

Partial edentulism and its correlation with educational status: a hospital-based study

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ABSTRACT



Background: Maintenance of oral hygiene is one of the most important factors to prevent tooth loss. Education plays a significant role to maintain good oral hygiene. The objective of the study was to determine partial edentulism based on Kennedy’s classification and to find out correlation between partial edentulism and educational status.

Methods: A cross-sectional study was carried out among 189 partially edentulous patients visiting dental OPD of three government hospitals. Patients above 18 years of age were selected using non-probability convenience sampling, 63 from each center. History taking and visual examination were done after getting informed consent from the participants. Descriptive (mean, median, standard deviation, range, ratio and percentage) and inferential (Man-Whitney test) statistics were applied.

Results: In 189 partially edentulous patients 61% were females and 39% were males, and 48.1% people had no formal education. Kennedy’s Class III was most common (59% in maxillary, 61% in mandibular arches) and Kennedy’s class IV was least common (1% in maxillary, 6% in mandibular arches). From the study, we found that the number of teeth missing was higher in people with no formal education and there was statistically significant difference in the number of missing teeth in people with formal education and people who didn’t have any formal education (p<0.05).

Conclusion: The study showed that education plays a vital role in generating awareness about maintenance of oral hygiene and people who are educated have a tendency of retaining more of their natural dentition. Preventive educational programs should be focused in the low education group so that more effective outcomes can be achieved.

Keywords: Caries, Edentulism, Kennedy’s classification, Oral hygiene, Periodontal Disease

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INTRODUCTION

Oral health, although having a significant impact on the general health and quality of life of individuals, has been one of the most neglected aspects in our community. Partial edentulism can be considered as one of the several outcomes of neglected oral health habits.¹ An edentulous space is a gap in the dental arch normally occupied by one tooth or more. It could be partial or complete.² Partial edentulism was classified into four groups by Kennedy in 1923 which reduces the burden of longevity classification and is simpler with easy application.³

Dental caries, periodontal disease, and trauma are the common reasons for tooth loss. Correlation between socioeconomic factors, educational status, age and gender with partial edentulousness has been identified.¹ For awareness of oral disease and its treatment, education plays a major role. Various studies identified that educational status and risk of becoming completely edentulous are inversely proportional to each other.¹⁻³ The objective of this study was to identify the partial edentulism and its correlation with educational status.

MATERIALS AND METHODS

It was a cross-sectional study conducted among patients visiting Dhankuta District Hospital, Sagarmatha Zonal Hospital and Koshi Zonal Hospital over a period of 3.5 months. The ethical approval was obtained from the Departmental Research Unit of College of Dental Surgery, B.P. Koirala Institute of Health Sciences, Dharan (17/074/075).

All patients above 18 years of age who visited above mentioned three centers for treatment of missing teeth were included in the study. Exclusion criteria were patients with missing third and/or second molars and not to be replaced (following Applegate's rules), pregnant woman, physically or mentally challenged.

Sample size was calculated based on Cochran's formula with the prevalence of 14% taken from study.¹ The total calculated sample size was 186 but 189 samples were taken in the study. From each of the hospitals, 63 patients were included with non-probability purposive sampling techniques.

There were four examiners. History taking and visual examination was done for each patient. The participant was asked about the past dental history, demographic details, educational level and other relevant details. Also, the intra-oral examination was carried out for recording the Kennedy's classification in upper and lower arches. The recording was maintained in a record book. Written informed consent was taken from all participants before history taking and examination. Inter-examiner reliability was checked by Kappa statistic which was found to be good.

For the descriptive statistics mean, standard deviation, range, percentage, ratio were calculated. For inferential statistics educational status was classified into two groups, literate and illiterate. On analysis of the number of missing teeth the data was not normally distributed. Mann-Whitney U test was applied.

RESULTS

In the study, about 61% of females and about 39% of males were examined. The age range of the studied population was from 18 years to 84 years with mean age 47.84 ± 15.31 . About 51.9% of the participants were literate and the rest 48.1% were illiterate which shows a slight majority of the participants had received formal education. A large percentage of the patients examined were farmers 31.2% followed by housewives 37%, teachers 5.8%, students 5.3%, businessmen 4.2% and others 16.4%.

The percentage of Kennedy's class III was highest, approximately 59% in maxillary and 61% in the mandibular arch and Kennedy's class IV was the least 1% in maxillary and 6% in the mandibular arch. (Table 1)

Similarly when comparing the Kennedy classes according to gender approximately 57% males and 61% females had Kennedy's class III partial edentulism in the maxillary arch which was the highest in both males and females. 56% males and 64% females had Kennedy's class III partial edentulism in the mandibular arch. (Table 1)

Table 1: Distribution of Kennedy's classes

Arch	Kennedy's classification	Male	Female	Total frequency	Total Percentage
		Frequency (%)	Frequency (%)		
Maxillary	Class I	8 (15.38)	12 (17.14)	20	16.39%
	Class II	13 (25)	14 (20)	27	22.13%
	Class III	30 (57.69)	43 (61.43)	73	59.84%
	Class IV	1 (1.92)	1 (1.43)	2	1.64%
Total		52 (100)	70 (100)	122	100%
Mandibular	Class I	4 (8)	12 (13.64)	16	11.59%
	Class II	11 (22)	17 (19.32)	28	20.29%
	Class III	28 (56)	57 (64.77)	85	61.59%
	Class IV	7 (14)	2 (2.27)	9	6.525%
Total		50 (100)	88 (100)	138	100%

Furthermore, we divided the edentulism in Kennedy-Applegate classification. The distribution of this classification is depicted in Table 2. As shown in table 2, class III with no modification was the highest in both maxillary (45%) and mandibular (37%) arches followed by class II with no modification in maxilla (13%) and class III with modification 1 in mandible (19%)

Table 2: Distribution for Applegate modification

Kennedy-Applegate classification	Maxillary		Mandibular	
	Frequency	Percentage	Frequency	Percentage
Class I no modification	10	8.20%	10	7.25%
Class I modification 1	7	5.74%	5	3.62%
Class I modification 2	3	2.46%	1	0.72%
Class II no modification	17	13.93%	19	13.77%
Class II modification 1	7	5.74%	6	4.35%
Class II modification 2	3	2.46%	3	2.17%
Class III no modification	56	45.90%	52	37.68%
Class III modification 1	14	11.48%	27	19.57%
Class III modification 2	3	2.46%	5	3.62%
Class III modification 3	0	0.00%	1	0.72%
Class IV	2	1.64%	9	6.52%
Total	122	100.00%	138	100.00%

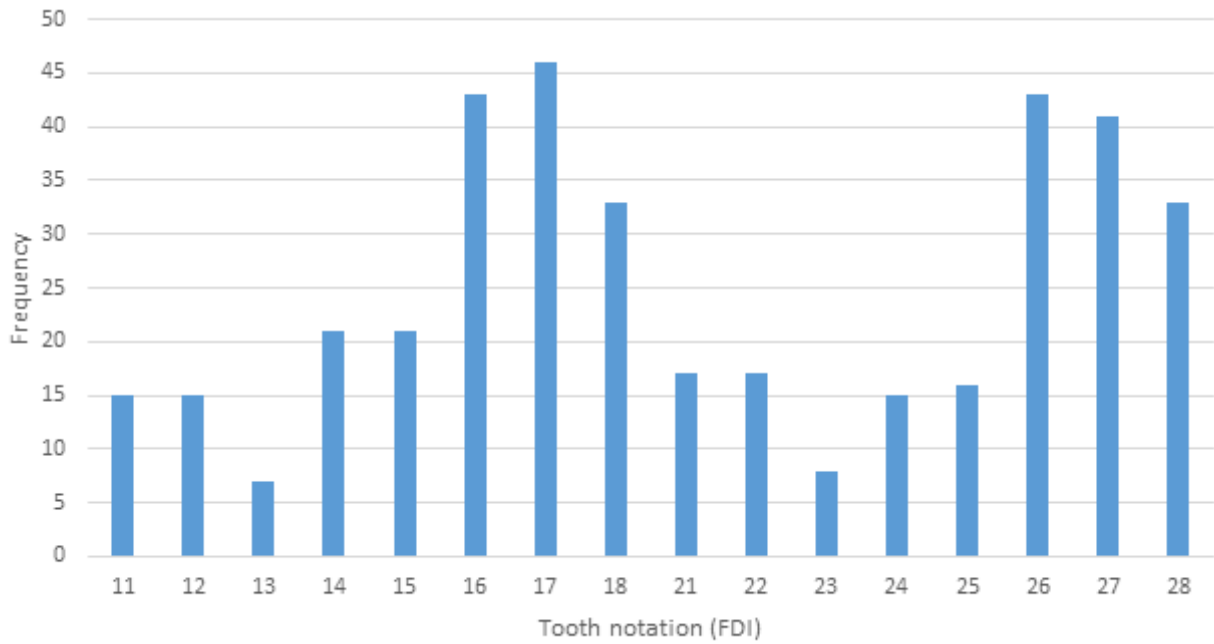


Figure 1: Number of individual missing teeth in maxilla

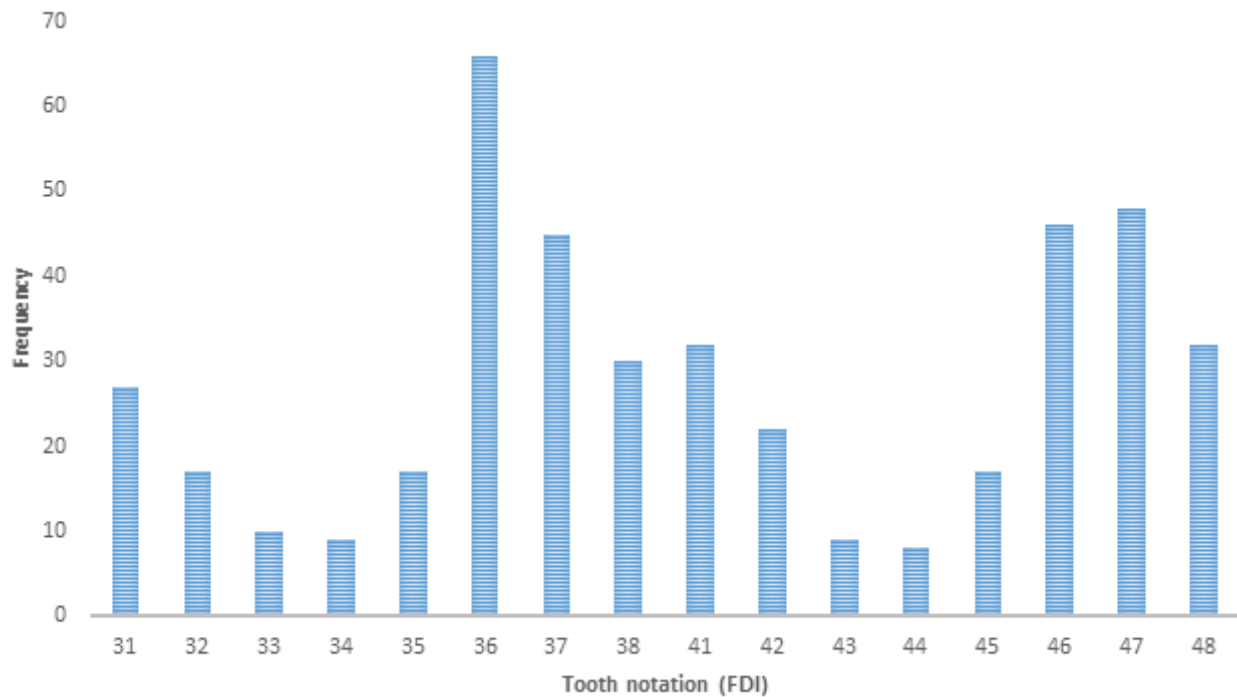


Figure 2: Number of individual missing teeth in mandible

In the study, the highest number of people, that is 66 had missing permanent left mandibular first molar followed by 48 people having permanent right second molar missing. Similarly, 46 had permanent right maxillary second molar as well as permanent right mandibular first molar missing respectively. Permanent right maxillary canine was the least

missing teeth in 7 people followed by permanent left maxillary canine and permanent right mandibular first premolar in 8 people. (Fig. 1 and 2)

Table 3: Comparison between educational status and missing teeth

Education	Missing teeth (N)	Mean Rank	p value
Literate	91	78.15	0.001*
Illiterate	98	113.15	
Total	189		

^aMann-Whitney U Test

Table no 3 depicts that literate people with the mean rank of 78.15 had lesser number of missing teeth (n=91) compared to illiterate people (n= 98) with the mean rank of 113.15 which was statistically significant (p=0.001*).

DISCUSSION

The factors like age, gender, socioeconomic status, occupation and educational status have been studied in various populations by correlating with partial edentulism.⁴ Contribution of education plays a major role in awareness of dental disease along with its prevention. Moreover, lower educational status has exhibited higher risk of teeth loss.^{1,3}

In our study, the highest number of partially edentulous patients about 42% fell in the age group 41-60 followed by about 35% in the age group of 21-40 which is not in agreement with the study where about 35% of edentulous patients were from age group 40-60 and about 40% patients were in the age group 20-40.¹ This may be due to difference in socio-demographic characteristics.

Most of the participants' occupation in the study was housewives (37%) which contradicts with study conducted in Pakistan with the percentage of housewives of 72%. This may be due to higher number of female are aware and are employed in study area.⁴

In the study, class III was the most common in both maxilla (59%) and mandible (61%) which is similar to the study conducted in Pakistan with 54% in maxilla and 53% in mandible whereas class IV was the least common in both maxilla (1%) and mandible (6%) which is in parallel with the same study with maxilla (9%) and mandible (5%).⁵

The majority of Kennedy's class I was without modification in both maxilla (10) and mandible (10) which is in agreement with other studies^{6,7} where as it contradicts with the study conducted in Nepal Medical College and Teaching Hospital.¹⁰ Likewise the majority of Kennedy's class III are also without modification in both maxilla (56) and mandible (52) which is in agreement with other studies.^{6,7}

In this study 34.9% patients had left mandibular first molar missing, 25.3% people had right mandibular second molar missing and 24.3% people had right maxillary second molar as well as permanent right mandibular first molar missing respectively. This frequency of molar missing is contradicting with the study conducted in India.¹¹ In the study 48.1% people had no formal education, 27% people had education below 10th standard, around 15.3% people had education up to school leaving certificate and intermediate and about 9.5% had bachelors and above which is in parallel with the past study conducted in Uttar Pradesh, India.¹²

This study found that the number of teeth missing is higher in people with no formal education (p<0.001), which indicates that the likelihood of retaining teeth in the mouth increases in educated people. This may be because people with higher educational status are more aware about their oral health and seek more care for the treatment of the dental problems from the available health facilities, as well as they have more positive peer influence in the maintenance of oral health.^{8,9,11} Additionally the people with higher educational status are likely to be economically stronger and capable of timely dental treatment. This is in line with past study conducted in India.¹¹

Limitations: Non-probability sampling technique was used thus it is difficult to generalize the findings over the country.

CONCLUSION

Kennedy's Class III classification has higher prevalence in maxillary and mandibular arch and literate the people lesser the number of missing teeth ($p=0.001^*$). Hence education is an indispensable asset for a person's oral health and consequently their general health. There is an alarming need to focus on awareness programs to the uneducated group of people.

The study conducted will help in gaining valuable information about edentulism as a result community dentists, public health workers and oral health care providers can focus their preventive and rehabilitative measures to the people with lower educational status who are likely to be unaware about maintenance of oral hygiene.

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