



## Original article

# **Tooth Loss in Adults: A Survey of Reasons and Patterns in the Eastern Province of Aljabal Al-Akhder-Libya**

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### **ABSTRACT:**

**Aim:** This study aimed to investigate the reasons and patterns of tooth extraction among adults in the eastern province of Libya.

**Methods:** A cross-sectional study was carried out in three cities in Aljabal Al-Akhder in the east of Libya. A convenience sample was recruited from Libyan adult patients who underwent teeth extractions in dental practices in Albida, Goba and Derna from January 2022 to December 2022. The reasons and patterns for tooth extraction were collected using a form and it is categorized into: caries, periodontal diseases, orthodontic treatment, prosthetic treatment, impaction, trauma, and other reasons. Collected data were analyzed using SPSS software, the significance level was set at  $P$  value 0.05.

**Results:** The study included data from 1000 patients, of whom 55.7% were females, and the mean age was 28 years (SD = 13.8). The most commonly reported reason for tooth extraction was dental caries (59.2%), followed by severe periodontitis (14.1%), tooth impaction (8.2%), prosthodontics reason (4.8%), and failed RCT (4.6%). The most common tooth extracted was the first molar (27.1%), followed by the third molar (19.2%) and second molar (15.3%). The least extracted teeth, other than retained primary teeth, were canine (1.7%) and central incisors (2.5%).

**Conclusion:** Dental caries and periodontal diseases are the main causes of tooth loss among Libyan adults in Aljabal Al-Akhder. Molar teeth were the most commonly extracted teeth. Measures should be directed toward the prevention and early treatment of oral conditions to reduce teeth extractions and improve the oral health related quality of life.

**Keywords:** *Tooth extraction, tooth loss, reasons, Libya, adults.*

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### **INTRODUCTION:**

Maintaining normal and functioning dentition is integral to oral and general health and related social well-being and quality of life.<sup>1</sup> Although many countries have improved figures in maintaining natural dentition, in many places around the globe (i.e in South Asia, Eastern Europe, Southern Latin America, Oceania, and Central Sub-Saharan Africa), there still be high rates of tooth loss with profound social inequality within countries.<sup>2</sup> There is growing interest in tooth loss as an epidemiological measure of dental status; it is regarded as an essential indicator of oral health, representing the

degree of dental care in a given community.<sup>3</sup> Identifying the causes of tooth loss is a prerequisite to assessing the oral health needs in a community to inform local authorities.<sup>3</sup> Many studies have been conducted in different parts of the world and reported the leading causes of tooth loss, including the sequelae of dental caries and periodontal disease, though trauma, orthodontic treatments, and pathologic reasons are also documented.<sup>4-13</sup> Tooth loss has been associated with several sociodemographic, behavioural, or medical factors and is linked to nutritional changes, medical problems, and general well-being.<sup>14</sup> Tooth loss

could also have an adverse impact on emotions and oral health-related quality of life, even after prosthetic replacement.<sup>15</sup>

Libya has three major provinces (West, East, and South). Most Libyans people live in the coastal cities. Aljabal Al-Akhder is located in the eastern province of Libya. It lies in the north east of the country. The capital is Bayda, the total population in the region was 157,747 with 150,353 Libyans. The inhabitants of this area include both urban and rural residents.<sup>16</sup> Tooth loss is a complex outcome that reflects not only the dental disease but also the availability and accessibility of dental care services.<sup>2</sup> Understanding the current trends in tooth loss is important for planning dental services and updating the dental curriculum. Although three studies have been carried out among Libyan to investigate the reason and pattern of tooth extraction,<sup>17-19</sup> none adequately represented Aljabal Al-Akhder. There is still a relative lack of information related to this area of research among Libyans in the eastern province. Therefore, this study aimed to investigate the reasons and patterns of tooth extraction among adults in the Green Mountain eastern province of Libya.

## MATERIALS AND METHODS

### Ethical consideration:

Permission was obtained from local authorities before commencing the study and informed verbal consent was obtained from all participants. The study was conducted in accordance with the Helsinki Declaration of research ethics.

### Study design:

A Cross-sectional study was conducted over a period of 12 months (from January 2022 to December 2022). Three cities in Aljabal Al-Akhder were selected (Albida, Goba and Derna) based on their geographic location, population size and the accessibility of communication with dentists willing to participate in the study.

### Sampling:

All dental patients aged 17 years and above who extracted their teeth in one of the selected dental clinics as study sites were included. A minimum study sample of 384 was required to estimate the number of Libyan adults who extracted their teeth for dental caries at a 95% confidence level and 0.05 margin of error.

### Data collection procedure:

Each participating dentist was informed about the study's aims, the methods to collect data, and how to fill out the forms. Data were collected through clinical examination and interviews using specially designed forms based on similar studies.

The dental examination was done on the dental chair using the light, mouth mirror, and dental probe. No other diagnostic aids, such as dental X-rays, were used.

The form contains information on patient's demographic variables such as age; gender; education level; dental attendance pattern; occupation; place of birth; type of dental clinic; the tooth number, and reason for its extraction. The reasons for tooth extraction were categorized as follows: dental caries, periodontitis, trauma, impaction, orthodontic reasons, prosthodontics reasons, pathology such as a cystic lesion, failed RCT, and retained primary or supernumerary teeth.

**Data analysis:** Data were analyzed using SPSS software Version 25. Numbers and percentages were used to describe the demographics of the study sample and the reasons for tooth extraction.

## RESULTS:

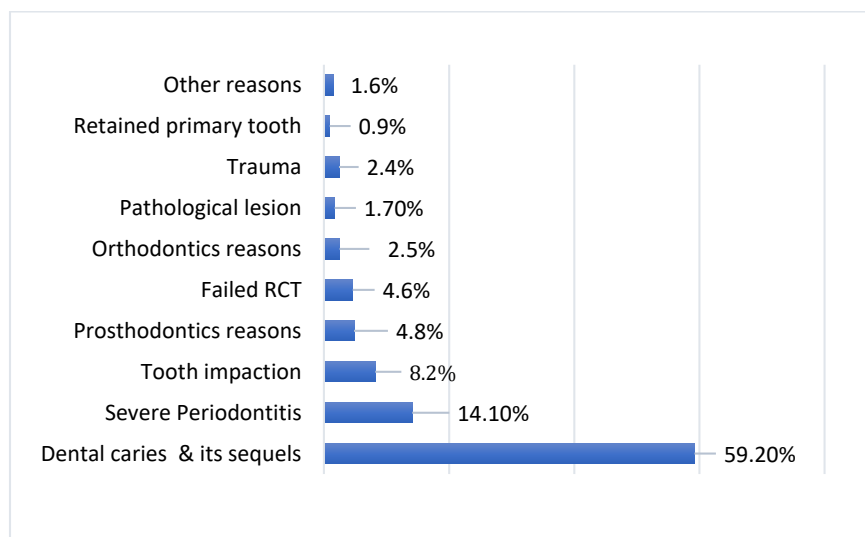
The total number of participants was 1000. The Demographic variables of the study sample are described in Table (1). It shows that more than half of the participants (557, 55.7%) were females., the age of participants ranged between 20 and 50 years with a mean of 28 years (SD = 13.8), and more than one-third (422, 42.2%) were from Albaida city. Nearly equal proportions of participants were recruited from public and private clinics (510, 51%, and 490,49%, respectively).

**Table 1:** Sociodemographic Characteristics

Variable	Mean (SD)	N	(%)
<b>Age</b>	28 (13.8)		
<b>Age Group</b>			
17-20		195	(19.5%)
21-30		221	(22.1%)
31-40		112	(11.2%)
41-50		332	(33.2%)
51-60		99	(9.9%)
≥61		41	(4.1%)
<b>Gender</b>			
Female		557	(55.7%)
Male		443	(44.3%)
<b>Dental Clinic</b>			
Public		510	(51.0%)
Private		490	(49.0%)
<b>Cities</b>			
Albaida		422	(42.2%)
Goba		247	(24.7%)
Derna		331	(33.1%)

The main reasons for tooth extraction among the study participants are depicted in Figure (1). It reveals that dental caries and its sequels is the most common

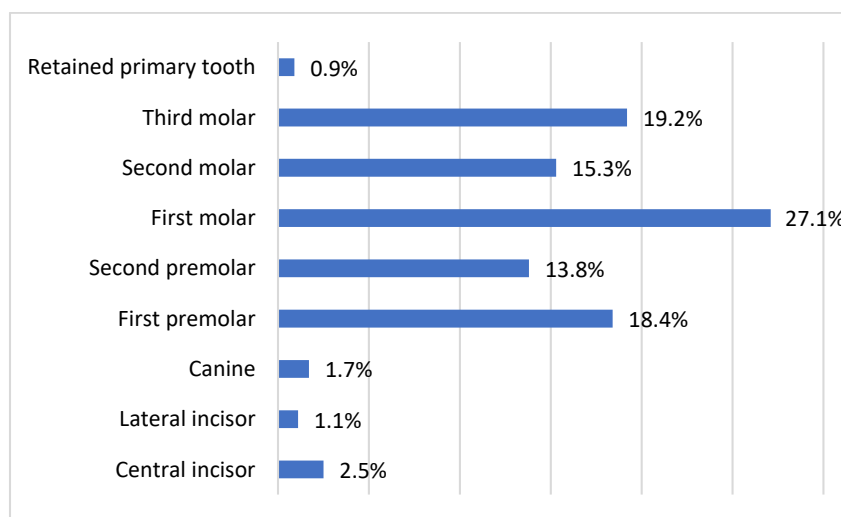
reason for tooth extraction (59.2%), followed by severe periodontitis (14.1%), tooth impaction (8.2%), prosthodontics reason (4.8%) and failed RCT (6.4%).



**Figure 1:** Distribution Based on the Reason for Tooth Extraction

Figure (2.) shows the percentage of extractions based on individual teeth. It reveals that the most common tooth extracted was the first molar (27.1%), followed

by the third molar (19.2%) and second molar (15.3%). The least extracted teeth other than retained primary teeth were canine (1.7%) and central incisors (2.5%).



**Figure 2:** Distribution Based on Individual Tooth Extraction

## DISCUSSION:

The study aimed to explore the reasons for tooth extraction among Libyan adults in the eastern province of Libya, namely Aljabal Al-Akhder. Our study demonstrated that dental caries, sequels, and severe periodontitis are the most common reasons for tooth extraction. These findings are consistent with other

studies conducted elsewhere in Libya<sup>17-19</sup> and other countries.<sup>6,8,10,11,20</sup> Moreover, caries continues to be a global public health problem and the most common oral disease with increased prevalence among the adult population.<sup>21</sup>

An alarming finding in the present study is the high extraction rate of first and second molars, which aligns with the results of the previous studies.<sup>7,22,23</sup> That might be explained by the fact that posterior teeth are more susceptible to dental caries than anterior teeth, mainly due to their morphology.<sup>24</sup> These teeth are critical for occlusion and function. Although dentists may have no choice but to extract these teeth to solve patients' problems, efforts should be made to minimize the need for extracting permanent teeth in general and molars specifically. Raising awareness of the importance of maintaining natural teeth should be included in future health education and promotion programs. In addition, free dental care for geriatric patients can be another solution to reduce the cost and need for prosthodontic treatment. Around 1 per cent of the study sample extracted teeth for prosthodontic reasons, suggesting low utilization of this service. In addition, prosthodontic services are provided in the private sector only.

The present study has some limitations which need discussion. First, the study used a cross-sectional design which can only provide a snapshot of reasons for tooth extraction with limited analysis. Second, the study data were collected by different dentists; hence, the extraction decision depends on their attitudes and clinical experience. Finally, the data was limited to the main cities, which may ignore the important rural population in the study region. However, a relatively large sample size was recruited with clinically assessed data, and the study population represented different social and geographic classes in Aljabal Al-Akhder, which lends strength to the current study.

## CONCLUSION:

This study shows that dental caries and periodontal diseases are still the major causes of tooth loss among study populations. Molar teeth were the most commonly extracted teeth. Measures should be directed toward the prevention and early treatment of oral conditions to reduce teeth extractions and improve the oral health-related quality of life.

It is of urgent need to give priority to the development and implementation of programs for oral health education and promotion.

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