Distribution of Extracted Teeth According to the Site, Type, Age, and Sex: A Retrospective Single-Center Study from Baghdad, Iraq

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ABSTRACT:

Background: Teeth extraction is a common therapeutic practice in dentistry. Clinics for management a variety of pathological, traumatic, or congenital conditions. The prevalence of teeth extraction is related to the dental hygiene of the participants.

Aim: This study aimed to demonstrate the distribution of the site and type of extracted teeth according to the age and sex of the participants.

Methods: This retrospective study was conducted in teaching dentistry clinics in the Al-Rafidain College University throughout 2019. The data of participants were extracted from case sheet archives of patients who attended the clinics during 2017-2019. The outcome measures extracted from these case sheets include age, gender, site, and type of the extracted tooth.

Results: A total number of 3,417 males and 2,377 females (with a ratio of 1.44:1) participated in this study. Patients aged 30-50 years constituted the highest frequency of those who attended the clinics for tooth extraction. Maxillary teeth extraction makes up 60.1% of tooth extractions in males compared to 55% in females. Females had a lower percentage (40.8%) of molar accused teeth, which is significantly different ($P=0.019$) from the rate reported in males (43.5%).

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Conclusion: The site and type of extracted tooth showed significant differences between males and females, as well as between age groups. Patients at risk of tooth loss are aged 30-50 years, and females are more vulnerable to lose their teeth at an earlier age than males.

KEYWORDS: Tooth extraction, Age, Sex, Maxillary teeth, Mandibular teeth, Type of tooth

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INTRODUCTION:

The epidemiology of teeth extraction varies from one country to another. The percentage of extracted teeth in the mandible is about two-folds of those in the mandible, and molar teeth are commonly extracted. A single-center study reported that the most common type of tooth extracted is the primary first molar, followed by the first incisor. Caries is the most common cause of extracted teeth in children aged two to 13 years, which accounted for 57.4% of participants in one study. Teeth extraction do not necessarily have to be due to the medical causes, as one study reported that 21.1% of extracted teeth are iatrogenic due to dentist-patients miscommunication and overloaded clinics. Moreover, the type of extracted teeth is related to the age of the patient. The first molar tooth is more commonly extracted in females than males before the age of 30 years, while the opposite was reported at age > 30 years. Tooth agenesis is one cause of missing teeth, often involving the mandibular second premolar tooth, and it gives a bias impression on the number of the extracted teeth. In one meta-analysis that included 4,423 participants from six studies, the data extracted showed that the average number of remaining teeth were 5.73 in the elderly age group. Poor oral hygiene, which was reported in refugees from the Middle East, is a cause of a high percentage of decay, missing, and filling teeth. The rationale of this study is the fact that Iraq is one of the Middle East countries that faced several impacts, including wars, sanctions, and issues involving security, economic, and health for over more than half a century, which reflected indirectly on the oral health and dental status of the general population. This retrospective study aimed to assess the distribution of the site and type of extracted teeth in both sexes in the teaching dentistry clinics of the Al-Rafidain College University in Baghdad, Iraq.

MATERIALS AND METHODS
Study Design and Setting

This retrospective study was carried out in the Department of Dentistry of the Al-Rafidain College University. The case sheet files of patients who attended the teaching hospital of the university from 2016 to 2019 were collected. The ethical and scientific committee approved this study (No. 4050-2019).

Participants

Eligible patients were of both sexes aged five to 80 years old. The criteria of inclusion are patients managed with tooth extraction due to either dental diseases or traumatic causes. The data extracted from the case sheet of the patients included age, sex, the site of the extracted tooth (maxillary or mandible teeth), and type of extracted teeth (incisor, canine, premolar, and molar). Data related to the causes of teeth extraction, procedures of extraction, and the socio-cultural factors and eating habits of refugees were not obtained because the variability in the records could affect the study in terms of bias.

Statistical Analysis

The results were expressed in terms of numbers, percentages, and mean ± SD. The significant difference between two independent samples was calculated using the difference between percentage test. Figures represented in form of curve-line, pie, and bar charts were done using Excel software 2010. P-value of ≤ 0.05 is considered to be significant.
RESULTS

Table 1: Distribution of patients according to the age and sex factors

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>Males (n=3417)</th>
<th>%</th>
<th>Female (n=2377)</th>
<th>%</th>
<th>p-value</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>7.7±0.5 (n=12)</td>
<td>0.35</td>
<td>0</td>
<td>0</td>
<td>&lt;0.003</td>
<td>12</td>
<td>0.21</td>
</tr>
<tr>
<td>11-20</td>
<td>17.2±2.6 (n=240)</td>
<td>7.02</td>
<td>15.3±2.7 (n=260)</td>
<td>10.93</td>
<td>&lt;0.001</td>
<td>500</td>
<td>8.63</td>
</tr>
<tr>
<td>21-30</td>
<td>25.7±3.1 (n=635)</td>
<td>18.58</td>
<td>26.3±2.7 (n=502)</td>
<td>21.11</td>
<td>0.025</td>
<td>1137</td>
<td>19.62</td>
</tr>
<tr>
<td>31-40</td>
<td>36.1±3.2 (n=843)</td>
<td>24.67</td>
<td>36.5±2.8 (n=600)</td>
<td>25.24</td>
<td>0.006</td>
<td>1443</td>
<td>24.91</td>
</tr>
<tr>
<td>41-50</td>
<td>45.5±2.9 (n=826)</td>
<td>24.17</td>
<td>46.1±3.0 (n=641)</td>
<td>26.96</td>
<td>0.028</td>
<td>1467</td>
<td>25.32</td>
</tr>
<tr>
<td>51-60</td>
<td>55.6±3.0 (n=501)</td>
<td>14.66</td>
<td>54.8±3.1 (n=286)</td>
<td>12.03</td>
<td>0.002</td>
<td>787</td>
<td>13.58</td>
</tr>
<tr>
<td>61-70</td>
<td>65.5±3.1 (n=289)</td>
<td>8.45</td>
<td>65.1±2.5 (n=68)</td>
<td>2.86</td>
<td>&lt;0.001</td>
<td>357</td>
<td>6.16</td>
</tr>
<tr>
<td>≥70</td>
<td>(74.6±1.7) (n=71)</td>
<td>2.07</td>
<td>(76.8±3.5) (n=20)</td>
<td>0.84</td>
<td>&lt;0.001</td>
<td>91</td>
<td>1.57</td>
</tr>
<tr>
<td>Total</td>
<td>3417</td>
<td>100</td>
<td>2377</td>
<td>100</td>
<td></td>
<td>5794</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 1, a total of 3,417 males and 2,377 females (with a ratio of 1.44:1) participated in this study. Majority of patients who attended the clinics were between 31 to 50 years for both sexes. The percentage of females at each group of age between 11 to 50 years was significantly higher than the corresponding percentage of males, while the percentage of males was significantly higher than that of females at the age groups between 51 to ≥70 years.
The total number of accused teeth was 5,921, with the ratio of accused teeth per participant 1.002:1 (3,425 per 3,417) for males and 1.050:1 (2,496 per 2,377) for females.

Figure 1 shows the distribution of the number of extracted teeth according to the age group. The distribution curves of males and females are approximately similar, and the higher numbers of accused teeth are observed at age groups 31 to 40 and 41 to 50 years.

**Figure 1: Distribution of the number of accused teeth according to the age group and sex factors.** Age groups: 1 (0-10), 2 (11-20), 3 (21-30), 4 (31-40), 5 (41-50), 6 (51-60), 7 (61-70), and 8 (>70)
Figure 2: Distribution of accused teeth according to the site. 1 (Lower left), 2 (Lower upper), 3 (Upper left), and 4 (Upper right)

Figure 2 shows the distribution of accused teeth according to the site. In males, the percentage of accused teeth in the maxillary teeth amounted to 60.1% (2,059 out of 3,425), which is significantly ($p<0.001$) higher than the corresponding percentage in females (55% or 1,373 out of 2,496). The percentages of accused teeth on the right site of males and females are 53.0% and 53.2%, respectively, which is not significantly different ($P=0.439$) from the corresponding percentages of the left side in both sexes.
Table 2: Distribution of accused teeth-site according to the age group

| Age group (year) | Mandible | | | Maxilla | | |
|-----------------|----------|---|---|----------|---|
|                 | Left | Right | Total | Left | Right | Total |
| -10             | 0(0) | 0(0) | 0(0) | 4(0.2) | 8(0.5) | 12(0.3) |
| 11-20           | 152(13.9) | 124(8.9) | 276(11.1) | 99(5.9) | 124(7.1) | 223(6.5) |
| 21-30           | 228(20.8) | 337(24.2) | 565(22.7) | 325(19.3) | 288(16.4) | 613(17.9) |
| 31-40           | 231(21.1) | 281(20.2) | 512(20.6) | 441(26.2) | 481(27.5) | 922(26.9) |
| 41-50           | 265(24.2) | 373(26.8) | 638(25.6) | 409(24.3) | 456(26.0) | 865(25.2) |
| 51-60           | 136(12.4) | 173(12.4) | 309(12.4) | 276(16.4) | 245(14.0) | 521(15.2) |
| 61-70           | 61(5.5) | 93(6.7) | 154(6.2) | 96(5.8) | 124(7.1) | 220(6.4) |
| >70             | 23(2.1) | 12(0.8) | 35(1.4) | 32(1.9) | 24(1.4) | 56(1.6) |
| Total           | 1096 (100) | 1393 (100) | 2489 (100) | 1682 (100) | 1750 (100) | 3432 (100) |

The results are expressed as number (percentage).

The peak percentage (25.6%) of accused mandibular teeth is at the age group of 41 to 50 years, while the corresponding percentage in the upper jaw (26.9) shifted to the age group of 31 to 40 years, as shown in Table 2.

There are no significant differences between males and females in the percentages of incisor (14.4% versus 13.3%, \( P=0.114 \)) and canine (8.2% versus 9.2%, \( P=0.088 \)) teeth extraction. The percentage of premolar extraction is significantly higher (\( P=0.013 \)) in females (36.7%) compared to the corresponding percentage in males (33.9%). Females had a lower percentage (40.8%) of molar accused teeth, which is significantly different (\( P=0.019 \)) from that reported in males (43.5%).
Figure 3: Distribution of accused teeth in respects to the types of teeth according to the age group (1:0-10, 2:11-20, 3:21-30, 4:31-40, 5:41-50, 6:51-60, 7:61-70, 8: >70).

Figure 3 shows that the highest number of accused teeth in males is the molar teeth at the age group of 31 to 40 years, while the peak number of extracted premolar teeth is at the age group of 41 to 50 years. In females, the
peak number of extracted molar teeth is at the age group of 21 to 30 years, while the peak number of extracted premolar teeth shifted to the age groups of 31 to 40 and 41 to 50 years.

DISCUSSION

The number of female patients who went to dental clinics is significantly higher than males because females generally have good knowledge of oral health compared to males. Abu-Gharbieh et al reported that females got more information from different sources about oral health than males, which explained the high number of female patients when it comes to dental care. The distribution of patients who underwent dental care services showed a reverse ratio at age >50 years. Systemic diseases that are associated with increasing age showed differences between males and females, which reflected on the number of female patients for attending these dental clinics. Pregnant women usually seek dental care more frequently compared to non-reproductive age women, which explained the significantly higher frequencies of attendance at age <40 years compared to age >50 years. The site of accused teeth also shows variability in respect to the age factor. This observation is attributed to many factors other than age, including dental caries, periodontal disease, eating disorders, and socio-cultural factors. An Arabian study attributed the social habit of eating to a higher frequency of extracted anterior mandibular teeth compared to the corresponding maxillary teeth, and most tooth loss occurred at age 55-64 years. Extraction of molar teeth had a higher number of occurrence compared to other teeth in males aged up to 40 years old and in females up to 30 years. This observation agreed with Kautto et al study who reported that the extraction of the third molar tooth typically occurred at age <30 years for women, while it occurred at age >30 years in men. Moreover, this study pointed out that cracked teeth is the most common cause of molar teeth extraction and is observed earlier in women compared with men. Therefore, this retrospective study highlights important points in the dental care, including improvement in the knowledge about oral health in both sexes, changing eating habits, and caring for the dental hygiene of patients aged 30 to 50 years. The limitations of the study included obtaining single-center data and small sample size of children compared to adults. The strength of this study is the inclusion of a higher number of participants for both sexes. In conclusion, the distribution of extracted teeth according to the site and type is influenced by two important demographic characteristics, namely age and sex. Patients at a higher risk of teeth loss are aged 30 to 50 years, and females are more vulnerable to lose their teeth at an age earlier than males.
REFERENCES


