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# An Epidemiological Study to Assess the Prevalence of Partial Edentulism based on Kennedy's Classification and Awareness to Restore Same among Middle Age and Older Adults

### Dr. Reecha Gupta<sup>1</sup>, Dr. Mudasir Nazir<sup>2</sup>, Dr. Rigzin Motup<sup>3</sup>

<sup>1</sup>Professor and Head, Post graduate Department of Prosthodontics and Crown & Bridge, Indira Gandhi Government Dental College, Jammu.

<sup>2,3</sup>PG student, Post graduate Department of Prosthodontics and Crown & Bridge, Indira Gandhi Government Dental College, Jammu.

### **Corresponding Author:**

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Dr. Reecha Gupta, Professor and Head, Post graduate Department of Prosthodontics and Crown & Bridge, Indira Gandhi Government Dental College, Jammu.

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#### ABSTRACT:

Edentulism is an indicator of the oral health of a population. Despite immense research and study in the field of dentistry around the world, a substantial portion of population loses natural teeth and are candidates of prosthodontic rehabilitation. Partially edentulous patients exhibit a wide range of physical variations from missing single tooth to many. Many classifications were given time to time to classify partial edentulous arches but at present Kennedy's classification is probably the most widely accepted and has classified partial edentulous spaces mainly into four types. Teeth loss affects speech, mastication, aesthetics and may result in decreased confidence of the patient which in turn may affect the overall quality of life. Considering the need of knowing prevalence of partial edentulism and awareness to restore the same among the population. A study was planned by the post graduate department of prosthodontics and crown & bridge. Indira Gandhi govt dental college and hospital Jammu. The aim of the study was to assess the prevalence of partial edentulism and awareness to the restore same among the population visiting the outpatient department of Indira Gandhi govt dental college and hospital Jammu. The study will also help us to know needs of patient, their preferences and will further direct us to promote awareness and knowledge of patients about the impact of missing teeth on oral functions and importance of dental prosthesis.

### Introduction

Partial edentulism is a medical condition characterized by the absence of one or more natural teeth. Many factors can lead to tooth loss some of which are inevitable, such as caries, periodontal conditions, trauma, impacted teeth and neoplastic conditions.<sup>11</sup> According to Bruce the major reason for tooth loss across all the ages is due to dental caries (83%) followed by periodontal disease (17%).<sup>2,7,6,10</sup> Hoover and McDermount found a higher incidence of edentulism in males than females whereas Marcus et al. reported that the edentulism prevalence had no relation with gender.<sup>2,7</sup> A simple estimate of the percentage of partially edentulous persons is a rough

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indication of the frequency of dental disease and the success or failure of dental care.<sup>5, 10</sup>,<sup>14</sup>Decrease in edentulous patient is considered to be reflection of the improvement in the oral health of the population.<sup>7</sup>

Partially edentulous patients exhibit a wide range of physical variations from single missing tooth to many. There are more than 65000 potential combinations of partial Edentulism pattern in maxillary and mandibular arches thus makes it logical to classify partial edentulous arches.<sup>7,9</sup> A classification of partially edentulous arches help to identify the relation of remaining teeth to edentulous ridges and facilitates communication, discussion, and comprehension of the

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Tooth loss may lead to following consequences such as tilting of adjacent teeth, super-eruption of antagonist tooth, impaired speech, aesthetics, and chewing and sometimes Temporomandibular disorders which in turn can lead to decrease confidence of the patient and affect overall quality of life.<sup>5,11</sup>. Despite immense research and study in the field of dentistry around the world, a substantial portion of population loses natural teeth and are candidates of Prosthodontic rehabilitation. Thus, the study of status and pattern of tooth loss may provide an important information about the level of oral hygiene, dental health awareness, causes and magnitude of oral problems, its squeale that eventually can act as guide for Prosthodontic treatment needs.

As epidemiologic studies on Edentulism and tooth loss vary considerably in prevalence between countries and between geographic regions within the countries. Till date, no study has been done which investigated prevalence of partial Edentulism based on Kennedy's classification and awareness to restore same among middle age and older adults in Jammu region. So, considering its need, this study was carried out among the population visiting outpatient department of Indira Gandhi Govt Dental College Jammu. This study will help us to know the needs of patient, their treatment preferences and will further direct us to promote awareness and knowledge about the impact of missing teeth on oral functions and importance of replacement of missing teeth.

# Material and Methodology Data collection:

The study was planned in the month of January and patients who attended the OPD of IGGDC, JAMMU for a period of four months formed the study participants. Necessary ethical clearance was obtained from institutional ethical committee and informed consent was obtained from all the participants. Participant who are in the age group of 40 to 75 years were involved in the study. Information was collected by using self-structured pro-forma, consisted of socio-demographic variables such as age, gender, education, address socioeconomic status, followed by an oral examination of an individual by a single examiner keeping in view the inclusion and exclusion criteria by using Kennedy's classification and history questionnaire. Kuppuswamy scale was used to assess socio-economic status of the individuals. P values were calculated for each characteristic. P < 0.05 (95% level of confidence) was considered statistically significant.

The primary object of the study was to assess the prevalence of partial Edentulism based on Kennedy's classification with or without modification. The other objectives were to determine its association with socio demographic parameters and the awareness to restore same among the population.

### Inclusion criteria

- Both male and female subjects
- Middle aged and old adults
- Kennedy's classification with/without modifications
- Willing to participate in the study
- Permanent dentition.

### Exclusion criteria

- Retained deciduous teeth
- Missing teeth due to trauma or orthodontic extraction
- Missing third molars
- Age <40 years
- Missing teeth due to syndromes
- Not willing to participate.

### Personal details

Name of the patient Age Sex Address Education Occupation Socioeconomic status OPD card number Contact number

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### CLINICAL EXAMINATION

### TEETH MISSING

81	71	61	51	41	31	21	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

### **TEETH REPLACED WITH PROSTHESIS**

81	71	61	51	41	31	21	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

### TYPE OF EXISTING PROSTHESIS

REMOVABLE PARTIAL	FIXED PARTIAL	IMPLANTS
Maxillary anterior	Maxillary anterior	Maxillary anterior
Mandibular anterior	Mandibular anterior	Mandibular anterior
Maxillary posterior	Maxillary posterior	Maxillary posterior
Mandibular posterior	Mandibular posterior	Mandibular posterior

### HISTORY QUESTIONNAIRE

- 1. Why did you visit dental hospital?
  - A) Regular dental check up
  - B) other reason
- 2. Do you know that you have missing teeth?
  - A) Yes /no
- 3. Do you know that how many missing teeth you have?
- 4. Do you know that in which jaw do you have missing teeth
  - A) Upper/lower
- 5. Do you know that in which side do you have missing teeth/
  - A) Right/left
- 6. What are the reasons for the loss of teeth?
  - a) Periodontal
  - b) Caries
  - c) Do not know
  - d) If other please specify
- 7. From how much time do you have missing teeth without treatment
- a) less than 1 year
- b) more than 1 year

- 8. Are you wearing or have worn any prosthesis Yes/no
- 9. If no please specify the reason
- a) Lack of awareness
- b) Economic reason
- c) No time
- d) No need of replacement
- 10. If yes what type of prosthesis you are wearing
- a) Fixed
- b) Removable
- c) Implant
- 11. From how much time are you wearing the prosthesis
- 12. Who advised you to replace those missing teeth
- 13. Do you want to replace missing teeth in your mouth
- 14. If yes what type of replacement you want If no, why do not you want replacement
- 15. In which region you want replacement
- a) Anterior
- b) Posterior
- c) Both
- 16. Do you feel that missing teeth affects your mastication

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Yes/no

- Do you feel that missing teeth affects your speech Yes no
- 18. Do you feel that missing teeth affects your smile
  - Yes/no
- 19. Do you feel that missing teeth affects your social interaction

### Table 1: Age and gender wise distribution of subjects participated.

Age	Males		Females		Total		
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
40 - 50	70	39.32	75	61.47	145	48.33	
50-60	50	28.08	31	25.40	81	27.00	
60 - 70	47	26.40	15	12.29	62	20.66	
70 - 80	11	6.17	1	0.81	12	4.00	
Total	178	100	122	100	300	100	

### Table 2 Partially edentulous subjects classified according to kinnedy's classification

Kennedy's class	Upper arch	L	Lower arch	l	Total
	Male fer	male	Male fer	male	
1	24	9	17	18	68
2	42	23	46	20	131
3	32	39	44	41	166
4	17	7	20	4	48

Table 3 shows gender wise prevalence of subjects surveyed. There were 245 partially edentulous patients indicating prevalence rate of 81.6%. Males were affected more than females. Out of 178 male subjects, 150 were

partially edentulous with prevalence of 84.2% and out of 122 females, 95 were partially edentulous with prevalence of 77.7%.

Table 3:	Gender-wise	prevalence of	nartial	edentulism.
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Gender	Dentulous	Partial edentulism	Total	Prevalence (95 % Confidence interval)
Males	28	150	178	84.2154(78.41 - 89.28)
Females	27	95	122	77.7778(69.43 - 84.36)
Total	55	245	300	81.6666(76.94 - 86.01)

### Yes/no

### Results

A total number of 300 individuals in the age group of 40 to 75 participated in the study in which 178 were Males and 122 were Females. About 48% Participants were from the age group of 40-50 years.

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Table 4 shows the prevalence of partial Edentulism with respect to employment out to 300 patients 188 were unemployed and 112 were employed it was seen that prevalence of partial Edentulism is more

in unemployed subjects and 83% of subjects were involved where as in case employed subjects only 78% were affected with partial Edentulism.

Employed status	Dentulous	Partial edentulism	Total	Prevalence ( 95 % Confidence interval)
Unemployed	31	157	188	83.7079(77.58 - 88.41)
Employed	24	88	112	78.5013(70.07 - 85.37)
Total	55	245	300	81.8182(76.94 - 86.01)

 Table 4 : Prevalence of partial edentulism with respect to Employment.

Table 5 shows the prevalence of partial edentulism with respect to socio economic status, here most of subjects belonged to middle class family out of 300 subjects 266 were belonging to this class. 218 subjects had partial Edentulism which contributed about 80% of the said class. Less subjects were surveyed from

higher income class 13 subjects had partial Edentulism out of only 17 subjects and contributed 76.4 % from this class. only 3 subjects were from low-income class and all of them had partial Edentulism contributed 100% of that class.

Table 5:	Prevalence	of partial	edentulism	with respect	to socio-economic status.
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Socio-economic status	Dentulous	Partial edentulism	Total	Prevalence (95 % Confidence interval)
1 Low-income class	0	3	3	100.00(43.85 - 100.00)
2 Upper middle class	20	120	141	85.1063(78.07 - 90.13)
3 Lower middle class	30	109	139	78.4172(71.05 - 84.9)
4 High income class	4	13	17	76.4706(52.74 - 90.44)
Total	55	245	300	81.8182(76.94 - 86.01)

Awareness among the participants regarding missing teeth



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### Reasons for the loss of teeth



### Participants who were wearing or wore prosthesis before



### Reasons for not replacement missing teeth



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### Type of prosthesis wore by the subject



### Participant who wants replacement of missing teeth





### Type of replacement participant want

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### Region of replacement of teeth



### Effect of missing teeth on mastication



### Effect of missing teeth on social interaction



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### Effect of missing teeth on smile



### Effect of missing teeth on speech



### Discussion

Loss of teeth reflects a major public health problem in many countries. Edentulism has a significant impact on the health and overall quality of life. Studies have shown that tooth loss is associated with aesthetical, functional, psychological and social impacts on individual.<sup>11</sup> There are many factors affecting the prevalence of edentulism such as education, occupation, economic situation, attitude toward the dental care and life style. So preventive strategies to decrease the burden of tooth loss are of great importance.

In the present study, 300 subjects of age group 40 to 75 participated. The prevalence of partial Edentulism was seen more among males than females, as evident from the results, the number of partially edentulous males and females were 150 and 95 respectively. These results matched with results drawn from the studies performed by Swominen-Taipale<sup>16</sup> and Hoover J N, McDermott  $RE^8$  whereby they showed gender difference in edentulism with more males becoming edentulous than females this may be due to the fact that males do not pay much attention to oral healthcare.

Among the different types of pattern of missing teeth. In this study it was seen that Kennedy's class 3 is the most frequent type of partial edentulism followed by class 2, class 1 and class 4 respectively. Similar results were drawn from the study done by Prabhu, et al.<sup>14</sup> In case of maxillary arch all the four Kennedys class are more prevalent in males than females. It was also seen that the partial edentulism of mandibular arch is more than maxillary arch. This could be due to the fact that the first molar is the first permanent tooth to erupt into the

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oral cavity having higher caries percentage and higher chances of of tooth being extracted.

It is observed that most of subjects surveyed (86%) belong to middle income class family out of which 80% had missing teeth. This could be attributed to the fact that majority of the subjects of middle-income group people could not have afforded treatment procedures that would have saved their tooth in question or may be due to ignorance about the importance of a tooth and therefore opted for extraction, which contributed to high percentage of tooth loss. Similar finding was drawn from the studies of Palmer and Moen<sup>12</sup>, Ronald and Pallegedara<sup>13</sup>.

The population who had basic primary education or less had a higher percentage of partially edentulous people than those who had secondary education or above. This could be because those with higher education are more informed about their oral health needs and may seek dental treatment earlier and more often than those of lower educational status. Similar observations were made by Ronald, Micheelis, Hogijorgen, Shah and Pallegedara.

The prevalence of partial Edentulism with respect to employment out of 300 patients 188 were unemployed and 112 were employed it was seen that employment status does not have much impact on the prevalence of partial edentulism

Tooth Pain (40%) was most common reason which made the participants to visit the dental hospital other main reasons were restoration of tooth, regular dental check and replacement of missing teeth. Regarding the awareness of missing teeth 99% partially edentulous subjects did know they have missing teeth but only 54% among them gave the exact number of missing teeth.

Majority of the study subjects lost their teeth because of caries (45%). whereas 19% of subjects gave reason of both caries and periodontal disease for their teeth loss. In 8% of subjects teeth loss was only due to periodontal disease and 8% were not aware about the cause. The fact that dental caries is the leading cause of tooth loss may be attributed to consumption of more cariogenic refined carbohydrate-rich food, lack of brushing habit, poor oral hygiene, socioeconomic background and lifestyle of the people over the years.

In this study replacement of missing teeth is associated more with the higher income group. This could be because the high-income group could afford the dental treatment. This finding correlates with the findings of Hobdel et al., Ettinger, Shahand Pallegedara. This is in agreement with Brodeur et al., and Pallegedara. The time period for edentulousness was more than one year in about 90% of participant subjects. The reason for not replacement of teeth were mainly lack of awareness 25%, economic reasons 42%, lack of time 27%, and 28% did not want replacement. Only 20% subjects replaced teeth previously or were wearing prosthesis.

Regarding replacement of missing teeth, it was found that only 46 subjects have previously restored their missing teeth among them approximately 65 % were males and rest were females. 55% of subjects had fixed partial prosthesis rest were removal partial prosthesis. The ratio of removable to fixed among the restored was found approximately 1:1 The percentage of replacement were more seen in upper income class as compared to middle class. About 90% of the subjects wanted replacement of teeth and gave preference to the posterior replacement because of the difficulty in mastication and 65% subjects wanted replacement with fixed restoration, 10% replacement with removal prosthesis and 23% subject were unaware about the prosthesis.

Moreover 75% subjects agreed that missing teeth affects their function of mastication this was because of the reason that greater percentage of the missing teeth was in the posterior region, 23% subject said that it affects their speech, 20% subjects said it affect their smile and 30% subjects said that it affects their social interaction.

#### Conclusion

Prevalence of partial Edentulism may not only be the reflection of pattern of tooth loss but also patients demands and affordability of alternative Prosthodontic treatment. Following conclusion were drawn from the study.

Prevalence (80%) of partial Edentulism was found in study participants.

Kennedy's class 3 is the most common class of partial Edentulism

Partial Edentulism is more common in mandible than maxilla in males and females.

Majority of the subjects wanted replacement of teeth with prosthesis giving Preference to fixed partial prosthesis. But due to their economic issues, lack of awareness, lack of motivation, busy life schedules they were unable replace them.

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So, community-based oral health programs are needed to increase the awareness regarding poor oral health, timely oral checkup and various risks of tooth loss. It also increases awareness about the missing teeth and their importance of prosthodontic rehabilitation to establish the arch for proper oral function.

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