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THE CORRELATION BETWEEN TOOTH LOSS AND NUTRITIONAL STATUS IN ELDERLY IN SOUTH DAHA DISTRICT

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ABSTRACT
Background: *Aging is a biological process that will occur in every human individual. According to the Law of the Republic of Indonesia, the elderly is someone who reached age of 60 years and over. Based on data from BPS Indonesia in 2021, there are 29.3 million elderly in Indonesia and in South Daha District 3,534 elderly. Tooth loss can make the elderly vulnerable to decreased quality of life. Tooth loss cases will interfere with masticatory function and decreasing nutritional status.* ***Objective:*** *This study aims to analyze the correlation between tooth loss and nutritional status in the elderly in South Daha District.* ***Methods:*** *This study is a correlational analytic study with a cross sectional approach. The research sample are 105 elderly. Data collection includes primary data that obtained through direct examination of the number of tooth and BMI. Data analysis used univariate and bivariate with the Spearman's test.* ***Results:*** *The results showed that most of the respondents had a low level of tooth loss (43.8%) and normal nutritional status (58.1%). The Spearman test showed that there was a significant correlation between tooth loss and nutritional status.* ***Conclusion:*** *There is a significant correlation between tooth loss and nutritional status in the elderly in South Daha District*

Keywords: *Elderly, Nutritional Status, South Daha District, Tooth Loss*
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INTRODUCTION

Aging is a biological process that cannot be avoided and will occur in every human individual. Elderly is the final stage of the human life cycle. According to the Law of the Republic of Indonesia, the elderly is someone who reached age of 60 years and over.[1] Someone who reaches the elderly stage will experience a decrease in physical function or the body's degenerative process as a result of aging.[2] Based on data from the Indonesian Central Statistics Agency (BPS) in 2021, there are 10.82% of the elderly population in Indonesia or around 29.3 million people and BPS data for Hulu Sungai Selatan Regency in 2020 shows the number of elderly people in Hulu Sungai Selatan Regency as many as 24,932 people and in South Daha District as many as 3,534 people.[3,4] Based on these data, it shows that the elderly population in South Daha District is high in Hulu Sungai Selatan Regency. The high elderly population in South Daha District must be balanced with an increase in the quality of life of the elderly because the elderly are vulnerable to decreased quality of life. The decline in the quality of life of the elderly occurs due to physical, social and physiological changes. The case of tooth loss is one of the physiological changes that occur in the elderly.[1]

Tooth loss is a condition in which one or more teeth fall out of their sockets.[5] Tooth loss is a dental and oral health problem that appears in

the community, especially in the elderly. Elderly with fewer teeth experience impaired mastication ability and difficulty swallowing.[6,7] Based on data from the 2018 Basic Health Research (RISKESDAS), tooth loss due to extraction or tooth loss is the second largest dental and oral problem in Indonesia after the problem of damaged teeth and caries. The percentage of tooth loss cases in the elderly in Indonesia reaches 30.6%. Based on these data, it is necessary to take action to overcome cases of tooth loss in the Indonesian elderly community because it interferes with the masticatory function which affects the eating process of the elderly and can lead to a decrease in the nutritional status of the elderly. [8]

This study aims to determine the correlation between tooth loss and nutritional status in the elderly in South Daha District.

RESEARCH METHODS

This research was conducted after obtaining ethical approval form the Ethical Committee of the Dentistry Faculty, Lambung Mangkurat University with No. 063/KEPKG-FKGULM/EC/V/2022. This research is a correlational analytic research conducted by cross sectional method. The subjects of this study were elderly at South Daha District as many as 105 people that experiencing tooth loss and not wearing dentures. The study was conducted during the COVID-19 pandemic so that the researchers applied a health protocol, namely using level 3 PPE in the form of hazmat, google, N95 masks, and hand scoons. The tools used include disposable diagnostic sets, digital scales (Onemed), and microtoise (Gea Medical).

Data were collected by examining the number of teeth in the respondent's oral cavity using a disposable diagnostic set to determine the number of remaining teeth and the level of tooth loss in the oral cavity., then the measurement of body weight (kg) and height (m) for the measurement of Body Mass Index (BMI). The number of teeth remaining in the oral cavity is grouped into <10 teeth which can be interpreted as having a high rate of tooth loss, 10-19 teeth have moderate tooth loss and 20 teeth have low tooth loss. Body Mass Index (BMI) was grouped into 5 categories, namely very thin (<17.0), thin (17.0-18.4), normal (18.5-24.9), overweight (25.0-27, 0), and obesity (>27,0). Data were analyzed using the Spearman correlation test with the Statistical Package for the Social Sciences (SPSS) application..

RESULTS

This study involved 105 samples that fulfilled the inclusion criteria.

Table 1. Distribution of respondents by gender

Gender	Amount	Percentage
Male	59	56,25%
Female	46	43,8%
Total	105	100%

Based on Table 1 most of the respondents were male as many as 59 respondents (56.25%) and female respondents as many as 46 respondents (43.8%).

Table 2. Distribution of respondents by category of tooth loss

Number of Teeth Remaining (Tooth Loss Rate)	Amount	Percentage
<10 teeth (High)	25	23,8%
10-19 teeth (Moderate)	34	32,4%
≥20 teeth (Low)	46	43,8%
Total	105	100%

Based on Table 2, most of the respondents had a low tooth loss rate or the number of teeth remaining ≥20 teeth, namely 46 respondents (43.8%), at a moderate tooth loss rate as many as 34 respondents (32.4%), and at a moderate tooth loss rate, there were 34 respondents (32.4%). high teeth as many as 25 respondents (23.8%) (Table 2).

Table 3. Distribution of respondents based on nutritional status

Nutritional Status Based on BMI	Amount	Percentage
Very thin	9	8,57%
Thin	31	29,52%
Normal	61	58,1%
Overweight	4	3,81%
Total	105	100%

Based on Table 3, it shows that most of the respondents in this study had normal nutritional status as many as 61 respondents (58.1%), followed by respondents with underweight nutritional status as many as 31 respondents (31%), very thin nutritional status as many as 9 respondents (8 ,57%) and 4 respondents (3.81%) with obese nutritional status (Table 3).

Table 4. Correlation between tooth loss and nutritional status in the elderly in South Daha District

Tooth Loss Rate	Nutritional Status				*p value*
	Very thin	Thin	Normal	Overweight	
High	9 (36 %)	15 (60%)	1 (4%)	0	0,000
Moderate	0	14 (41,18 %)	19 (55,88 %)	1 (2,94%)	
Low	0	2 (4,35%)	41 (89,13 %)	3 (6,52%)	

Based on Table 4, it shows that respondents with low tooth loss rates have normal nutritional status (89.13%). The results also showed that the elderly with a high rate of tooth loss had very thin nutritional status (36%) and thin nutritional status (58.3%).

Spearman correlation test results show a p value of 0.000. If the significance value is less than 0.05 then there is a correlation. Based on Table 4, it can be concluded that there is a significant correlation between tooth loss and nutritional status in the elderly in South Daha District, Hulu Sungai Selatan Regency, South Kalimantan.

DISCUSSION

Tooth loss in the elderly is a common oral health problem because it can be caused by caries, periodontal disease, systemic disease and trauma that occurs with age.[9] Permanent tooth loss in humans has always been associated with the development of dental caries and periodontal disease. According to the World Health Organization (WHO), the main causes of tooth loss are caries, periodontal disease and dental trauma.[10]

Based on Tiwari's research, tooth loss was significantly associated with lower income and daily consumption of sweet beverages. The other factors that were significantly associated with tooth loss in older adults were not having dental insurance, the length of time since last dental visit, older age and poor or fair general health status. The age-related effect on tooth loss can be attributed to the accumulation of oral disease over the life span.[11]

Partial or complete loss of teeth can have emotional, systemic, and functional consequences. Emotional impacts include: loss of self-confidence, feelings of sadness, depression, feeling of loss of body parts, and feeling old. Systemic impacts include cardiovascular disease, osteoporosis, and gastrointestinal diseases, such as esophageal cancer, gastric cancer, and pancreatic cancer. The functional impact of tooth loss is speech and masticatory disorders.[12]

Based on tooth loss, this study shows that the majority of respondents have a low rate of tooth loss (43,8%). This is in line with Okamoto's research which in his research found that the majority of respondents had a low rate of tooth loss.[13] This study is also in line with Adhiatman's research which in his research showed that the majority of respondents had a low rate of tooth loss, namely 65,1%.[7]

The low rate of tooth loss in this study could be due to the fact that the majority of respondents were still classified as early elderly or aged 65 years and under so that the risk of tooth loss was lower than the elderly aged 65 years and over. This is in line with Carr's theory that increasing age is associated with tooth loss due to its use over time.[14]

Nutritional status has been defined as an individual's health condition as it is influenced by the intake and utilization of nutrients.. The nutritional status of the elderly is strongly influenced by the aging process. The aging process is very individual and its development is different for each individual because it is influenced by internal and external factors. Nutrient intake from food affects the aging process because all cell activities (body metabolism) require adequate nutrients in addition to disease and environmental factors.[15]

The definition of malnutrition in the elderly is defined as following: faulty or inadequate nutritional status; undernourishment characterized by insufficient dietary intake, poor appetite, muscle wasting and weight loss. Malnutrition is one of the nutritional problems that often occurs in the elderly. This is as a result of insufficient energy and protein intake. Older people in general suffer from macro and micro nutritional deficiencies will have a low immune system and function if the elderly immune function can be improved, the quality of life of the elderly will increase so that they can become healthy elderly and can suppress health services.[16] The Body Mass Index (BMI) is an indicator of nutritional status often used due to the ease of its application, the existence of reference patterns that allow comparisons between populations, it not being invasive and also not an expensive process.[17]

Based on nutritional status, this study shows that the majority of respondents have normal nutritional status (58,1%). This result is

in line with Hasibuan's research which shows that the majority of respondents have a non-underweight BMI.[18] This result is also in line with Perera's research which found that most of the respondents in his study had normal nutritional status, namely from 272 respondents from 437 respondents or as many as 62.2%.[19]

Normal nutritional status in this study can be caused by the level of tooth loss in the elderly, the majority of whom have low tooth loss so that they do not experience impaired masticatory function which will interfere with nutritional intake in the elderly and decrease the nutritional status of the elderly.[12]

The results of this study were then processed using the Statistical Package for the Social Sciences (SPSS) application with Spearman's correlation test and obtained a significance value of 0,000 which means that there was a significant correlation between tooth loss and nutritional status in the elderly in South Daha District. This is in accordance with Hasibuan's research, that there is a correlation between partial tooth loss and the nutritional status of the elderly with significance value of 0,001.[18] The results of this study are also in accordance with research conducted by Okamoto that high rates of tooth loss are associated with low nutritional status with significance value of 0,001. Loss of teeth will result in decreased masticatory function and difficulty during mastication. This is in accordance with Okamoto's research, which states that the reduced number of teeth in the oral cavity has a significant correlation with reduced chewing ability.[13]

Masticatory disorders due to partial tooth loss will make a person avoid consumption of meat, fruits, nuts and fibrous vegetables because they are difficult or cannot be chewed. As a result of this, a person who experiences mastication disorders will experience nutritional deficiencies that cause a decrease in nutritional status.[19] According to the theory of Sihadi (2000) which states that lack of nutrition will reduce a person's resistance to various diseases, especially infectious diseases that greatly interfere with a person's growth and physical development.[21]

It is necessary to take action for the elderly who experience tooth loss so as not to experience impaired masticatory function and a decrease in nutritional status, namely by using dental prostheses or dentures. Based on Bitencourt's research, someone who experienced tooth loss and did not receive treatment found it very difficult to chew food and to speak but with treatment, namely with a dental prosthesis, the complaint was resolved because the functional function of the tooth had been replaced by the prosthesis.[22]

Based on the results of the study, it can be concluded that there is a significant correlation between tooth loss and nutritional status in the elderly in South Daha District.

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