

The comparison of body mass index of elderly used and did not use full denture

Perbandingan indeks massa tubuh antara manula yang menggunakan dengan yang tidak menggunakan gigitiruan penuh

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ABSTRAK

Kehilangan gigi pada kondisi lansia dilaporkan cukup tinggi. Hal tersebut mengganggu fungsi kunyah yang selanjutnya dapat mempengaruhi asupan nutrisi manula. Rehabilitasi gangguan fungsi kunyah pada manula yang kehilangan seluruh giginya dapat dilakukan dengan menggunakan gigitiruan penuh (GTP), walaupun hanya dapat memperbaiki fungsi kunyah 30-50%. Penelitian ini dilakukan untuk mengetahui perbandingan status gizi antara manula yang menggunakan dan yang tidak menggunakan gigitiruan penuh dengan indikator indeks massa tubuh (IMT). Analisis deskriptif dilakukan pada 32 sampel manula untuk masing-masing kelompok. Hasil pengukuran IMT pada manula yang menggunakan GTP dan tidak menggunakan GTP dengan kategori sangat kurus (0% : 9,4%), kurus (9,4% : 28,1%), normal (68,8% : 53,1%), obesitas ringan (3,1% : 3,1%), obesitas sedang (12,5% : 3,1%), dan obesitas berat (6,2% : 3,1%). Secara keseluruhan tidak didapatkan perbandingan yang bermakna ($P = 0,14$), namun apabila dilihat pada setiap kategori ada perbedaan pengukuran IMT, yaitu keadaan status gizi manula yang menggunakan GTP lebih baik dibandingkan manula yang tidak menggunakan GTP.

Kata kunci: lansia, indeks massa tubuh, gigitiruan penuh

ABSTRACT

Several studies showed that tooth loss was quite high occurred in elderly, which could interfere their chewing function, and finally affected their nutrient intake. Rehabilitation of chewing dysfunction in elderly who have lost all their teeth can be managed by using full denture (FD). However, a FD can only improve 30-50% of chewing function in elderly. This study was aimed to compare the nutritional status involved measured by Body Mass Index (BMI) indicators in elderly with or without FD. This descriptive analysis study of 64 elderly, consists of 32 with FD and other 32 who did not wear FD. The results showed that the category of elderly wearing FD were sequentially very underweight 0%, underweight 9.4%, normal 68.8%, mild obese 3.1%, obese 12.5%, severe obese 6.2%, while the category of elderly who did not wear FD were sequentially very underweight 9.4%, underweight 28.1%, normal 53.1%, mild obese 3.1%, moderate obese 3.1%, severe obese 3.1%. Statistical analysis showed no significant differences ($P = 0.14$), but there are differences in each category which measured by BMI. This study concluded that nutritional status of elderly using FD was better than the elderly who didn't wear FD.

Key words: elderly, body mass index, full denture

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INTRODUCTION

Aging process led to the defense and repair of body tissues gradually become less effective and resulting in death of cell and decrease of organ function.¹ In addition, several reports showed that tooth loss in elderly is quite high. As reported by WHO, the prevalence of tooth loss in the population aged 65-75 years in France was 16.9%, 24.8% in Germany, and 31% in United States, while in Indonesia, although there are not sources of data yet but it can be predictable that the amount is greater than in developed countries.² Elderly population are being increase in every year, tooth loss in the elderly can lead to

dysfunction of mastication which result in decreased function of the tongue, oral mucosa, muscles for mastication, salivary glands and nervous systems, so will affect the general health.¹

The decrease in health and physical limitations in elderly require a good and adequate nutrition to support and maintain their health, with consideration that elderly patients are often found to lack one or more nutrients. Lack of concentration of thiamine, riboflavin or folic acid in elderly patient's plasma might be associated with a decreased of tissues tolerance and loss of teeth in the mouth or edentulous.³ Wearing of full denture (FD) could overcome the hope that elderly

can consume several foods, for both the count and type, so that rehabilitation with FD in elderly who have lost all their teeth was aimed to maintain the function of mastication, phonetics and esthetic.⁴ The users of FD can consume food with the same quality as the other toothed people, although FD only improving 30-50% of mastication process with adjusting some ways of food processing, including changing its shape to make it more easily chewed by longer cooked or refined. However, this process can lead to loss of some vitamins because this vitamins could be denaturated.^{5,6} Therefore, it is not a constant that the elderly with FD have better body mass index (BMI) than the elderly who didn't wearing it.

In this article the author will report the comparison of BMI for elderly using and not using FD and expecting to provide information as well as a reference for further research.

MATERIALS AND METHODS

This observational analytical study using purposive sampling method was conducted at RSGM drg. Hj.Halimah Dg.Sikati, University of Hasanuddin on 4-15 October 2010. Samples of 64 elderly (32 with FD and other 32 who didn't wearing FD) is selected according to predefined inclusion criteria as follows the elderly who aged

over 55 years, wearing FD for 2-3 years, mentally and physically health, still have ability to stand upright, and had no history of systemic disease.

The Glass Electronic Personal Scales (Camry) was used to measure body weight (BW) and Metertoice with height 200 cm No.26 BC was used to measure the height samples. In indonesia, BMI category was performed to determine the nutritional status, which normal weight could be determined by assessing the index of body weight to height squared. The primary data was tabulated in tables and graphs, and analyzed using computerized data processing program SPSS 16.

RESULTS

The tables summarized the overall result of comparative studies of BMI in elderly with and without FD. Mean of nutritional status measured by BMI of elderly using FD is 28.12 kg/m (Table 1). Meanwhile mean of nutritional status measured by BMI of elderly did not use FD is 22.13 kg/m (Table 2).

DISCUSSION

Based on statistical analysis using chi square test (table 3), resulted in $P = 0.14$ ($P > 0.05$). It was found that there was no significant difference on BMI of elderly with and without FD. The result

Table 1. Body mass index of elderly with FD

Elderly	Minimum	Maximum	Mean	Std.Deviation
Age	55	85	65.38	6.833
BMI	15	37	28.12	4.412

Table 2. Body mass index of elderly did not wear FD

Elderly	Minimum	Maximum	Mean	Std.Deviation
Age	55	75	61.66	4.736
BMI	13	30	22.13	3.675

Table 3. The results of comparative analysis of BMI in elderly with and without FD (chi-square test)

Body Mass Index	Elderly		Total	Statistic Analisis
	Wearing FD	Not Wearing FD		
< 16.49 (very underweight)	0 (0.0%)	3 (9.4%)	3 (4.6%)	P= 0.14
16.5-18.49 (underweight)	3 (9.4%)	9 (28.1%)	12 (18.7%)	
18.5-24.99 (Normal)	22 (68.8%)	17 (53.1%)	39 (60.9%)	
25-26.99 (Mild Obese)	1 (3.1%)	1 (3.1%)	2 (3.1%)	
27-29.99 (Moderate Obese)	4 (12.5%)	1 (3.1%)	5 (7.8%)	
>30 (Severe Obese)	2 (6.2%)	1 (3.1%)	3 (4.6%)	
TOTAL	32 (100.0%)	32 (100.0%)	64 (100%)	

were not significant was because of several factors that found when the study took place; some of these factors affects the nutritional needs of the elderly. The factors might be the decreased ability of samples to digest food, reduced food taste, decreased neuromuscular coordination, physical condition are less well, the economic and social factors, and food absorption factor.⁷

In this study, several factor affects the elderly nutritional status, both before and after wearing FD.¹ Most patients with FD complained pains, especially when chewing food, although the denture has been used for a while. Therefore, some patients remove their FD while eating caused by discomfort factor when chewing food, which could affects their nutritional intake. This patients wearing the denture mostly because aesthetic function without regard to the mastication function. The pain complained might caused by some factors, which according to references the factor could be excessive edge of denture base, less dexterity of the denture, the inadequate centric occlusion, disruption cups teeth, and the 'V' shaped of alveolar process.⁸ However, most samples who experienced this lack of denture were advised to revisit the dentist, some because of the socioeconomic factors, as well as their perception that FD have not been longer needed. Some patients is still wearing the denture eventhough it has decreased in function. Other complaint was the unfit of the denture while using. This is because of the unretentive and unstable of the denture base. Furthermore, samples complained feel like vomiting, called retching. Retching is a sense of vomiting reflex that is general caused by the maxillary denture base overextend to the distal. Retching can be caused by inadequate design of the denture, such as retention of the loss, balance disorders occlusion, and support networks strongless, this factor can caused they didn't wearing the denture for chewing function, but aesthetic.⁸

Sometimes patients complain that the denture not taste good but can not explain the reason for sure. This case is difficult to diagnose because there is no pain and denture retention is quite satisfactory. Based of reference, if the discomfort happen when wearing full denture maybe caused by there are too narrow space for the tongue to move, changes in the vertical dimension, and changes in occlusal.⁸

Although the differences were not significant, but the frequency data result from multiple categories of BMI shows difference between the

frequency of BMI revealed a very underweight (<16.49 kg/m) in the elderly with FD that was 0.0% or no patients have very underweight status nutrition, the underweight elderly with FD is 9.4%. The severe obese category was 6.2% in elderly with FD, while in elderly who did not wearing FD found 3.1%, the comparison in this category was 2:1. This result show that the comparison are quite different, which the elderly with FD based on the frequency of BMI have better than in the elderly who did not wearing FD. These results are correlated with a statement that someone with no teeth then replaced it with FD, besides aiming to restore the esthetic and phonetic function, the most important thing is to restore the mastication function, so they can digest more varied or nutritious food. Unlike the case with elderly who have untreat edentulous, or toothless then not wearing a FD, they are tend to be disturbed in their process of chewing food and nutrient intake is quite low due to a diet restricted to soft foods and not fibrous. As we know that the mastication function is crucial in smoothing the food, especially foods that has rich in various essential nutrients that are difficult to directly consumed and absorbed by the body without smoothed firstly.

Also, the results was correlated with *Joshiyura et al* statement, as quoted from research conducted by *Sheiham et al*, says that elderly who did not wearing FD consume fewer vegetables, fiber, and carotene. Tooth loss associated with intake less on hard to chew foods such as apples and carrots. As for the other studies cited by *Sheinam et al*, who analyzed the effect of dental health status of non-strach polysaccharida consumption (dietary fiber) reported a decrease in nutrition intake gizi.^{6,9}

Differences were also seen in the normal category, the nutritional status of elderly with FD is found 68.8%, which is quite different from the elderly who did not wearing FD, found only 53.1%. This result proves that the elderly with FD have better nutritional status than the elderly who did not, which is this can lead to various systemic disease caused by nutritional deficiencies. In some other research journals reports that there are significant relationship between tooth loss and nutritional intake, especially for elderly.^{9,10}

Full denture does not restore the overall function of mastication, a lower ability in the sense of taste and texture as well as mastication are also found more slowly; nevertheless wearing FD is expected to restore the function of

mastication in elderly who already began to decrease the nutrition status.¹⁰

CONCLUSION

Based on the results, it can be concluded that the elderly with FD have better BMI because there are no elderly with poor nutritional status, while the elderly with normal nutritional status are 68.8%. The elderly who did not wearing FD has 9.4% of poor nutritional status, while elderly with normal nutritional status are 53.1%. So, there is no significant comparison on BMI of elderly with and without FD.

SUGGESTION

Proper care of elderly must be supported by the ability, knowledge, and understanding of dentist about the common condition occurs in elderly, especially their nutritional status issues. This research has not yielded a maximum, so that further studies using the method of data and more effective measurement are needed.

REFERENCES

1. Mawi M. Proses menua sistem organ tubuh pada lansia. *Majalah Ilmiah Kedokteran Gigi USAKTI* 2001; 44: 61-72.
2. World Health Organization. Oral health surveys: basic methods. 3rd Ed. Geneva: WHO; 2000.
3. Akhmadi. Permasalahan lanjut usia. [serial online]. Available from: URL: <http://www.suarakarya.online.com/news.html?id=228285>. Cited 2009 October 28.
4. Utama MD, Jubari EH. Pertimbangan prostetik pada pasien lansia. *J Dentofasial* 2003; 1: 217.
5. Shinkai RSA, Hatch JP, Sakai S, Mobley CC, Saunders MJ, dkk. Oral function and diet quality in a community-based sample. *J Dent Res* [serial online] 2001 [cited 2010 Aug 14]; 80(7). Available from <http://jdr.sagepub.com/content/80/7/1625>
6. Sheiham A, Steele JG, Marcenes W, Lowe C, Finch S, dkk. The relationship among dental status, nutrient intake, and nutritional status in older people. *J Dent Res* 2001; 80(2). [serial online] Available from: URL:<http://jdr.sagepub.com/content/80/2/408>. Cited 2010 Aug 14.
7. Nugroho W. Keperawatan gerontik. 2nd Ed. Jakarta: EGC; 2002. p.16-20.
8. Barnes IE. Perawatan gigi terpadu untuk lansia. Alih Bahasa: Hutaauruk C. Editor: Juwono L. Jakarta: EGC; 2006.
9. Ritchie CS, Joshipura K, Hung HC, Douglass CW. Nutrition as a mediator in the relation between oral and systemic disease: association between specific measures of adult oral health and nutrition outcomes. *Crit Rev Oral Bio Med* 13(3): 291-300. [serial online] Available from: URL:<http://cro.sagepub.com/content/13/3/291> Cited 2010 Aug 14.
10. N'Gom PI, Woda A. Influence of impaired mastication on nutrition. *J Prosthet Dent* 2002; 87:667-7.