used to analyse images of gender, age, body mass index, and the number of missing teeth. Inferential analysis in this study used the Pearson correlation test to determine the correlation between age and BMI and tooth loss. Linear regression analysis was used to determine the prediction model for

the number of tooth losses based on age and body mass index. P-value of <0.05 with 95% confidence interval was considered statistically significant.

## Results

Respondent characteristics were analyzed to determine the diversity of research respondents described by gender and age. Gender distribution can be seen in Table 1.

**Table 1:** Gender.

Variables	Frequency	
	N	%
Gender		
Male	6	14,29
Female	36	85,71
Total	42	100

The gender of respondents who experienced tooth loss in Lok Baintan Village was mostly female, namely 36 people (85.71%), with the least number of men, namely 6 people (14.29%). The analysis of tooth loss in this study was based on the factors of age and body mass index (BMI). Age distribution, body mass index, and tooth loss can be seen in Table 2.

**Table 2:** Age Distribution, Body Mass Index, and Tooth Loss.

Variable	Mean	SD
Age	40,79	5,95
Body Mass Index	25,14	4,98
Tooth Loss	5,10	6,10

The average age of respondents who experienced tooth loss in Lokbaintan Village was 40.79 years old, with an average body mass index of 25.14, or in the obesity category. The average tooth loss among respondents in Lokbaintan Village was 5.10 teeth. The analysis that influences tooth loss in Lok Baintan Village can be seen in Table 3.

**Table 3:** Analysis of the Relationship between BMI and Age on Tooth Loss.

Correlation	Tooth Loss	
BMI	Pearson Correlation	-0,854
	p-value	0,644
Age	Pearson Correlation	0,491
	p-value	0,004

Pearson correlation analysis found that there was a relationship between age and the incidence of tooth loss with a p value of 0.004 and a correlation value of 0.491, which means the strength of the relationship is quite strong. However, there is no relationship between BMI and the incidence of tooth loss, with a p value of 0.664. The results of the analysis were continued using a linear regression test because there was one risk factor associated with tooth loss. Regression analysis aims to predict the incidence of tooth loss based on the risk factors assessed in this study. The results of the linear regression analysis can be seen in Table 4.

**Table 4:** Linear Regression Test Analysis.

Variables	B	SE	P value	R <sup>2</sup>
Constant	-1,870	1,086	0,095	0,241
Age	0,080	0,26	0,004	

Analysis of linear regression results shows that the number of tooth losses will increase by 0.080 if there is an increase in age of 1 year. The model equation formed in the linear regression analysis test is as follows: Tooth loss =  $-1.870 + 0.080$  (age).

## Discussion

### Gender

The results of this study found that cases of tooth loss were more common in women than men. This is in accordance with research conducted by Nuvvula et al., which found that cases of tooth loss were more common in women.<sup>7</sup> The results of research by Berbato et al., Kalyanpur, and Prasad, which assessed tooth loss among urban and rural adult populations in Dharwad district (India), found that women compared to men had higher tooth loss.<sup>8,9</sup>

Gender tends to be an important factor in the prevalence of tooth loss. Many studies support the hypothesis that edentulism is more common in women than men.<sup>10,11</sup> Although there are a number of reasons associated with tooth loss, more prosthodontic rehabilitation among women may be related to higher rates of edentulism, indicating the increasing importance of aesthetics among women.<sup>12</sup>

### Age

This research found that the average age of tooth loss in Lokbaintan Village was 40.79 years. The prevalence of tooth loss tends to increase as the age of the individual studied increases, and tooth loss first occurs in adults and continues to occur throughout the individual's life.<sup>13</sup> A relationship between age and tooth loss has been demonstrated in the scientific literature, although the physiological ageing process does not determine the rate of tooth loss.<sup>14,15</sup>

Although the prevalence of tooth loss increases gradually with age, showing a sharp increase around age 70, corresponding to a peak incidence at age 64, the severity and accumulation of tooth loss throughout life reduce the total number of tooth losses in the oral cavity and increase the likelihood of the loss of remaining teeth. Therefore, research has shown that there is a strong association between previous tooth loss and new tooth loss, and this is not simply due to the presence of a previous oral health condition but may indicate that the individual or dentist prefers to lose new teeth.<sup>14,16</sup>

### Body Mass Index

According to the study's findings, the average body mass index of the participants was 25.14, falling into the obesity category. The epidemics of obesity and dental caries are both significantly influenced by eating habits. Dietary trends such increasing soft drink, fast food, and refined sugar consumption have significantly altered the public's diet and are now recognised as frequent risk factors for obesity and dental caries. The link between dental caries and body weight is biologically plausible given the substantial evidence linking irregular dietary patterns and quality to dental caries as well as the connection between abnormal dietary intake and the early onset of obesity.<sup>17</sup> When someone watches a lot of TV, they tend to snack more often, especially on foods that are high in fat and/or sugar. This not only increases overall

calorie intake, which can lead to obesity, but also increases the risk of tooth decay because the length of time food is in contact with the teeth increases.<sup>17</sup>

Dental caries is a multifactorial disease and attacks the majority of the world's population. This is a major cause of mouth pain and tooth loss. This disease is considered one of the most common oral diseases. Due to its potential for high morbidity, this disease is now a major focus of the dental hygiene profession.<sup>17</sup>

### **Tooth Loss**

The average number of tooth losses in Lokbaintan Village is 5.10. Several research results have found that there are differences in the average number of teeth lost in adults in several regions. The average number of teeth lost by adults in Brazil is 7.57.<sup>18</sup> Historically, there has been a decrease in the number of lost teeth among adults in Brazil. However, the number of tooth losses remains higher in less developed areas of the country.<sup>18</sup>

### **The Relationship between Age and Body Mass Index on Tooth Loss**

The results of the study found that there was no significant relationship between body mass index and the number of teeth lost. These results are in accordance with research conducted by Pioh et al., who found that there was no relationship between body mass index and the number of teeth lost. The results of research conducted by Ridwan found that there was no relationship between body mass index and the number of teeth lost.<sup>19,20</sup> The average body mass index of respondents was 25.15 or was included in the mild obesity category. The tooth loss experienced by the Lokbaintan Village Community was mostly caused by their lack of knowledge in maintaining oral health. People who have a thin, normal or obese body mass index do not affect the number of tooth loss, this is because they have less knowledge regarding healthy teeth and mouth so they have bad habits in maintaining the health of their teeth and mouth. The results of research conducted by Gao et al found that rural communities had low knowledge scores regarding dental and oral health.<sup>21</sup>

The results of the study found that there was a relationship between age and the number of teeth lost. The direction of the correlation between age and the number of teeth lost shows a positive direction, meaning that the higher the age, the greater the number of teeth lost. Lee et al. found that there was a relationship between age and the number of teeth lost. The overall average for tooth loss was 9.1. The average tooth loss in the 20–44 year age group is 4.1, for the 45–64 year age group it is 8.4, and for the 65 and over age group it is 10.7. Eight percent lost total teeth, 45.2% lost 1–5 teeth, and 41.4% lost 6–31 teeth. The prevalence of total tooth loss increases with age, from 0.7% at ages 20–44 years to 20.2% at ages 65 years and over.<sup>22</sup> The results of several studies show that tooth loss is higher in older adults.<sup>10,23,24</sup>

### **Limitations and Recommendations**

This study has limitations that need to be considered in interpreting its findings. Apart from budget and time limitations, this research is a cross-sectional study conducted in only one village, so the results cannot be generalised to the entire community of Banjar Regency. It is recommended that further research expand the research area to include all sub-districts in Banjar Regency. Apart from that, research needs to be carried out regarding other risk factors that can influence tooth loss, such as behaviour to maintain oral health.

## Conclusion

The results of this study found that the average tooth loss rate for people aged 36–55 was 5.10. Increasing age is the main factor in tooth loss in Lokbaintan Village. The results of this study are consistent with other studies that state that increasing age is directly proportional to increasing tooth loss. Even though the average rate of tooth loss in Lokbaintan Village is in the high category, people still do not care about their dental health. One of the reasons for the low public awareness of dental health is the lack of public knowledge of dental and oral health and the socio-economic status of the community, which on average is in the middle to lower category.

The Lok Baintan Village community needs to be given special attention regarding dental and oral health, especially providing knowledge about maintaining dental and oral health by the local health centre, in order to increase community awareness of maintaining dental and oral health. The socio-economic improvement of the community also needs to be improved, especially in the tourism sector. This is due to the socio-economic improvement in increasing community access to health services.

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## Conflict of Interest

There is no conflict of interest, according to the authors.

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