

# Pattern of Partial Edentulism and its Relation with Age and Gender

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## Abstract:

**Introduction:** The pattern of partial edentulism must be categorized to communicate with dental professionals and laboratory technicians and to apply principles of removable partial denture design. This study was designed to assess the pattern of partial edentulism and its relation with age and gender.

**Material and methods:** This analytic-type cross-sectional study was done on 230 partially edentulous patients. Secondary data on age, sex, arch type, and missing teeth were collected from the hospital record book. Partially edentulous arches were categorized by missing teeth according to Kennedy's classification system with Applegate's rules. Kennedy's classes I, II, III, and IV were categorized according to age, gender, and type of arch. Statistical analysis was performed using a chi-square test with the data presented in frequency and percentages using SPSS software program version 22.

**Results:** The mean±Standard deviation of the age of 230 patients was 49.5±12.86. Of 230 patients, 60 % (138) were male and 40% (92) were female. 48.7% (112) were mandibular partially edentulous arches, and 51.3% (118) were maxillary partially edentulous arches. Kennedy's class III was the highest (54.8%) among all classes. The least (8.7%) was Kennedy's class IV. Kennedy's class I was 10.4% and class II was 14.8%. Kennedy's class II was more common in the maxillary arch and Kennedy's class I, class II, and class IV were more common in the mandibular arch. A significant relation of the pattern of partial edentulism among genders and among different age groups was found.

**Conclusion:** According to this study, Kennedy's Class III is the most common pattern of partial edentulism, and Kennedy's Class IV is the least common pattern. Both gender and age significantly affect the pattern of partial edentulism.

**Keywords:** Partial edentulism, Kennedy's classification.

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## Introduction

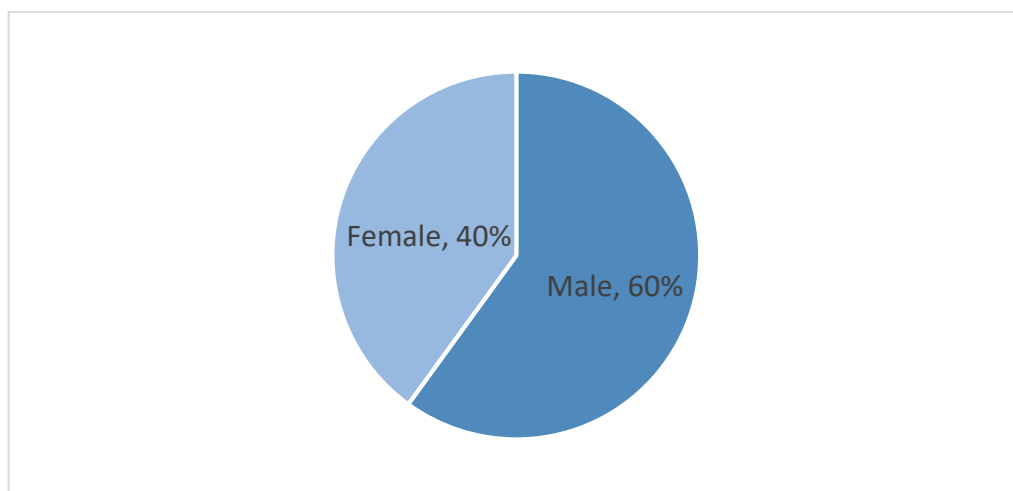
Oral diseases are estimated to affect more than 3.5 billion people worldwide. The total global prevalence of dental caries, periodontal disease, and tooth loss has remained unchanged at 45 percent over the last three decades.<sup>1</sup> Edentulism is a measure of a population's dental health.<sup>2</sup> A partially edentulous arch is characterized by missing one or more teeth but not all. Caries, periodontal diseases, trauma, severe tooth wear, neoplastic lesions, cystic lesions, etc. are local causes of partial edentulism.<sup>3,4</sup> Patients with partial edentulism present with a diverse array of anatomical features and medical problems. Loss of teeth impairs mastication, speech, and appearance, all of which have an adverse effect on quality of life.<sup>5</sup> There are around 65,000 different partial edentulism combinations. Partially edentulous arches with similar attributes, characteristics, qualities, or traits should be classified into different patterns. Beckett, Godfrey, Swenson, Kennedy Friedman, Wilson, Skinner, Applegate, Avant, Miller, and others proposed various methods for classifying partially edentulous arches. Nowadays, Kennedy's classification with the Applegate rule is the most widely accepted classification.<sup>6</sup> Several studies have been conducted to investigate the patterns of partial edentulism in various countries and populations.<sup>7-10</sup> Many studies have attempted to determine the relationship between patterns of partial edentulism and sociodemographic variables, but the results have been inconclusive.<sup>11-15</sup>

## Materials and Methods

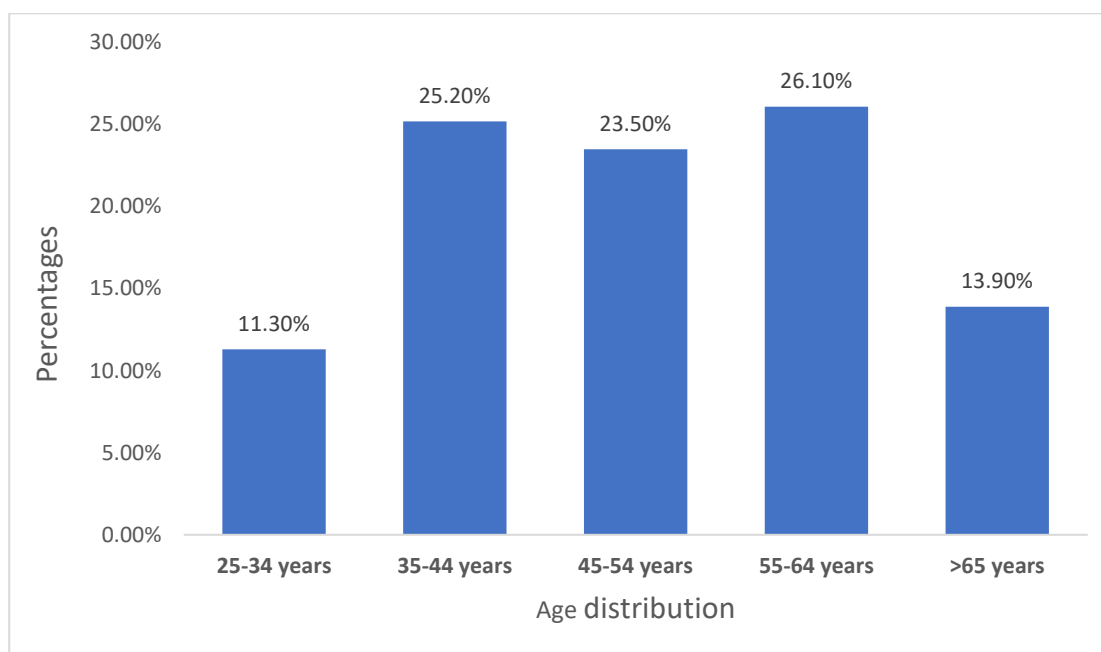
This was an analytic-type cross-sectional study. A total of 230 partially edentulous patients were selected from the record book of the Department of Prosthodontics of Sapporo Dental College and Hospitals by simple random sampling. Secondary data on age, sex, arch type, and missing teeth were collected from the record book. Partially edentulous arches were categorized by missing teeth according to Kennedy's classification system with Applegate's rules. Kennedy's classes I, II, III, and IV were categorized according to age, gender, and type of arch. Statistical analysis was performed using a chi-square test with the data presented in frequency and percentages using SPSS software program version 22.

## Results

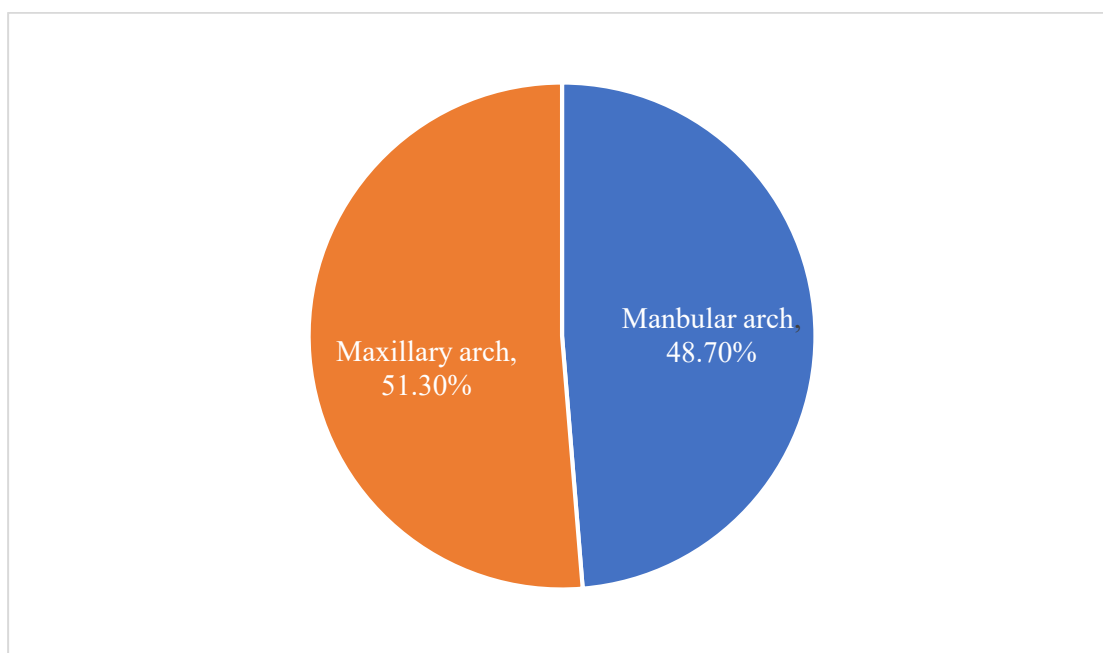
The mean±Standard deviation of the age of 230 patients was 49.5±12.86. Of 230 patients, 60 % (138) were male and 40% (92) were female. (Figure 1). 11.3% (26) of patients were from the age group 25-34 years, 25.2% (58) were from the age group 35-44 years, 23.5% (54) were from the age group 45-54 years, 26.1% (60) were from the age group 55-64 years, and 13.9% (32) were from the age group more than 65 years (Figure 2). 48.7% (112) were mandibular partially edentulous arches, and 51.3% (118) were maxillary partially edentulous arches (Figure 3).



**Figure 1:** Pie chart showing the percentage distribution of males and females (n=230)



**Figure 2:** Bar chart showing the percentage distribution of patients in different age groups (n=230).

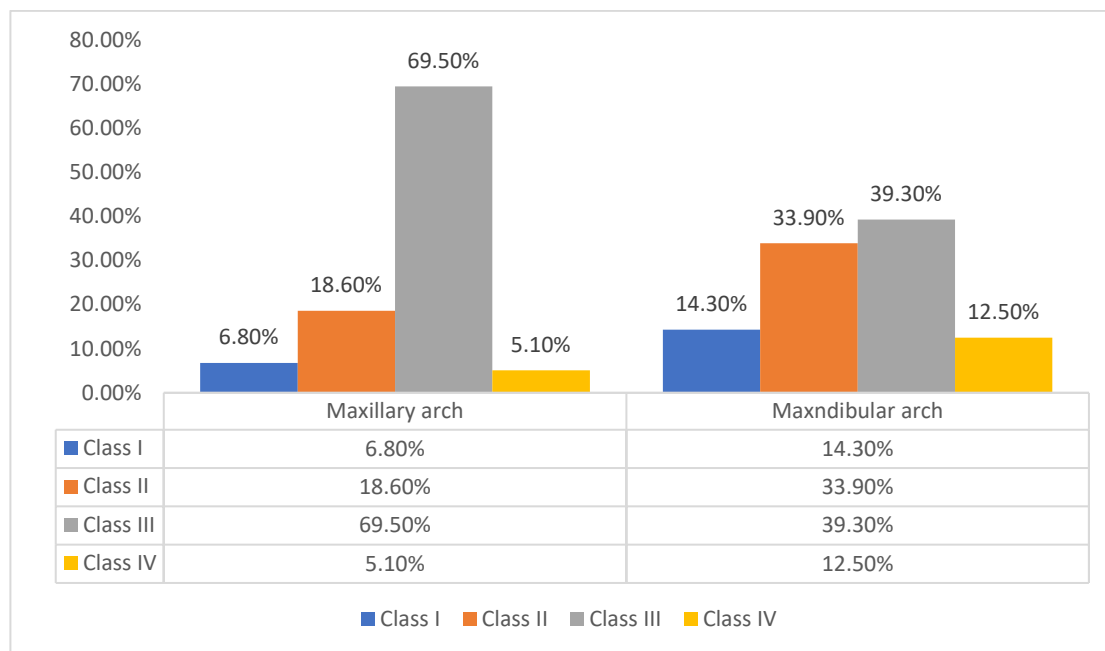


**Figure 3:** Pie chart showing the percentage distribution of types of arches (n=230)

**Table 1:** Frequency and percentages of Kennedy's classifications with modification area.

Kennedy's class	No modification	Modification 1	Modification 2	Modification 3	Total
Class I	10.4% (24)	0%	0%	0%	10.4% (24)
Class II	14.8% (34)	6.1% (14)	5.2% (12)	0%	26.1% (60)
Class III	43.5% (100)	9.6% (22)	0.9% (02)	0.9% (02)	54.8% (126)
Class IV	8.7% (20)				8.7% (20)

Table 1 shows that Kennedy's class III was the highest (54.8%) among all classes. The least (8.7%) was Kennedy's class IV. Kennedy's class I was 10.4% and class II was 14.8%.



**Figure 4:** Bar chart showing pattern of partial edentulism in different arches

Figure 4 shows that Kennedy's class II was more common in the maxillary arch and Kennedy's class I, class II, and class IV were more common in the mandibular arch.

**Table 2:** Pattern of partial edentulism according to gender

Kennedy’s class	Gender				P-value
	Male		Female		
	No.	%	No.	%	
Class I	22	15.9%	02	2.2%	0.000
Class II	28	20.3%	32	34.8%	
Class III	70	50.7%	56	60.9%	
Class IV	18	13.0%	02	2.2%	

Table 2 shows there was a significant difference in the pattern of partial edentulism of males and females.

**Table 3:** Pattern of partial edentulism according to age groups

Kennedy's class	Age groups					P-value
	25-34 years	35-44 years	45-54 years	55-64 years	>65 years	
Class I	0(0%)	2(3.4%)	8(14.8%)	6(10%)	8(25%)	0.001
Class II	4(15.4%)	12(20.7%)	16(29.6%)	20(33.3%)	8(25%)	
Class III	22(84.6%)	40(69%)	26(48.1%)	28(46.7%)	10(31.3%)	
Class IV	0 (0%)	4(6.9%)	4(7.4%)	6(10%)	6(18.8%)	

Table 3 shows there was a significant difference in the pattern of partial edentulism in different age groups.

## Discussion

It is difficult to communicate with dental professionals and laboratory technicians when making dentures to replace teeth because of so many combinations of partially edentulous arches. Principles of denture designing cannot be done for individual cases. Thus, it is necessary to classify partial edentulous arches. To achieve this goal, the Kennedy classification was chosen for this present study. One of the main benefits of the Kennedy classification is that it makes it possible to see the partial edentulous arch right away and to address design issues logically. It also enables the implementation of partial denture design ideas, making it a reasonable classification scheme.<sup>16</sup>

In few studies carried out on the Indian population<sup>8</sup>, Saudi population<sup>13,17</sup>, and Pakistani population<sup>18</sup> concluded that Kennedy's Class III was the most commonly occurred pattern of partial edentulism and Kennedy's Class IV was the least common pattern. The result of the present study (Table 1) was similar to the result of these studies. However, a study carried out on the Turkish population concluded that Kennedy's class I was the most commonly encountered pattern of partially edentulous arches.<sup>19</sup>

In this study, we found that partial edentulism was more common in the maxillary arch than in the mandibular arch (Figure 3). Sapkota B *et al.*, also found that partial edentulism was common in the maxillary arch compared to the mandibular arch.<sup>20</sup> Naveed *et al.*, and Khalil A. *et al.* reported that the frequency of partial edentulism was higher in the mandibular arch compared to the maxillary arch<sup>21,22</sup>. Sadiq WM *et al.* reported that Class I and Class II were predominant in the mandibular arch, while Classes III and IV were common in the maxillary arch.<sup>17</sup> Keyf F found that Class I was the most common type for mandibular arch and Class II was the most common type

for maxillary arch.<sup>19</sup> This study observed that class III was the most common type in both arches, but more so in the maxillary arch (Figure 4).

Various authors have considered gender and age as important factors of partial edentulism. The majority of authors have concluded that there is no significant relationship between the prevalence of partial edentulism and gender.<sup>8,13,15,17</sup> Few researchers, meanwhile, have found a significant relationship between gender and different classes of partial edentulism.<sup>23</sup> Al Dwairi ZN *et al.* noted that Kennedy's Class II and Class III patterns were more frequent among males than females.<sup>24</sup> This study found that class I and class IV were more in males and class II and class III were more in females, which had a significant relationship (Table 2).

This study reported that age had a significant relationship with the pattern of partial edentulism. The occurrence of Kennedy's class I increased with the increase of age and class III was commonly found at young age. Zaigham AM *et al.* concluded that with an increase in age, there was an increase in Kennedy's Class I and Class II partial edentulism and a decrease in Class III and Class IV patterns.<sup>18</sup> Abdel Rahman HK *et al.* reported that Class III and Class IV were in more in the younger age group.<sup>25</sup>

## Conclusion

According to this study, Kennedy's Class III is the most common pattern of partial edentulism, and Kennedy's Class IV is the least common pattern. Both gender and age significantly affect the pattern of partial edentulism.

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