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Original Article

Frequency of Dental Anomalies in Patients at Riyadh Elm University Clinics

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ABSTRACT

This study aimed to assess the prevalence of dental anomalies and to examine the patients based on various factors such as age, gender, ethnicity, anomaly presence, and type, as well as systemic conditions. In total, 385 patient records, including both Saudi and non-Saudi individuals, were reviewed using convenient sampling. Participants aged 18 years and older were included in the study. The results showed that 47.8% of the patients had normal teeth, while 52.2% showed at least one anomaly. The most common anomalies found were dilacerations (11.65%), congenitally missing teeth (24.9%), impactions (59.7%) and Other anomalies identified included ectopic eruption (1%), odontoma (5.5%), and taurodontism (2.2%). While impactions, congenitally missing teeth, and dilacerations were the most frequent anomalies, no statistically significant difference was found when comparing the data based on gender or nationality.

Keywords: Prevalence, Dental anomalies, Dental patients

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Introduction

Dental anomalies are common congenital deformities that may occur either on their own or as part of a broader syndrome [1-4]. These developmental irregularities can impact both primary and permanent teeth and can take various forms, for example, gemination, concrescence, fusion, dilaceration, enamel pearls, taurodontism, dens evaginatus (DE), or peg-shaped lateral incisors. These anomalies have clinical importance due to their effects on aesthetics, malocclusion, and their potential to increase the risk of dental caries and other oral health issues [4-6].

Dental abnormalities can be categorized into congenital, developmental, and acquired types, all of which affect the teeth and gums in distinct ways. Congenital abnormalities are present at birth and often have a genetic origin, while developmental anomalies emerge during tooth formation. Acquired abnormalities, on the other hand, occur after the teeth are fully developed [6-8]. Both genetic factors and environmental influences contribute to the development of these dental issues. Dental developmental abnormalities can range from isolated occurrences to manifestations of complex syndromes. These irregularities encompass variations in the number, eruption timing, shape, size, and of teeth. They can lead to malocclusion, heightened sensitivity, cosmetic concerns, and difficulties in dental procedures for example root canal treatments and tooth extractions [9-12].

Dental anomalies are often encountered in dental clinics, though they are less common than widespread

oral health issues like periodontal diseases and dental caries. Despite their lower prevalence, these anomalies can complicate treatment planning, as they are associated with problems such as malocclusion, aesthetic concerns, functional difficulties, and an increased risk of other oral health conditions. As a result, managing these anomalies often requires more intricate clinical attention [13-16].

A study conducted in Saudi Arabia found that 45.1% of patients displayed at least 1 dental anomaly. Among the findings, 25.7% had congenitally missing teeth, 21.1% had impacted teeth, 1.1% had dilacerated teeth, and 0.1% each had supernumerary teeth, odontomas, and taurodontism. Similarly, a study in India, involving 20,182 patients, identified 350 cases of dental anomalies. Of these, 57.43% were found in males, while 42.57% occurred in females. Common anomalies included root dilaceration,hyperdontia, peg-shaped laterals (microdontia), and hypodontia [17-19].

Several notable associations between different dental anomalies were observed in the studies [20, 21]. For instance, significant links were found between impacted teeth, supernumerary teeth and tooth transposition and odontomas, hypodontia, displacement of maxillary canines, and tooth ankylosis and impacted teeth. These correlations may point to shared underlying causes for these conditions [20-23].

Dental abnormalities can manifest as differences in tooth number, shape, exfoliation, structure, and eruption. These abnormalities often result from disruptions during the morphodifferentiation phase of tooth development, particularly in the patterns of exfoliation and eruption. Recognizing the presence of such anomalies is crucial for planning orthodontic and dental treatments of patients [20, 22, 24].

The frequency of dental anomalies has been extensively studied across different populations. Prevalence rates have varied widely, ranging from 5.46% to 74.7%, with variations influenced by factors such as ethnicity, sampling methods, and diagnostic criteria. Many studies tend to focus on specific categories or subtypes of dental anomalies. While some data exists on the prevalence of agenesis (5.5–7%) and molar incisor hypomineralization (MIH) (7.30–21.80%) in European populations, there is a lack of research specifically focused on French individuals [20, 21, 23].

This study aims to provide essential data on dental anomalies among Saudi patients. The findings will be beneficial for researchers by highlighting specific anomalies that require further investigation, ultimately aiding in their treatment and epidemiology. A better understanding of these anomalies will contribute to improved dental care and treatment planning, ensuring more effective management of such conditions in clinical settings.

One of the key hypotheses of this research is that the prevalence of dental anomalies among patients visiting Riyadh Elm University (REU) clinics is relatively low. By testing this hypothesis, the study seeks to quantify the actual occurrence of these anomalies and assess whether they significantly vary across different demographics.

The primary objectives of this study include determining the prevalence of various dental anomalies among both Saudi and non-Saudi patients. Additionally, the research aims to explore potential associations between the occurrence of dental anomalies and factors such as gender and ethnicity. Understanding these relationships will offer valuable insights into the distribution of dental anomalies and their potential genetic or environmental influences.

Materials and Methods

This study was designed to analyze dental anomalies among a sample of Saudi and non-Saudi patients. A total of 385 patient records were reviewed using a convenient sampling method. The study included only individuals aged 18 years and above, while those younger than 18 years were not included in the research. By examining a diverse patient population, the study aimed to provide a broader understanding of dental anomalies across different demographic groups. The sample size was determined based on statistical calculations, ensuring a confidence level of 95% with a population size of 2,000 individuals. A margin of error of 5% was considered, leading to the selection of 385 patient records for analysis. This sample size was deemed appropriate for obtaining reliable and representative findings regarding the prevalence of dental anomalies.

To facilitate data collection, a structured data sheet was utilized to document key patient details, including gender, age, ethnicity, and the presence of dental anomalies. The research team examined patients' panoramic radiographs (OPGs) to identify and record dental anomalies accurately. This systematic approach ensured that all relevant information was properly documented and analyzed.

For statistical analysis, the collected data were processed using SPSS software. Frequencies of different anomalies were recorded, and a chi-square test was conducted to assess potential associations between gender, ethnicity, and the prevalence of dental anomalies. A significance level of less than 0.05 was

considered for determining statistically significant relationships within the data.

Results and Discussion

Table 1. Descriptive statistics of study participants

Variables	Frequencies
Age	Mean age: 33.57 (SD = ± 13.53)
Gender	Male: 61.3%
Ethnicity	Saudi: 79%
Presence of anomaly	Yes: 47.8%
Type of anomaly	Impactions: 59.7%
	Congenitally missing: 24.9%
	Dilaceration: 11.6%
	Taurodontism: 2.1%
	Odontoma: 0.5%
	Ectopic eruption: 1%
Systemic condition	Yes: 16.7%

The statistical analysis of dental anomaly prevalence among study participants is summarized in **Table 1**. The findings indicate that the mean age of the patients was 33.57 years. In terms of gender distribution, 61.3% of the participants were male, while 38.7% were female. Regarding ethnicity, the study sample consisted of 79% Saudi individuals and 21% non-Saudis.

One of the key aspects examined in this study was the presence of dental anomalies among the participants. The results show that 47.8% of the individuals assessed exhibited at least one dental anomaly, while 52.2% had no recorded abnormalities. Among the various types of dental anomalies identified, impactions were the most prevalent, affecting 59.7% of those with anomalies. Congenitally missing teeth accounted for 24.9% of cases, followed by dilacerations, which were observed in 11.6% of affected individuals. Additionally, less common anomalies, such as ectopic eruption (1%), odontoma (0.5%), and taurodontism (2.1%), were also recorded.

Furthermore, the study explored the presence of systemic conditions among participants, revealing that 16.7% of the individuals had an underlying systemic condition, while 83.3% did not report any such ailment. These findings provide insight into the prevalence and distribution of dental anomalies within the study population, contributing to a better understanding of their occurrence concerning demographic factors.

Table 2. Comparison between genders regarding the presence and type of dental anomaly

	Male	Female	
Presence of anomaly	Yes: 48.1% No: 51.9%	Yes: 51.9% No: 48.1%	.395
Type of anomaly	Not applicable: 51.2% Congenitally missing: 12.5% Impactions: 28.8% Ectopic eruption: 0% Dilaceration: 5.6% Odontoma: 0% Taurodontism: 1.7%	Not applicable: 48.9% Congenitally missing: 12% Impactions: 30.8% Ectopic eruption: 1.3% Dilaceration: 6% Odontoma: 0.6% Taurodontism: 0%	.277

Table 2 presents a comparison of dental anomaly prevalence between male and female participants. The statistical analysis of the P-value indicates that there is no significant difference between genders regarding the presence of dental anomalies. Among those affected, 48.1% were male, while 51.9% were female.

Examining the distribution of different types of anomalies, the data shows that 51.2% of males and 48.9% of females exhibited no dental anomalies. Among the specific anomalies observed, congenitally missing teeth were recorded in 12.5% of males and 12% of females. Impactions were slightly more frequent in females, with 30.8% affected, compared to 28.8% of males.

Certain anomalies were found exclusively in female participants. Ectopic eruption and odontoma were observed in 1.3% and 0.6% of females, respectively, while no cases were reported among males. In contrast, dilaceration and taurodontism were recorded in both genders, with 5.6% of males and 6% of females presenting with dilaceration. However, taurodontism was only found in males (1.7%), with no reported cases

among female participants. These findings suggest that while the overall prevalence of dental anomalies does not differ significantly between genders, specific types of anomalies may be more common in one gender than the other.

Table 3. Comparison between ethnicities regarding the presence and type of dental anomaly

	Saudi	**Non-Saudi**	
Presence of anomaly	Yes: 49% No: 51%	Yes: 51% No: 49%	.214
Type of anomaly	Not applicable: 49.3% Congenitally missing: 12.5% Impactions: 13.5% Ectopic eruption: 0.6% Dilaceration: 5.6% Odontoma: 0.5% Taurodontism: 1.32%	Not applicable: 54.4% Congenitally missing: 7.5% Impactions: 31.6% Ectopic eruption: 0% Dilaceration: 6.3% Odontoma: 0% Taurodontism: 0%	.656

Table 3 provides a comparison of dental anomalies based on nationality, examining both the presence and types of abnormalities among Saudi and non-Saudi participants. Statistical analysis of the P-value suggests no significant difference in anomaly prevalence between the two groups. The data shows that 49% of Saudi participants exhibited dental anomalies, while 51% of non-Saudi participants were also affected.

In terms of specific anomaly types, 49.3% of Saudis and 54.4% of non-Saudis had no applicable dental disease. Among congenital anomalies, congenitally missing teeth were recorded in 12.5% of Saudi participants and 7.5% of non-Saudis. Impactions showed a more noticeable variation, with 13.5% of Saudi participants affected compared to 31.6% of non-Saudis.

Additionally, the study found that certain dental anomalies, such as ectopic eruption, odontoma, and taurodontism, were present only in Saudi participants, with prevalence rates of 0.6%, 0.5%, and 1.32%, respectively. In contrast, these anomalies were not observed among non-Saudi participants. These findings suggest that while the overall presence of dental anomalies does not significantly differ between the two groups, variations exist in the distribution of specific anomaly types.

In this study, 38.7% of the male participants were found to have dental anomalies. However, statistical analysis did not reveal any significant correlation between gender and the occurrence of dental abnormalities, except microdontia and ectopic eruption, both of which were exclusively observed in female participants. The study sample consisted of a higher proportion of female participants, both in the overall group and within specific study subgroups.

Regarding specific dental anomalies, previous research has shown mixed findings, with some studies reporting no significant gender-based differences, while others highlight notable variations. Existing literature suggests that genetic factors play a crucial role in the development of dental anomalies, despite their relatively low prevalence, which has been estimated to range from 2.4% to 4.8% [24]. A study conducted by Basdra *et al.* [25] identified a significantly higher incidence of congenital dental anomalies, reporting a prevalence of 56.6% in a sample of 267 cases. In contrast, the present study found a lower prevalence, with only 29.4% of cases exhibiting congenital anomalies [25].

Thongudomporn and Freer [26] found a notably higher prevalence of dens invaginatus (26.1%) in their patient group. However, no cases of this condition were observed in the study. The most common dental anomalies observed in our sample were impactions (59.7%), congenitally missing teeth (24.9%), and dilacerations (11.65%). These results align with the broader spectrum of dental anomalies examined in the study. In contrast, previous research has indicated that individuals of Mongoloid descent tend to have a higher frequency of dental anomalies, including ectopic eruptions and dilacerations, with an average occurrence rate of 2.2%. The prevalence of these anomalies was particularly higher in maxillary incisors than in previous reports [27, 28].

The study found that impactions were present in 59.7% of the participants, a rate consistent with other studies. For instance, a different study reported a lower impaction rate of 15.5%, which is lower than the prevalence observed in our research. Afify and Zawawi [12] found a prevalence of 21.2% for impacted teeth. In our study, canines (excluding third molars) were most frequently impacted, with a prevalence of 3.1%. This was notably lower than the findings of Fardi *et al.* [29], who mentioned an 8.8% prevalence of impacted teeth in the Greek population.

The analysis of nationality and gender comparisons in this study revealed that the P-value was greater than 0.05, suggesting that there is no strong correlation between these 2 factors. Paranaiba *et al.* [30] identified the most prevalent dental anomalies as tooth agenesis (47.5%), impacted teeth (13.1%), and microdontia (12.7%), and they observed a statistically significant link between gender and the occurrence of these anomalies.

In terms of limitations, this study was based solely on patient records from a single REU campus, which limits its generalizability. Additionally, compared to some earlier studies that involved larger sample sizes, this study's sample size was relatively small. Increasing the sample size in future studies could enhance the precision of the findings and allow for the documentation of less common anomalies.

Conclusion

In conclusion, the study identified impactions, congenitally missing teeth, and dilacerations as the most frequently occurring dental anomalies. No significant correlation was found between the anomalies and gender or nationality. To gain a more comprehensive understanding of the prevalence of other dental abnormalities, it is suggested that future research include a larger sample size.

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