Dental Prosthetic Status and Treatment Needs of Adult Population in Makkah Region of Saudi Arabia: A Survey Report

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A B S T R A C T

BACKGROUND: Teeth play an important role in the maintenance of a positive self-image. The loss of teeth results in significant disabilities, which can profoundly disrupt social activities. Tooth loss is very traumatic and upsetting and is regarded as a serious life event that requires significant social and psychological readjustment.

AIM: The aim of the study was to evaluate the dental prosthetic status and treatment needs among the 20–70 year old adults of Makkah region of Saudi Arabia.

MATERIALS AND METHOD: A cross-sectional study was conducted among the Adult population of Makkah region of Saudi Arabia aged 20-70 years. 226 subjects who were above 20 years and who was reporting to Dental OPD of Ibn Sina National College for Medical studies, Jeddah for prosthesis of missing teeth was target of cross-sectional study and these patients were randomly selected. A questionnaire was developed and patient's consent was taken and examination of the patient was done and data collected. The data was compiled and subjected to descriptive and inferential analysis using the SPSS software version 21. Univariate analysis was performed using Chi-square test at 5% level of significance.

RESULTS: Among the participants, 29.6% of them had crown and 27.4% of them had brides and only 6.2% of them had porcelain veneers. 31.9% of them desired fixed partial denture and 6.2% of them wanted Implant supported prosthesis. 22.6% of them were suitable for removable partial denture, 29.6% of them were suitable for fixed partial denture and only 3.1% of them suitable for Implant supported prosthesis. 38.9% of them opted for removable partial denture, 38.1% of them opted for fixed partial denture and only 13.3% of them opted for Implant supported prosthesis.

CONCLUSION: Prosthodontists should to be able to understand a patient's motive in seeking Prosthodontic care and identify these before starting the treatment. This study provides data for an oral health-care provider program for Makkah region. The study confirms the relationship between increasing age and prosthetic status and treatment needs.

KEYWORDS: Treatment Needs, Removable Partial Denture, Fixed Partial Denture, Implant Supported Prosthesis.

INTRODUCTION

Oral health is one of the major challenges for the welfare of each individual. It contributes significantly to the quality of life. Poor oral health and tooth loss affect not only the nutritional status and phonetics, but also the overall health of individuals.[1] Tooth loss profoundly affects the psychosocial well-being of the patients.[2] It leads to a decrease in the height and width of the alveolar bone leading to a decrease in the size of denture-bearing area, radical alteration in the facial appearance giving rise to a "dished in" appearance, and reduced masticatory efficiency, leading to diminished nutritional intake. Hence, to prevent or ameliorate decrements in oral health-related quality of life, removable or fixed prosthetic treatment for edentulousness is often recommended.[3]

A healthy stomatognathic system and healthy oral cavity are attributes of a healthy human being.[4] We live in a social world and how we look influences our interactions with others. The face and smile play a crucial role in the creation and maintenance of positive attitudes about one's self and have a tremendous emotional significance. The face has become a symbol for the total self. A smile is a window into one's personality.[5]

De Van said, *"Meet the mind of the patient, before you meet the mouth of the patient."* Clinical skills and fulfilment of patient's needs are inseparable so before starting the patient work it is vital to determine what patient has in mind and by knowing this we can truly fulfil our duty by providing successful prosthesis.[6] The term 'need' is commonly used to describe the type of treatment that dentist's judge their patients ought to have, whilst 'demand' refers to the treatment requested by the patients. Studies reporting the dental prosthetic status of people give an indication of the awareness and perception of patients toward dental treatment, accessibility to dental services, priorities, and willingness to take treatment. Further, studies assessing the prosthetic treatment needs of the population indicate the burden of unmet treatment needs, and the data are highly useful for planning an oral health promotional program and improvement of prosthetic

treatment facilities.[6]

The present study was undertaken as a part of hospital population-based oral health survey to formulate an oral health-care provider program.

The aim of the study was to evaluate the dental prosthetic status and treatment needs among the 20–70-year-old adults of Makkah region of Saudi Arabia. Objective of the study was to comparing the prosthetic status and treatment needs in relation to age.

MATERIALS AND METHOD

A cross-sectional study was conducted among the Adult population of Makkah region of Saudi Arabia aged 20-70 years. The study was conducted for 2 months. Sampling technique was convenience sampling and 226 subjects who were above 20 years and were reporting to Dental clinic OPD of Ibn Sina National College for Medical studies, Jeddah for prosthesis of missing teeth were target of cross-sectional study and these patients were randomly selected. A questionnaire consisting of 11 close ended, pre-tested questions developed to determine patients' need with their Dental prosthesis. The questionnaire served as a guide to interview the patient and collect data on perceptions of the patient regarding Prosthetic status and treatment needs. The patients consent was taken and oral examination was conducted in natural day light and findings were recorded using WHO oral health assessment form. The examiners were two dental interns who had been trained and calibrated for inter examiner variability data obtained was then recorded on the questionnaires and subsequently entered into SPSS software version-20 to be analyzed statistically. Microsoft word and excel sheet were used to generate graphs and tables and descriptive statistical analysis was then carried out.

The data was compiled and subjected to descriptive and inferential analysis using the SPSS software version 21. Univariate analysis was performed using Chi-square test at 5% level of significance.

RESULTS

The study included 100 male patients (44.2%) and 126 female patients [(55.8%),(Table 1)]. Age of the patients ranged from 20-70 year old patients, 20-30 year old patients 94 (41.6%), 30-40 years old patients, 74 (32.7%), 40-50 year old patients, 34 (15%), 50-60 year old patients, 16 (7.1%) and 60-70 year old patients 8 [(3.5%) (Table2)].

	NUMBER	PERCENTAGE
Gender		
Male	100	44.2
Female	126	55.8

Table 1. Gender Wise Distribution of Study Participants

AGE (in years)	NUMBER	PERCENTAGE
20-30	94	41.6
30-40	74	32.7
40-50	34	15.0
50-60	16	7.1
60-70	8	3.5

Table 2. Age Wise Distribution of Study Participants

Socioeconomic status of the patients as follows; 56 (24.8%) of them were poor, 106 (46.9%) of them were middle class and 64, (28.3%) of them were high class (Table 3).

SOCIOECONOMIC STATUS	NUMBER	PERCENTAGE
1 (Poor)	56	24.8
2 (Middle Class)	106	46.9
3 (High Class)	64	28.3

Table 3. Distribution of Participants Based on Socioeconomic Status

Occupation of the patients were as follows; Labor class 3 (1.3%), farmers 26, (11.5%), sweeper 46,(20.4%) small general merchants 32 (14.2%) , Housewife 56 (24.8%), Business 23 (10.2%), Service 24 (10.8 %), and Professional 16 (7.1%) (Table 4).

OCCUPATION	NUMBER	PERCENTAGE
1 (Labor Class)	3	1.3
2 (Farmers)	26	11.5
3 (Sweeper)	46	20.4
4 (Small Merchant)	32	14.2
5 (Housewife)	56	24.8
6 (Business)	23	10.2
7 (Service)	24	10.8
8 (Professional)	16	7.1

Table 4. Distribution of Participants Based on Occupation

Education of the participants were as follows; illiterate 26, (11.5%), Till primary 34, (15.0%), Till high school 82, (36.3%,), Inter and above 27 (11.9%), Graduate 34 (15.0%) and Postgraduate 23 (10.2%) (Table 5).

EDUCATION	NUMBER	PERCENTAGE
1 (Illiterate)	26	11.5
2 (Primary)	34	15.0
3 (High School)	82	36.3
4 (Inter & above)	27	11.9
5 (Graduate)	34	15.0
6 (Post Graduate)	23	10.2

Table 5. Distribution of Participants Based on Education

Among the participants, 29 (12.8%) of them were completely edentulous, Kennedy's class 1 were 27, (11.9%), Kennedy's class 2 were 44 (19.5%), Kennedy's class 3 were 85(37.6%) and Kennedy's class 4 were 14 (18.1%) (Table 6).

EDENTULISM	NUMBER	PERCENTAGE
Edentulous	29	12.8
Kennedy's class 1	27	11.9
Kennedy's class 2	44	19.5
Kennedy's class 3	85	37.6
Kennedy's class 4	41	18.1

Table 6. Distribution of Participants Based on Edentulism

Among the participants, Prosthetic Status were as follows; 67(29.6%) of them had crown, 12(5.3%) of them had crown and bridges, 13 (5.8%) of them had crown, bridge and porcelain laminates, 7 (3.1%) of them had crown, bridge and different type of prosthesis, 62, (27.4%) of them had only bridge, 14, (6.2%) of them had porcelain and laminates, 24, (10.6%) of them had complete denture, 25, (11.1%) of them had Removable partial denture, 2, (0.9%) had different type of prosthesis (Table 7).

Need of the patient were as follows: 57, (25.2%) of them wanted prosthesis for mastication, 23, (10.2%) of them wanted prosthesis for mastication and esthetics, 15 (6.6%) of them wanted prosthesis for mastication, esthetics, phonetics and for comfort, 9(4.0%) of them wanted prosthesis for mastication, esthetics and for

comfort, 8, (3.5%) of them wanted prosthesis for mastication and for comfort, 46, (20.4%) of them wanted prosthesis for esthetics, 39, (17.3%) of them wanted prosthesis for phonetics, 8 (3.5%) of them wanted prosthesis for phonetics and comfort, 21, (9.3%) of them wanted prosthesis for comfort (Table 8).

PROSTHETIC STATUS	NUMBER	PERCENTAGE
1 (Crown)	67	29.6
1,2 (Crown & Bridge)	12	5.3
1,2,3 (Crown, Bridge and porcelain laminates)	13	5.8
1,2,5 (Crown, Bridge and different type of Prosthesis)	7	3.1
2 (Bridge)	62	27.4
3 (Porcelain & Laminates)	14	6.2
4 (Complete Denture)	24	10.6
5 (RPD)	25	11.1
6 (Different Prosthesis)	2	0.9

Table 7. Distribution of Participants Based on Prosthetic Status

NEED OF THE PATIENT	NUMBER	PERCENTAGE
1 (Mastication)	57	25.2
1,2 (Mastication & Esthetics)	23	10.2
1,2,3,4 (Mastication, Esthetics, Phonetics and for Comfort)	15	6.6
1,2,4 (Mastication, Esthetics and for Comfort)	9	4.0
1,4 (Mastication and Comfort)	8	3.5
2 (Esthetics)	46	20.4
3 (Phonetics)	39	17.3
3,4 (Phonetics & Comfort)	8	3.5
4 (Comfort)	21	9.3

Table 8. Distribution of Participants Based on Needs of the Patient

It was seen that 17 (7.5%) of them desired complete denture, 10 (4.4%) of them desired complete denture and Implant supported prosthesis, 34(15.0%) of them desired removable partial denture, 9(4.0%) of them desired removable partial denture and fixed partial denture, 14, (6.2%) of them desired removable partial denture, fixed partial denture and implant supported prosthesis, 35 (15.5%) of them removable partial denture, Implant supported prosthesis, 72, (31.9%) of them desired fixed partial denture, 21(9.3) of them desired fixed partial denture and implant supported prosthesis, 14 (6.2%) of them desired Implant supported prosthesis (Table 9).

DESIRED TREATMENT	NUMBER	PERCENTAGE
1 (Complete Denture)	17	7.5
1,4 (Complete Denture & Implant)	10	4.4
2 (RPD)	34	15.0
2,3 (RPD & FPD)	9	4.0
2,3,4 (RPD, FPD & Implant)	14	6.2
2,4 (RPD& Implant)	35	15.5
3 (FPD)	72	31.9
3,4 (FPD & Implant)	21	9.3
4 (Implant)	14	6.2

Table 9. Distribution of Participants Based on Desired Treatment (Implant= Implant Supported Prosthesis)

Treatment options explained by clinicians as follows: 16, (7.1%) is suitable for Complete denture, 8 (3.5%) is suitable for Complete denture and Implant supported prosthesis, 51(22.6%)%) is suitable for Removable partial denture, 9 (4.0%) is suitable for removable partial denture and fixed partial denture, 18 (8.0%) is suitable for removable partial denture, fixed partial denture and implant supported prosthesis, 39 (17.3%) is suitable for Removable partial denture and Implant supported prosthesis, 67(29.6%) is suitable for Fixed partial denture, 11 (4.9%) is suitable for Implant supported prosthesis and Fixed partial denture, 7(3.1%) is suitable for, Implant supported prosthesis (Table 10).

TREATMENT OPTIONS	NUMBER	PERCENTAGE
1 (Complete Denture)	16	7.1
1,4 (CD & Implant)	8	3.5
2 (RPD)	51	22.6
2,3 (RPD & FPD)	9	4.0
2,3,4 (RPD, FPD & Implant)	18	8.0
2,4 (RPD & Implant)	39	17.3
3 (FPD)	67	29.6
3,4 (FPD & Implant)	11	4.9
4 (Implant)	7	3.1

Table 10. Distribution of Participants Based on Treatment Options (Implant= Implant Supported Prosthesis)

Final Treatment opted by participants as follows:
22(9.7%) of them opted for complete denture, 88 (38.9%) of them opted for removable partial denture, 86(38.1%) of them opted for fixed partial denture, 30 (13.3%) of them opted for Implant supported prosthesis (Table 11).

FINAL TREATMENT	NUMBER	PERCENTAGE
1 (Complete Denture)	22	9.7
2 (RPD)	86	38.1
3 (FPD)	88	38.9
4 (Implant)	30	13.3

Table 11. Distribution of Participants Based on Final Treatment Opted by the Patient (Implant= Implant Supported Prosthesis)

Table 12 shows there were a statistically significant difference between prosthetic status and the age groups (χ_2 = 58.882, P < 0.01).

	VALUE	DF	ASYMP. SIG. (2-SIDED)
PEARSON CHI-SQUARE	58.882[a]	32	.003
LIKELIHOOD RATIO	63.569	32	.001
N OF VALID CASES		226	

Table 12. Statistically Significant Difference Between Prosthetic Status and the Age Groups (χ_2= 58.882, p < 0.01).

Table 13 shows there were no statistically significant difference between desired treatment and the age groups (χ_2 = 43.330, P> 0.05).

	VALUE	DF	ASYMP. SIG. (2-SIDED)
PEARSON CHI-SQUARE	43.330 a	32	.087
LIKELIHOOD RATIO	40.642	32	.141
N OF VALID CASES	226		

Table 13. Statistically Significant Difference Between Desired Treatment and Age Groups (χ_2 = 43.330, p> 0.05)

Table 14 shows there was a statistically significant difference between need of the patient and Prosthetic status (χ_2 = 76.19, p< 0.001).

	VALUE	DF	ASYMP. SIG. (2-SIDED)
PEARSON CHI-SQUARE	76.197 a	15	.000
LIKELIHOOD RATIO	85.673	15	.000
LINEAR-BY-LINEAR ASSOCIATION	15.937	1	.000
N OF VALID CASES	226		

Table 14. Statistically Significant Difference Between Need of the Patient and Prosthetic Status (χ_2 = 76.19, p< 0.001)

DISCUSSION

Aging is a universal process and a normal biological wonder. With the advancement in the field of medical science and the improved social conditions, there is escalation in the life span of an individual. Oral health can be considered as gauge of general health and quality of life for any individual.[7] Early loss of permanent teeth leads to stomatognathic system disability, loss of masticatory functions, and alterations in speech and face aesthetics.[8] Patients' perception of need frequently gives rise to a demand for health care. Patients are often unaware of the treatment options available and depend on the health care provider to suggest the appropriate care for their conditions. Planning of treatment is essential for good prognosis. It also helps to prepare the patients psychologically for the type of treatment they will receive without any unrealistic imagination of the treatment.[9]

Distribution of participants in this study was found to be 55.8% were female participants and males were 44.2%.

The majority of sample was in age group 20-30 years & 30-40 years for both male and female, unlike other study where most of the participants at the age group of 40-49 years & 50-59 years.[10-12]

Most of the participants were middle class category and maximum of them were housewives and studied up to high school. In this study, the income status of the patients was a significant predictor of the wearing of dentures. Previous studies showed that replacement of missing teeth was more common among those from a higher socio-economic status[13] and income.[14] Income and educational status of individuals are often correlated. In their study, Shah et al.[11] reported that the prevalence of wearing of dentures increased with the increase in the level of literacy. It may be that individuals with higher educational attainments have greater health concerns and thus seek prosthodontic care more often than those with lower levels of education.

It has been established from a past study that an increase in the educational level of a population affects the needs and demands of that population. The educational level and social standard of the study population was poor which led to unmet prosthetic need.[15] Owing to the monthly income, the socioeconomic status was seen as the poor were 60.4%, the middle were 28% and high were 11.6%.The occupations of the people were that the labor class were 28.3%, farmers were 23.5%, sweepers were 19.2%, small general merchants were 17.4%, housewives were 15.5%, businessmen were 7.5% and servicemen were 6.1%. According to the education, illiterate people were 46.8%, those educated till primary level were 22.8%, people with education till high school were 15.6% and higher education was seen in 14.8%.The edentulous people were 184 and partially edentulous were 66.

Only 9.7% opted for complete denture as final treatment choice, where as 38.9% opted for FPD and 38.1% opted for RPD and 13.3% opted for Implant supported prosthesis.

In the present study, it was observed that the total prosthetic needs were 15.5% whereas in a study done on a representative German sample, 81% had normative prosthetic treatment needs. This vast difference in prosthetic needs might be due to the difference in criteria used in the assessment of prosthetic needs between the studies. While assessing the prosthetic needs, Walter et al have included all those individuals with grade III mobile teeth, extreme malocclusion and intraosseous and non-restorable hard tissue decay.[16]

People with edentulousness and without prosthetic rehabilitation suggest that they are not motivated to take treatment, cannot bear the finances,[17] are not aware of the different treatment modalities,[18] have time constrains to take treatment,[19] or have the fear of dental treatment. Since the level of education also influences the treatment-seeking behaviour, this may have had an impact on the prosthetic rehabilitation of the people in Jizan, as nearly 30% of Jizan population studied was illiterate. Further, income may not play a major role with respect to prosthetic rehabilitation, as the Saudi government provides free dental treatment to the people.[20]

Even today, conventional removable dentures continue to represent the first rehabilitative option offered to the edentate in many places around the world.[21] In the present study, implants were reported in very less number of patients. Cost is not a hindrance in Jizan, but creating awareness, motivation, and imparting correct knowledge about the treatment procedure may improve the implant placement among the people.

It was seen that majority patients were poor, labor class and illiterate. These patients had maximum edentulous and partially edentulous state. Therefore they expressed willingness for conventional acrylic complete and removable partial dentures. The study by Eklund SA and Burt and Gilbert GA et al. also found the prosthetic status to be better among the subjects in the higher classes.[22] An inverse relationship was observed between the socioeconomic status and prosthetic need.[23]

Among the needs, mastication was the chief need in 52.4%, esthetics and mastication was needed in 27.2%,

esthetics, mastication and phonetics was needed in 11.2%, esthetics was desired by 4.8% and comfort in 4.4.%. Similar findings have been given as by Annette Thomas – Weintraub, who stated that masticatory difficulty was the most frequently voiced complaint.[24]

The clinician explained different treatment options to the patients. Implants were suggested to 62%, fixed partial dentures were told to 28% and special dentures explained to 10%.The final treatment that was opted by the patient after being told about various options by the clinician were that complete denture were opted by 56.8%, acrylic removable partial dentures were agreed to by 28%, fixed partial dentures were the choice of 12.4%, implants were agreeable with 1.6% and special dentures were finalized by 1.2%.It can be seen that though the clinician suggested better options to the patient, majority of them chose to conventional acrylic prosthesis. It could be due to the low economic state, education, awareness, age and ability to afford extra visits to the institution. However, demand for prosthetic replacement by patients was much less than their actual need. Also the clinical possibilities to prosthetic replacement for each patient according to the missing teeth were significantly different from patient desire.[25]

It has to be realized that the decision of whether or not to undergo prosthodontic treatment belongs to the patient, who when properly educated about the dental aspects of the decision can best weigh his or her own priorities[26] any studies regarding dental prosthetic status and treatment needs were done on elderly individuals residing at elderly home[27], hospitals, institutions and elderly general population. Prosthetic needs of our study was 15.5% which was very low when compared to that of previous, in a study done on elderly home residents 82% of the subjects were in need of fixed, removable or combined prosthodontic treatment.[28] Reason for this great difference in prosthetic needs between the present and past studies may be due to the reason that our study population comprised of adults (20-60 years). It has been established from a past study that an increase in the educational level of a population affects the needs and demands of that population. The educational level and social standard of the study population was poor which led to unmet prosthetic needs. Past studies[29,30] have collected information regarding prosthetic needs as subjective and normative prosthetic treatment and found out that a discrepancy always exists between the subjective and normative needs, but in our present

study we have recorded only normative prosthetic needs as only clinical examination of the subjects was done without any questionnaires or interviews.

The clinician explained different treatment options to the patients were complete denture, Removable partial denture, fixed partial denture and Implant supported prosthesis. The final treatment opted by the patient after being told about various options by the clinician was that the majority of sample was in age group for both male and female. As expected and consistent with the findings of other studies[31], the results revealed a significant association between the number of tooth loss and age. Dental caries and periodontal diseases are the major causes of tooth loss. As a result of the cumulative effects of these two conditions, the likelihood of tooth loss will increase with age. Our patients usually do not complain until pain and heavy discomfort are present. Only when complaints are reported, the patients see the dentist. These results are in agreement with Knabe & Kram (1997) who described similar findings.[32]

CONCLUSION
Based on the results of this study it is concluded that:
1. The present results may serve as a baseline for the future evaluation of attitudes towards replacement of teeth.
2. Prosthodontists should to be able to understand a patient's motive in seeking Prosthodontic care and identify these before starting the treatment.
3. This study provides data for an oral health-care provider program for Makkah region. It was evident from the study that more than half of the surveyed adult population was in need of some or the other forms of prosthesis. The study confirms the relationship between increasing age and prosthetic status and treatment needs.

Clinical Relevance: Most population do not convey to Prosthodontist about their needs. Once they do so, Prosthodontist can use different treatment options successfully.

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