# PREVALENCE AND PATTERN OF PARTIAL EDENTULISM AMONG EGYPTIAN PATIENTS. AN OBSERVATIONAL CROSS-SECTIONAL STUDY

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## ABSTRACT

**Objective:** the study aimed to ascertain the pattern and the prevalence of partial edentulism among Egyptian patients.

**Materials and Methods:** An observational cross-sectional study was conducted by screening patients attending out-patients clinics of three prosthodontics departments of dental faculties in Egypt. The prevalence of partial edentulism among all patients was recorded. Patients were grouped into four groups according to the age into Group I: 21–30 years, Group II: 31–40 years, Group III: 41–50 and Group IV: over 50 years. The pattern of partly edentulous arches was identified using Kennedy's classification. To eliminate the complexity, the assessment did not consider the modification areas. Data was analyzed using IBM SPSS Statistics for Windows, Version 23.0: IBM Corp.

**Results:** Kennedy Class I partial edentulism was 30.92%, (17.83, 13.09) in the mandible and the maxilla, followed by class III that was 30.73%, (17.73,13.00) in the mandible and the maxilla, followed by class II that was 27.11%, (15.60 ,11.51) in the mandible and the maxilla,and finally class IV was 11.23%, (6.04 ,5.20) in the mandible and the maxilla and Kennedy's Class III was the most common partially edentulous pattern (11.05 %,9.56%) between ages (20-30 and 31-40) years, Kennedy's Class I,II was the most common partially edentulous pattern (12.81 %,7.99 %) (11.33%,9.10%,) between ages (41-50)(over50) years.

**Conclusions:** With increasing age, there is a rise in Classes I , II ,IV Kennedy classification and a drop in Classes III. Class III was more prevalent in the younger population, but Class I was more prevalent in elder patients.

**KEY WORDS:** Kennedy's classification, partial edentulism pattern, partial denture, prevalence of partial edentulism

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## INTRODUCTION

Teeth loss has a significant impact on oral health-related quality of life, social, and psychological dimensions. In recent decades due to improved oral hygiene measures, the prevalence of tooth loss has decreased significantly in many countries. [1-3]

Partial edentulism is caused by a variety of reasons, some of which are inevitable, such as dental caries, periodontal disease, trauma, impacted teeth, and neoplastic or cystic lesions. Dental caries is the major cause of tooth loss, followed by periodontal disease. [4,5]

Untreated edentulous areas can lead to TMJ disorders, speech impediments, and the misalignment of neighboring and opposing teeth, among other problems. Using teeth, implants, or even oral structures, removable or fixed rehabilitation techniques can be used to treat partially edentulous arches. [6]

With recent developments in dental health care and improved health-care system's preventive measures favoring natural dentition maintenance, the number of edentulous patients is expected to decline. . [1,7-10] .

To detect and classify various partial edentulous conditions, several classifications have been proposed to classify partially edentulous arches. Kennedy's classification for partially edentulous arches is currently the most generally accepted classification. Kennedy's classification allows for instant visualization, recognition of prosthesis support, and evaluation of removable partial denture design aspects. [11-13]

One of the most often discussed subjects in dentistry is partial edentulism. Numerous studies have examined the partial edentulism patterns in diverse populations and nations. Epidemiological data on healthcare and related topics are essential for future health care planning. [4,7]

Because the prevalence of edentulism and tooth loss varies significantly between countries and geographic regions within the same country, and because there are no or little studies that have investigated the prevalence of partial edentulism among Egyptian patients, the current study's purpose was to assess the incidence of Kennedy's classification among partially edentulous individuals, as well as its correlations. Oral health planners could use this information to propose solutions that would aid in the growth of dental health care management in Egypt.

## MATERIAL AND METHODS

This study was conducted among dental patients at three Egyptian dental faculties in different geographical areas (Ahram Canadian, Beni-Suef and Al Azhar university Assuit branch Outpatient Clinics) for one academic semester.

The inclusion criteria for participants included being of either gender, older than 20, and having one or both jaws partially edentulous . Excluding all patients with congenitally missing teeth, unerupted teeth, or merely missing third molars.

Four age groups of chosen patients were created. Group I: 21–30 years. Group II: 31–40 years.

Group III: 41–50 years.Group IV: over 50 years. The participant examination were carried out at the outpatient clinic of prosthodontic department,.

The pattern of partially edentulous arches was determined using Kennedy's classification. To prevent complication, the assessment did not include modification regions. Statistical analysis was performed with IBM SPSS Statistics for Windows, Version 23.0: IBM Corp.

## RESULTS

Prevalence and pattern of partial edentulism among dental patients attending different faculties of dentistry (Ahram Canadian, Beni-Suef, Al Azhar Assiut) in different geographical areas in Egypt from upper  middle and lower Egypt were studied. (Table 1, 2, 3, 4) (Fig. 1, 2, 3, 4)

TABLE (1) The distribution of the various Kennedy's classes at faculty of dentistry Ahram Canadian University

|           | 20-30 Years |        | 30-40 Years |         | 40-50 Years |         | Over 50 Years |         | Total |          |
|-----------|-------------|--------|-------------|---------|-------------|---------|---------------|---------|-------|----------|
| Class I   | 3           | 1.16%  | 9           | 3.49%   | 31          | 12.02%  | 32            | 12.40%  | 73    | 28.29%   |
| Class II  | 10          | 3.88%  | 19          | 7.36%   | 21          | 8.14%   | 23            | 8.91%   | 74    | 28.68%   |
| Class III | 21          | 8.14%  | 26          | 10.08%  | 18          | 6.98%   | 6             | 2.33%   | 77    | 29.84%   |
| Class IV  | 3           | 1.16%  | 6           | 2.33%   | 9           | 3.49%   | 21            | 8.14%   | 34    | 13.18%   |
| Total     | 37          | 14.34% | 60          | 23.26%  | 79          | 30.62%  | 82            | 31.78%  | 258   | 100.00%  |

TABLE (2) The distribution of the various Kennedy's classes at faculty of dentistry Beni-Suef University.

|           | 20-30 Years |        | 30-40 Years |        | 40-50 Years |        | Over 50 Years |        | total |          |
|-----------|-------------|--------|-------------|--------|-------------|--------|---------------|--------|-------|----------|
| Class I   | 6           | 1.95%  | 15          | 4.87%  | 37          | 12.01% | 36            | 11.69% | 94    | 30.52%   |
| Class II  | 16          | 5.19%  | 21          | 6.82%  | 24          | 7.79%  | 24            | 7.79%  | 85    | 27.60%   |
| Class III | 41          | 13.31% | 22          | 7.14%  | 20          | 6.49%  | 10            | 3.25%  | 93    | 30.19%   |
| Class IV  | 1           | 0.32%  | 9           | 2.92%  | 12          | 3.90%  | 14            | 4.55%  | 36    | 11.69%   |
| Total     | 64          | 20.78% | 67          | 21.75% | 93          | 30.19% | 84            | 27.27% | 308   | 100.00%  |

TABLE (3) The distribution of the various Kennedy's classes at faculty of dentistry Al-Azhar University Assiut.

|           | 20-30 Years |        | 30-40 Years |        | 40-50 Years |        | Over 50 Years |        | Total |          |
|-----------|-------------|--------|-------------|--------|-------------|--------|---------------|--------|-------|----------|
| Class I   | 7           | 1.37%  | 33          | 6.46%  | 72          | 14.09% | 54            | 10.57% | 166   | 32.49%   |
| Class II  | 16          | 3.13%  | 26          | 5.09%  | 41          | 8.02%  | 50            | 9.78%  | 133   | 26.03%   |
| Class III | 56          | 10.96% | 54          | 10.57% | 35          | 6.85%  | 16            | 3.13%  | 161   | 31.51%   |
| Class IV  | 5           | 0.98%  | 11          | 2.15%  | 16          | 3.13%  | 19            | 3.72%  | 51    | 9.98%    |
| Total     | 84          | 16.44% | 124         | 24.27% | 164         | 32.09% | 139           | 27.20% | 511   | 100.00%  |

TABLE (4) The comparison of the various Kennedy's classes between all groups .

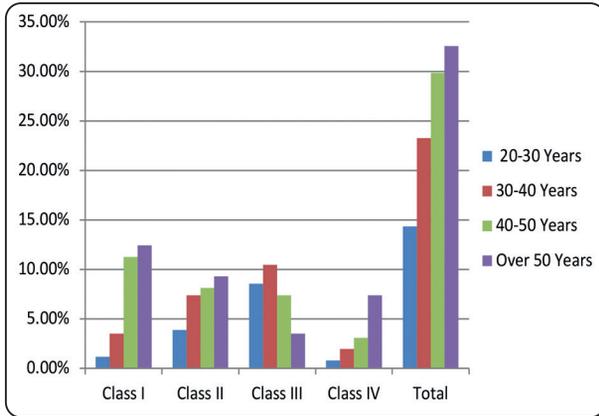|           | Max (Ahram) |        | Man (Ahram) |        | Max (Beni-Suef) |        | Man (Beni-Suef) |        | Max (Al Azhar) |        | Man(Al Azhar) |        |
|-----------|-------------|--------|-------------|--------|-----------------|--------|-----------------|--------|----------------|--------|---------------|--------|
| Class I   | 28          | 10.85% | 45          | 17.44% | 41              | 13.31% | 53              | 17.21% | 72             | 14.09% | 94            | 18.40% |
| Class II  | 32          | 12.40% | 42          | 16.28% | 36              | 11.69% | 49              | 15.91% | 56             | 10.96% | 77            | 15.07% |
| Class III | 32          | 12.40% | 45          | 17.44% | 39              | 12.66% | 54              | 17.53% | 69             | 13.50% | 92            | 18.00% |
| Class IV  | 17          | 6.59%  | 17          | 6.59%  | 16              | 5.19%  | 20              | 6.49%  | 23             | 4.50%  | 28            | 5.48%  |
| Total     | 109         | 42.25% | 149         | 57.75% | 132             | 42.86% | 176             | 57.14% | 220            | 43.05% | 291           | 56.95% |

Fig. (1) The distribution of the various Kennedy's classes at faculty of dentistry Ahram Canadian University.
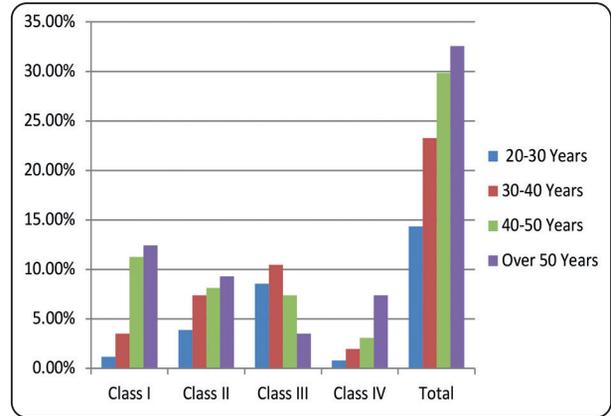


Fig. (2) The distribution of the various Kennedy's classes at faculty of dentistry Beni-Suef University .
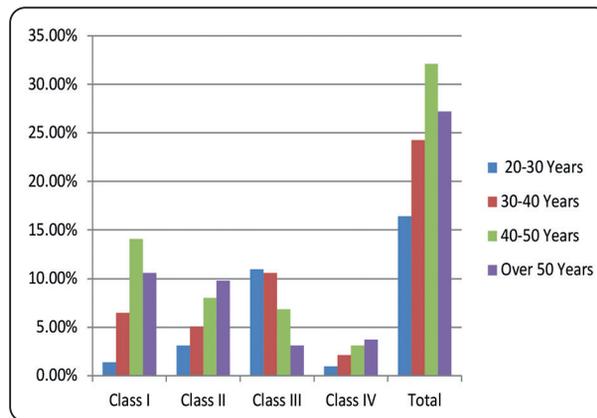


Fig. (3) The distribution of the various Kennedy's classes at faculty of dentistry Al-Azhar University Assiut.
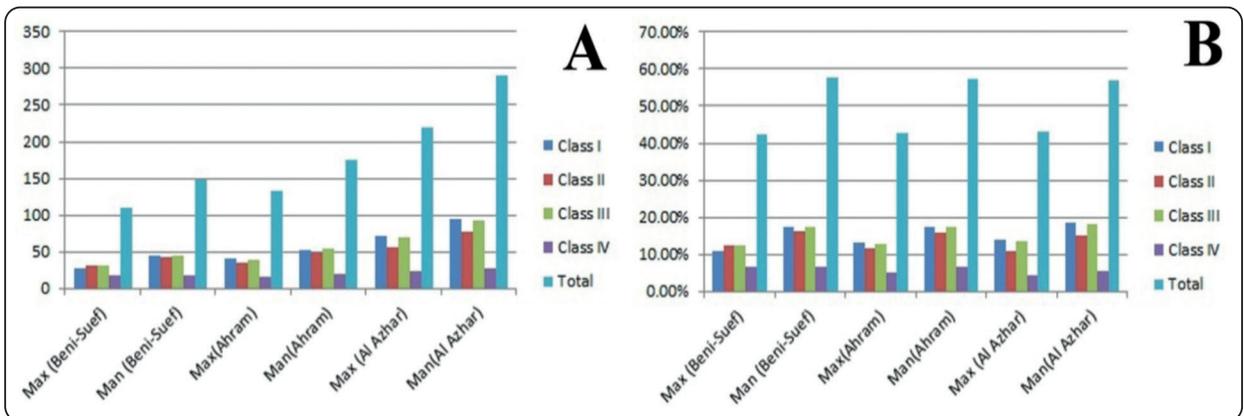


Fig. (4) The comparison of the various Kennedy's classes between all groups.

The results showed that the occurrence of Kennedy Class I partial edentulism was 30.92%, (17.83, 13.09) in the mandible and the maxilla respectively, followed by class III partial edentulism that was 30.73%, (17.73, 13.00) in the mandible and the maxilla respectively, followed by class II partial edentulism that was 27.11%, (15.60, 11.51)in the mandible and the maxilla respectively, and finally class IV partial edentulism was 11.23%, (6.04, 5.20) in the mandible and the maxilla respectively. (Table 5) (Fig.5)

Based on these results, Kennedy's Class III was the most prevalent partially edentulous pattern (11.05%, 9.56%) among the maxillary and the mandibular arch between ages (20-30 and 31-40) years respectively, Kennedy's Class I, II was the most prevalent partially edentulous pattern (12.81 %, 7.99 %) (11.33%, 9.10%) among the maxillary and the mandibular arch between ages (41-50) (over 50) years respectively. (Table 4) (Fig. 4)

Distribution of different classes in each arch class I was (17.83%, 13.09%) in the mandible and maxilla respectively, class II was (15.6%, 11.51%) in the mandible and maxilla respectively, class III was (17.73%, 13.00%) in the mandible and maxilla respectively and finally class VI was (6.04%, 5.2%) in the mandible and the maxilla respectively. (Table.5)(Fig.5)

TABLE (5) The comparison  of the various Kennedy's classes at different ages and arches .

| | 20-30 Years | | 30-40 Years | | 40-50 Years | | Over 50 Years | | Total maxilla | Total maxilla | Total mandible | Total mandible | Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Class I | 16 | 1.49% | 57 | 5.29% | 138 | 12.81% | 122 | 11.33% | 141 | 13.09% | 192 | 17.83% | 333 | 30.92% |
| Class II | 42 | 3.90% | 66 | 6.13% | 86 | 7.99% | 98 | 9.10% | 124 | 11.51% | 168 | 15.60% | 292 | 27.11% |
| Class III | 119 | 11.05% | 103 | 9.56% | 74 | 6.87% | 35 | 3.25% | 140 | 13.00% | 191 | 17.73% | 331 | 30.73% |
| Class IV | 8 | 0.74% | 25 | 2.32% | 36 | 3.34% | 52 | 4.83% | 56 | 5.20% | 65 | 6.04% | 121 | 11.23% |
| Total | 185 | 17.18% | 251 | 23.31% | 334 | 31.01% | 307 | 28.51% | 461 | 42.80% | 616 | 57.20% | 1077 | 100.00% |
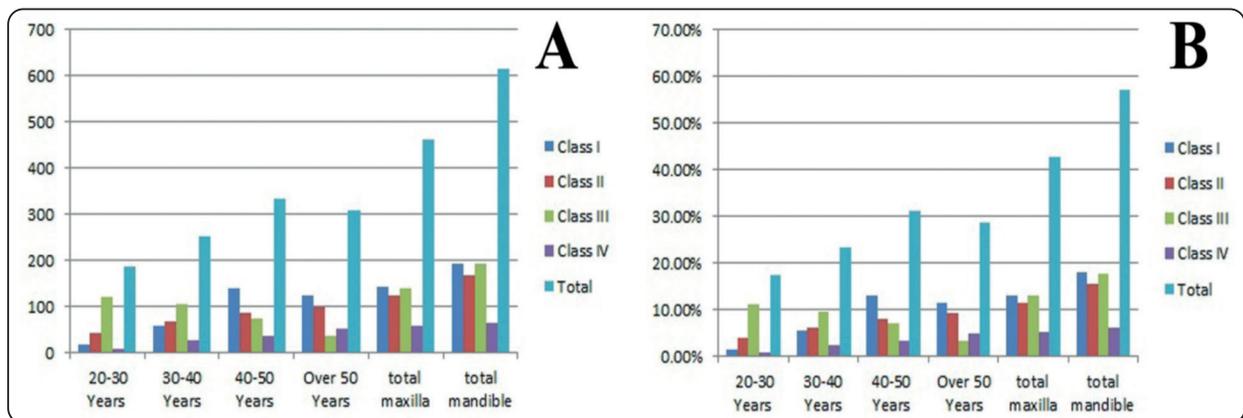


(Fig.5)The comparison of the various Kennedy's classes at different ages and arches.

## DISCUSSION

The primary goal of establishing a classification for RPDs is to make it easier to describe partially edentulous instances. The Kennedy classification was chosen for the current study because it provides a logical manner to display design difficulties and simplifies the application of basic principles of partial denture design. [12] The current study was started to evaluate the incidence and pattern of partial edentulism among patients at three different geographical areas in Egypt . The results of this study found that partial edentulism in the mandibular arch was more prevalent than partial maxillary edentulism in the study population . that matches with Curtis et al statement that the  mandibular RPD are more prevalent than maxillary one [14]

Pun et al and Curtis et al found that Kennedy Class I was the most prevalent, with a frequency of 38.4 % that matches with this study with frequency of 30.92%. [14,17] While Kennedy Class III was found to be the most prevalent pattern among Iraqis  and in Benin population in a studies done by Hatim et al and Ehikhamenor, et al respectively. [15,16].

The current study was somewhat in agreement with studies which mentioned that as people age, there is a greater inclination toward Class I and II and a lesser tendency toward Class III. In the youngest age groups, Class III is the most common class. (16,18-20)

Curtis et al.'s[14] finding that Kennedy's Class III was only prevalent in the maxillary arches, but Kennedy's Class I was the most dominant pattern in the mandibular arches while in this study all classes are prevalent in the mandibular arches.

## CONCLUSION

With increasing age, there is a rise in Classes I, II, IV Kennedy classification and a drop in Classes III. Class III was more prevalent in the younger population, but Class I was more prevalent in elder patients. Prosthodontic care is predicted to become more important as people get older.

## Limitations

Including a small duration for taking the sample, nonprobability convenience sample. This study is limited by the size and homogeneity of the sample, thus more research is needed.

## Recommendations

More research into long-term dental care outcomes and the types of prostheses needed could reveal more details regarding partially edentulous people.

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