ORIGINAL RESEARCH

Role of Self Care Practices and Denture Maintenance in Oral Health

[1]Mallika S Shetty, [2]Rekha P Shenoy, [3]Vinu Thomas George

ABSTRACT

Background: Edentulous patients seek treatment to restore their oral function and esthetics, so that they can eat and speak more easily and feel better about themselves. The dental prosthesis helps replacement of teeth and restores oral function and esthetics. For the success of the treatment and acceptance of the prosthesis, maintenance of the prosthesis by the patient is very important.

The authors' objective in this study was to analyze how self-care practices in terms of oral hygiene habits, maintenance of dentures, type of prosthesis are affected by age, gender and education level.

Materials and methods: The authors developed a written oral health questionnaire and administered it to 586 individuals in dental care centres in Mangalore, South India. They collected demographic information as well as data on oral hygiene practices and prosthetic status. The data was compared using Chi-squared test and the value of $p < 0.05$ was considered statistically significant.

Results: The sample surveyed consisted of 586 participants (257 males and 329 females) of which 76 (13.0%) were with complete dentures, 312 (53.3%) with Fixed Prosthesis, 165 (28.2%) with Removable Partial dentures and 33 (5.5%) had a combination of the fixed and removable prosthesis. The study showed that denture cleansing habits, Oral hygiene habits, how prosthesis was worn, type of prosthesis were significantly associated with age and educational status of the subjects.

Conclusion: Intensive population-directed strategies for oral health education should be developed in order to improve the oral hygiene practices, denture cleansing habits in the entire population.

Keywords: Denture cleansing, Dental prosthesis, Oral hygiene habits, Oral status, Self care practices.

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INTRODUCTION

Edentulous patients seek treatment to restore their oral function and esthetics, so that they can chew and speak more easily and feel better about themselves.[1] The dental prosthesis helps replacement of missing teeth and restores oral function and esthetics. The maintenance of the prosthesis by the patient is very important for the success of the treatment.

Patients when questioned about denture cleansing habits and oral hygiene maintenance. Most of the patients reported cleansing the prosthesis frequently. Regardless of their cleansing effort, soft debris, bacterial plaque and dental calculi were often found on denture surfaces[2] when examined.

Many individuals with either fixed or removable dental prosthesis could not maintain oral hygiene and denture hygiene because of diminished dexterity, impaired vision,[3] or lack of awareness. Ill-fitting prosthesis coupled with poor oral hygiene constitutes a major predisposing factor for poor oral health which includes caries, periodontitis and inflammatory mucosal changes.

The objective of this study is to emphasize the importance of denture care, duration of use and condition of prosthesis on oral hygiene maintenance.

MATERIALS AND METHODS

The study was conducted at the 3 dental care centres affiliated to a teaching hospital in Mangalore. Subjects were examined for a period of 6 months from March 2012 to August 2012. The inclusion criteria were being subjects of 15 years or more in age with either fixed or removable dental prosthesis.

A total of 586 individuals who satisfied the inclusion criteria were informed of the nature of the investigation and their consent was obtained. Patients who were not co-operative and unwilling were excluded from the study. Approval for the study was obtained from the Institutional review board. Confidentiality was assured to participants and all recording forms were numbered, but not named to avoid bias.

The study involved completion of a pre-designed questionnaire containing 15 variables. The questionnaire was structured to record the sociodemographic factors like age, gender, educational status and oral and prosthetic status like

[1,2]Reader, [3]Associate Professor

[1]Department of Prosthodontics, Yenepoya Dental College Mangalore, Karnataka, India

[2]Department of Public Health Dentistry, Yenepoya Dental College, Mangalore , Karnataka, India

[3]Department of Prosthodontics and Crown and Bridge, Manipal College of Dental Sciences, Manipal, Karnataka, India

Corresponding Author: Mallika S Shetty, Reader, Department of Prosthodontics, Yenepoya Dental College, Mangalore Karnataka, India, Phone: 9448131550, e-mail: mallika_msshetty@yahoo.com

condition of dentition, periodontal status, mucosal status, oral hygiene and habits, type, duration of wear and condition of prosthesis, and care of dentures. The subjects were clinically examined and interviewed by both investigators. Clinical examinations were carried out using sterile mouth mirrors, community periodontal index (CPI) probe. Strict procedure for infection control was followed as per the guidelines. The clinical examination lasted for an average of 15 minutes per adult. Both investigators underwent training and calibration before the survey began.

DATA ANALYSIS

Data were compared using chi-square test. The level of significance was chosen as 0.05. All data were statistically analyzed using SPSS-10 statistical software.

RESULTS

A total of 586 subjects [257 males (43.9%) and 329 females (56.1%)] aged 15 years and above (mean age 39.94) formed the study population. The distribution of subjects according to their age, group and gender is given in Table 1.

According to educational background, 3.9% were illiterate (no primary education), 48.0% attended primary school, 42.7% attended high school and 5.5% were graduates.

According to condition of dentition, 26.1% had decayed teeth, 21.5% had missing teeth, 1.5% had restored teeth, 0.7% had attrition, 0.2% had abrasion, 49.5% had a

combination of the above conditions and 0.5% subjects had sound dentition.

Periodontal evaluation in relation to gender, age and education showed bleeding on probing in 52.3% of females and 37.7% of males, recession was present in 11.3% of males and 6.7% of females and mobility was found to be 8.2% of males and 3.3% of females. Mobility gradually increased with age till 60 years. As educational standards increased, incidence of mobility decreased.

According to mucosal evaluation, 24.6% had inflamed oral mucosa and 3.7% had inflamed denture bearing area. The distribution according to mucosal status against gender and education was found to be insignificant. When mucosal status was evaluated across age groups it was found to be very highly significant $\chi^2 = 205.917$, p <0.001.

Examination for oral hygiene data showed 27.6% had debris, 16.7% had calculi, 8.4% had stains, 35.2% had combination of the above conditions and 12.1% had no debris, calculi or stains. Examination of the oral hygiene status against gender showed that calculus and debris were found to be more in females while stains were found to be more in males. When oral hygiene status was evaluated across age groups, it was found to be very highly significant $\chi^2 = 152.814$, p<0.001. When oral hygiene status was evaluated across educational status it was found to be significant $\chi^2 = 43.859$, p = 0.029.

According to oral hygiene habits, 0.3% subjects massaged the gums, 65.4% brushed once daily, 27.1% brushed twice daily, 2.0% brushed more than twice, 0.9% brushed occasionally and 4.3% never brushed. Females exhibited better oral hygiene habits than males. The result was statistically significant $\chi^2 = 11.646$, p = 0.04. The distribution of subjects according to their age group and education is given in Tables 2 and 3.

The distribution of subjects according duration of use of prosthesis is given in Table 4.

According to the type of prosthesis they wear, 13.0% presented with complete dentures, 53.3% with fixed prosthesis, 28.2% with removable partial dentures, 5.5% had a combination of the fixed and removable prosthesis. Higher

Table 1: Distribution of subject according to their age group and gender

Age groups	Sex		
	Male (%)	Female (%)	Total (%)
<20	13 (30.2)	30 (69.8)	43 (100)
20-30	55 (34.6)	104 (65.4)	159 (100)
30-40	40 (31.5)	87 (68.5)	127 (100)
40-50	57 (55.3)	46 (44.7)	103 (100)
50-60	53 (58.9)	37 (41.1)	90 (100)
60-70	31 (59.6)	21 (40.4)	52 (100)
≥70	8 (66.7)	4 (33.3)	12 (100)
Total	257 (43.9)	329 (56.1)	586 (100)

Table 2: Distribution according to oral hygiene habits and age groups

Oral hygiene habits	Age groups							Total (%)
Brushing	<20 (%)	20-30 (%)	30-40 (%)	40-50 (%)	50-60 (%)	60-70 (%)	≥70 (%)	
Massage the gums	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1.9)	0 (0)	2 (0.3)
Once daily	24 (55.8)	96 (60.4)	88 (69.3)	76 (73.8)	60 (66.7)	29 (55.8)	10 (83.3)	383 (65.4)
Twice daily	18 (41.9)	57 (35.8)	37 (29.1)	25 (24.3)	15 (16.7)	7 (13.5)	0 (0)	159 (27.1)
More times	1 (2.3)	5 (3.1)	2 (1.6)	1 (1)	2 (2.2)	1 (1.9)	0 (0)	12 (2)
Occasionally	0 (0)	1 (0.6)	0 (0)	0 (0)	2 (2.2)	2 (3.8)	0 (0)	5 (0.9)
Never	0 (0)	0 (0)	0 (0)	0 (0)	11 (12.2)	12 (23.1)	2 (16.7)	25 (4.3)
Total	43 (100)	159 (100)	127 (100)	103 (100)	90 (100)	52 (100)	12 (100)	586 (100)

$\chi^2 = 120.444$, p<0.001; VHS: Very highly significant

Table 3: Distribution according to oral hygiene habits and education

Oral hygiene habits	Education					Total
Brushing	Illiterate (%)	Primary school (%)	High school (%)	Graduates (%)	Postgraduate (%)	
Massage the gums	1 (4.3)	0 (0)	1 (0.4)	0 (0)	0 (0)	2 (0.3)
Once daily	9 (39.1)	210 (74.7)	144 (57.6)	19 (61.3)	1 (100)	383 (65.4)
Twice daily	4 (17.4)	49 (17.4)	95 (38)	11 (35.5)	0 (0)	159 (27.1)
More times	3 (13)	2 (0.7)	6 (2.4)	1 (3.2)	0 (0)	12 (2)
Occasionally	2 (8.7)	2 (0.7)	1 (0.4)	0 (0)	0 (0)	5 (0.9)
Never	4 (17.4)	18 (6.4)	3 (1.2)	0 (0)	0 (0)	25 (4.3)
Total	23 (100)	281 (100)	250 (100)	31 (100)	1 (100)	586 (100)

$\chi^2 = 96.271$, $p < 0.001$; VHS: Very highly significant

Table 4: Duration of use of prosthesis

Duration (years)	No. of subjects
0-1	81
1-5	298
5-10	181
10-15	18
15-20	5
>20	3

percentage of females had fixed and removable partial dentures than males. With regard to the most commonly used type of dental prosthesis in the group of subjects studied, the study showed 53.3% wear fixed prosthesis. When type of prosthesis was evaluated across age groups it was found to be very highly significant $\chi^2 = 425.962$, $p < 0.001$. In the age group between 20 and 30, and 30 and 40 fixed and removable partial dentures were most commonly used. In the age group between 40-50 and 50-60, all types of prosthesis were present, and removable partial prosthesis was found to be higher. In the age group of 60-70 and >70, use of complete denture was found to be higher.

When type of prosthesis was evaluated with respect to educational status, it was found to be very highly significant $\chi^2 = 81.27$, $p < 0.001$. FPD was most commonly used among Graduates. Removable partial denture and complete denture was most commonly used among illiterates.

According to condition of prosthesis, 8.9% had ill-fitting prosthesis, 7.7% had fractured prosthesis, 3.4% had prosthesis with occlusal wear, 14.8% had prosthesis with deposits, 14.7% had a combination of the above conditions and 50.5% had intact prosthesis.

According to duration of wear per day, 64.2% wear the prosthesis day and night, 34.6% wear the prosthesis only during the day, 0.9% wear the prosthesis occasionally, 0.3% has never worn the prosthesis. When gender was compared between those who wore the prosthesis day and night, and those who wore the prosthesis only during the day, it was found to be nonsignificant. When education and age group were compared between those who wore the prosthesis day and night and those who wore the prosthesis only during the

day, it was found to be very highly significant, $\chi^2 = 22.553$, $p < 0.001$ and $\chi^2 = 155.655$, $p < 0.001$ respectively.

According to denture cleansing habits, among the removable prosthesis wearers, 2.8% did not clean the denture, 19.5% wash the denture with water, 64.7% wash with brush and paste/soap, 13.0% use denture cleansing pellets. This parameter was not considered for fixed prosthetic wearers. The distribution of subjects according to their age group and education is given in Tables 5 and 6.

According to denture storage for removable prosthetic wearers (when not in use), 80.4% immersed their dentures in water while 19.6% did nothing in particular.

DISCUSSION

The study covered a wider range of population, as compared to the studies by Valderhaug J et al[4] (40 to 60 years group), Drake CW[5] (65 years and above group) and Zlataric DK[6] (38-89 years group). On examination of the periodontal condition, bleeding on probing, recession and periodontitis was less compared to the study done by Corchero AMI et al.[7] Tooth mobility was 8.2% in males and 3.3% in females. In the study by Carlsson[8] et al after one year of denture usage, there was an increase in tooth mobility. Mobility gradually increased with age 20 to 60 years and declined from 60 to >70 years. As educational level increased mobility decreased. Nakazwa[9] found that the increase in mobility varied according to age, denture cleansing habits, and stability and retention of dentures.

Mucosal status to gender and education were found to be insignificant. Around 3.7% had inflamed denture bearing area and 4.8% had normal denture bearing. Roberts[10] reported that only 67 of the 224 subjects in his survey had normal tissues. Others had painful or reddened saddle areas or showed irritation to prosthesis.

When examining oral hygiene against gender, females have poor oral hygiene than males. As the educational level increased, oral hygiene was better (stains decreased with increase in education). Poor oral hygiene is the most common cause of gingival inflammation which may cause

Table 5: Denture cleansing habits *vs* education

	Illiterate (%)	Primary school (%)	High school (%)	Graduates (%)	Total (%)
Do not cleanse the denture	3 (13)	3 (1.1)	1 (0.4)	0 (0)	7 (1.2)
Wash the denture with water	5 (21.7)	39 (13.9)	19 (7.6)	1 (3.1)	64 (10.9)
Wash with brush and paste/soap	13 (56.5)	105 (37.4)	61 (24.4)	6 (18.8)	185 (31.6)
Use denture cleansing pellets	2 (8.7)	134 (47.7)	169 (67.6)	25 (78.1)	330 (56.3)
Total	23 (100)	281 (100)	250 (100)	32 (100)	586 (100)

$\chi^2 = 72.391$, $p < 0.001$; VHS: Very highly significant

Table 6: Denture cleansing habits *vs* age groups

	Age groups							Total (%)
	<20 (%)	20-30 (%)	30-40 (%)	40-50 (%)	50-60 (%)	60-70 (%)	≥70 (%)	
Do not cleanse the denture	0 (0)	0 (0)	1 (0.8)	3 (2.9)	2 (2.2)	1 (1.9)	0 (0)	7 (1.2)
Wash the denture with water	1 (2.3)	5 (3.1)	11 (8.7)	18 (17.5)	18 (20)	9 (17.3)	2 (16.7)	64 (10.9)
Wash with brush and paste/soap	0 (0)	17 (10.1)	29 (22.8)	37 (35.9)	53 (58.9)	39 (75)	10 (83.3)	185 (31.6)
Use denture cleansing pellets	42 (97.7)	137 (86.2)	86 (67.7)	45 (43.7)	17 (18.9)	3 (5.8)	0 (0)	330 (56.3)
Total	43 (100)	159 (100)	127 (100)	103 (100)	90 (100)	52 (100)	12 (100)	586

$\chi^2 = 230.305$, $p < 0.001$; VHS: Very highly significant

periodontal disease. It was observed that 16.7% of subjects had dental calculus which is higher than that observed by Corchero AMI et al.[7]

When oral hygiene habits were observed, frequency of brushing teeth once daily was higher as compared to the study conducted by Akar C et al[3] while frequency of tooth brushing more than twice daily was lower compared to the study conducted by Akar C et al.[3]

Better oral hygiene habits were observed in the age group between 20 and 30 years than the rest. This may be due to increased awareness and that they are more conscious about their appearance. The education level was found to be another factor for better oral hygiene habits. Higher percentage of females had dental prosthesis than males between the age group of <20 and 20 to 40 years.

This study showed that 64.7% of the subjects clean their dentures with brush which is in accordance with the study by Khasawneh S et al[11] and Amjad M et al.[12] Higher percentage of females had better denture cleansing habits than males which is in accordance with the study by Mohommad Amjad et al.[12]

Prevalence of complete denture wearers was more in males than females which was in accordance to the findings of Shah N.[13] While Galon D et al[14] found that the prevalence of complete denture wearers was equally distributed between males and females.

The duration of use of dentures in this study ranged from 1 to 25 years, which was in accordance with the study by Khasawneh et al.[11] As for the storage of dentures, majority of the subjects immersed their denture in water which is in accordance with the study by Mohommad Amjad et al.[12]

CONCLUSION

The importance of instructing subjects on maintaining the hygiene of prosthesis as well as the oral cavity is of paramount importance because, however well adapted, well-polished and contoured a prosthesis is, periodontal disease and dental caries may develop after insertion, if oral hygiene is not maintained. As appropriate design and good oral hygiene decrease the incidence of oral diseases, intensive population-directed strategies for oral health education should be developed and implemented.

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