

Pattern of Partial Edentulism in Correlation to Age and Gender among a Selected Saudi Population

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Abstract Objective: Documenting the prevalence and pattern of partial tooth loss is very important for identifying the prosthetic needs of the studied community as well as aiding the provision of educational and preventive materials suitable for this population in terms of language and composition. The aim of this study was to find the patterns of partial edentulism among a selected Saudi population and to correlate the pattern of partial edentulism with age and gender. **Subjects and Methods:** This study was conducted on male and female dental patients of age above 21 years attending the screening clinics of King Fahad Hospital, Almadinah Province, Saudi Arabia. It was based on visual examination of the selected subjects for determining the pattern of the partial edentulism according to Kennedy's Classification System with Applegate's modification rules. The cases belonged to Kennedy's classes I, II, III and IV were categorized according to age and gender of the patient as well as the relation to the maxillary and mandibular arches. **Results:** The results of this study showed that; the patients with Kennedy's Class III were found to be the most common pattern (56.5%), followed by Class II (23.6%) and class I (19.2%) while class IV was the least among the other classes (0.7%). It was also found that Kennedy's Class III was founded more in the age group of 21–30 (78.5%) and least in the patients above 60 years old (31.8%). **Conclusion:** Kennedy's Class III was the most commonly encountered pattern of partial edentulism in both upper and lower arches and Kennedy's Class IV was the least common pattern. With age, an increase in the tendency to Class I & Class II and a decrease in Class III was shown with a statistical significant difference between the different age groups, on the other hand there was no statistical significant difference between both genders.

Keywords: *partial edentulism, Kennedy classification*

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1. Introduction

Edentulism (partial or complete) is an indicator of the oral health of a population. [1] It may also be a reflection of the success of various preventive and treatment modalities put in place by the health care delivery system. [2] With the changing trends in dental treatment that favor retention of natural teeth, a decline in the number of complete dentures with an increase in the number of removable partial dentures (RPDs) is anticipated. [3] Partially edentulous patients exhibit a wide range of physical variations and health conditions. Teeth loss effects speech, mastication and may result in poor esthetics which in turn affect the quality of life. [4]

Several methods of classification of partially edentulous arches have been proposed and are in use e.g. by Beckett, Godfrey, Swenson, Friedman, Wilson, Skinner, Applegate, Avant, Miller and others. At present, Kennedy's classification is the most widely used and accepted because of its simplicity, ease of application, immediate visualization of the type of partially edentulous arch being considered and differentiation between tooth borne and tooth tissue borne partial dentures.

[5] It also permits a logical approach to the problems of design apart from making possible the application of sound principles of partial denture design. Kennedy's classification was originally proposed by Edward Kennedy in 1925 by this classification a tremendous number of possible semi dentulous combinations have been reduced to four simple groups namely Class I, Class II, Class III and Class IV. Application of Kennedy's classification is however difficult in every situation without employment of certain rules, recommended by Applegate aimed at integrating, the factual clinical situations and appliance designs within the classification. [6,7]

The trends in the incidence of the various classes of removable partial dentures should be reviewed periodically to serve as teaching guidelines. [8] Also documenting the prevalence and pattern of partial tooth loss is very important for identifying the prosthetic needs of the studied community as well as aiding the provision of educational and preventive materials suitable for this population in terms of language and composition. [9]

Publications on the prevalence of partial edentulism among the Saudi population are scarce, the earliest survey was in 1995 by Idouw AT & Al-Shamrani SM which examined a selected population attending the dental

school at King Saud University (KSU) in Riyadh, Saudi Arabia and reported the Mandibular first molar to be the most frequently missing tooth with a tendency for higher tooth loss in females compared to males. Loss of anteriors and premolars in the maxilla was found to be more frequent than the mandible in which loss of molars was more prevalent. [9] A later survey conducted at 2002 by Sadiq W. and Idouw A of patients receiving removable partial dentures (RPD) at KSU reported that Kennedy Class III RPD was the most commonly constructed with higher prevalence in Saudi male subjects. [3] In another study of RPD usage in Saudi male patients conducted by Akeel R (2010), he found that the most commonly provided definitive RPD constructed by undergraduate students at KSU were Kennedy Class III in both arches, while Class IV RPDs were the least common. [10]

In (2012) a five year survey on the prevalence and pattern of tooth loss in a sample of patients attending King AbdulAziz University - Faculty of Dentistry was conducted by Shinawi L, a total of 293 charts were reviewed and Kennedy Class III was found to be the most common classification in the entire sample and definitive partial dentures was the first choice for treatment with removable prosthesis. [11] Although these previous studies there is no specific study about the pattern of partial edentulism in Almadinah Province, Saudi Arabia.

The aim of this study was to determine the patterns of partial edentulism among dental patients attending King Fahad Hospital, Almadinah Province, Saudi Arabia and to find the association of the pattern of partial edentulism with age and gender.

2. Subjects and Methods

This cross-sectional study, which was conducted on male and female dental patients of age above 21 years

attending the screening clinics of King Fahad Hospital, Almadinah Province, Saudi Arabia was based on visual examination of the selected subjects for determining the pattern of the partial edentulism according to Kennedy's Classification System with Applegate's modification rules. The clinical findings were recorded on a specially designed form, and the study was approved by the Research Ethical Committee of College of Dentistry, Qassim University.

The inclusion criteria included patients from both genders, above the age of 21 years and having partially edentulous areas in either or both jaws. While the exclusion criteria included completely edentulous patients, patients with full dentition and those with only missing maxillary and mandibular third molars.

The cases belonged to Kennedy's classes I, II, III and IV were categorized according to age and gender of the patient as well as the relation to the maxillary and mandibular arches.

The selected sample was divided into 5 groups according to their age (21 -30), (31-40), (41-50), (51-60) and (above 60 year old).

Data collection was planned to continue for 2 months with a minimum sample size goal of 400 subjects. After the data collection, statistical analysis was performed using chi square test with the data presented in frequency and percentages using SPSS software program version 20.0 for windows.

3. Results

The data were collected from 484 Saudi patients aged from 21 to more than 60 years of both genders who were attend the screening clinics of King Fahad Hospital, Almadinah. The gender distribution was 215 (44.4%) males and 269 females (55.6%) (Table 1).

Table 1. Age and Gender Distribution of the Sample Population

Gender	21-30		31-40		41-50		51-60		>60	
	No	%	No	%	No	%	No	%	No	%
MALE (N1=215)	42	19.5%	68	31.6%	43	20.0%	30	14.0%	32	14.9%
FEMALE (N2= 269)	66	24.5%	89	33.1%	57	21.2%	40	14.9%	17	6.3%
Total (N=484)	108	22.3%	157	32.4%	100	20.7%	70	14.5%	49	10.1%

Table 2. Pattern of Partial Edentulism in Relation to Gender

Arch	Class	Sex				X ²
		MALE		FEMALE		
		No	%	No	%	
Maxillary (N=390)	I	29	16.8%	47	21.7%	0.215
	II	37	21.4%	59	27.2%	
	III	105	60.7%	109	50.2%	
	IV	2	1.2%	2	0.9%	
Mandibular (N=414)	I	35	19.6%	43	18.3%	0.895
	II	43	24.0%	51	21.7%	
	III	100	55.9%	140	59.6%	
	IV	1	0.6%	1	0.4%	
Total (N=804)	I (19.2%)	64	18.2%	90	19.9%	0.809
	II (23.6%)	80	22.7%	110	24.3%	
	III (56.5%)	205	58.2%	249	55.1%	
	IV (0.7%)	3	0.9%	3	0.7%	

Out of the selected sample; 86 patients had a maxillary full dentition and 8 patients were maxillary completely edentulous while 67 patients had a mandibular full dentition and 3 patients were mandibular completely edentulous, these results were excluded from the study and the total number of studied arches were 804 arches.

The age distribution of the sample (Table 1) showed that; the age range of (31-40) was the most prevalent (32.4%) and the patients above 60 years were the least prevalent (10.1%).

Regarding the pattern of partial edentulism (Table 2); class III (56.5%) was the most common pattern in both dental arches followed by class II (23.6%) then class I

(19.2%), while class IV was the least among the other classes (0.7%) (Table 2). Regarding the correlation of the pattern of partial edentulism with the gender there was no statistical significant difference between both genders.

Regarding the relation of the partial edentulism pattern to the age (Table 3 & Figure 1) there was a high statistical significance difference between different age groups. It was found that with an increase in age, there is an increase in the tendency to Class I & Class II and a decrease in Class III. Class III is the most prevalent class in the younger three age groups (21-30), (31-40) and (41-50 years old) while class I is the most prevalent in the 2 older age groups (51-60) and (> 60 years old).

Table 3. Pattern of Partial Edentulism in Relation to Age

Arch	Class	Age										X ²
		21-30		31-40		41-50		51-60		>60		
		No	%	No	%	No	%	No	%	No	%	
Maxillary	I	5	6.6%	19	15.1%	16	18.2%	21	36.8%	15	34.9%	P<0.001*
	II	15	19.7%	33	26.2%	18	20.5%	18	31.6%	12	27.9%	
	III	56	73.7%	73	57.9%	53	60.2%	16	28.1%	16	37.2%	
	IV	0	0.0%	1	0.8%	1	1.1%	2	3.5%	0	0.0%	
Mandibular	I	4	4.6%	19	14.2%	14	16.9%	24	35.3%	17	40.5%	P<0.001*
	II	11	12.6%	29	21.6%	24	28.9%	16	23.5%	14	33.3%	
	III	72	82.8%	85	63.4%	44	53.0%	28	41.2%	11	26.2%	
	IV	0	0.0%	1	0.7%	1	1.2%	0	0.0%	0	0.0%	
Total	I	9	5.5%	38	14.6%	30	17.5%	45	36%	32	37.6%	P<0.001*
	II	26	16%	62	23.8%	42	24.6%	34	27.2%	26	30.6%	
	III	128	78.5%	158	60.8%	97	56.7%	44	35.2%	27	31.8%	
	IV	0	0.0%	2	0.8%	2	1.1%	2	1.6%	0	0.0%	

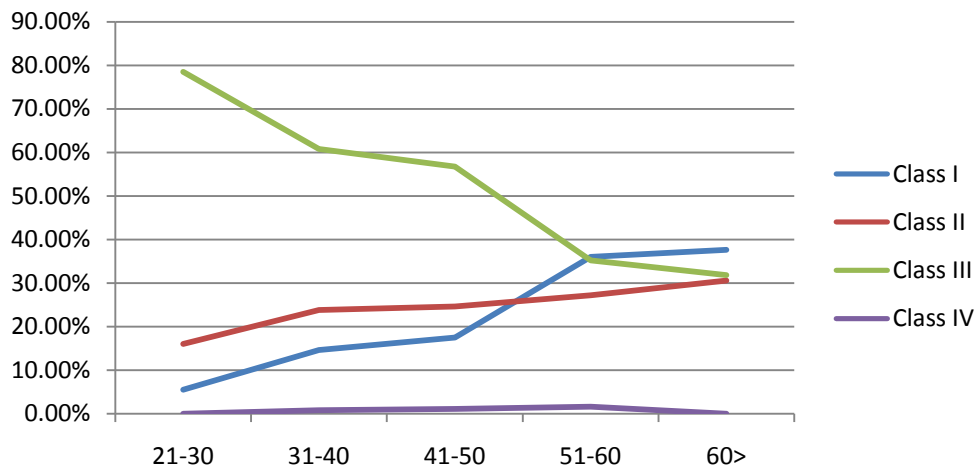


Figure 1. Change in the pattern of partial edentulism according to age

Table 4. Prevalence of Kennedy's Classes According to the Pattern of Modification

Modification	No modification		Modification 1		Modification 2		Modification 3		Modification 4	
	no.	%	no.	%	no.	%	no.	%	no.	%
Class I	93	60.4%	39	25.3%	20	13%	2	1.3%	0	-
Class II	38	20%	99	52.1%	39	20.5%	11	5.8%	3	1.6%
Class III	238	52.4%	173	38.1%	33	7.3%	7	1.5%	3	0.7%

Regarding the Pattern of modification among patients with Class I those with no modification were the most prevalent (60.4%), the same was noted in Class III patients with no modification (52.4%), while in patients with Class II those with modification 1 were the most common (52.1%). (Table 4)

4. Discussion

The primary purpose in using a classification for RPDs is to simplify the description of potential combinations of teeth to ridges. [3] In the present study, the Kennedy classification was preferred to fulfill this purpose. One of the principal advantages of the Kennedy classification is that; it permits the immediate visualization of the partially edentulous arch, and enables a logical approach to the problems of design. In addition it makes possible the application of sound principles of partial denture design, and is therefore a logical method of classification. [12]

A comparison of percentage distribution of various Kennedy's classes of the present study are in line with the similar studies performed by Filiz KEYF (2001) [13], Bharathi M (2004) [14].

In a study carried out on a Saudi population, Sadig and Idowu [3] concluded that out of the 422 partially dentate arches examined, Kennedy's Class III was the most commonly encountered pattern of partial edentulism in both upper and lower arches and Kennedy's Class IV was the least common pattern which is in accordance with the results of this study.

Gender has been one of the key factors analyzed by various authors. Most of the authors have concluded that there is no significant gender correlation with occurrence of partial edentulism. However, few studies have observed that there has been significant relationship between gender and various Classes of partial edentulism. [15] The results of this study reinforced the first opinion as the results showed that there was no statistical significant difference between both genders.

In 2010, Zaigham AM et al [16] examined 367 patients attending the prosthodontics OPD – Lahore Medical & Dental College, Lahore for partial denture to find the pattern of tooth loss and its relationship with age and gender he concluded that with an increase in age, there was an increase in Class I & Class II dental arch tendency and a decrease in Class III which in line with the results of the present study.

The majority of Kennedy's Class I in both the arches was without modification areas; this finding is comparable with the results of earlier reported studies. [3,17] Class II modification 1 was the most prevalent class II pattern which is in line with the results of a previous study [18] conducted by Abdel-Rehman et al, 2013.

5. Conclusion

According to this study Kennedy's Class III is the most commonly encountered pattern of partial edentulism in both upper and lower arches and Kennedy's Class IV is the least common pattern. Gender has no significant relationship with the pattern of partial edentulism, While

age significantly affects the pattern of partial edentulism and there is an increase in Class I & Class II dental arch tendency and a decrease in Class III.

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