



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

International Journal of Current Research  
Vol. 10, Issue, 11, pp.75533-75537, November, 2018

DOI: <https://doi.org/10.24941/ijcr.32647.11.2018>

## RESEARCH ARTICLE

### STUDY OF PREVALENCE AND ASSOCIATED FACTORS OF PATTERN OF PARTIAL EDENTULISM IN RURAL PATIENTS REPORTED TO SHARAD PAWAR DENTAL COLLEGE AND HOSPITAL

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#### ARTICLE INFO

##### Article History:

Received 20<sup>th</sup> August, 2018  
Received in revised form  
03<sup>rd</sup> September, 2018  
Accepted 19<sup>th</sup> October, 2018  
Published online 30<sup>th</sup> November, 2018

##### Key Words:

Kennedy's Classification,  
Partial Edentulism,  
Age, Gender.

#### ABSTRACT

This study aims to study the prevalence of pattern of partial edentulism and its associated factors such as age, gender, socioeconomic status and systemic diseases among rural population. The data were collected from 100 patients aged 22 - 60 years of both genders. The survey was based for determining the incidence of Kennedy's classification with respect to age, gender, occupation and systemic diseases. Kennedy's class III in both dental arches was the most dominant pattern, with class IV being the least in number. With an increase in age, there was an increase in the Class I and Class II dental arch and a decrease in Class III and class IV in both arches. Gender had no significant relationship with distributions of RPD classification. Edentulism is observed more in workers, farmers and labors especially in Kennedy's class I and II patient's. Systemic diseases found to be prevalent in class I patients and increasing age. Kennedy's class III is the most common in both dental arches. Gender had no effect on the prevalence of various Kennedy classes, while age, socioeconomic status and systemic diseases have a significant effect.

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Citation: Dr. Trupti M. Dahane, Rasika S. Jibhakate, Sonia Aswale, Deepika Rathi and Priyanka Khungar. 2018. "Study of prevalence and associated factors of pattern of partial edentulism in rural patients reported to Sharad Pawar Dental college and Hospital", *International Journal of Current Research*, 10, (11), 75533-75537.

## INTRODUCTION

Teeth are the main functional component of the oral cavity. Teeth provide variety of function includes mastication, speech and esthetics. Absence of teeth in the oral cavity resulting in difficulty in chewing food, alteration of speech and poor esthetics, greatly affect the quality-of-life (Muneeb, 2013; Zaigham, 2010). Partial edentulousness is a dental arch in which one or more but not all natural teeth are missing. Generally, it occurs by caries, periodontal problems, traumatic injuries, impactions, supernumerary teeth, neoplastic and cystic lesions (Muneeb, 2013; Zaigham, 2010; Ekhikhamenor et al., 2010; Abdel-Rahman et al., 2013). Some studies have reported caries as the main causative agent for tooth loss (Prabhu et al., 2009; Reddy et al., 2012; Akinboboye et al., 2014). Tooth loss has an impact on an individual's oral health-related quality of life at biologic, psychological, and social levels. The prevalence and extent of tooth loss have decreased significantly in many countries during recent decades.

There still remains a significant variation in tooth loss distribution. These disparities may be attributed partly to the increased availability and accessibility to oral diseases prevention and control programs, as well as to increase in the awareness of the importance in oral health. The study of trends in tooth loss, comparing rate of occurrence between different populations, may provide important information about risk factors for tooth loss, potential changes in oral health status, and possible causes of these changes. Partial edentulism leads to several drawbacks to the subjects including clinical challenges and lifestyle compromises. Clinically, partial edentulism results in drifting and tilting of adjacent teeth, supra eruption of opposing teeth, altered speech, changes in facial appearance and temporo-mandibular disorders [1,2,8]. Also, the loss and continuing degradation of the alveolar bone, the adjacent teeth and also the supporting structures will influence the difficulty to achieve an adequate restoration in a partially edentulous patient [9]. On the lifestyle compromises, partial edentulism restricts dietary options, which leads to weight loss. Further, it leads to lack of confidence and confined social activities, which may adversely affect the quality of life and lead to psychological dissatisfaction (Muneeb, 2013).

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Pattern of tooth loss in partial edentulism is a clear indicator of levels of oral hygiene, dental health awareness, the magnitude of dental problems, and suggestive of type of prosthesis required and its prognosis. Pattern of partial edentulism can be clearly interpreted with the help of classification system for the ease of communication among the dental fraternity.

Various methods of classification like Kennedy, Applegates, Avant, Neurohar, Eichner, ACP (American College of Prosthodontics) have been proposed. Kennedy's classification is widely studied and clinically accepted by Dental Community (Zaigham, 2010; Ehikhamenor et al., 2010; McGarry et al., 2002; Assessment of Partially edentulous patient based on Kennedy's classification and its relation with Gender Predilection, 2014). As per Kennedy's classification, there are four main types of partially edentulous arches as :

**Class I:** Bilateral edentulous areas located posterior to the remaining natural teeth.

**Class II:** A unilateral edentulous area located posterior to the remaining natural teeth.

**Class III:** A unilateral edentulous area with natural teeth remaining both anterior and posterior to it.

**Class IV:** A single, but bilateral (crossing the midline) edentulous area located anterior to the remaining natural teeth.

Kennedy's classification is widely accepted due to its advantages of immediate visualization and recognition of prosthesis support (Zaigham, 2010; Ehikhamenor et al., 2010; Naveed, 2011). This study also uses Kennedy's classification and aims to study the prevalence of pattern of partial edentulism and its correlation with gender, age, systemic diseases and socio-economic status. This type of study has been carried out for populations like Andhra Pradesh, Goa and Karnataka and also for some of the populations internationally. But no study is documented for rural population of Maharashtra as yet. Such type of epidemiological data can be useful to the health departments for formulating the measures to improve health services in the concerned geographical area. Also it can be used as a good predictor for the prognosis of the treatment plan. This study hypothesizes that the factors such as gender, age, systemic diseases and socioeconomic factors have no significant association with the pattern of edentulism.

## MATERIALS AND METHODS

This institution based, cross sectional, epidemiological study was conducted in the department of prosthodontics, Sharad Pawar Dental College and hospital, Sawangi. All the partially edentulous patients qualifying inclusion and exclusion criteria participated in the study reported from August to January.

### Patient Inclusion criteria

- Age group from 22 years and above
- Patients having partially edentulous areas in either or both the jaws.

### Patient Exclusion criteria

- Third molars are excluded while determining the classification

Clinical examination of each patient was carried out after obtaining an informed consent.

Intraoral examination was done visually using a mouth mirror and probe. The pattern of partial edentulism identified according to the Kennedy's classification for mandibular arch of each patient. Un-erupted or congenitally missing teeth, root tips, and very loose teeth indicated for extraction were not included as remaining teeth and were excluded from the study.

The associated factors considered in this study for correlation were age, gender, systemic diseases and socioeconomic status. The selected patients were divided into 4 groups as:

Group 1: 22 - 32 years

Group 2: 33 - 42 years

Group 3: 43 - 52 years

Group 4: 53 - 60 years

The information was tabulated including age, gender, systemic conditions, occupation and Kennedy's class in partially edentulous patients.

**Statistical analysis:** Statistical Analysis was done by using descriptive and inferential statistics using Chi-square test and software used in the analysis were SPSS 17.0 version, GraphPad Prism 6.0 version and EPI-INFO 6.0 version and  $p < 0.05$  is considered as level of significance.

## RESULTS

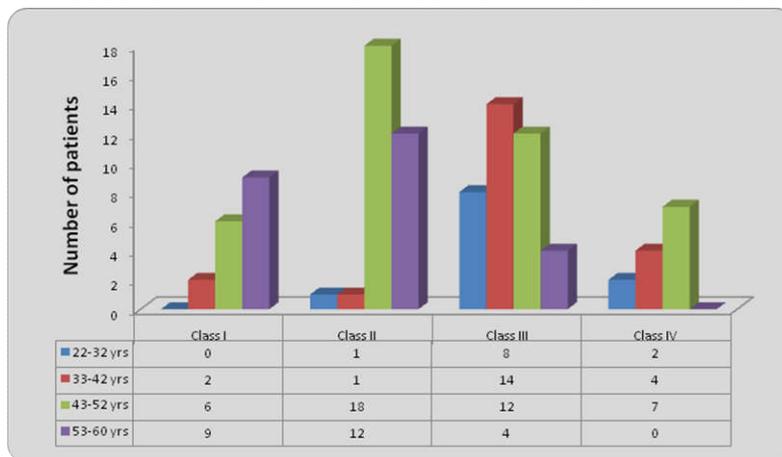
A total of 100 patients with partial edentulism were included in this study out of which 41 were females and 59 were males. Table no 1 : The patients were divided into 4 groups and compared with respect to Kennedy's class. It was found that there was significant difference in the incidence of partial edentulism when compared with different age groups ( $p < 0.05$ ). It was observed that prevalence of Kennedy's class I and II increases with increase in age (43 - 60 years). Class III is found to be more common pattern among the young aged patients and class IV being the least in number. (graph 1). Table 2 : P value is not significant, that is it follows the normal distribution ( $p > 0.05$ ) which indicates that gender has no statistically significant relation with prevalence of various Classes of partial edentulism. Table no. 3 : Systemic diseases like diabetes, hypertension were found to be associated with edentulism. ( $p < 0.05$ ). Systemic diseases were seen significantly in class I and II pattern of Kennedy's classification (graph 2). Table no 4 : It was observed that there was significant relation of occupation with partial edentulism. It was found that the group of patients with less or limited income such as labors, workers, farmers are directly related with edentulism, Students being least in number.

## DISCUSSION

This indicates that the incidence of tooth loss is decreased in younger population. Earlier Kennedy's classification mentioned bilateral distal extension situation as the most common, hence classified as class I. With the same analogy class III being the most common can occupy the class I position followed by class II, class I and IV. Disagreement with other studies (Abdel-Rahman et al., 2013; Al-Dwari, 2006; Sapkota, 2013; Charyeva et al., 2012), reflects a light on many factors responsible for loss of teeth most common being poor oral hygiene measures and awareness, dietary habits with high sugar consumption.

**Table 1. Correlation of Kennedy’s class with age**

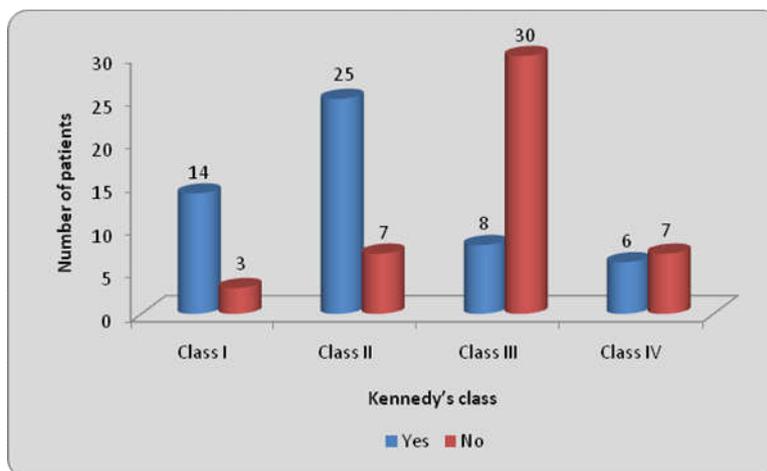
Kennedy’s class	Age in years				Total	χ <sup>2</sup> -value	p-value
	22-32 yrs	33-42 yrs	43-52 yrs	53-60 yrs			
	A	B	C	D			
Class I	0	2	6	9	17	34.87	0.0001,
Class II	1	1	18	12	32		S,p<0.05
Class III	8	14	12	4	38		
Class IV	2	4	7	0	13		
Total	11	21	43	25	100		



**Graph 1. Correlation of Kennedy’s class with age**

**Table 2. Correlation of Kennedy’s class with gender**

Kennedy’s class	Gender		Total	χ <sup>2</sup> -value	p-value
	Male	Female			
Class I	11	6	17	3.49	0.32,NS,p>0.05
Class II	21	11	32		
Class III	18	20	38		
Class IV	9	4	13		
Total	59	41	100		



**Graph 2. correlation of Kennedy's class with systemic diseases**

**Table 3. Correlation of Kennedy’s class with systemic diseases**

Kennedy’s class	Systemic Disease		Total	χ <sup>2</sup> -value	p-value
	Yes	No			
Class I	14	3	17	29.80	0.0001,
Class II	25	7	32		S,p<0.05
Class III	8	30	38		
Class IV	6	7	13		
Total	53	47	100		

**Table 4. Correlation of Kennedy's class with occupation**

Kennedy's class	χ <sup>2</sup> -value				
	Job	Jobless			
Class I	8	9	17	26.59	0.002, S.p<0.05
Class II	17	15	32		
Class III	20	18	38		
Class IV	12	1	13		
Total	57	43	100		

Changing to class II in older age groups but the incidence of class I has decreased to significant extent and least commonly occurring situation is class IV. This study did not show any predilection towards a particular gender. However there are studies 14,,22, showing higher percentage of a particular Kennedy's situation in female. Al Dwairi ZN *et al.* noted that Kennedy's Class II and Class III patterns were more frequent among males than females [D'Souza, 2014]. Prabhu N *et al.*, observed that there was statistically no significant correlation between gender and partial edentulism on examining 350 patients with 147 males and 203 females [Akinboboye *et al.*, 2014]. But there is statistically significant correlation between gender and various Classes of partial edentulousness in the upper and lower arch [Prabhu *et al.*, 2009]. Zaigam AM *et al.*, found that gender had no correlation with distribution of RPD classification on his study comprising 367 patients with 157 males and 210 females [Zaigam, 2010]. Abdel Rahman HK *et al.*, studied that gender has no statistically significant relation with prevalence of various Classes of partial edentulism [Abdel-Rahman *et al.*, 2013]. Regarding the systemic diseases, this study found that systemic diseases were associated with the pattern of partial edentulism and patients with systemic diseases, considering asthma, diabetes and hypertension, have greater prevalence towards Kennedy's class II pattern of partial edentulism. According to other studies, angina and hypertension were found to be associated with edentulism. 24.25. Several other clinical studies have suggested a possible association between rheumatoid arthritis and periodontitis and tooth loss (Mercado *et al.*, 2003; Yavuzylmaz *et al.*, 1992; Han *et al.*, 2009) Lee *et al.* (2004) demonstrated that edentulism was associated with a weight gain of > 5% in one year. Socioeconomic status or occupation was found to be significantly associated with pattern of partial edentulism with the percentage of 35.5% in Kennedy's class III cases in patients having job whereas prevalence in Kennedy's class II was found in patients with no job. Partial edentulism also depends on socio-economic parameters like family income, education, occupation, etc. Partial edentulism decreases in the employed group and when family monthly income increases. Also, subjects in this group are more aware to replace the missing teeth. The lower income group people could not afford to the treatment procedures that would have saved their questionable tooth, so might have opted for extraction. Less educated people aren't much aware about oral health care. People with better employment status are more concerned about their aesthetics and opted for dental treatment. Socio economic parameters have direct influence on the replacement of missing teeth. Prabu *et al.* (2014), have found that the lack of motivation was the common reason for not seeking dental treatment.

## Conclusion

Kennedy's class III is the most common RPD in both dental arches. Gender had no gender effect on the prevalence of

various Kennedy's classes, while age, socioeconomic status and systemic diseases have a significant effect.

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