

Prevalence of Dental Anomalies among Patients Who Report to the Komfo Anokye Teaching Hospital's Orthodontic Clinic

Ama Agyeibea Amuasi¹, Daniel K. Sabbah¹, Alexander Oti-Achempong², Rahman N. Mamah²

¹The Department Child Oral Health & Orthodontics, School of Medicine and Dentistry, College of Health Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

²The Department of Oral & Maxillofacial Sciences, School of Medicine and Dentistry, College of Health Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Email: amaamuasi@gmail.com

How to cite this paper: Amuasi, A.A., Sabbah, D.K., Oti-Achempong, A. and Mamah, R.N. (2024) Prevalence of Dental Anomalies among Patients Who Report to the Komfo Anokye Teaching Hospital's Orthodontic Clinic. *Open Journal of Stomatology*, 14, 103-117.

<https://doi.org/10.4236/ojst.2024.142010>

Received: August 9, 2023

Accepted: February 6, 2024

Published: February 9, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

BACKGROUND: Dental anomalies are variations from the established well-known general anatomy and morphology of the tooth as a result of disturbances during tooth formation. They can be developmental, congenital, or acquired and may be localized to a single tooth or involve systemic conditions. **AIM:** To evaluate the prevalence of dental anomalies in patients who report to the Komfo Anokye Teaching Hospital (KATH) dental clinics. **METHOD:** A descriptive cross-sectional design was used with a sample size of 92 patients aged 18 or older, obtained through convenience sampling. Data analysis was performed using SPSS version 26.0. **RESULTS:** The study included 92 patients aged 18 to 72 years, with 47.8% males and 52.2% females. Dental anomalies were observed in 51.1% of participants, with a higher prevalence in females (55.3%). The most common anomalies were diastema (48.3%), impacted teeth (22.0%), dilaceration (11.9%), and peg-shaped lateral teeth (6.8%). **CONCLUSION:** This study highlights the importance of conducting thorough dental examinations to identify and address dental anomalies, which may have implications for treatment. Early detection and correction of these anomalies are crucial to prevent future complications.

Keywords

Dental Anomalies, Prevalence, Impacted Teeth, Dilaceration

1. Background and Introduction

Dental anomalies are variations from the established anatomy and morphology

of teeth, resulting from disturbances during tooth formation (Oxford Dictionary, n.d.). These anomalies can include hypodontia, hyperdontia, peg-shaped laterals, macrodontia, and microdontia [1] [2]. The prevalence of dental anomalies in the population is approximately 5%, with 60% of these anomalies affecting the teeth, upper jaw, or face (Yamada, 1983). Geographic variations exist in the incidence and degrees of dental anomalies, suggesting the influence of hereditary and genetic [3]. Dental anomalies are less frequently encountered compared to common oral diseases like dental caries and periodontal diseases [4].

Dental anomalies can be developmental, congenital, or acquired and may be localized to a single tooth or involve systemic conditions [4]. They can have a genetic basis and be associated with recessive or multifactorial inheritance, new mutations, or stochastic events [2]. Factors such as trauma to the primary dentition or the alveolar bone, as well as nutrition, can also affect tooth development [5]. Dental anomalies tend to occur more frequently in the permanent dentition and can be correlated with gender, socioeconomic status, and body mass index [6]. Clinical and radiographic examinations are commonly used to identify dental anomalies, with traditional radiographs being useful for diagnosing shape, size, and position anomalies [6]. Cone-beam computed tomography provides better visualization of tooth position anomalies. Prevalence studies play a crucial role in understanding the occurrence of dental anomalies in specific populations [7]. The current study aims to determine the prevalence of dental anomalies among patients attending dental clinics at Komfo Anokye Teaching Hospital (KATH) in Ghana.

While dental anomalies are not commonly encountered in dental clinics, they can still have a significant impact on treatment outcomes. These anomalies, although representing a small percentage of dental complaints, are associated with malocclusion, aesthetic and functional problems, and an increased susceptibility to other oral disorders. Therefore, understanding their prevalence and etiological factors among the Ghanaian population is essential.

2. Study Objective

2.1. Main Objective

This study seeks to evaluate the prevalence of dental anomalies in patients who report to the Komfo Anokye Teaching Hospital dental clinics.

2.2. Specific Objectives

- To ascertain the prevalence of dental anomalies in the study cohort.
- To ascertain the role of gender in the prevalence of dental anomalies.
- To determine the arch distribution of dental anomalies.
- To determine regional distribution of dental anomalies.

2.3. Justification

Developmental dental anomalies encompass abnormalities in tooth size, shape,

position, and structure that arise during tooth development. These anomalies can affect arch length, arch width, and arch perimeter, leading to malocclusions and necessitating orthodontic interventions. Early identification, diagnosis, and appropriate treatment of these anomalies are crucial. Dental practitioners can benefit from understanding the prevalence of these defects to formulate effective treatment plans and address functional issues within the orofacial complex.

3. Literature Review

3.1. The Prevalence of Dental Anomalies

In a cross-sectional study conducted by Olatosi *et al.* at the Paediatric Dental Clinic in Lagos, Nigeria, dental records of 6175 children aged 0 to 16 years were reviewed [8]. The study found that 17.52% of the participants exhibited dental malformations, with hypoplasia being the most common anomaly (9.06%). Retained primary teeth accounted for 8.84% of the anomalies, while hypodontia accounted for 1.36%. The least common anomalies were dentinogenesis imperfecta and transposition. Irish reported that hyperdontia affected 3.08% of modern Sub-Saharan Africans and 0.82% of premodern individuals, with negligible regional variations [9]. Drenski conducted a study on Croatian orthodontic patients and found that 24.1% had at least one dental aberration, with hypodontia being the most common anomaly (7.5%), followed by teeth impaction (6.3%) [10]. A retrospective study by Jain *et al.* assessed the frequency and magnitude of developmental dental anomalies in a diverse population of 4000 individuals aged 10 to 40 years. Hypodontia, hyperdontia, and supernumerary teeth were the most common anomalies, with microdontia being the most common size abnormality [11]. Nzomiwu *et al.* reviewed dental records of orofacial cleft patients and found that 80.7% of the anomalies were on the left side of the face, with hypodontia accounting for 62.9% of the cases [12].

The prevalence of hypodontia, hyperdontia, and concomitant hypo-hyperdontia (CHH) were sorted among patients who visited the University of Nevada, Las Vegas (UNLV) School of Dental Medicine clinics [13]. A retrospective search was performed on the clinical notes of patients with keywords including “hypodontia,” “hyperdontia,” “supernumerary teeth,” and “congenitally absent teeth.” Panoramic radiographs from 2010 to 2018 were utilized to confirm hyperdontia, hypodontia, or CHH in patients. Out of 1101 patients identified using relevant keywords, 192 had dental anomalies. Hyperdontia was observed in 186 patients, hypodontia in 23 patients, and CHH in 3 patients. Hispanics, African Americans, Asians, Caucasians, and patients of unknown ethnicity accounted for 43.39%, 14.25%, 3.30%, 8.02%, and 31.13% of those with a dental anomaly, respectively [13]. In a study to determine the prevalence of radiographically detectable developmental dental anomalies (DDA) in a university-based pediatric dentistry clinic and see if there were any links between DDA and health, two trained and calibrated examiners reviewed retrospective data extracted from computerized dental records of a three-year pediatric patient sample [14]. A to-

tal of 1478 people were included in the study, with 69% of them being in good health. Hyperdontia, hypodontia, and microdontia were seen in 25% of the patients, with hyperdontia being the most prevalent dental anomaly [14].

A retrospective radiographic analysis was conducted in Saudi Arabia's Eastern Province to determine the prevalence of dental deformities. The study included 1,104 participants, aged 7 to 65 years, whose panoramic radiographs (OPGs) were evaluated. Developmental abnormalities such as congenitally absent teeth, impactions, ectopic eruption, supernumerary teeth, odontomas, dilacerations, taurodontism, dens in dente, gemination, and fusion were examined. The study found that 36.3% of participants had developmental abnormalities, with dilacerations (30.2%) and congenitally absent teeth (23.3%) being the most common anomalies [15]. In a study conducted in the East Indian population, 2385 patients were evaluated for developmental dental abnormalities. The most common anomaly observed was microdontia, followed by peg laterals, amelogenesis imperfecta, and dentinogenesis imperfecta. Incidences of dens, fusion, hyperdontia, hypodontia, and macrodontia were low [16]. Another study in Saudi Arabia assessed 2481 individuals seeking dental treatment at Taif University Dental Hospital. The prevalence of developmental dental abnormalities affecting shape, size, and location was found to be 15.56%, with 8.54% having multiple anomalies [17]. A study at Najran University's dental college clinic and hospital included 572 patients. The most common dental anomalies identified were transposition, impaction, hypodontia, peg-shaped laterals, and hypercementosis [18]

3.2. The Relation between Gender and Dental Anomalies

Several studies have investigated the prevalence of dental abnormalities and their association with gender. In these studies, various dental anomalies were examined, including retained primary teeth, natal/neonatal teeth, fusion/germination, hypodontia, peg-shaped lateral incisors, and others. The findings indicate that the impact of gender on the prevalence of dental abnormalities is not consistent across studies. A study done by Olatosi *et al.* found that males had a significantly higher prevalence of retained primary teeth and the cusp of Carabelli, while females had a higher prevalence of natal/neonatal teeth, fusion/germination, hypodontia, and peg-shaped lateral incisors [8]. However, Drenski reported that gender did not have a major impact on the frequency of various dental anomalies in Croatian orthodontic patients [10]. Similarly, Bukhurji and friends found no statistically significant differences in the distribution of dental malformations by gender in their retrospective study [19]. Other studies, reported varying prevalence rates of dental abnormalities among males and females but did not observe significant gender differences [15] [16] [18]. Therefore, it appears that the occurrence of dental anomalies varies among different populations, and individual variations and genetic factors may play a significant role in their development.

3.3. Dental Anomalies and Arch Distribution

Multiple studies have investigated the frequency of dental abnormalities in different populations. Olatosi conducted a cross-sectional study with 1090 individuals aged 0 to 16 years. The study revealed a prevalence of dental malformations at 17.52%, with the maxilla exhibiting the highest proportion of anomalies [8]. Tunis *et al.* conducted a study on 2897 individuals and found dental abnormalities in 36% of the participants. They observed that the upper jaw had a higher occurrence of abnormalities compared to the lower jaw [20]. Bello *et al.* examined panoramic radiographs obtained from dental clinics in Nigeria and found a prevalence rate of 1.09% for maxillary hyperdontia [21]. In their study, Gurbur *et al.* found that 68.9% of the 2203 patients examined had dental anomalies, such as rotation, dilaceration, ectopia, talon cusp, microdontia, and hyperdontia [22]. Ifesanya *et al.* discovered a notable disparity in the occurrence of tooth agenesis between the maxilla and mandible [23]. In their study, Yemitan *et al.* documented the presence of agenesis, peg-shaped, and tiny maxillary lateral incisors in orthodontic patients [24]. Hagiwara *et al.* detected the occurrence of hypodontia in Japanese high school pupils, observing a higher prevalence in specific teeth [25]. Campoy *et al.* conducted a study on supernumerary teeth and impacted canines, and observed a greater occurrence of absent third molars in the group with impacted canines [26]. These studies offer significant perspectives on the frequency and dispersion of dental anomalies among various populations.

3.4. The Effects of Dental Anomalies

Dental anomalies can greatly affect both the appearance and functionality of the teeth. In a study conducted by Fekonja *et al.*, individuals with dental anomalies were treated using orthodontic appliances, which led to a significant improvement in patient satisfaction with their look [27]. Jahanimoghadam *et al.* conducted a comprehensive analysis of existing research on dental anomalies and identified several abnormalities in tooth structure caused by developmental issues. They highlighted the importance of conducting a full evaluation and implementing interdisciplinary treatment approaches [28]. Malformations in dental structure can also result in the mistreatment and adverse psychological outcomes for young individuals. Scheffel emphasized the need of offering cosmetic dentistry procedures to enhance self-image, assurance, and overall well-being for those impacted by dental imperfections [29]. These studies emphasize the need of treating dental problems for both physical and psychological well-being.

4. Methodology

4.1. Study Area

The study was conducted at the Dental Clinics at Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana. KATH is a 1200-bed hospital located in Kumasi, which serves as a major healthcare hub accessible to individuals from various

regions in Ghana and neighboring countries. The hospital's oral health directorate comprises four departments and receives patients nationwide, making it a suitable choice for the study due to its representative population.

4.2. Study Design and Study Type

A descriptive study with a cross-sectional design was employed.

4.3. Data Collection Technique

Clinical examination was carried out using a data collection form and radiographic examination of OPGs taken from patients.

4.4. Sampling

The sampling technique used was convenience sampling. The study population comprised the patients that reported to KATH dental clinic. The sample size used for this study was 92. The sample was made up of all patients aged 18 or older. The Sample size (n) was calculated using the Cochran formula.

$$n = \frac{Z^2 pq}{e^2}$$

Z = Z value for level of confidence 95% is 1.96;

p = population proportion which is 6% or 0.06;

q = $1 - p$;

e = margin of error is 5% or 0.05.

$$n = \frac{1.96^2 \times 0.06 \times (1 - 0.06)}{0.05^2}$$
$$n = 87$$

The sample size used was 92 obtained by adding 5 to the calculated sample size to account for the margin of errors.

4.5. Inclusion Criteria

- 1) Participants must be a patient who visits the orthodontic clinic at KATH.
- 2) Participants must be aged 18 and above.
- 3) Participants must not have previously undergone orthodontic treatment to correct any dental anomaly.
- 4) Participants must consent to the study.

4.6. Exclusion Criteria

- 1) Participants with difficulty in opening their mouth.
- 2) Participants with severe dental pain.

4.7. Data Collection

Clinical examination of selected participants was carried out within the premises of the orthodontic clinic of the Oral Health Department at KATH during working hours by the researcher with assistance from his colleagues under the super-

vision of the Head of Department. A radiographic examination was carried out on the requested radiographs taken by the patient based on the presenting complaint. A case report form was employed in this process to document data. The study was conducted from March 2022 to June 2022.

4.8. Data Processing and Analysis

The statistical package for social science (SPSS) software version 26.0 was used for the processing, analysis and management of data. Data analysis involved frequency generation and percentages and results will be presented in the forms of tables, figures and quantitative statistical values.

4.9. Ethical Consideration

- Human subjects were involved in this study and as such ethical approval was obtained from the Committee on Human Research, Publications and Ethics (CHRPE) of the School of Medicine and Dentistry, Kwame Nkrumah University of Science and Technology.
- Written informed consent or assent was sought from study participants or their parents/legal guardians. All information gathered for the purpose of the study was kept strictly confidential.

5. Results

Demographics of study participants

The study comprised a total of 92 patients with an age range of 18 to 72 years. Majority of participants were within the age range of 18 - 32 years. A total of 44 (47.8%) were males and 48 (52.2%) were female patients in a ratio of 1: 1.1 (**Table 1**).

Dental anomalies observed in the study

Following the assessment of all participants and their orthopantomograms (OPGs), dental anomalies were found in at least one participant in 47 cases, accounting for 51.1% of the total (**Table 2**). The gender distribution with abnormalities consisted of 21 men (44.7%) and 26 girls (55.3%). Out of the total of 47

Table 1. Demographics of study participants.

Demographic Parameters	Variables	Frequency	Percentage (%)
Age	18 - 24	28	30.4
	25 - 34	32	34.8
	35 - 44	13	14.1
	45 - 54	12	13
	55 - 64	3	3.3
	65 - 72	4	4.4
Gender	Male	44	47.8
	Female	48	52.2

Table 2. Dental anomalies observed with gender distribution.

Dental Anomalies	Total (%)	Gender (%)	
		Male	Female
Diastema	57 (48.3)	40 (70.2)	17 (29.8)
Impacted teeth	26 (22.0)	19 (73.1)	7 (26.9)
Dilacerations	14 (11.9)	5 (35.7)	9 (64.3)
Peg-Shaped Lateral teeth	8 (6.8)	4 (50.0)	4 (50.0)
Supernumery Teeth	5 (4.2)	3 (60.0)	2 (40.0)
Rotation	5 (4.2)	5 (100)	0 (0)
Congenital missing teeth	3 (2.6)	0 (0)	3 (100)
Total	118 (100)	76	42

subjects with anomalies, 14 patients (29.8%) had several different anomalies. Specifically, 13 patients (92.9%) had two different types of defects, while 1 patient (7.1%) had three different types of anomalies. The study indicated that age did not have a significant impact on the occurrence of anomalies, whether patients had one kind or multiple types of anomalies. Among the subjects, females exhibited a higher likelihood of having many types of anomalies, with a prevalence of 57.1%, in comparison to males. A total of 118 abnormalities were recorded, as shown in **Table 2**. The most prevalent abnormality recorded among the overall anomalies was diastema, with a prevalence of 57 (48.3%). The presence of the condition was detected in both arches, with a higher prevalence observed in the maxilla. Additionally, it was discovered to be positioned more towards the front rather than the back. In terms of gender, the percentage of male patients was larger, accounting for 70.2%. Incidence of impacted teeth was observed in 26 (22.0%) of individuals, making it the second most prevalent anomaly identified. Furthermore, it was shown that male patients accounted for 73.1% of the affected teeth. Only the third molars were found to have impacted teeth, with the Mandibular third molars having the highest prevalence (53.8%) followed by the maxillary third molars (46.2%). Fourteen (11.9%) research subjects were reported to have dilacerations, which ranked as the third most frequently observed aberration. Furthermore, a significant proportion of dilacerations, specifically 64.3%, were observed in female patients. The prevalence of dilacerations was highest in mandibular third molars (42.8%), followed by maxillary first molars and mandibular second molars (28.6% each). Eight subjects (6.8%) exhibited peg-shaped lateral teeth. All of them were in the maxilla and were evenly divided among genders. Throughout the investigation, a total of 5 subjects (4.2%) with supernumerary teeth were discovered. Two instances of mesiodens were recorded, whereas parapremolar, paramolar, and distomolar were each observed once. The occurrence of rotation was observed in 4.2% of the participants, namely 5 individuals. Rotations were seen exclusively in the

mandible and were specifically related with the canines and premolars. Three subjects (2.6%) were found to have congenitally lacking teeth. Most of the instances were linked to the maxilla, with two cases involving the canine and one involving the lateral incisors. **Table 2** displays the gender distribution of dental abnormalities. The findings indicated a higher prevalence of dental malformations in males, with 76 anomalies (64.4%), compared to females, who had 42 anomalies (35.6%). The anomalies that showed nearly comparable occurrence and distribution in both genders were supernumerary tooth and peg-35 shaped lateral incisors, whereas rotation and congenitally absent teeth displayed a more gender-specific distribution.

Dental anomalies and jaw distribution

Figure 1 displays the distribution of dental abnormalities within the jaws. The maxilla had a greater incidence of dental abnormalities (56.8%) in comparison to the mandible (43.2%). Rotation, dilacerations, and impacted teeth were more common in the mandible, whereas diastema, peg-shaped lateral teeth, supernumerary teeth, and congenital missing teeth were more common in the maxilla. Notable disparities were noted between the jaws in terms of peg-shaped teeth, which were exclusively found in the upper jaw, and teeth rotations, which were exclusively seen in the lower jaw. The absence of teeth at birth was only observed in the upper jaw.

Dental anomalies and regions distribution

Figure 2 provides a concise overview of the geographical distribution of dental abnormalities. Diastemas were predominantly observed in the anterior region, whereas the premolar and molar regions exhibited comparatively lower frequencies. The presence of impactions was predominantly observed in the molar area. Only molar area exhibited dilacerations. The presence of peg lateral teeth was limited to the front region. The occurrence of supernumerary teeth

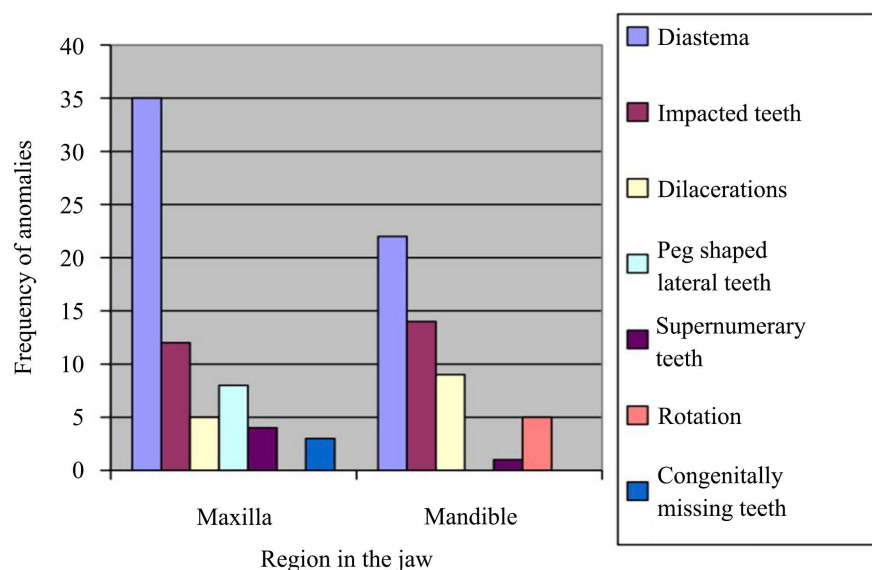


Figure 1. Frequency of dental anomalies according to jaw classification.

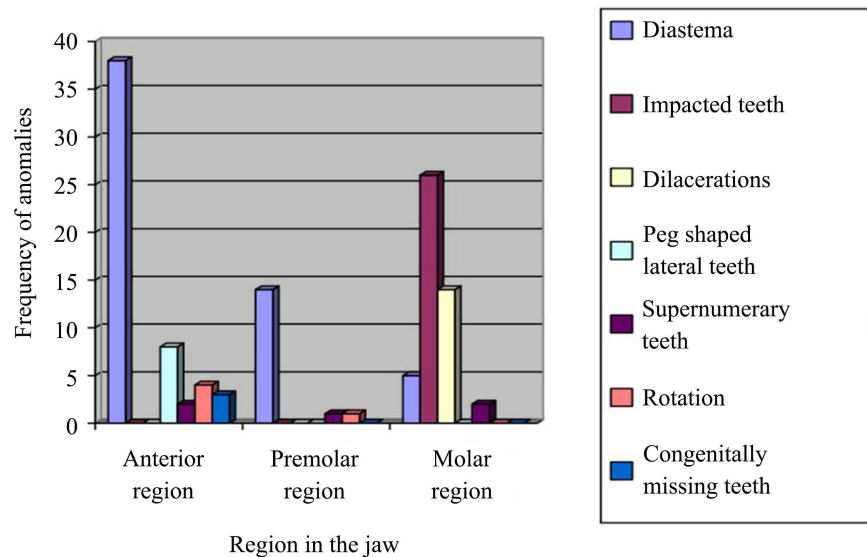


Figure 2. Distribution of dental anomalies by region.

was less common in the premolar area. Rotation was infrequent in the premolar region and completely absent in the molar region. The presence of congenitally absent teeth was limited to the anterior region. The premolar area exhibited the lowest frequency of dental abnormalities.

6. Discussion

6.1. Gender and Dental Anomalies

The percentage distribution of dental anomalies by gender showed a higher prevalence in females (55.3%) compared to males (44.7%) in this study (**Table 2**). This finding was consistent with previous studies by Al Humaid *et al.* [15], Cunha *et al.* [30], Saberi *et al.* [31] and Aren *et al.* [32]. However, Jain *et al.* [11] reported male dominance. Diastema was more prevalent in males in the current study, contrasting with the study done by Gurbuz *et al.* [22]. Dilaceration had a higher prevalence in females, unlike studies done by Drenski *et al.* [10] and Cunha [30]. Peg-shaped lateral teeth were evenly distributed by gender, in line with research by Alassiry [18] and Drenski [10], but differed from other studies. Supernumerary teeth were more prevalent in males, consistent with several studies. Congenitally missing teeth were found only in females, which aligns with other studies.

6.2. Dental Anomalies and Jaw Distribution

The current study, along with studies by Olatosi [8], Sella Tunis [20] and Bello [21], found a higher prevalence of dental anomalies in the maxilla (**Figure 1**). Diastema was predominantly observed in the maxilla and more anteriorly, consistent with the findings of Gurbuz [22] in the Turkish population. Impaction was primarily observed in third molars, similar to previous studies. Peg-shaped lateral teeth were exclusively found in the maxilla, in agreement with other stu-

dies. Mesiodens was the most common supernumerary tooth, followed by extra molars, aligning with Zhu's study [33]. Rotation was commonly associated with canines and premolars, consistent with the study done by Gupta [34].

6.3. Prevalence of Dental Anomalies

The prevalence of developmental anomalies in the present study (51.1%) was comparable to the findings of Afify [7] with 45.1%, Goncalves [35] with 56.9%, and Gurbuz [22] with 68.9%. However, other studies, including those by Drenski [10], Fekonja [27], Olatosi [8] and Al Humaid [15], reported lower prevalence rates. Differences in diagnostic criteria, sampling techniques, and study design could explain the inconsistency.

Diastema

Diastema was the most common dental anomaly in the present study with a prevalence of 48.3%. This finding aligns with the study by Gurbuz [22] where diastema was the second most common anomaly. Diastema between anterior teeth is often a reason for dissatisfaction with one's smile, as reported by Fekonja [27].

Impacted Teeth

Impacted teeth were the second most common anomaly in the current study, with a prevalence of 22.0%. This finding is consistent with studies by Patil [36], Alassiry [18], Shokri [37], Afify [7], and Dalili *et al.* (2013) that reported similar or higher prevalence rates of tooth impaction. In contrast, studies by Cunha [30], Saberi [31] and Gupta [34] reported lower prevalence rates.

Dilaceration

Dilacerations were observed in 11.9% of the participants in this study, which is consistent with the prevalence reported by Afify [7], Gurbuz [22], Cunha [30], Saberi [31]. However, the prevalence of root dilacerations in this study was lower compared to studies by Al Humaid [15], Goutham [38], and Shokri [37] where it was the most common anomaly. Differences in study settings, methods, and diagnostic criteria may account for the variation.

Peg-Shaped Lateral Teeth

Peg-shaped lateral teeth had a low prevalence of 6.8% in this study, which aligns with the findings reported in studies by Al Humaid [15], Goutham [38], Drenski [10], Bakhurji [19], Hagiwara [25] and Saberi [31] with similar low prevalence.

Supernumerary Teeth

The prevalence of supernumerary teeth in this study was found to be 4.2%, which aligns with the relatively low incidence reported in previous studies conducted by Al Humaid [15], Gurbuz [22], Campoy [26], Cunha [30], Gupta [34], Patil [36], Basalamah [39], Afify [7], and Shokri [37], where the incidence ranged from 0.3% to 6.8%. Nevertheless, Drenski [10] documented a greater prevalence rate of 21%. Supernumerary teeth can be linked to a range of circumstances, including genetic and developmental abnormalities.

Rotation

The prevalence rate of rotation in this study was determined to be 4.2%, which is significantly lower than the rates reported in previous studies conducted by Bakhurji [19], Al Humaid [15], Gurbuz [22], and Gupta [34], where the rates ranged from 10.3% to 58.4%. The disparity observed in this current study may be attributed to the reduced sample size and variations in the study conditions.

Congenitally Missing Teeth

The prevalence of congenitally missing teeth in this study was found to be 2.6%, which aligns with previous research conducted by Bakhurji [19], Saberi [31], and Goutham [38]. These studies similarly revealed low prevalence rates ranging from 1.1% to 5.4%. Nevertheless, alternative research conducted by Afify [7], Al Humaid [15], and Patil [36] have documented greater occurrence rates of congenitally absent teeth, ranging from 16.3% to 25.7%.

7. Conclusion

The study carried out at the orthodontic unit of Komfo Anokye Teaching Hospital (KATH) aimed to establish the prevalence of dental anomalies among the participants. The findings revealed a significant prevalence rate of 51.1%, with females demonstrating a higher frequency compared to males. The most often found defects were diastema, impacted teeth, dilaceration, peg-shaped lateral teeth, supernumerary teeth, rotation, and congenitally absent teeth. Dental abnormalities' prevalence might fluctuate among populations due to factors like diagnostic criteria, genetic factors, racial traits, environmental disparities, and dietary factors. The range in prevalence rates is also influenced by differences in sampling methodology, inclusion criteria, and study design.

8. Recommendations

- This study provides a baseline for the prevalence of dental anomalies in patients that report to the Komfo Anokye Teaching Hospital dental clinic and as such further similar studies should be done with a larger sample size.
- Although dental anomalies are uncommon, they should be corrected as soon as possible to avoid subsequent issues.
- Aside from presenting the abnormality, comparisons with other world populations are warranted, and additional research is encouraged. Both dental clinicians and anthropologists may benefit from these discoveries

9. Limitations

The smaller sample size used for the current study may have hampered the accurate estimation of the prevalence of dental anomalies. The current study did not consider a possible ethnic variation in the prevalence of dental anomalies. It is possible some anomalies may be more common in certain ethnic groups than others. A more uniformed OPG and other imaging techniques may be required to accurately diagnose all dentals in order to accurately determine their prevalence.

Conflicts of Interest

The authors declare no conflict of interest.

References

- [1] Sejdini, M. and Çerkezi, S. (2018) Dental Number Anomalies and Their Prevalence according to Gender and Jaw in School Children 7 to 14 Years. *Open Access Macedonian Journal of Medical Sciences*, **6**, 867-873. <https://doi.org/10.3889/oamjms.2018.174>
- [2] Klein, O.D., Oberoi, S., Huysseune, A., Hovorakova, M., Peterka, M. and Peterkova, R. (2013) Developmental Disorders of The dentition: An Update. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*, **163**, 318-332. <https://doi.org/10.1002/ajmg.c.31382>
- [3] Baydas, B., Oktay, H. and Metin Dagsuyu, I. (2005) The Effect of Heritability on Bolton Tooth-Size Discrepancy. *European Journal of Orthodontics*, **27**, 98-102. <https://doi.org/10.1093/ejo/cjh088>
- [4] Khan, M.I., Ahmed, N., Neela, P.K. and Unnisa, N. (2022) The Human Genetics of Dental Anomalies. *Global Medical Genetics*, **9**, 76-81. <https://doi.org/10.1055/s-0042-1743572>
- [5] Thesleff, I. (2006) The Genetic Basis of Tooth Development and Dental Defects. *American Journal of Medical Genetics Part A*, **140**, 2530-2535. <https://doi.org/10.1002/ajmg.a.31360>
- [6] Temilola, D.O., Folayan, M.O., Fatusi, O., Chukwumah, N.M., Onyejaka, N., Oziegbe, E., Oyedele, T., Kolawole, K.A. and Agbaje, H. (2014) The Prevalence, Pattern and Clinical Presentation of Developmental Dental Hard-Tissue Anomalies in Children with Primary and Mix Dentition from Ile-Ife, Nigeria. *BMC Oral Health*, **14**, Article No. 125. <https://doi.org/10.1186/1472-6831-14-125>
- [7] Afify, A.R. and Zawawi, K.H. (2012) The Prevalence of Dental Anomalies in the Western Region of Saudi Arabia. *International Scholarly Research Notices*, **2012**, Article ID: 837270. <https://doi.org/10.5402/2012/837270>
- [8] Olatosi, O.O., Oyapero, A., Akinwande, K.O., Ayedun, O.S., Aladenika, E.T. and Obe, O.I. (2022) Pattern and Prevalence of Dental Anomalies among a Paediatric Population in Lagos, Nigeria. *Nigerian Postgraduate Medical Journal*, **29**, 167-172. https://doi.org/10.4103/npmj.npmj_23_22
- [9] Irish, J.D. (2022) Hyperdontia across Sub-Saharan Africa: Prevalence, Patterning, and Implications. *Archives of Oral Biology*, **140**, Article ID: 105463. <https://doi.org/10.1016/j.archoralbio.2022.105463>
- [10] Drenski Balija, N., Aurer, B., Meštrović, S. and Lapter Varga, M. (2022) Prevalence of Dental Anomalies in Orthodontic Patients. *Acta stomatologica Croatica*, **56**, 61-68. <https://doi.org/10.15644/asc56/1/7>
- [11] Jain, A., Saxena, A., Jain, S., Parihar, A.P.S. and Rawat, A. (2021) Prevalence of Developmental Dental Anomalies of Number and Size in Indian Population according to Age and Gender. *International Journal of Clinical Pediatric Dentistry*, **14**, 531-536. <https://doi.org/10.5005/jp-journals-10005-1980>
- [12] Nzomiwu, C.L., Fomete, B. and Omisakin, O.O. (2021) Dental Anomalies Associated with Orofacial Cleft among a Group of Individuals in Northwestern Nigeria. *West African Journal of Medicine*, **38**, 3-7.
- [13] Eshgian, N., Al-Talib, T., Nelson, S. and Abubakr, N.H. (2021) Prevalence of Hyperdontia, Hypodontia, and Concomitant Hypo-Hyperdontia. *Journal of Dental*

- Sciences*, **16**, 713-717. <https://doi.org/10.1016/j.jds.2020.09.005>
- [14] Bakhurji, E.A., Aldossary, F., Aljarbo, J., AlMuhammadi, F., Alghamdi, M. and Nazir, M.A. (2021) Prevalence and Distribution of Nonsyndromic Dental Anomalies in Children in Eastern Saudi Arabia: A Radiographic Study. *The Scientific World Journal*, **2021**, Article ID: 9914670. <https://doi.org/10.1155/2021/9914670>
- [15] ALHumaid, J., Buholayka, M., Thapasum, A., Alhareky, M., Abdelsalam, M. and Bughsan, A. (2021) Investigating Prevalence of Dental Anomalies in Eastern Province of Saudi Arabia through Digital Orthopantomogram. *Saudi Journal of Biological Sciences*, **28**, 2900-2906. <https://doi.org/10.1016/j.sjbs.2021.02.023>
- [16] Mohan, S., Viswanath, B., Thakur, J., Tekriwal, S., Singh, A. and Jaiswal, R. (2021) Prevalence and Distribution of Selected Dental Anomalies in the Patients Reporting to Dental Institute, RIMS, Ranchi. *Journal of Pharmacy and Bioallied Sciences*, **13**, S993-S996. https://doi.org/10.4103/jpbs.jpbs_148_21
- [17] Aljuaid, T.S.S., Manjunatha, B.S., Amith, H.V., Alshehri, R.A., Alharthi, F.B. and Kariri, A.M. (2021) Prevalence and Distribution of Selected Developmental Dental Anomalies in Taif, Saudi Population. *Journal of Public Health Research*, **11**, 2132. <https://doi.org/10.4081/jphr.2021.2132>
- [18] Alassiry, A. (2020) Prevalence and Distribution of Selected Dental Anomalies in Najran City of Saudi Arabia. *Egyptian Dental Journal*, **66**, 1471-1482.
- [19] Bakhurji, E.A., Aldossary, F., Aljarbo, J., AlMuhammadi, F., Alghamdi, M. and Nazir, M.A. (2021) Prevalence and Distribution of Nonsyndromic Dental Anomalies in Children in Eastern Saudi Arabia: A Radiographic Study. *The Scientific World Journal*, **2021**, Article ID: 9914670. <https://doi.org/10.1155/2021/9914670>
- [20] Sella Tunis, T., Sarne, O., Hershkovitz, I., Finkelstein, T., Pavlidi, A.M., Shapira, Y., Davidovitch, M. and Shpack, N. (2021) Dental Anomalies' Characteristics. *Diagnostics*, **11**, Article 1161. <https://doi.org/10.3390/diagnostics11071161>
- [21] Bello, S., Olatunbosun, W., Adeoye, J., Adebayo, A. and Ikimi, N. (2019) Prevalence and Presentation of Hyperdontia in a Non-Syndromic, Mixed Nigerian Population. *Journal of Clinical and Experimental Dentistry*, **11**, e930-e936. <https://doi.org/10.4317/jced.55767>
- [22] Gürbüz, Ö., Ersen, A., Dikmen, B., Gumustas, B. and Gundogar, M. (2019) The Prevalence and Distribution of the Dental Anomalies in the Turkish Population. *Journal of the Anatomical Society of India*, **68**, 46-51.
- [23] Ifesanya, J., Temisanren, O. and Oladayo, J. (2018) A Radiographic Assessment of the Prevalence and Pattern of Dental Agenesis in a Nigerian Population. *African Journal of Oral Health*, **8**, 24-29. <https://doi.org/10.4314/ajoh.v8i1.178495>
- [24] Niazi, M., Saqib, S., Abbasi, H., Abbas, S., Ahmad, M. and Arshad, A. (2022) Dental Anomalies Seen in Adult Patients Reporting to the Orthodontic Department of Islamabad Dental Hospital. *Pakistan Orthodontic Journal*, **14**, 83-88. <https://www.poj.org.pk/index.php/poj/article/view/331>
- [25] Hagiwara, Y., Uehara, T., Narita, T., Tsutsumi, H., Nakabayashi, S. and Araki, M. (2016) Prevalence and Distribution of Anomalies of Permanent Dentition in 9584 Japanese High School Students. *Odontology*, **104**, 380-389. <https://doi.org/10.1007/s10266-015-0225-2>
- [26] Campoy, M.D., González-Allo, A., Moreira, J., Ustrell, J. and Pinho, T. (2013) Dental Anomalies in a Portuguese Population. *International Orthodontics*, **11**, 210-220. <https://doi.org/10.1016/j.ortho.2013.02.007>
- [27] Fekonja, A. (2017) Prevalence of Dental Developmental Anomalies of Permanent Teeth in Children and Their Influence on Esthetics. *Journal of Esthetic and Restor-*

- ative Dentistry*, **29**, 276-283. <https://doi.org/10.1111/jerd.12302>
- [28] Jahanimoghadam (n.d.) Dental Anomalies: An Update. <https://www.aihbonline.com/article>
- [29] Scheffel, D.L.S., Jeremias, F., Fragelli, C.M.B., dos Santos-Pinto, L.A.M., Hebling, J. and dos Hebling Jr., O.B. (2014) Esthetic Dental Anomalies as Motive for Bullying in Schoolchildren. *European Journal of Dentistry*, **8**, 124-128. <https://doi.org/10.4103/1305-7456.126266>
- [30] Cunha, M.G.M., Nicollo, R.D., Teramoto, L. and Fava, M. (2013) Prevalence of Dental Anomalies in Children Analyzed by Orthopantomography. *Brazilian Dental Science*, **16**, 28-33. <https://doi.org/10.14295/bds.2013.v16i4.925>
- [31] Saberi, E.A. and Ebrahimipour, S. (2016) Evaluation of Developmental Dental Anomalies in Digital Panoramic Radiographs in Southeast Iranian Population. *Journal of International Society of Preventive and Community Dentistry*, **6**, 291-295. <https://doi.org/10.4103/2231-0762.186804>
- [32] Aren, G., Guven, Y., Guney Tolgay, C., Ozcan, I., Bayar, O.F., Kose, T.E., Koyuncuoglu, G. and Ak, G. (2015) The Prevalence of Dental Anomalies in a Turkish Population. *Journal of Istanbul University Faculty of Dentistry*, **49**, 23-28. <https://doi.org/10.17096/jiufd.86392>
- [33] Park, S.Y., Jang, H.J., Hwang, D.S., Kim, Y.D., Shin, S.H., Kim, U.K. and Lee, J.Y. (2020) Complications Associated with Specific Characteristics of Supernumerary Teeth. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, **130**, 150-155. <https://doi.org/10.1016/j.ooolo.2020.03.002>
- [34] Gupta, S.K., Saxena, P., Jain, S. and Jain, D. (2011) Prevalence and Distribution of Selected Developmental Dental Anomalies in an Indian Population. *Journal of Oral Science*, **53**, 231-238. <https://doi.org/10.2334/josnusd.53.231>
- [35] Goncalves-Filho, A.J., Moda, L.B., Oliveira, R.P., Ribeiro, A.L.R., Pinheiro, J.J. and Alver-Junior, S.R.M. (2014) Prevalence of Dental Anomalies on Panoramic Radiographs in a Population of the State of Pará, Brazil. *Indian Journal of Dental Research*, **25**, 648-652. <https://doi.org/10.4103/0970-9290.147115>
- [36] Patil, S., Doni, B., Kaswan, S. and Rahman, F. (2013) Prevalence of Dental Anomalies in Indian Population. *Journal of Clinical and Experimental Dentistry*, **5**, e183-e186. <https://doi.org/10.4317/jced.51119>
- [37] Shokri, A., Poorolajal, J., Khajeh, S., Faramarzi, F. and Kahnemoui, H.M. (2014) Prevalence of Dental Anomalies among 7- to 35-Year-Old People in Hamadan, Iran in 2012-2013 as Observed Using Panoramic Radiographs. *Imaging Science in Dentistry*, **44**, 7-13. <https://doi.org/10.5624/isd.2014.44.1.7>
- [38] Goutham, B., Bhuyan, L., Chinnannavar, S.N., Kundu, M., Jha, K. and Behura, S.S. (2017) Prevalence of Dental Anomalies in Odisha Population: A Panoramic Radiographic Study. *The Journal of Contemporary Dental Practice*, **18**, 549-553. <https://doi.org/10.5005/jp-journals-10024-2082>
- [39] Basalamah, M. and Baroudi, K. (2016) Prevalence of Oro-Dental Anomalies among Schoolchildren in Sana'a City, Yemen. *Eastern Mediterranean Health Journal*, **22**, 34-39. <https://doi.org/10.26719/2016.22.1.34>