

The Association of Chewing Ability and Diet in Elderly Complete Denture Patients

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The purpose of this study was to investigate the relationship between chewing ability and diet among elderly edentulous patients whose dentures were funded by the Department of Health in Kaohsiung City, Taiwan. A cluster sample of 103 elderly edentulous subjects 65 years and older (68 men, 35 women) was gathered randomly and assessed through use of a questionnaire. The responses to queries regarding demographics, health, and chewing capabilities were correlated with dietary guidelines for the five basic food groups. Chi-square test analysis revealed that subjects with chewing difficulty consumed fewer vegetables. Only 17% of the total subject pool consumed the recommended daily allowance (RDA) of vegetables. Approximately 58% of subjects reported dissatisfaction with their dentures and 51% reported discomfort on chewing. Approximately 4% of the subjects met the RDA standards for all five food groups and 4% did not meet the RDA standards for any of the five food groups. Patient satisfaction with the comfort of their denture during mastication significantly impacted the diet of these elderly edentulous patients. *Int J Prosthodont* 2010;23:127-128.

Approximately 21% of the population of Taiwan is edentulous. However, the relationship between chewing ability and diet among edentulous individuals has received limited attention in the dental literature. Although dental prostheses help to restore some of the lost function, edentulous individuals will experience diminished masticatory function¹ that subsequently predisposes this group to a higher risk of malnutrition.² The results from various studies established that diets among the edentulous population are lower in fruits and vegetables than among the dentate population.^{3,4}

The purpose of this study was to assess the dietary intake of edentulous subjects and to investigate the relationship between chewing ability and diet

Materials and Methods

Nutritional analysis consisted of a 24-hour dietary intake analysis in accordance with the recommendation of Shinkai et al⁵ and the Nutritional Health Survey in Taiwan. Output variables were obtained by instructing subjects to record their food intake. Foods were then placed into one of five food group categories: grains, milk products, meat and beans, vegetables, and fruits. This study followed the Taiwan Department of Health conversion tables for food categories and servings, as well as recommended daily allowance (RDA) guidelines for the five food groups for geriatric populations.

All variables were analyzed using chi-square tests. The Fisher exact test was used instead of the chi-square test in instances where there were fewer than five cases in a given category.

Results

Table 1 shows that 58% of subjects were dissatisfied with their dentures and 51% reported discomfort during mastication. Table 2 reveals that among the 103 subjects in this study, only 4 individuals (3.9%) satisfied the RDA standards for all five food groups. In addition, 4 subjects (3.9%) didn't satisfy any of the RDA

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Table 1 Self-Perceived Denture Satisfaction and Chewing Ability (n = 103)

	No. of subjects answering "Yes"	Self-perceived denture satisfaction		P
		Satisfied (n = 60)	Dissatisfied (n = 43)	
		n (%)	n (%)	
Do you have difficulty chewing meat?	89	30 (33.7)	59 (66.3)	< .0001*
Do you have difficulty chewing salad?	89	30 (33.7)	59 (66.3)	< .0001
Do you have difficulty chewing an apple that has not been peeled and cut?	94	34 (36.2)	60 (63.8)	.0002*
Do you have difficulty chewing nuts?	62	9 (14.5)	53 (85.5)	< .0001*
The number of questions answered "Yes" by each subject				< .0001†
4–5 questions	72	13 (18.1)	59 (81.9)	
0–3 questions	31	30 (96.8)	1 (3.2)	

*Chi-square test.

†Fisher exact test.

Table 2 Number of Food Groups Satisfied (n = 103)

No. of groups satisfied	Total n (%)	Chewing difficulty*		P
		Yes (n = 72) n (%)	No (n = 31) n (%)	
0	4 (3.9)	18 (90.0)	2 (10.0)	.0186†
1	16 (15.5)			
2	27 (26.2)	54 (68.4)	25 (31.6)	
3	32 (31.1)			
4	20 (19.4)			
5	4 (3.9)	0 (0.0)	4 (100.0)	

*Chewing difficulty was combined and assessed for patients satisfying 0 and 1 groups; 2, 3, and 4 groups; and 5 groups.

†Fisher exact test.

food group standards. Table 3 shows that only 17 of 103 subjects (16.5%) satisfied the RDA standards for vegetables.

Discussion

It is of concern that 58% of patients reported being dissatisfied with their current complete dentures and 51% reported experiencing discomfort when chewing. In addition, this study revealed a statistically significant correlation between chewing discomfort and diminished nutritional consumption. Although the standard metrics applied to denture analysis, such as retention, stability, occlusal function, etc, were not included in this study, the results suggest that a disproportionate number of dentures were structurally inadequate, subsequently impacting dietary consumption in a detrimental manner. In Taiwanese society, vegetables are a highly valued part of the normal diet. In addition, fresh vegetables are readily available and affordable year-round at local markets. Consequently, it is difficult to diminish the impact that denture discomfort during chewing has on vegetable consumption. Reduced consumption of vegetables may predispose subjects to diminished vitamin, nutrient, and dietary fiber intake that is vital to this age group. The correlation between chewing discomfort and the inability to satisfy reasonable daily nutritional standards suggests that additional dental assistance for the elderly may be beneficial.

Table 3 Mastication Comfort Compared with RDA Satisfaction for Vegetables (n = 103)

	n	Discomfort during mastication		P
		Yes (n = 53) n (%)	No (n = 50) n (%)	
RDA satisfied	17	4 (23.5)	13 (76.5)	.015*
RDA not satisfied	86	49 (57.0)	37 (43.0)	

*Fisher exact test.

Conclusion

This study demonstrated that patient satisfaction with dentures and the absence of discomfort during mastication can significantly influence the quality and quantity of nutrition that elderly patients consume. Discomfort from dentures during chewing significantly impacted the consumption of vegetables.

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