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Original Research Article

Assessment of Prevalence of Edentulousness, Prosthetic Status and Prosthetic Need in the Population of Madhuban, Bihar

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Abstract

Introduction: The increasing proportion of the elderly among the populations of almost all countries is presenting them and their societies with specific challenges. This rise in aged population would create new problems and challenges, requiring changes in the organization of our society. For these people, oral health promotion and protection is very essential to improve the quality of life, both physically and mentally [3]. Oral health is always an inseparable part of general health and awareness plays a vital role in determining the oral health of an individual [4]. ***Aim:*** The present study was conducted to assess the prevalence of edentulousness, the prosthetic status and prosthetic need in the population of Madhuban, Bihar, India. ***Methodology:*** A descriptive cross-sectional study was conducted among the population of Madhuban, Bihar. The sample size included 460 subjects. Belonging to an age group of 25 years and above. ***Result:*** After the examination of 460 patients. It was seen that the total of 285 were edentulous, which included partially edentulous to be 279 (60.00%) and completely edentulous to be 6(4.75 %). The data from the survey revealed the high occurrence of fixed partial denture treated patient, which was amounting to 57 out of 285, the second most prevalent were the removable partial denture which were 27 out of 285 and the least were Complete denture which were 6 out of 285. The rest of the patients without any treatment for edentulism were found to be 175. The rate of edentulism in male was more as compared to female. ***Conclusion:*** India, being an agrarian society, 72% of its total population and 80% of its geriatric population reside in rural areas [13]. In contrast, 80% of the trained dental manpower is concentrated in urban areas [14].

Keywords: Edentulism, Trained dental manpower.

INTRODUCTION

Indian is the second most populous country in the world with over 1 billion population. Of these 7.7% are over the age of 60 years, which amounts to 77 million people. It is predicted that the elderly population of India shall be the highest in the world by 2025. Their contribution to the demographic profile is increasing every day. Loss of teeth could be a disturbing emotional experience for many people. Some people associate the loss of teeth with growing old, which may be emotionally disturbing. Poor oral health and loss of teeth not only adversely affect the dietary intake and nutritional status and there by compromise general health, but can also deny them the pleasure of taking food of their choice. Oral health is always an inseparable part of general health and awareness plays a vital role in determining the oral health of an individual.[1]

The loss of teeth is an end product of oral disease and reflects the attitudes of the patients, the dentists in a society, the availability and accessibility of dental care as well as the prevailing philosophies of care [1]. According to the WHO definition, a person who is edentulous is deemed to be handicapped [2]. Edentulism is regarded widely as a poor health outcome since it may compromise an individual's quality of life [3]. A number of personal factors are known to be associated with the oral health of the elderly, such as socio-economic status, literacy level and deleterious habits like smoking, tobacco chewing and alcohol consumption [4]. Epidemiologic studies on edentulism and tooth loss vary considerably, with great differences evident in prevalence between countries, between geographic regions within countries, and between patient groups with various backgrounds. Some studies have reported that the incidence of edentulism correlates with education level and income status, with those in the lower levels of both sociodemographic factors exhibiting higher risks of becoming completely

edentulous. However, growing economy, rising literacy and education level in younger peoples, diminishing cultural misbelieve about oral hygiene, implementation of National oral health program led by WHO and "National policy on older health" adopted by central and state governments are the hope for decline in prevalence of edentulousness among Indian population. The ascending number of dental educational institutes, dental professionals and dental clinics are added prospects for oral health awareness and treatment avenues. This may contribute for diminished edentulousness in Indian peoples in days to come [5].

In order to promote the oral health and formulating a plan for an oral health care programme, we need to know and acquire the base line information regarding the prevalence of edentulousness, dental prosthetic status and prosthetic needs. As of today there is no data available for Madhuban, Bihar. Hence, an effort has been made to collect the baseline information.

Aim

To evaluate the prevalence of edentulousness, the present prosthetic status and the need for prosthetic treatment in the population of Madhuban, Bihar.

Objectives

- To record the number of edentulous subjects
- To record the prosthetic status of male and female
- To record the incidence of pre existing prosthesis wearer
- To record the need for prosthesis in male and female
- To record the incidence of edentulousness in maxilla and mandible in males and females

MATERIALS & METHODOLOGY

Source of data

About 460 subjects, belonging to an age group of 25 years and above, were selected from the dental camp conducted at Madhuban, Bihar.

Exclusion criteria

- Subjects unwilling to cooperate for the conduction of the study.
- Subjects suffering from long standing debilitating diseases that preclude the use and maintenance of prostheses, such as, paralysis, advanced Parkinsonism, psychotic disorders, etc was excluded from the study.

Methodology

A descriptive cross-sectional study was conducted among the population of Madhuban, Bihar. The sample size included 460 subjects. Belonging to an age group of 25 years and above.

Before conducting the study, prior permission of ethical committee was taken for the study. All the subjects were randomly selected from the dental camp at Madhuban, Bihar.

- The subjects were explained in detail about the purpose and nature of the study.
- Only those subjects willing to sign a written consent were included in the study.
- Each subject was interrogated with the help of a predesigned closed ended questionnaire.
- The prior written consent was taken by the subjects.

The data thus obtained after survey all the 460 samples were tabulated and subjected to statistical analysis. The software used for statistical analysis was (SPSS) version 20.

RESULTS

The result obtained were out of total 460 people that took part in the study out of them 285 were found to be suffering from edentulism of some form (Refer to Table-1 and Fig-1). Out of all the examined people the pre existing prosthesis wearer were separated in three categories of CD, RPD, FPD among Males (CD-1.4%, RPD- 6.31% and FPD- 13.68%) and females (CD- 0.7%, RPD- 3.15% and FPD- 6.31%) which came to a total of 57 (Refer to Table-2 and Fig-2). On studying the distribution of subjects according to gender and their prosthetic status. The one who do not require any prosthesis were 9 in males which was more than females which was 4. The males were found to be 29 with the bridge as compared to females which came to be 11, the samples who had more than 1unit prosthesis were 11 in males and only 7 in females. Partial denture in males was found to be 8 and in females to be 2. Both bridge and RPD were found in 4 males and 5 females. Full removable dentures were found to be 0 in both males and females the Chi-square came to be 3.7149 the result came to not significant ($p<0.01$) for the prosthetic status distribution among males and females of the region (Refer to Table-3 and Fig-3).

On comparison of the prosthetic needs among the males (117) and females (78) of the region the result came to be insignificant with $p<0.05$. (Refer to Table-4 and Figure-4).

On comparison of edentulousness of maxilla among males was found to be complete edentulous 1, partial edentulous single unit 17 and partial edentulous multiple unit was 22 and in females it was found to be complete edentulous 0, partial edentulous single unit was higher among females at 37 and partial edentulous multiple unit was 16 which was less as compared to males the result were insignificant ($p<0.05$) (Refer to Table-5 and Figure-5).

On comparison of edentulousness of mandible among males was found to be complete edentulous 3, partial edentulous single unit 79 and partial edentulous

multiple unit was 39 and in females it was found to be complete edentulous 2, partial edentulous single unit was less among females at 39 and partial edentulous multiple unit was 30 which was less as compared to males the result were insignificant ($p<0.05$) (Refer to table-6 and Figure-6).

Table-1: Prevalence of edentulousness patient in the town of Garhwa

S no	Type of edentulousness	Male	Female	Total
1	Completely	4 (1.40%)	2 (0.70%)	6
2	Partial	157 (55.04%)	122 (42.80%)	279
3	Total	161 (56.50%)	124(43.50%)	285 (100%)

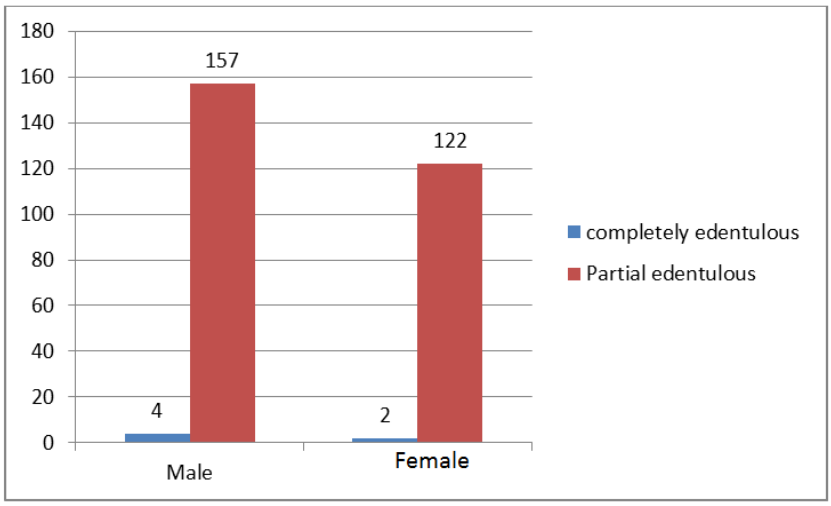

Fig-1:

Table-2: No of pre existing prosthesis wearer

S no	Prosthetic wearer	Male	Female	Total
1	CD	4 (1.40%)	2 (0.70%)	6
2	RPD	18 (6.31%)	9 (3.15%)	27
3	FPD	39 (13.68%)	18 (6.31%)	57

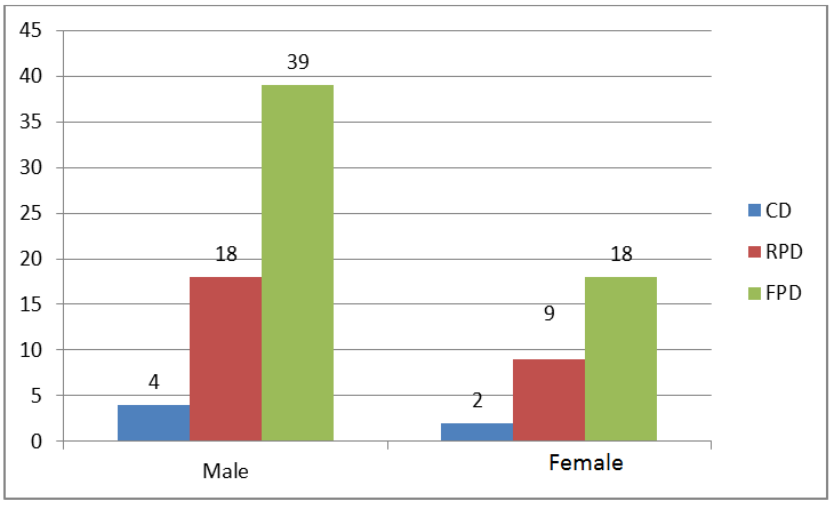

Fig-2:

Table-3: The distribution of study subjects according to gender and the prosthetic status

S no	Prosthetic Status	Male	Female
1.	No prosthesis need	9	4
2.	Bridge	29	11
3.	More than 1 unit prosthesis	11	7
4.	Partial denture	8	2
5.	Both bridge and partial denture	4	5
6.	Full removable denture	0	0
7.	Total	61	29

The chi-square statistic is 3.7149. The p-value is .445957. The result is not significant at p < .01.

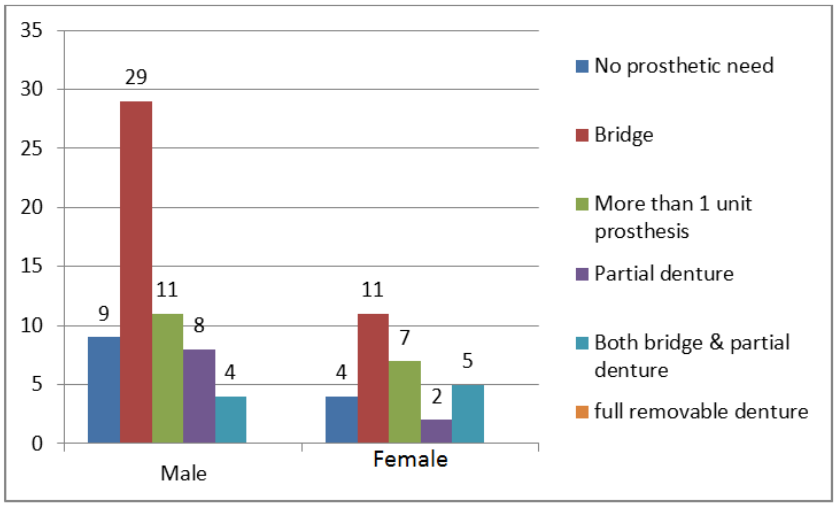

Fig-3:

Table-4: Comparison of prosthetic need between male and female

S no	Sex	Prosthetic status	Total
1	m	117	250
2	F	78	210

The chi-square statistic is 1.7758. The p-value is .18266. The result is not significant at p < .05.

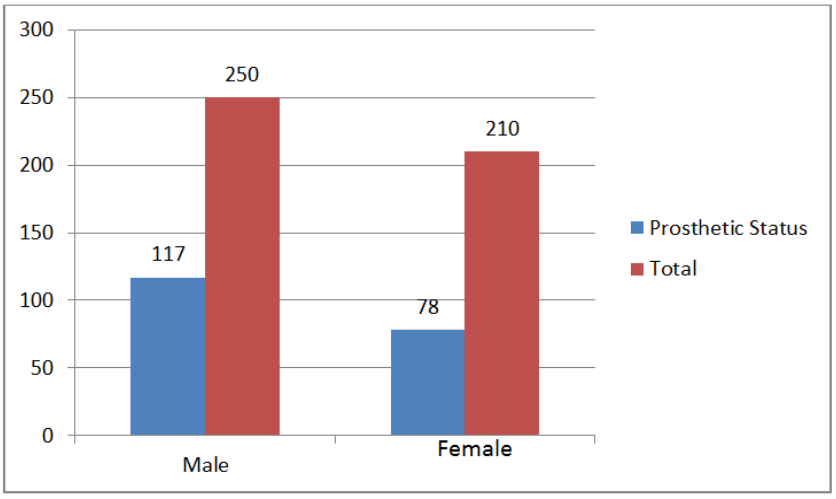

Fig-4:

Table-5: Comparison of edentulousness in maxilla between male and female

S no	Type of prosthesis	male	female
1.	Complete	1	0
2.	Partial (singal)	17	37
3.	Partial (multiunit)	22	16

The chi-square statistic is 7.6878. The p-value is .02141. The result is not significant at p < .01.

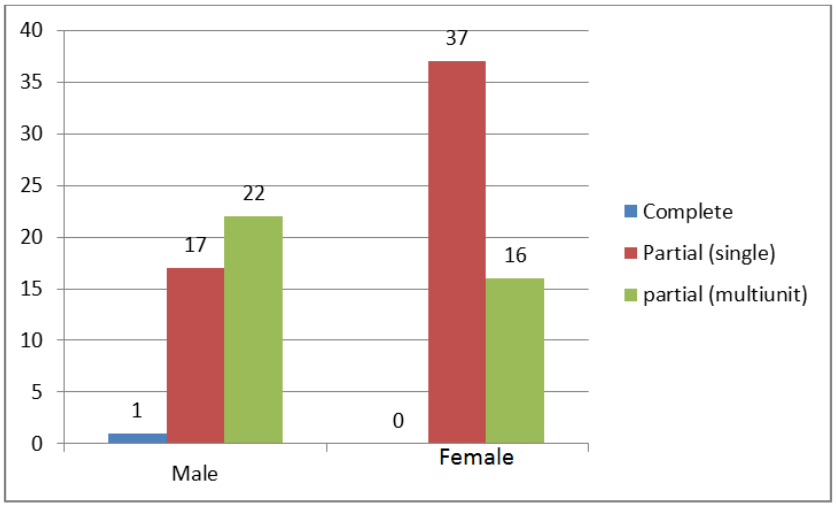

Fig-5:

Table-6: Comparison of edentulousness in mandible between male and female

S no	Type of prosthesis	male	female
1	Complete	3	2
2	Partial (singal)	79	39
3	Partial (multiunit)	39	30

The chisquare statistic is 2.0515. The p-value is .358522. The result is not significant at p < .01.

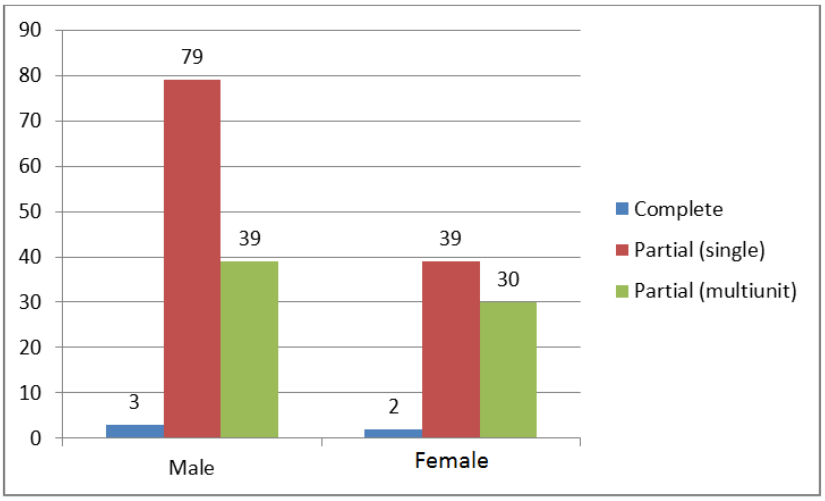

Fig-6:

"Assessment of Prevalence of Edentulousness, Prosthetic Status and Prosthetic Need in the Population of Madhuban, Bihar"

Name……..
…….Age……Years
Sex: Male…….…… Female……. ……. Marital status: Married……..
Unmarried…….

<table>
<tr><td>Occupation
1) Professional
2) Semi-Professional
3) Clerical, Shop Owner, Farmer
4) Skilled worker
5) Semi- skilled worker
6) Unskilled worker
7) Unemployed</td><td>Monthly income :
1. ≥36,997
2. 18,498-36,996
3. 13,874-18,497
4. 9,249-13,873
5. 5547-9248
6. 1866-5546
7. ≤1865</td></tr>
<tr><td colspan="2">Literacy status:
1. Professional or Honours
2. Graduate or Post graduate
3. Intermediate or post high school diploma
4. High school certificate
5. Middle school certificate
6. Primary school certificate
7. Illiterate</td></tr>
<tr><td>Medical problems:
1. Systemic illness
2. Past major illness
3. Minor illness
4. No medical problems</td><td>Last dental visit:
1. 6 month or less
2. 6 months to 1 year
3. 1 year to 3 year
4. More than 3 year
5. Never visit a dentist</td></tr>
<tr><td>Habits:
1. Smoking
2. Pan/betel chewing
3. Tobacco/ Zarda
4. Alcohol
5. All of the above
6. None</td><td>Brushing habits:
1. Using finger & powder/paste.
2. Using aids like datun/salt.
3. Using tooth brush & tooth paste.</td></tr>
<tr><td colspan="2">Teeth missing
 
</td></tr>
<tr><td>Reasons for loss of teeth:
1. Caries.
2. Periodontal
3. Trauma
4. Others
5. Not applicable.</td><td>Time since loss of teeth:
1. 6 months or less.
2. 6 months to 1 year.
3. 1 year to 3 year.
4. More than 3 year.
5. Not applicable.</td></tr>
<tr><td>Reason for not Replacing the missing Teeth
1. Cost factor
2. Lack of facilities
3. Lack of awareness
4. Others (specify)</td><td>Reason for Replacement of Teeth
1. Aesthetic
2. Difficulty in chewing
3. Difficulty in speech
4. Motivation by health care professional or family member</td></tr>
</table>

	Adversely affected	Not affected
Effects on function		
Effects on esthetics		

Prosthetic status 1. No prosthesis 2. Bridge 3. More than 1 bridge 4. Partial denture 5. Both bridges & partial denture 6. Full removable denture 7. Not required	Maxillary	Mandibular
Prosthetic need 1. No prosthesis needed 2. Need for one unit prosthesis 3. Need for multi unit prosthesis 4. Need for combination of one and / or multi unit prosthesis 5. Need for full prosthesis(replacement of all teeth) 6. Not required	Maxillary	Mandibular

Prosthetic status				
		RPD	FPD	CD
Problem with existing prosthesis	Loose			
	Unsatisfactory esthetics			
	Other			

DISCUSSION

Edentulism is defined as the loss of all permanent teeth and is the terminal outcome of a multifactorial process involving biologic processes like caries, periodontal disease, pulpal pathology, trauma and oral cancer. The distribution and prevalence of complete and partial edentulism between developed and less-developed countries may be associated with a complex interrelationship between cultural, individual access to care and socioeconomic factors.

The increasing proportion of the edentulouness among the populations of almost all countries is presenting them and their societies with specific challenges. This rise in aged population would create new problems and challenges, requiring changes in the organization of our society. For these people, oral health promotion and protection is very essential to improve the quality of life, both physically and mentally [6]. Oral health is always an inseparable part of general health and awareness plays a vital role in determining the oral health of an individual.[1]

Teeth and their supporting structures are an integral part of the facial skeleton. They support and interact in tandem with other parts of the skull to provide a biological system for chewing, speaking and expressing emotions. The loss of teeth, until very recently was accepted as a normal and inevitable part of ageing and old age was endured sans teeth, sans eyes, sans taste, sans everything [7]. Tooth loss, if not substituted by a well functioning prosthesis, often substantially reduces the quality of life.

The participants of the study were randomly selected among the patient attending the dental camp at Madhuban, Bihar. After the examination of 460 patients. It was seen that the total of 285 were edentulous, which included partially edentulous to be 279 (60.00%) and completely edentulous to be 6(4.75 %).

The data from the survey revealed the high occurrence of Fixed partial denture treated patient, which was amounting to 57 out of 285, the second most prevalent were the Removable partial denture which were 27 out of 285 and the least were Complete denture which were 6 out of 285. The rest of the patients without any treatment for edentulism were found to be 175.

The rate of male edentulism was more as compared to female. Which was similar to the studies conducted in the year [8, 4] in Gujarat which showed that the prevalence of edentulism was more in male as compared to females.

Whereas, the study conducted in various parts of the world. Like in Denmark in the year 1987 revealed the prevalence of more edentulism in females as compared to the males, which might be because of various social stigmas of the region, in this study the prevalence of males were more because of their various habits likes smoking, gutkha chewing, betel nuts chewing and not brushing habits. Whereas the females were less into these habits as compared to males and were found to be taking more care of oral health as compared to the male counterpart.

The present study showed more prevalence of fixed partial denture, as it is the most preferred treatment of choice by the local practitioners because of monetary benefits. The examination also revealed that fixed partial denture were not of good quality as well as faulty in nature.

The second most prevalent were removable partial denture which were also faulty prosthesis and were given to the patient on the pretext of fixed treatment given to them by the quacks rather than the dentist, the prevalence was more because of, lack of awareness and socio economic factors.

The least were the Complete denture patients examined under the study, which was almost 6 patients under the category of prosthetic status, the dentures presented by the patients were almost a decade old with severely attrited teeth, the others were presented with the suction cups in the maxillary dentures, which had been long finished in dentistry as these suction cups deshape the hard palate and they are not used now.

The prosthesis seen and examined were either too old or if new were all faulty as well as below the standard. The prime factors seen in these were, either they were given by the people who are not dentist and they practise dentistry as their jobs. The financial constraints were also seen as the major reason by the patients for not getting a good treatment under the qualified and knowledgeable people.

The total size of the sample are 460, in which the result found of the survey to be 285 with edentulism which is 60.00% of the patients seen or examined under the study. The total number of patient with prosthesis was found to be 110. In which 57 patients were treated with fixed partial denture, 27 with removable partial denture and the remaining 6 were treated with complete denture and 175 patients are without any treatment. On searching for the reasons the participants of the study revealed many factors for not getting the treatment at good medical and dental facilities as they have had bad experiences during dental treatments, and the major factor for not getting the treatment done was seen to be the financial constraints.

The contradictory result were found about the distribution of the edentulous subject among male and female populations in various surveys conducted in India and abroad, this is probably due to the various cultural factors acting locally and at the community level that influences the people of their sexes to accept or reject a treatment modality.

When the ratio on male is to female was studied in the category of pre existing prosthesis it was found that, 6 complete denture were found in which male wear 4(1.40%) and female wear 2(0.70%). In RPD 27 were found in which 18(6.31%) are male wearers and 9(3.15%) were female wearer. In FPD 57 were found in which 39(13.68%) were male wearers and 18(6.31%) were female wearer.

The females of the region were found to be less edentulous as compared to the males as well as their oral hygiene was much better as compared the males. Instead of using the conventional datoon they were found more to be using the brushes and toothpastes for brushing. Though the count of such females was less but looking at the backwardness of the region the count was very much considerable.

In the survey conducted in the year [9] in a sample of 512 green marble mine labours in Udaipur, India .Only 3.5% of the subject surveyed had some sort of dental prosthesis. The similar reasons were found in the survey also which highlighted the financial constraints as the major factor for not getting the treatment.

The large number of participants of the study had more of fixed partial dentures which they got treated locally by the peoples who were not qualified practitioners.

The study conducted in the year 2010 and 2012 conducted in Haryana India and Ambala India revealed that the survey showed that the participants of their study had some kind of the prosthesis. The similar results were found in the present survey where participants had some sort of prosthesis, which clearly indicates that the patients want dental treatments in these areas also, but due to lack of facilities they deter from getting the treatment.

A definite relationship was seen between the increase in age and level of edentulism. The younger age group had the maximum number of fully dentate subject while the elder age had least number of dentate subject. With increasing age more edentulousness was found.

In the study conducted in the year [10] in the suburbs of Chennai, India contradictory result were found. According to the study females had 47.9% of tooth loss compared to 42.9% of males

Whereas, the study conducted in Gujarat in 2004 which showed the very same result in which males were more as compared to the females because of their oral habits and hygiene maintenance.

When the present study is compared to all the other studies it was found that there is lack of awareness in older age participants.

During the survey the prosthetic needs were also studied to understand the requirement of which type of prosthesis is required by the participants in

future. Only 9 males and only 4 females were found who do not require any prosthesis and their maintenance of oral hygiene was very good. A three unit bridge was required in 29 males as compared to11 females. More than one prosthesis was required 11 males and 7 females. Whereas, partial dentures were required in 8 males and in 2 females. Both bridge and partial dentures were required in 4 males and 5 females.

Maximum number of participants were seen who had to be treated with 3 unit bridge because they were of young age as well as the region of edentulousness was in the anterior region. The prosthesis was required for the esthetic reasons. The remaining participants either did not have very good support from the remaining teeth and oral structures they were to be treated with removable partial dentures or a combination of partial dentures and fixed prosthesis for their betterment.

A large number of males were indicated for some sort of dental treatments as compared to the female counterparts other than the need for the prosthesis directly.

Even the edentulousness in maxilla and mandible was also studied among the male and female participants. This revealed that the amount edentulousness was found more in maxilla of males as compared to the maxilla of the females. The results showed that the females required more of single unit prosthesis as compared to the males who required more of a multi unit treatment for missing tooth. Only 1 male with complete edentulous maxilla was found among the participants with no female with all missing maxillary teeth.

When the results for the mandibular segment were seen there was an increase in the number of both males and females. Complete edentulous males were found to be 3 as compared to be 2 females. 79 of the male subjects had single unit edentulousness and 39 females had single unit edentulousness. Multi unit edentulousness was seen in 39 males and 30 female participants.

The results in maxilla and mandible edentulousness when compared it was found that the edentulousness was found more in the maxillary segment as compared to the mandibular segment.

Comparison of prosthetic status between male and female subject, out of 460 subject 195 subject opted for prosthesis. In which 117 were male and 78 were female subject.

Quite similar result were found in a study conducted at the Gujrat in the year [8] and similar study conducted at Gulbarga in the year [11]. They found that there is low percentage of prosthetic replacement. Similar study conducted in Taiwanese, in the year [12]. As compared to other study and present study there is lack of awareness and financial constraints,

Thus it can be concluded that lack of awareness and, financial constraints is the most common reason for not opting prosthesis in India and as well as abroad.

While considering the distribution of the prosthetic needs among the male and female out of 460 subject 117 were male subject and 78 were female subject.

Similar study conducted at Panvel, Navi Mumbai. In the year [1]. The study revealed that 88% of the total population surveyed did not have any prosthesis. The low proportion of those who had prosthesis may be due to under use dental facilities due to lack of awareness, financial constraints. Thus is concluded that there is lack of dental facilities and lack of dental hygiene in the present study.

Comparison of edentulousness in maxilla between male and female subject, out of 285 subject , male 1 and female 0 is complete edentulouness, partial(single) 17 were male and 37 were female, partial (multiunit) 22 were male and 16 were female subject. Where as in mandible 3 were in male and 2 were in female are complete edentulouness, partial (single) 79 were are male and 30 were are female subject

Quite similar results were found in a study conducted in Gujarat in the year [10]. Thus contradictory result was found about the distribution of the edentulous subject among male and female population in various surveys conducted in India and abroad. This is probably due to the various culture and socio economic factors acting locally at the community level that influences the people of either sex to accept or reject a treatment modality.

In India, being an agrarian society, 72% of its total population and 80% of its geriatric population reside in rural areas [13]. In contrast, 80% of the trained dental manpower is concentrated in urban areas [14]. The government should take steps to bring the dental professional residing in urban areas to such rural areas where they are required more for the betterment of the people of such remote locations as the one used in present study.

CONCLUSION

India is a developing country with a very large population, more than 80% of which resides in the villages. Rural areas present a bleak picture in contrast to the urban areas as the residents are mostly illiterate, ignorance and myths prevail widely, the standard of living and economic status are low and no importance is given to woman's education and liberation. When we

consider the aging population, disease and lack of mobility compound the existing problems. Dental treatment is obviously given a go-by till tooth loss occurs dentists too are responsible for this state as for the same population ratio; there are 10 times more dentists in the cities than in villages in India.

Although baseline results have been achieved, yet the small sample size hinders the generalization of the results to the general population. Hence, further studies are needed at a large scale to collect extended oral health data and to plan prosthetic services for the people of Madhuban, Bihar.

Conflict of Interest: None

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