

RELATIONSHIP OF MASTICATION CAPABILITY AND NUTRITION STATUS OF ELDERLY BUGINESE AND MANDARNESE

(HUBUNGAN KEMAMPUAN PENGUNYAHAN DENGAN STATUS GIZI LANJUT USIA PADA SUKU BUGIS DAN MANDAR)

Bahrudin Thalib

Department of Prostodontic
Faculty Of Dentistry, University of Hasanuddin
Jl. Kande. No.5, Makassar
Email : bathalib64@yahoo.com

Abstract

The effect of mastication disorder in elderly caused difficulty in chewing hard or tough food leads to change eating pattern to softer food. As a result, the tendency to eat softer, prepared, fast food, sugar, carbohydrate and soda is increased. This study aimed to find out the relationship of mastication capability to nutrition status in elderly Buginese and Mandarnese, and the difference of diets between both cultures as adaptability to food pattern and eating habit. Four hundred subjects taken using purposive sampling, sample aged 55 years old and above, nutrition status was taken directly (anthropometric) BB/TB2 and mastication capability taken with custom questioner along with scoring value. The result showed that elderly Buginese had 64.9% with poor nutrition status caused by poor mastication capability, mastication capability and nutrition status in elderly Buginese had significant relation ($p=0.04$), while elderly Mandarnese had 39.8% with poor nutrition status caused by poor mastication capability, but statistically, the relation between mastication capability with nutrition status in elderly Mandarnese was not significant ($p=0.076$). As conclusion there was significant relationship between mastication capability and nutrition status in Buginese and Mandarnese, and mastication capability and nutrition status of Mandarnese were better than Buginese.

Key words : mastication capability, nutrition status, elderly

INTRODUCTION

The advance on life in many aspects brings a higher life expectancy. In well developed countries, it was projected to reach 82.1 years old for female and 76 years old for male in 2025, thus seniors' population booming is in progress.¹ The Census Bureau of America (1993) projected Indonesian seniors population growth to be the highest in the world, 414% by 2025. Information from BPS projectted seniors' population in 2020 is 11.34% from total citizens.²

Tooth loss will increase as we are aging, there was 9.7% tooth loss at 18 years old and above and it's drastically increased to 33.1% at 65 years old and above reported in America.³ The Study in Japan showed the means for remaining teeth in Japanese aged 65-74 years old are 41.9% of 75-84 years old still have 29.7% and 85 years old and above still have 26.3%.⁴ WHO report for the prevalence of

tooth loss in population 65-75 years old was as follows, France 16.9%, Germany 24.8% and 31% in The United State.⁵

Tooth loss will cause mastication disorder which leads to decrease function of tongue, oral mucosae, mastication muscles, saliva glands and nerve systems, which end to a compromised general health.⁵ Mastication is a process of chewing foods, begin from chopping, grinding and mixing food before at the end swallowed and digested.

Difficulties in digesting food in elderly will be adapted by making changes in food pattern to meet their nutrition needs. Greksa LP et al reported changes in diet pattern in elderly which is from hard and tough food to soft and tender, lowmeat, fruit and vegetable consumptions, whereas prepared, fast-food, sugar carbohydrate and soft drink increased.⁶ The increased types of food are me with sugar, salt, cholesterol and fat which potentially worsening oral health and increased risks to many chronic diseases.

Specific low nutrition intake will also compromise the integrity of oral cavity. Various important nutrients needed for healing and defense mechanisms in elderly. Proteins have important role information of alveolar bone matrix, enamel, dentine, cementum and periodontal ligamentum; vitamin C take cares of oral cavity mucosal integrity; vitamin A increased ephitelitation; vitamin D and Calcium inhibit alveolar bone resorption and some other minerals such as Zinc and Copper helping in wound healing.⁷ It is also reported that quality of life in an elderly significantly related to oral cavity health of the subject.⁸

South Sulawesi was populated by four kinds of ethnicity, they are Buginese, Mandarnese, Makassarnese and Torajanese, however after further developed the Mandarnese is now located in West Sulawesi, thus these two ethnics are geographically different. Buginese populated almost the whole land and hills on the south, while Mandarnese on the west coast. Buginese population is the largest in South Sulawesi with more than three million people whereas Mandarnese had fewer, around 400,000 people.⁹ These different environment and cultural backgrounds affected their way of life include food pattern.

This study will analyze mastication capability to nutrition status on both ethnics' elderly.

MATERIALS AND METHODS

This study is an epidemiological survey with cross sectional study approach. The experiment was held at district of Barru for Buginese and Majene for Mandarnese. Sampling location picked for its population which is still relatively homogenous in economic, culture and with assumption that life and food pattern is still uniform. Total sample was 400 people, 200 for each ethnic. Sample was 55 years old and above with no history of heart disease, diabetes mellitus, asthma and TBC. Sample group based on age and sex into 55-65 years old, 66-75 years old, 76-85 years old, 86-95 years old, and 95 years old and above.

Mastication capability was measured using questionair with score value 1: for good mastication, 2: moderate mastication, 3: difficult mastication and elderly nutrition status were analyzed with body mass index (BMI) anthropometric. Weight measured using a *Seca* step scale, height measured using body microtoise. All acquired data subsegmently presented in a frequent table, statically analyzed using chisquare test.

RESULT

The percentage of female was higher (65%) than male (35%). Group age of 55-65 years old was the biggest portion 66.25% followed by group age of 66-75 years old 20.5% that gradually became lesser for an older group age (Table 1).

Table 1. Distribution of frequencies based on age and Sex groups in elderly Buginese and Mandarnese

Age Group (years old)	Male		Female		Total
	n	%	n	%	
55-65	95	35,9	170	64,1	265
66-75	36	43,9	46	56,1	82
76-85	7	7	34	83	41
86-95	2	8	9	82	11
>96	0	0	1	100	1
Total	140	35	260	65	400

The biggest portion in Buginese is still senior female 64.5% while male 35.5% , mostly are in 55-56 years old age group. This result is also similar to Mandarnese showed on Table 3 with senior female 65.6% and male 34.5%, the biggest portion was also in 55-56 years old age group (Table 2, 3).

Table 2. Distribution of frequencies based on age and sex groups in elderly Buginese

Age Group (years old)	Male		Female		Total
	n	%	n	%	
55-65	52	35,4	95	64,6	147
66-75	11	42,3	15	57,7	26
76-85	7	41,2	10	58,8	17
86-95	1	11,2	8	88,8	9
>96	0	0	1	100	1
Total	71	35,5	129	64,5	200

Table 3. Distribution of frequencies based on age and sex groups in elderly Mandarnese

Age Group (years old)	Male		Female		Total
	n	%	n	%	
55-65	43	36,4	75	63,6	118
66-75	25	44,6	31	55,4	56
76-85	0	0	24	100	24
86-95	1	50	1	50	2
>96	0	0	0	0	0
Total	69	34,5	131	65,5	200

The mastication capability in elderly Buginese, decreased from 57% difficult, 24.5% moderate to 18.5% good, compared to Mandarnese which has

mastication capability percentage as follows 29.5% difficult, 24% moderate, 49.5% good (Table 4, 5).

Table 4. Distribution of frequencies age groups in relation to mastication capability in elderly Buginese

Age Group (years old)	Mastication capability						To- tal
	Difficult		Moderate		Good		
	N	%	N	%	n	%	
55 – 65	96	65.3	34	23.1	17	11.6	147
66 – 75	11	42.3	8	30.7	7	27	26
76 – 85	3	17.6	5	29.4	9	53	17
86 – 95	4	44.4	2	22.2	3	33.4	9
> 96	0	0	0	0	1	100	1
Total	114	57	49	24.5	37	18.5	200

Table 5. Distribution of frequencies age group in relation to mastication capability in elderly Mandarnese

Age Group (years old)	Mastication Capability						Total
	Difficult		Moderate		Good		
	N	%	n	%	n	%	
55 – 65	42	35.3	28	23.5	49	41.2	119
66 – 75	9	16.4	15	27.2	31	56.4	55
76 – 85	7	29.2	5	20.8	12	50	24
86 – 95	1	50	0	0	1	50	2
Total	59	29.5	48	24	93	46.5	200

Nutrition status was shown on Table 6 and 7, for elderly Buginese under weight 40.5%, normal 50.5%, while for Mandarnese under weight 31.5% and normal 57.5%.

Table 6. Distribution of frequencies age groups in relation to nutrition status in elderly Buginese

Age Group (years old)	Nutrtion Status						Total
	Under Weight		Normal		Over Weight		
	N	%	n	%	n	%	
55 – 65	50	34	81	55.1	16	10.9	147
66 – 75	11	42.4	14	53.8	1	3.8	26
76 – 85	12	70.6	4	23.5	1	5.9	17
86 – 95	7	77.7	2	22.2	0	0	9
> 96	1	100	0	0	0	0	1
Total	81	40.5	101	50.5	18	9.0	200

Table 7. Distribution of frequencies age groups in relation to nutrition status in elderly Mandarnese

Age Group (years old)	Nutrition Status						To- tal
	Under Weight		Normal		Over Weight		
	N	%	n	%	N	%	
55 – 65	33	27.7	69	58	17	14.3	119
66 – 75	18	32.7	33	60	4	7.28	55
76 – 85	11	45.8	12	50	1	4.16	24
86 – 95	1	50	1	50	0	0	2
Total	63	31.5	115	57.5	22	11	200

Mastication capability in relation to nutrition in elderly showed the biggest percentage is on under weight nutrition status with difficult mastication 64.9% for Buginese and 41.9% on Mandarnese. As for the biggest percentation on normal nutrition is with good

mastication capability which is 57% for Buginese and 57.6% for Mandarnese (Table 8, 9).

Table 8. Distribution of mastication capability to nutrition Status in elderly Buginese

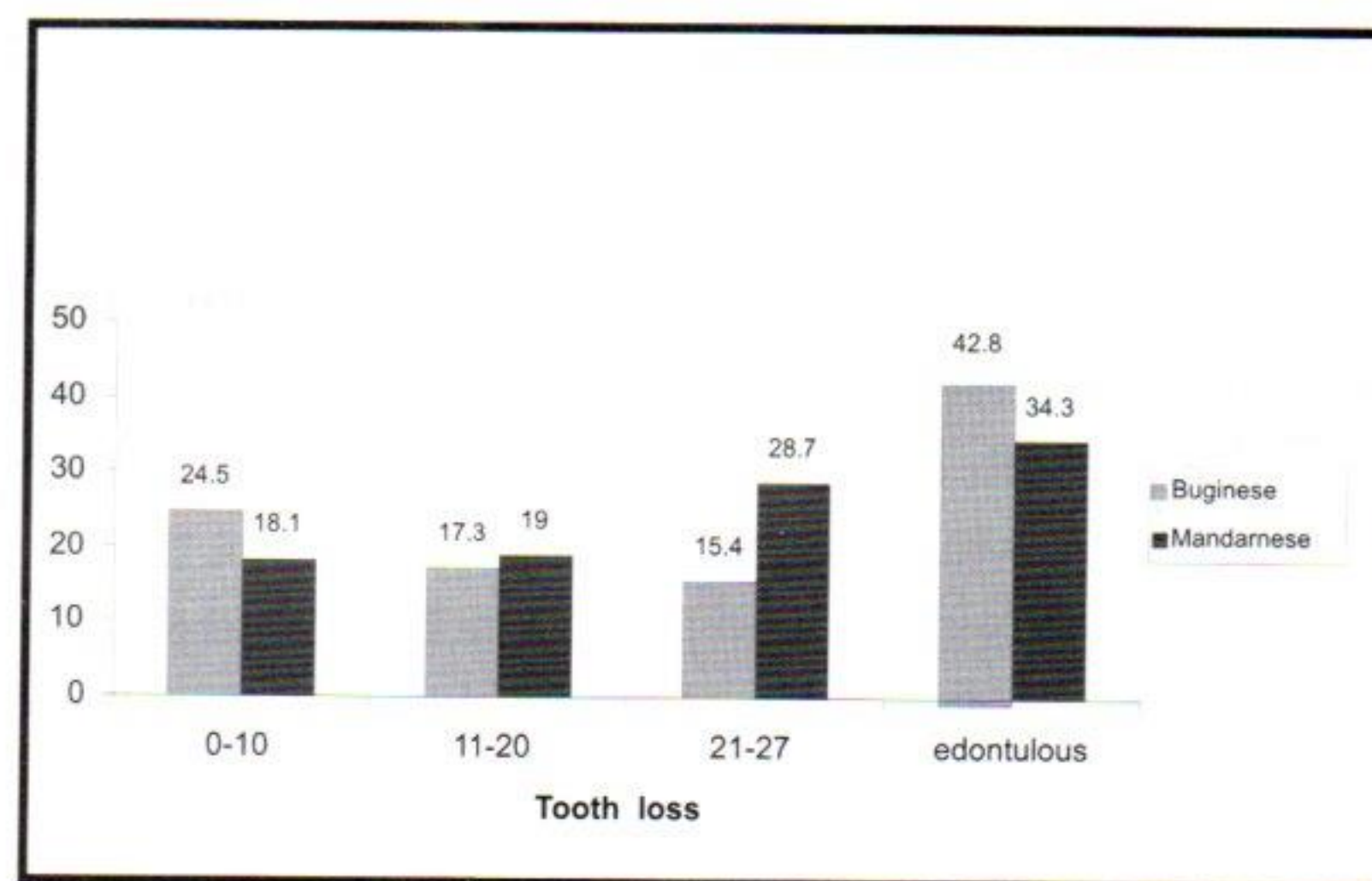
Mastication Capability	Nutrition Status						Total
	Over Weight		Normal		Under Weight		
	n	%	N	%	n	%	
Good	13	11.4	65	57.0	36	31.6	114
Moderate	5	10.2	23	46.9	21	42.9	49
Difficult	0	0	13	35.1	24	64.9	37
Total	18	9.0	101	50.5	81	40.5	200

Table 9. Distribution of mastication capability to nutrition Status in elderly Mandarnese

Mastication Capability	Nutrition Status						Total
	Over Weight		Normal		Under Weight		
	n	%	n	%	n	%	
Good	10	17	34	57.6	15	25.4	59
Moderate	7	14.6	32	66.7	9	18.75	48
Difficult	5	5.4	49	52.7	39	41.9	93
Total	22	11	115	57.5	63	31.5	200

The total tooth loss in elderly Buginese (42.8%) higher than elderly Mandarnese (34.3%) (Figure 1).

Figure 1. Distribution of tooth loss group in elderly Buginese and Mandarnese



DISCUSSION

Percentage of female (65%) was higher than male (35%). Comparison between female and male is 1.8:1, this fits to the census report that shows female to be higher than male. Based on age group, the 55-65 years old group has the highest percentage 66.25%, this also fits with Indonesians' life expectancy nowadays which is 63 years old.²

Mastication capability is an individual score to mastication or chewing function whereas in this study we used Self Assessment of Masticator Function Method. This method was often used in epidemiological survey. Using questionnaire, sample was questioned about chewing capability by criteria:

good, moderate, poor or easy, rather easy, difficult, very difficult. This method needs large samples but it gives a good result and with practical evaluation.⁵ Mastication capability of Buginese was mostly difficult (57%) as for Mandarnese those with difficult mastication capability only 29.5%. Findings from the study showed a high prevalence of total tooth loss, 43% for Buginese and 34% for Mandarnese. The result showed that the increasing of tooth loss will cause difficulties in mastication process. Teeth have important roles in mastication besides of the masticator muscles which are tongue, oral mucosa, saliva gland and temporomandibular joint. Mastication is a process of chewing, grinding and mixing the food before swallowed and digested. Mastication capability was highly connected with the amount of remained teeth, chewing capability will decrease significantly as the total of tooth loss increased. Furthermore, tooth supporting tissue weakened and tasting also lowering as chewing in elderly became more limited.¹⁰

Body Mass Index (BMI) is an anthropometric way to make a direct measure to the nutrition status, this method is usually performed in epidemiological survey.¹¹ Findings on relationship between mastication capability and body mass index in Buginese showed those with poor mastication capability were the highest percentage in the under weight nutrition status group (64.9%) which was higher than in Mandarnese that only 39.8%. The high percentage of under weight status in Buginese compared to Mandarnese caused by mastication capability in Mandarnese averagely better than those in Buginese. Tooth loss in Buginese was also reported higher than in Mandarnese. These differences might come as the Buginese tends to eat sweeter and softer food, which is more cariogenic.⁹ Likewise on the over weight status, Mandarnese showed higher percentage (12.8%) than in Buginese (9%). These differences reasoned by high coconut and coconut oil consumption rate in Mandarnese.¹² Nutrition intake of vitamin C, vitamin E, Calcium, iron, thiamin, Riboflavin, niacin, panthotenic acid, fiber and protein were higher in elderly with teeth than toothless ones.^{3,14} Mojon et al found elderly who lived in senior house had lower body mass index and albumin concentration, which was a marker for malnutrition in elderly.¹⁵

Statistical findings showed significant relationship between mastication capability and nutrition status, thus mastication capability is an important part of

good nutrition intake.

As conclusion, there was a significant relationship between mastication capability and nutrition status. Mastication capability in elderly Mandarnese was better than those in Buginese, this is also proved in their nutrition status, where Buginese suffered from more under weight status than Mandarnese.

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