

## ORIGINAL RESEARCH

# Prevalence of Complete Edentulousness among Rural and Urban Population of Malwa, Madhya Pradesh

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## ABSTRACT

**Introduction:** Edentulousness is an important indicator of the oral health of a population, especially for the elderly. In recent studies of oral health of older adults, it is recognized that loss of all remaining teeth has a negative impact on the health-related quality of life of the elderly population.

**Aim:** This study aims to evaluate the percentage, duration, and reasons of complete edentulousness in relation to age and gender.

**Materials and Methods:** This study was a descriptive cross-sectional study. The duration of the study was 7 months, i.e., January–July 2017. Descriptive analysis was done (in percentages).

**Results:** A total of 680 completely edentulous patients were examined for the study. Of which, 460 (67.6%) were male and 220 (32.4%) were female. A total of 574 (84.4%) subjects were from rural areas and 106 (15.6%) were from urban areas. *P* value was statistically non-significant for both rural and urban region.

**Conclusion:** From the findings of the present study, it can be concluded that the prevalence of edentulousness increases with age which results in various long-term effects of tooth removal on patient's facial structure and general well-being, thereby increasing the need for prosthodontics rehabilitation. The results of the survey clearly stated that there is lack of dental awareness among the people. Hence, "dental education and oral health-care facilities" are the most important aspect of prosthodontic treatment.

**Keywords:** Complete edentulous, Prevalence, India.

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## INTRODUCTION

The improvements in health-care methods and delivery have resulted in the elderly population being the fastest growing section of population and this needs due consideration. By 2020, India will harbor about 158 million elderly, the second largest population of elderly worldwide after China (230 million).<sup>[1]</sup> Edentulism is an important indicator of the oral health of a population, especially for the elderly. In recent studies of oral health of older adults, it has been recognized that loss of all remaining teeth has a negative impact on the health-related quality of life of the elderly population.<sup>[2,3]</sup>

Edentulism rates among the elderly have been reported as relatively high in number of European countries such as England (74–79%), Scotland (85%), Ireland (72%), Northern Ireland (69%), The Netherlands (83%), Denmark (68%), Finland (67%), and Norway (57%). In Australia, 68% of people aged 65 or more were edentulous. Edentulism is consistently shown to increase with age, with females having higher rates of edentulism than do males.<sup>[4]</sup>

The percentage of edentulous people is expected to decrease in the coming decades as a result of improved oral health, whereas the number of edentulous people will increase as a result of the strong increase in the aging population.<sup>[5]</sup>

Therefore, this study was planned to evaluate the prevalence of edentulousness of adult population. It was also planned to study the difference according to age and gender.

## Aims and Objectives

The present study was conducted to evaluate the percentage, duration, and reasons of complete edentulousness in relation to age and gender.

## MATERIALS AND METHODS

### Study Hypothesis

The main hypothesis of the study was to evaluate the percentage, duration, and reasons of complete edentulousness in relation to age and gender in rural and urban areas of Malwa, Madhya Pradesh.

The second hypothesis is to educate and create awareness regarding the importance of dental care on general and oral health in edentulous patients.

## Study Duration

The duration of the study was 7 months, i.e. January–July 2017.

## Study Subjects

Subject's age was divided into following groups:

- Group A - 30–50 years
- Group B - 51–70 years
- Group C - 71 years and above.

A total of 800 completely edentulous subjects, who reported for complete denture treatment, at the Department of Prosthodontics, College of Dental Sciences and Hospital, Rau, Indore, were assessed. Subjects were selected on the basis of clinical oral examination only. A total of 120 subjects who did not complete the questionnaire and were uncooperative were excluded from the study, yielding a sample of 680 individuals.

## Study Design

This study was a descriptive cross-sectional study.

## Official Permission and Ethical Clearance

The study protocol was reviewed by the Institutional Ethics Committee of College of Dental Sciences and Hospital, and ethical clearance was granted.

## Informed Consent

A written consent was obtained from all the patients.

## Eligibility Criteria

### Inclusion criteria

The following criteria are included in the study:

- Patients were selected from dental OPD who belonged to western Malwa, were domicile resident for at least 3 years, and were in the age group of 30–71 years and above.
- Subjects willing to participate in the study.

### Exclusion criteria

- Medically compromised patients and patients suffering from chronic illness.

## Pro Forma Details

Figure 1 depicts the survey form which included self-explanatory questions in correspondence to previous studies conducted by Kaira *et al.*<sup>[6]</sup> and Sonkesariya *et al.*<sup>[7]</sup> A random sampling method with convenient sample size was used. Questionnaire was prepared both in English and Hindi (local language) to improve the participants' understanding of the questions.

### QUESTIONS ASKED

#### Age

- Group A - 30–50 years
- Group B - 51–70 years
- Group C - 71 years and above

#### Sex -

- Male/Female

#### Locality -

- Urban/Rural

#### Duration of edentulousness

- Up to 6 months
- 6 months–1 year
- 3 years–5 years
- 5–10 years
- 10–15 years
- 15–20 years

#### Reasons of complete edentulousness

- Periodontal disease
- Dental caries

Figure 1: Questionnaire

The patients took 10–15 min to complete the questionnaire. Filled questionnaire pro forma was collected and analyzed.

## Statistical Analysis

The data were entered into Microsoft Excel spreadsheet and processed using the Statistical Package for the Social Sciences version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive analysis was done (in percentages).

## RESULTS

A total of 680 completely edentulous patients were examined for the study [Table 1]. Of which, 460 (67.6%) were male and 220 (32.4%) were female. A total of 574 (84.4%) subjects were from rural areas and 106 (15.6%) were from urban areas. *P* value was statistically non-significant for both rural and urban region [Table 2]. Table 3 summarizes the distribution of the study subjects according to the gender and duration of edentulousness. Of 680 subjects, a maximum number of male subjects (13.8%) were edentulous for 10–15 years of age and minimum was for 15–20 years in female subjects (3.7%). Table 4 summarizes the distribution of the study subjects according to the gender and reasons of edentulousness. A maximum number of male subjects were edentulous due to periodontal disease (44.9%) and a minimum number of female subjects were edentulous due to dental caries (9.6%). Table 5 summarizes the distribution of the study subjects according to the age group and duration of edentulousness. Table 6 summarizes the distribution of the study subjects according to the age group and reasons of edentulousness. Table 7 summarizes the distribution of the study subjects according to the region and

duration of edentulousness. Of 680 subjects, a maximum number of subjects were edentulous for up to 6 months in rural region (4.4%) and minimum was from 15 to 20 years in urban region (0.6%). *P* value was statistically non-significant. Table 8 summarizes the distribution of the study subjects according to the region and reasons of edentulousness. Of 680 subjects, a maximum number of subjects were edentulous due to periodontal disease (55.6%) in rural region and minimum was due to dental caries (6.2%) in urban region. *P* value was statistically non-significant.

## DISCUSSION

The preservation of dentition can be justified on the following grounds that “teeth” are useful for maintenance of arch length, esthetics, maintenance of healthy oral environment, mastication, phonetics, etc. Tooth loss is the dental equivalent of mortality. It is the end product of oral disease, and it also reflects the attitudes of patients, availability and accessibility of dental care, and socioeconomic status. One of the major handicaps in the elderly of our population is loss of teeth, affecting their mastication, dietary intake, and nutritional status. The

importance of this study is to establish baseline data on the prevalence of edentulism in adult population, seeking care.

The study was conducted to evaluate the prevalence of complete edentulousness among rural and urban population of Malwa, Madhya Pradesh.

A total of 680 completely edentulous willing patients were examined and divided according to the different factors as gender and age group. It was observed that 106 (15.6%) participants were from urban areas, of which 70 (10.3%) were male and 36 (5.3%) were female and 574 (84.4%) were belongs to rural areas, of which 390 (57.4%) were male and 184 (27.1%) were female. When these results were compared with other studies, similar findings were observed in the studies conducted by Basnyat *et al.*,<sup>[8]</sup> Kaira *et al.*,<sup>[6]</sup> Nagaraj *et al.*,<sup>[9]</sup> Sonkesariya *et al.*,<sup>[7]</sup> and Vadavadagi *et al.*,<sup>[10]</sup> but these results were not in accordance with the study conducted by Peltzer *et al.*<sup>[11]</sup>

Of 680 subjects, a maximum number of male subjects (13.8%) were edentulous for a duration of 10–15 years and minimum was for a duration of 15–20 years in female subjects (3.7%). *P* value was statistically significant for both male and female. Similar result was found in studies conducted by Nagaraj *et al.*<sup>[9]</sup> while opposite result was seen in a study conducted by Kaira *et al.*<sup>[6]</sup> These differences were statistically significant.

In the present study, a maximum number of male subjects were edentulous due to periodontal disease (44.9%) and a minimum number of female subjects were edentulous due to dental caries (9.6%). *P* value was statistically non-significant for both male and female.

When these results were compared with other studies, similar findings were observed in the studies conducted by Kaira *et al.*<sup>[6]</sup> and Vadavadagi *et al.*,<sup>[10]</sup> but these results were not in accordance with the studies conducted by Reddy *et al.*<sup>[12]</sup> and Sonkesariya *et al.*<sup>[7]</sup> However, it is documented in the literature that dental caries was the most prevalent reason rendering the patients edentulousness.<sup>[13]</sup> Periodontal disease and dental caries have been considered as main determinants for the high occurrence of tooth loss and consequently for the high percentage of edentulism.<sup>[14,15]</sup>

The present showed that a maximum number of

**Table 1:** Demographic distribution of the study subjects

Demographics	N (%)
Sex	
Male	460 (67.6)
Female	220 (32.4)
Age	
Group 1 (30–50 years)	130 (19.1)
Group 2 (51–70 years)	375 ( 55.1)
Group 3 (71 years and above)	175 (25.7)
Location	
Urban	106 (15.6)
Rural	574 (84.4)

**Table 2:** Distribution of the study subjects according to the gender and region (N=680)

Region	Gender, N (%)		Total N (%)	$\chi^2$	P value
	Male	Female			
Urban	70 (10.3)	36 (5.3)	106 (15.6)	0.700	0.149
Rural	390 (57.4)	184 (27.1)	574 (84.4)		
Total	460 (67.6)	220 (32.4)	680 (100)		

**Table 3:** Distribution of the study subjects according to the gender and duration of edentulousness (N=680)

Duration of edentulousness	Gender, N (%)		Total N (%)	$\chi^2$	P value
	Male	Female			
Up to 6 months	78 (11.5)	56 (8.2)	680 (100)	10.834	0.055
6 months–1 year	47 (6.9)	31 (4.6)			
3 years–5 years	86 (12.6)	32 (4.7)			
5–10 years	93 (13.7)	38 (5.6)			
10–15 years	94 (13.8)	38 (5.6)			
15–20 years	62 (9.1)	25 (3.7)			
Total	460 (67.6)	220 (32.4)			

**Table 4:** Distribution of the study subjects according to the gender and reasons of complete edentulousness (N=680)

Reasons of complete edentulousness	Gender, N (%)		Total N (%)	$\chi^2$	P value
	Male	Female			
Periodontal disease	305 (44.9)	155 (22.8)	680 (100)	1.171	0.279
Dental caries	155 (22.8)	65 (9.6)			
Total	460 (67.6)	220 (32.4)			

**Table 5:** Distribution of the study subjects according to the age group and duration of complete edentulousness (N = 680)

Duration of edentulousness	Age in years			Total N (%)	$\chi^2$	P value
	Group 1	Group 2	Group 3			
Up to 6 months	48 (7.1)	179 (26.3)	60 (8.8)	680 (100)	12.563	0.249
6 months–1 year	25 (3.7)	60 (8.8)	36 (5.3)			
3 years–5 years	19 (2.8)	48 (7.1)	30 (4.4)			
5–10 years	12 (1.8)	20 (2.9)	14 (2.1)			
10–15 years	15 (2.2)	40 (5.9)	19 (2.8)			
15–20 years	11 (1.6)	28 (4.1)	16 (2.4)			
Total	130 (19.1)	375 (55.1)	175 (25.7)			

**Table 6:** Distribution of the study subjects according to the age group and reasons of complete edentulousness (N=680)

Duration of edentulousness	Age in years			Total N (%)	$\chi^2$	P value
	Group 1	Group 2	Group 3			
Periodontal disease	78 (11.5)	259 (38.1)	159 (23.4)	680 (100)	42.34	0.000
Dental caries	52 (7.6)	116 (17.1)	16 (2.4)			
Total	130 (19.1)	375 (55.1)	175 (25.7)			

**Table 7:** Distribution of the study subjects according to the region and duration of complete edentulousness (N=680)

Duration of edentulousness	Region, N (%)		Total N (%)	$\chi^2$	P value
	Urban	Rural			
Up to 6 months	47 (6.9)	275 (40.4)	680 (100)	8.971	0.110
6 months–1 year	36 (5.3)	125 (18.4)			
3–5 years	8 (1.2)	65 (9.6)			
5–10 years	5 (0.7)	48 (7.1)			
10–15 years	6 (0.9)	42 (6.2)			
15–20 years	4 (0.6)	19 (2.8)			
Total	106 (15.6)	574 (84.4)			

**Table 8:** Distribution of the study subjects according to the region and reasons of complete edentulousness (N=680)

Duration of edentulousness	Region, N (%)		Total N (%)	$\chi^2$	P value
	Urban	Rural			
Periodontal disease	64 (9.4)	378 (55.6)	680 (100)	1.180	0.277
Dental caries	42 (6.2)	196 (28.8)			
Total	106 (15.6)	574 (84.4)			

subjects were edentulous for up to 6 months (26.3%) in age Group 2 (51–70 years) and minimum was for 15–20 years (1.6%) in age Group 3 (70 years and above). P value was statistically non-significant. Similar results were found in studies conducted by Jandial *et al.*<sup>[16]</sup> and Sonkesariya *et al.*<sup>[7]</sup> but the study conducted by Hunt *et al.*<sup>[4]</sup> was not in agreement with the present study.

In the present study, a maximum number of subjects were edentulous due to periodontal disease (55.6%) in rural region and minimum was due to dental caries (6.2%) in urban region. P value was statistically non-significant.

Similar findings were found in a study conducted by Vadavadagi *et al.*<sup>[10]</sup> but these results were not in accordance with the studies conducted by Chakravarty *et al.*<sup>[17]</sup> and Simhachalan *et al.*<sup>[12]</sup> where majority of the subjects were edentulous due to dental caries.

## CONCLUSION

From the findings of the present study, it can be concluded that the prevalence of edentulousness increases with age which results in various long-term effects of tooth removal on patient's facial structure and general well-being, thereby increasing the need for

prosthodontics rehabilitation. The results of the survey clearly stated that there is lack of dental awareness among the people. Hence, “dental education and dental health-care facilities” that are still not available to the urban areas are the main cause of edentulism when compared to urban population, and this is an important factor that affects the treatment modalities and outcome in such population.

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