

Prosthetic Status And Treatment Need Of The General Population Of Arcot (Vellore, Tamil Nadu) In Relation To Sociodemographic Characteristics: A Cross Sectional Study

Research Article

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Abstract

Introduction: Very few studies have been conducted in the Arcot (Vellore city Tamil Nadu) about the prosthetic status and prosthetic needs of the population. Hence, this study was conducted to determine the prosthetic status and prosthetic needs of general population of Arcot. Additionally, we aimed to correlate the demographic characteristics and socioeconomic status, with the prosthetic status and needs of the general population of Arcot.

Materials and Methods: This population based cross-sectional survey was conducted among the general population of Arcot. The population to be studied was selected from the geographical boundaries of Arcot (4 urban and 4 rural). A simple random sampling was carried out. The data was collected from various public places such as schools, households, hospitals, hostels, colleges and various other places of work. All age groups were included in the study so that the results represent the status of the whole sample rather than particular age groups. The questionnaire was prepared which enquired about the age, gender, area of residence, education, occupation, family income, prosthetic status and needs. A single calibrated examiner with the help of an assistant examined the samples.

Results: A total number of 7000 subjects were included in the study in which 4702 (67.17%) were males and 32.83% were females. Only subjects with permanent dentition were considered. Most samples ranged from 18 years and above up to 75. As per convenience the sample was re-grouped into 14-17 years, 18-34 years, 35-44 years, 45-64 years and 65 years and above age groups. Most of the population had no prosthesis. Prosthetic needs in the present study were 41.7% in maxillary arch and mandibular arch. Correlation between prosthetic status and need with other characteristics was done by Spearman's rank correlation method. Positive correlation was observed between age, level of education and prosthetic status and needs. The occupation and prosthetic status were negatively correlated. Income was negatively correlated with prosthetic status and needs. **Conclusion:** Most of the prosthetic population were unmet with prosthetic needs being approximately two-fold greater than the prosthetic status.

Keywords: Prosthetic Status; Prosthetic Needs.

Introduction

Oral health is an integral part of general health and plays an important role in improving the quality of life. The oral cavity is the port of entry for many diseases and presents several unique features that make it especially prone to occupational diseases.[1, 2] Every age group is susceptible to certain oral diseases. Also, as the age advances, changes can be observed in the tooth structure partly due to normal wear and tear and also, due to certain diseases that become.[3]

Loss of teeth could be a disturbing emotional experience for many people.[4] Tooth loss adversely affect the dietary intake and nutritional status of individuals.[5] Some people associate the loss of teeth with growing old, which may be emotionally disturbing. Tooth loss constitutes a final common pathway for most dental diseases and conditions including dental caries and periodontal diseases. This tooth loss can lead to substantial impacts on quality of life.[6] In order to prevent or improve the oral health-related quality of life, dentists frequently recommend replacement of teeth with either a fixed or removable prosthesis.[7] Dental prosthesis has the ability to reduce the deficits attributed to lost teeth,

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because it improves their chewing ability, digestion, aesthetics, and as a result, their quality of life.[8, 9]

Various studies in the past have revealed that socioeconomic status; especially education level and income have a strong association with oral health.[10, 11] Findings from recent studies show that people with low and very low incomes are 5 times more likely to have a poor oral health status compared to those with high incomes.[12] In addition, a higher level of education is commonly related to better oral health and quality of life. [12] Education also ensures the possibility to attain and understand information regarding oral health. [10, 12]

Very few studies have been conducted in the Arcot (Vellore city Tamil Nadu) about the prosthetic status and prosthetic needs of the population. The available data is scanty. This was the first known attempt to the author's knowledge to access and form a baseline data to describe the prosthetic status and treatment needs and socioeconomic data of the general population of Arcot. Hence, this study was conducted to determine the prosthetic status and prosthetic needs of general population of Arcot. Additionally, we aimed to correlate the demographic characteristics and socioeconomic status, with the prosthetic status and needs of the general population of Arcot.

Materials And Methods

Basic profile of Study area: Arcot is located at 12.9°N 79.33°E. It has an average elevation of 164 meters (538 ft.) Arcot Town has a 7.49 km² area with a population of 70000 as per the 2011 census. The Municipal office is situated nearly 1/4 km east from the bus stand. The town is located on the southern bank of Palar River, easily accessible from the capital of Tamil Nadu. Chennai is within 120 km and the district headquarters are within 25 km. Arcot has been developing as a commercial centre for long time as it is connected to Chennai and Vellore by the National Highways-46 Ranipet to Krishnagiri Road (Arani to Chennai) passing through this town. Besides this, tourists see nick beauty namely Delhi Gate. This generates floating population to this town.[13]

Sampling Design: The population to be studied was selected from the geographical boundaries of Arcot. A simple random sampling was carried out.

Urban area: The following urban areas i.e., Arcot Municipality, Timiri Town panchayat, Vilapakkam town panchayat, Tajpura Census Town in the Arcot city were selected randomly.

Rural area: The following rural areas i.e., Agaram, Aroor, Durgam, Irungur, around Arcot city were selected randomly.

Obtaining approval from the authorities

Before the start of the study official permission was obtained from the concerned authorities. Ethical clearance to conduct the study was issued by the ethical clearance board, scientific committee, Faculty of Dentistry, Maharaj Vinayak Global University, Jaipur, Rajasthan.

Study population, sampling and data collection

The target population is general population of Arcot (Vellore city Tamil Nadu). Verbal consent to participate in the study will be taken from the participants, being assured that they will remain anonymous concerning their personal data. The data was collected from various public places such as schools, households, hospitals, hostels, colleges and various other places of work. All age groups were included in the study so that the results represent the status of the whole sample rather than particular age groups.

Questionnaire

A single page questionnaire was designed to be used to assess the oral hygiene practices habits and systemic diseases. The questionnaire was prepared in English; it was translated into vernacular language and retranslated into English to evade language errors. (Refer to Appendix-1)

The questionnaire enquires about the age, gender, area of residence, education, occupation, family income, prosthetic status and needs.

Examiner and examination

A single calibrated examiner with the help of an assistant examined the sample. W.H.O Type 3 examination was carried out. Examination was carried out in the nearest public dental centre with natural light to reduce diagnostic bias.

Statistical analysis

Descriptive and inferential statistical analyses were carried out in the present study. Results on continuous measurements were presented on Mean \pm SD and results on categorical measurement were presented in number (%). Level of significance was fixed at $p=0.05$ and any value less than or equal to 0.05 was considered to be statistically significant. The data was presented as number and % for the categorical variables. The Spearman's rank correlation method was used to correlate the prosthetic status and needs with sociodemographic variables. The Statistical software IBM SPSS statistics 20.0 (IBM Corporation, Armonk, NY, USA) was used for the analyses of the data and Microsoft word and Excel were used to generate graphs, tables etc.

Results

In the present study most participants, 45.37 percent were aged 18-to-34-year category, followed by 27.74 percent aging from 45 - 64 years and only 10.57 percent were above 65 years. 67.17 percent were males and 32.8 were females. 55.17 percent belong to urban area and 44.8 percent belong to rural area. (Table 1)

In the present study only 6.6 percent were either professional or holding doctorates, 13 percent were graduates or postgraduates, 14.8 percent were intermediate level, 33 percent were high school passed outs, 12 percent were middle and primary school passed out. 20.6 percent of the sample was illiterate. In the present study 7.8 percent of the sample were professionals, 6.2 percent were semi-professionals, 4.3 percent were either shop owners, clerks or farmers, 8.6 percent were skilled workers, 9.5 percent were semi-skilled workers, 9 percent were unskilled workers and 54.60 were unemployed (31.2 percent were unemployed. 23.4 percent of the

sample was still studying). The income distribution is mentioned in table 3.

For the maxillary arch, 83.7 percent of the samples had no prosthesis, 8.7 percent had bridge, 3.3 percent were had more than one bridge, 1.7 percent had partial dentures, 0.8 percent was had both bridge and partial dentures. For mandibular arch, 86 percent of the samples had no prosthesis, 6.9 percent had bridge, 3.2 percent had more than one bridge, 1.8 percent were had partial dentures, 0.63 percent had both bridge and partial dentures whereas 1.5 percent of the sample were had fully removable dentures. (Table 3)

In the present study 58.3 percent of the sample did not require any prosthesis, 19.7 percent required single unit prosthesis, 13.1 percent required multiple unit prosthesis and 4.23 percent re-

quired the combination of single and multiple unit prosthesis whereas 4.4 percent required full prosthesis. In the present study 58.3 percent of the sample did not require any prosthesis, 19.4 percent required single unit prosthesis, 12.7 percent required multiple unit prosthesis and 4.54 percent required the combination of single and multiple unit prosthesis where as 4.83 percent required full prosthesis. (Table 4)

Correlation between prosthetic status and need with other characteristics was done by Spearman's rank correlation method. Positive correlation was observed between age, level of education and prosthetic status and needs. The occupation and prosthetic status were negatively correlated. Income was negatively correlated with prosthetic status and needs.(Table 5)

Table 1. Distribution of respondents according to age groups.

Variables	Sub-groups	n	%
Gender	Male	4702	67.17
	Female	2298	32.83
Age group	14 – 17	18	0.26
	18 – 34	3176	45.37
	35 – 44	1124	16.06
	45 – 64	1942	27.74
	65 & Above	740	10.57
Area of residence	Rural	3138	44.83
	Urban	3862	55.17

Table 2. Distribution of respondents according to Level of Education and occupation.

Education level	No	Percentage
1-Doctorate/profession	462	6.6
2-Graduate/post graduate	912	13.03
3-Intermediate	1036	14.8
4-High school	2312	33.03
5-Middle school	410	5.86
6-Primary school	424	6.06
7-Illiterate	1444	20.63
Occupation		
1-Professional	546	7.8
2-Semi profession	432	6.17
3-Clerical/farmer/shop	304	4.34
4-Skilled worker	600	8.57
5-Semi-skilled worker	664	9.49
6-Un-skilled	632	9.03
7-Unemployed	3822	54.6
Income		
800- 3000	698	10
300- 6000	2104	30.1
6001-10000	3106	44.4
10001-15000	806	11.5
15001-25000	260	3.7
25001-50000	18	0.3
50001- 89000	8	0.1

Table 3. Distribution of respondents according to Maxillary Prosthetic status.

Prosthetic status	Maxillary		Mandibular	
	Number	%	Number	%
No prosthesis	5862	83.74	6018	85.97
Bridge	606	8.66	482	6.89
More than one bridge	230	3.29	222	3.17
Partial denture	120	1.71	126	1.8
Both bridge and partial denture	58	0.83	44	0.63
Full removable denture	120	1.71	104	1.49
Not recorded	4	0.06	4	0.06

Table 4. Distribution of respondents according to maxillary and mandibular prosthetic needs.

Prosthetic needs	Maxillary		Mandibular	
	Number	Percentage	Number	Percentage
No prosthesis needed	4080	58.29	4082	58.31
Need of one unit prosthesis	1380	19.71	1358	19.4
Need for multiunit prosthesis	918	13.11	888	12.69
Combination of above	296	4.23	318	4.54
Need for full prosthesis	308	4.4	338	4.83
Not recorded	18	0.26	16	0.23

Table 5. Correlation between prosthetic status and needs with other sociodemographic characteristics by Spearman's rank correlation method.

Factors	prosthetic status		Prosthetic needs	
	maxillary	mandibular	Maxillary	Mandibular
Age	0.187	0.200	0.407	0.396
	P=<0.001**	P=<0.001**	P=<0.001**	P=<0.001**
Sex	0.038	0.019	-0.029	-0.0389
	P=0.0016*	P=0.1214	P=0.0145*	P=0.0012*
Place of residence	0.053	0.065	-0.078	-0.071
	P=<0.001**	P=<0.001**	P=<0.001**	P=<0.001**
Levels of education	0.076	0.058	0.296	0.314
	P=<0.001**	P=<0.001**	P=<0.001**	P=<0.001**
Occupations	-0.072	-0.078	-0.017	0.003
	P=<0.001**	P=<0.001**	P=0.1607	P=0.7782
Income	-0.012	-0.008	-0.201	-0.2
	P=0.2997	P=0.5255	P=<0.001**	P=<0.001**

(p< 0.05 - Significant*, p < 0.001 - Highly significant**)

Discussion

Presence of teeth is a very important aspect of happy and healthy life as it helps the individual to maintain proper general health. People having their missing teeth whether few or all realize the importance of teeth. Very few studies have been conducted about the prosthetic status and needs of general population as most of the studies are conducted either on elderly age groups or old age home inmates or special populations, but this study aims at knowing the prosthetic status and needs of the general population as teeth are important in all ages of life. This study was conducted in Arcot region, Vellore district in Tamil Nadu.

A total number of 7000 subjects were included in the study in which 4702 (67.17%) were males and 32.83% were females. Only subjects with permanent dentition were considered. Most samples ranged from 18 years and above up to 75. As per convenience the

sample was re-grouped into 14-17 years, 18-34 years, 35-44 years, 45-64 years and 65 years and above age groups. Most of the population had no prosthesis. Prosthetic needs in the present study were 41.7% in maxillary arch and mandibular arch. The bridge was the most common prosthesis used followed by complete and partial denture. Nagaraj, E., et al.[14] and Shah et al [3] had similar study findings. The low proportion of prosthesis may be due to the lack of awareness, financial concerns and misconceptions regarding prosthesis.

In the present study positive correlation was seen between the age and prosthetic status and need, i.e., as the age increased the prosthetic needs also increased significantly (p<0.001) in both the arches. The reason of more prosthetic needs in elder age groups may be tooth loss would have been due to periodontal diseases which are common in elder age groups.[15] Females had lesser prosthetic needs than males. Males require more prosthesis than

females. The findings are similar to study done by Shah et al [3] and Shenoy et al [16]. The reason may be habits such as use of tobacco, smoking and negligence of general dental health by men. [14] Similarly prosthetic status positively correlated with urban population as well as prosthetic need decreased in urban samples. The reason could be that large proportion of dentists resides in the urban population. Dentists to population ratio, there are 10 times more in cities than in villages in India.[17] Moreover, in rural areas the standard of living and economic status is low and dental treatment is therefore obviously neglected till tooth loss is the final result.[17, 18]

In the present study, the prosthetic status was more in higher level occupation (professionals). The increased educational status was associated with better prosthetic status and lesser prosthetic need. The reason could be that the educated class would be more aware and recognize the importance of good dental health and go for preventive care. But with the less educated groups, extraction would be much common and knowledge on preventive care would be limited. The social pressure of maintaining the esthetics and function may be the driving force that influences the subjects in the upper class to get their missing teeth replaced.[19] Moreover those of a higher education status are more likely to be able to afford regular dental care than those of a lower education status. [14] In addition to this, the attitude and awareness toward dental care, and the cost of dental treatment might also be the significant factor.[11]

In the present study, there was no association between prosthetic status and income in our study, whereas, increased income was associated with decreased prosthetic need in both upper and lower arches. That is the people who had money could afford for dental treatments and save their teeth and poor people usually prefer extractions.[17]

The results are similar to that of Shah et al3,Shah et al20, Bhardwaj et al11 and Hameed A et al10 where upper socioeconomic class had fewer prosthetic needs (both upper and lower) than middle, upper lower and lower socio economic class people. The socioeconomic status and education level had a strong association with oral health.

To know the prevalence of a disease and the treatment needs are the first step in the right direction to deal with the dental disease. However, our study had certain limitations. Firstly, the study population was conveniently selected hence reducing the external validity of the study. Nevertheless, the study area was selected by random selection and may accurately represent the population of Arcot. A nationwide evaluation of health services should carry out further epidemiological surveys on a larger scale with door-to-door data acquisition related to wealth, religion and caste on individual basis. This helps us to estimate the prosthetic status and need and associated factors.

Conclusion

This is the first study done to determine the prosthetic status and treatment needs of the general population of Arcot. The findings in this study revealed a significant relationship between sociodemographic variables and edentulism with age, educational

level and socioeconomic status playing vital roles in edentulism and denture demand. Unmet prosthetic treatment needs existed in Arcot, indicating the existence of barriers to accessible dental care. A sizeable amount of population is also in need of dental prosthesis and the same needs immediate attention. The present results may serve as a baseline for the future evaluation of attitudes towards replacement of teeth.

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