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Self perception of food choice in geriatric dental prosthesis users

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Abstract

Purpose: To evaluate the self-perception of the food choice of elderly and users of dental prosthesis, in order to verify the influence of dental prosthesis on their feeding.

Methods: The present study conducted with 100 elderly, aged between 60 and 70 years old. They are divided into 4 groups (Group CD, CE, PE, PD) with 25 patients in each group. Group CD (Complete Denture wearer) compared with Group CE (Completely Edentulous), Group PD (Partial Denture wearer) compared with Group PE (Partially Edentulous). All participants answered to a questionnaire of Geriatric Oral Health Assessment Index (GOHAI).

Results: The GOHAI average score for CE was 23.88 and PE was 22.68 which is classified as "low" indicates that the edentulous elderly whether partially or completely who participated in this study have a bad self-awareness regarding oral health. The GOHAI average score for CD was 31.72 and PD was 31.84 which is classified as "moderate" indicates that the edentulous elderly whether partially or completely who participated in this study have an average self-awareness regarding oral health.

Conclusion: The overall quality of life from our study was compared between all four groups found that Denture wearers either complete or partial rarely complaint about discomfort or embarrassment on feeding with moderate GOHAI score. Whereas edentulous always have difficulty or embarrassment in feeding with low GOHAI score indicating worst quality of life.

Keywords: Geriatric, GOHAI score, denture wearer, quality of life, phonetics and esthetics

Introduction

The world's population is ageing. Every country is experiencing growth in the number and proportion of geriatric in their population [1]. A report by the United Nations Population Fund and Help Age India suggests that the number of graying population is expected to grow to 173 million by 2026. By the end of the century, the elderly will constitute nearly 34 percent of the total population in the country [2]. State - wise data shows that Kerala has maximum proportion of elderly in its population (12.6 per cent) followed by Goa (11.2 per cent) and Tamil Nadu (10.4 per cent) as per Population Census 2011 [3]. So the need is high for us to take care of the oral health and well-being of elderly population.

Nutrition i elderly is important and edentulism is common in them. It is one of the main complaints of the elderly regarding feeding. So, proper mastication is a need. A proper mastication guarantees an enjoyable and pleasant feeding. This is achieved by adequate and complete dentition, muscular strength allowing mastication and breakdown of solid food added to a healthy oral cavity with no lesions [4]. Also, The increase of the average life expectancy leads to an increase in the use of complete or partial dentures aiming to provide a better quality of life regarding feeding for the elderly population [5]. The dental prosthesis helps to facilitate chewing and to reestablish nutrient intake by mouth. Sometimes maladaptation of dental prosthesis generates discomfort or pain while eating, and trouble biting and chewing, especially solid food, therefore, geriatric prefer eating pasty consistency, which may compromise their proper nutrition [6].

Also, aging process generates changes in the stomatognathic functions, hence, the risk of oral dysphagia increases. This higher risk added to presbyphagia and oral sensory impairment, makes mastication and swallowing alterations more severe; also, it may cause articulatory imprecision and distortions, muscular atrophy and reduction of the tongue mass that will reduce the control and propulsion of the bolus into the pharynx and generate muscular and skeletal changes [7].

The presence of complaints regarding dental prosthesis is quite usual in the clinical practice. Different evaluation tools are used to assess the disadvantages on the quality of the feeding process in the elderly. GOHAI - Geriatric Oral Health Assessment Index is used for this study. They are self-assessment protocols to measure the feeding satisfaction with use of dental prosthesis by considering the individuals symptoms and complaints [8]. Therefore, the aim of the present study is to evaluate the auto-perception of the food choice of elderly and users of dental prosthesis, in order to verify the influence of dental prosthesis on their feeding.

Methodology

This was a cross sectional study done in patients hailing treatment from our institution. The geriatric included were 100. They are divided into 4 groups (Group CD, CE, PE, PD) with 25 patients in each group. All are educated and completed at least primary schooling. Group CD (Complete Denture wearer) compared with Group CE (Completely Edentulous), Group PD (Partial Denture wearer) compared with Group PE (Partially Edentulous). Inclusion criteria include complete and partial edentulous elderly aged between 60 to 70 years. Group CD include Complete Denture wearers with prosthesis for 5 years. Group CE include patients who are Completely Edentulous for a period of 5 years. Group PD include Kennedy's class I Cast Partial Denture wearers for 5-6 years. Group PE include Partial Edentulism -Kennedy's class I missing teeth for 5-6 years. Exclusion criteria who are unable to answer the questionnaire, having any neurological or degenerative disease or any other condition that could negatively influence swallowing; also, having signs of cognitive impairment while responding to the questionnaire (comprehension difficulties observed by the evaluator). The study was explained to the participants in their language. The participant who agreed to participate signed an informed consent form. This study was submitted to the committee for Ethics in Research Ethical clearance by Madha Medical Research and Foundation, Chennai and was approved.

Two tools were used for data collection: a questionnaire elaborated by the researchers with 10 closed questions regarding, gender, age, years of education, type of dental prosthesis, time of use of the dental prosthesis, preferred consistency of food and nutritional status referred through Body Mass Index- BMI, that was used to characterize the sample; and the GOHAI - Geriatric Oral Health Assessment Index – developed by Atchison and Dolan [8]. It has 12 questions to assess three dimensions:

A. Physical function: that includes eating, speaking and swallowing (questions 1 to 5);
B. Psychosocial function: that included worry or concern about oral health, dissatisfaction with appearance, self-awareness regarding oral health and avoidance of social contacts due to oral problems (questions 6 to 10);
C. Dimension of pain and discomfort in the mouth: related to oral discomfort while eating due to the use of dental prosthesis (questions 11 and 12).

For each question there are three possible answers: always, sometimes and never that are scored as 1, 2 and 3, respectively. The simple sum of the answers provides the index score; the total score ranges from 12 to 36 points. Higher scores represent better self-perception regarding the use of the dental prosthesis. Score values between 34 and 36 are considered 'high'; between 31 and 33, 'moderate'; and smaller than 30 are considered 'low'. Answers from each group are categorized in an Excel spreadsheet to organize the data. The statistical analysis used parametric tests, the significance level was set at 0.05 (5%) and a 95% confidence interval was constructed.

Results

The present study counted with 100 elderly individuals between 60 and 70 years old. Information from the descriptive analysis of the data showed there was 58% (n = 58) of women and 42% (n = 42) of men (p-value <0.001). In regard to the "Nutritional status", CE is compared with CD (Table 1). In CE 68% (n=17) the elderly classified as "Good", 4% (n=1) as "regular", 28% (n=7) as "bad". In CD 84% (n=21) the elderly classified as "Good", 8% (n=2) as "regular", 8% (n=2) as "bad" with chi square 2.899 (p-value 0.235). PE is compared with PD (Table 2). In PE 64% (n=16) the elderly classified as "Good", 4% (n=1) as "regular", 32% (n=8) as "bad". In PD 64% (n=16) the elderly classified as "Good", 32% (n=8) as "regular", 4% (n=1) as "bad" with chi square 10.889 (p-value 0.004). This indicates Group CD has good nutrition than Group CE. Whereas Group PE has poor nutrition than Group PD.

Table 1: Comparison of nutritional status between Group CE and CD

		Prosthesis		Total	Chi square value	P value
		CE	CD			
Nutrition	Good	17	21	38	2.899	0.235
	Regular	1	2	3		
	Poor	7	2	9		
Total		25	25	50		

Table 2: Comparison of nutritional status between Group PE and PD

		Prosthesis		Total	Chi square value	P value
		PE	PD			
Nutrition	Good	16	16	32	10.889	0.004
	Regular	1	8	9		
	Poor	8	1	9		
Total		25	25	50		

The preferred consistency of food of geriatric is compared. In CE 40% (n= 10) of the elderly prefer all type of food, however, majority report a preference for pasty (n=15) 60%, because of its easy intake. In CD 52% (n= 13) of the elderly preferred all food, however, some did report a preference for pasty 48% (n=12) with chi square 0.742 (p value 0.389) (Table 3). In PE 56% (n= 14) of the geriatric reported not to have a preference, however, preference for pasty (44%), In PD 88% (n= 22) of the geriatric reported not to have a preference, however, some did report a preference for pasty (12%), with chi square 4.667(p value 0.031) (Table 4).

Table 3: Comparison of Preferred consistency of food between Group CE and CD

		Prosthesis		Total	Chi square value	P value
		CE	CD			
Consistensy	Soft	15	12	27	0.742	0.389
	All	10	13	23		
Total		25	25	50		

Table 4: Comparison of Preferred consistency of food between Group PE and PD

		Prosthesis		Total	Chi square value	P value
		PE	PD			
Consistensy	Soft	11	4	15	4.667	0.031
	All	14	21	35		
Total		25	25	50		

Still related to this, it was possible to observe the relationship between nutrition and preferred consistency of food. It is found that in CD individuals who reported to eat all types of consistencies were most likely to classify their

nutrition as "Good" (44%); while the elderly who could not, were most likely to classify it as "regular". In CE people who prefer all consistency had good nutrition (36%) while others had regular (Table 5).

Table 5: Relationship between Classification of Nutrition and Consistency of food

Group	Nutrition	All		Soft		Total	
		N	%	N	%	N	%
CE	Good	9	36	8	32	17	68
	Regular	0	0	0	0	0	0
	Bad	1	4	7	28	8	32
CD	Good	11	44	10	40	21	84
	Regular	1	4	1	4	2	8
	Bad	1	4	1	4	2	8

N=Individual number

In PE people who prefer all consistency had good nutrition (24%) while others had regular. In PD people who prefer all consistency had good nutrition (64%) while others had regular (Table 6). This indicates that people who prefer all consistency food has good nutrition and also the edentulous elderly people eat all kinds of consistency despite the discomfort with harder food.

Table 6: Relationship between Classification of Nutrition and Consistency of food

Group	Nutrition	All		Soft		Total	
		N	%	N	%	N	%
PE	Good	6	24	11	44	17	68
	Regular	1	4	0	0	1	4
	Bad	7	28	0	0	7	28
PD	Good	16	64	0	0	16	64
	Regular	6	24	2	8	8	32
	Bad	0	0	1	4	1	4

N = Individual number

Considering these findings, it is possible to infer that the elderly people make natural adaptations to chew and swallow. These adaptations can be cutting solid foods, like meat, into smaller pieces, eating more food with pasty consistency, breakdown of food into a bolus of a swallow-ready consistency for a better intake using dental prosthesis. The loss of teeth changes the homeostasis of the Stomatognathic System due to the deterioration of part of the facial bones, associated with loss of bone mass and neuromuscular responses. These deteriorations interfere in chewing properly and in the swallowing and speaking functions, which will restrict and interfere with social and family activities [9]. The dental prosthesis aims to reestablish these aspects changed due to the edentulism and to restore the Stomatognathic System functions related to facial aesthetics, providing facial harmony, better facial expressions and dental prosthesis user's well-being [10].

Regarding the dimension of physical function

In CE only 20% of the elderly respondents said they never had limitation regarding the kind and amount of food, 4% said never to have trouble while biting or chewing, 24% elderly report they never had trouble speaking. However, the frequency of elderly (68%) that reported to swallow with discomfort and participants (56%) have trouble biting or chewing which indicates possible alteration in the breakdown of food (Table 7).

In CD 48% of the elderly respondents said they never had limitation regarding the kind and amount of food, 48% said never to have trouble while biting or chewing, 84% elderly report they never had trouble speaking due to the use of dental prosthesis. However, no elderly reported to swallow with discomfort, confirming that a few participants (12%) have difficulty to eat. which indicates possible alteration in the breakdown of food.

Table 7: Frequency of responses to individual GOHAI Questions

GOHAI Index	Group CE			Group CD			Group PE			Group PD		
	Always	Some Times	Never	Always	Some Times	Never	Always	Some Times	Never	Always	Some Times	Never
Physical Function												
1. Limit the kinds of food consumed	16	4	5	11	2	12	13	6	6	3	1	21
2. Trouble biting or chewing	18	6	1	7	6	12	16	8	1	1	8	16
3. Able to swallow comfortably	2	6	17	0	0	25	8	6	11	0	1	24
4. Unable to speak clearly	18	1	6	3	1	21	14	5	6	1	7	17
5. Able to eat without discomfort	14	8	3	3	8	14	16	6	3	1	4	20
Psychosocial Function												
6. Limit contact with people	12	1	12	1	2	22	9	7	9	1	7	17
7. Pleased with appearance of teeth	11	7	7	1	5	19	9	8	8	2	6	17
8. Worried about teeth, gum or dentures	10	9	6	2	9	14	15	9	1	3	11	11
9. Nervous about teeth, gum or dentures	9	3	13	1	2	22	3	13	9	0	4	21
10. Uncomfortable eating in front of others	10	4	11	2	2	21	6	8	11	0	5	20
Pain and Discomfort												
11. Use medication to relieve pain	0	7	18	0	6	19	4	8	13	2	6	17
12. Sensitive to hot, cold or sweet food	0	4	21	0	2	23	6	11	8	3	10	12

In PE 24% of the elderly respondents said they never had limitation regarding the kind and amount of food, 4% said never to have trouble while biting or chewing, 24% elderly report they never had trouble speaking. However, the elderly (44%) reported to swallow with discomfort, and participants (64%) have trouble biting or chewing which indicates possible alteration in the breakdown of food.

In PD 84% of the elderly respondents said they never had limitation regarding the kind and amount of food, 64% said never to have trouble while biting or chewing, 68% elderly report they never had trouble speaking due to the use of dental prosthesis. However, 96% elderly reported to swallow without discomfort, confirming that a few participants (4%) have difficulty to eat.

Regarding the dimension of psychosocial function

In CE individuals 48% never limited contacts with people, also never avoided eating in front of people (44%) due to their teeth or dental prosthesis. Plus, most of them were unpleased with their appearance regarding their teeth always or sometimes in their life (72%). However, 40% participants have worry or concern related to their teeth and gums. Half of the participants (52%) reported no nervousness related to their dental care.

In CD individuals 88% never limited contacts with people, also never avoided eating in front of people (84%) due to their teeth or dental prosthesis. Plus, most of them were pleased with their appearance regarding their teeth (76%); also, there was no worry or concern related to their teeth, dental prosthesis and gums (88%). However, participants (56%) reported no worries related to their dental care.

In PE individuals 36% never limited contacts with people, also never avoided eating in front of people (44%) due to their teeth or dental prosthesis. Plus, most of them were unpleased with their appearance regarding their teeth (68%) always or sometimes in their life. Also, there were (60%) always worry about their teeth and gums (36%). However, few of the participants (36%) reported no nervousness related to their dental care, and asked the researchers about specialize clinics for dental health care.

In PD individuals 68% never limited contacts with people, also never avoided eating in front of people (80%) due to their teeth or dental prosthesis. Plus, most of them were pleased with their appearance regarding their teeth (68%); also, there was no worry or concern related to their teeth and gums (44%). However, majority participants (84%) reported no nervousness related to their dental care.

Regarding dimension of pain and discomfort

In CE the more than half reported never having used medication to relieve pain or discomfort (72%), and large majority have no sensitivity to hot, cold or sweets (84%).

In CD the more than half reported never having used medication to relieve pain or discomfort (76%), and large majority have no sensitivity to hot, cold or sweets (92%).

In PE the geriatric reported never having used medication to relieve pain or discomfort (52%), and (32%) reported no sensitivity to hot, cold or sweets. In PD the majority of the elderly reported never having used medication to relieve pain or discomfort (68%), and nearly half reported no sensitivity to hot, cold or sweets (48%).

The positive sensation regarding the elderly appearance is very important once it includes many factors like the participation in the social, family and love life, in addition to the oral communication that is the main way of socialization; the quality of life in this context is assessed by the absence of pain [11]. Majority of elderly prosthesis users showed absence of problems related to the dimension of pain and discomfort, which is in accordance with previous study with same objective and with elderly individuals [12].

The GOHAI average score for CE was 23.88 and PE was 22.68 which is classified as “low” once it is below 30 points; this indicates that the edentulous elderly whether partially or completely who participated in this study have a bad self-awareness regarding oral health. The dimension of physical function had the lower proportional average score (Table 8).

Table 8: Description of Quantitative variables

GROUP	CE		CD		PE		PD		
	Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**	**Sig.**
Physical	8.56	2.200	12.40	2.273	8.40	2.432	13.68	1.406	.000
Psychological	9.88	3.551	13.64	2.099	9.84	2.528	13.20	1.780	.000
Pain & discomfort	5.44	.917	5.68	.627	4.44	1.083	4.96	1.207	.000
GOHAI Total	23.8800	4.711	31.7200	3.57678	22.6800	4.356	31.8400	2.11503	.000

The GOHAI average score for CD was 31.72 and PD was 31.84 which is classified as “MODERATE” as it is between 31 and 33 points; this indicates that the edentulous geriatric whether partially or completely who participated in this study have an average self-awareness regarding oral health.

Discussion

In general, Quality of life (QoL) is an individual’s perception of his or her position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, and concerns [13]. Edentulism may lead to poorer QoL like impaired mastication, denture trauma, aesthetic concerns, or negative self-perception [14]. Another research compared the self-awareness regarding oral health in institutionalized and non-institutionalized elderly people. The average score of the index was below 30, which is considered as a low self-perception [15]. From this study we can evaluate the quality of life from three prime factors like nutritional status, phonetics and esthetics in elderly edentulous and in denture wearers either complete or partial.

Nutrional status

A previous research, similar to the present study that also used the GOHAI, found that over half of the geriatric preferred pasty food, which reinforces the present study findings and proves that geriatric people without prosthesis have trouble chewing harder foods like apples [16]. Several studies have supported the association between tooth loss, diet, and nutrition. Incomplete dentition results in less food intake, affects the taste of food, its selection, preparation and eating patterns [17]. Studies have demonstrated that diet in edentulous subjects consists of food that is low in fiber and high in saturated fat, with a significant lack of intake of high-fiber foods such as breads, fruits, vegetables, and nonstarch polysaccharides [17, 18, 19, 20]. Locker [21] in his study found that 39% of edentulous elders were prevented from eating foods they would like to have, 29% reported a decline in their enjoyment of food, and 14% avoided eating with others. Minimal diets may prevent edentulous elders from meeting daily required dietary allowances leading to compromised nutritional states, especially in edentulous elders without dentures [20, 22, 23]. Our study shows irrespective of edentulous either partial or complete prefer soft consistency than those with dentures. Also, the nutrional status of complete denture wearer is good than completely edentulous. But the status is same for partial edentulous and partial denture wearers.

Esthetics

Teeth plays vital role in facial appearance, speech, and eating ability. There is overwhelming evidence showing the negative effect of edentulism on oral health quality of life [24, 25]. Compromised oral function has been linked to decreased self-esteem and a decline in psychosocial well-being [26]. Edentulous people may avoid participating in social events as they are embarrassed to speak, smile, or eat in front of others, leading to isolation [27]. Fiske *et al*. [28] demonstrated that denture wearers have low self-confidence, premature aging, change in self-image, and behavioral change in socializing and forming close relationships. At the same time, dentures could improve oral appearance and social interactions of individuals, which might enhance self-esteem and thus contribute to psychological well-being [29]. Our study shows that Denture wearers irrespective of complete or partial never limit their contact with people, never avoid eating infront of people and are happy with their appearance. But edentulous people are very much worried about their lost teeth and unhappy with their appearance. Also they prefer to isolate themselves.

Phonetics

The absence of teeth creates difficulties in the articulation of certain speech sounds. Allen [30] has stated that a patient fitted with complete dentures generally adjusts his speech pattern to the new appliance and thus improves. Kaires and Ylppo and Sovijarvi [31, 32] reported that, in the absence of dentures, the concentration of the higher frequencies in the over-all acoustic spectrum of speech was reduced. Our study shows majority of denture wearers either complete or partial never had trouble speaking. But for edentulous elderly it is vice versa.

The overall quality of life from our study was compared between all four groups found that Denture wearers either complete or partial rarely complaint about discomfort or embarrassment on feeding with moderate GOHAI score. Whereas edentulous always have difficulty or embarrassment in feeding with low GOHAI score indicating worst quality of life.

Conclusion

Within the limitation of the study, the self-perception of food choice in geriatric edentulous is soft diet and for denture wearers it is mixed diet.There is improvement in quality of life in geriatric denture wearers either complete or partial than edentulous. Also, edentulism has harmful effects like impaired masticatory function, an unhealthy diet, social disability, and poor oral health quality of life. For an overall well-being both physiological and psychological, teeth play an important role either in the form of denture. So, future research could have been addressed with larger population and their chewing efficiency by modern means.

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