The Saudi Dental Journal 36 (2024) 751–755

Contents lists available at ScienceDirect

The Saudi Dental Journal

journal homepage: www.ksu.edu.sa
www.sciencedirect.com

Original Article

Pediatric oral pathology in Saudi Arabia: A 10-year retrospective study at an academic dental hospital

Nada O. Binmadi *, Hebah AlDehlawi

Department of Oral Diagnostic Sciences, King Abdulaziz University Faculty of Dentistry, Jeddah, Saudi Arabia

ARTICLE INFO

Keywords:
Oral lesions
Pediatric
Oral and maxillofacial pathology
Saudi Arabia

ABSTRACT

Introduction: Pediatric oral pathology encompasses a wide range of diseases and conditions affecting the oral cavity in children. In this study we conducted an analysis on a dataset from one academic center in Saudi Arabia to investigate the prevalence of various oral lesions in pediatric patients.
Methods: To conduct this study we analyzed oral pathology reports of pediatric patients (age range: 0–18 years) who underwent biopsies at our institution's oral pathology laboratory between January 2012 and December 2022. The data we collected included demographic information and diagnostic findings. Statistical analysis was performed to determine the prevalence rates of and associations between different variables.
Results: The study analyzed a total of 183 pediatric cases with oral pathologies. The most common conditions observed were mucocele (12 %), periapical granuloma (7.7 %), dentigerous cyst (6.6 %), and radicular cyst (6.6 %). Some conditions showed variations in prevalence based on age and gender. For example, mucoceles were more prevalent among patients who were 6–12 years of age and female.
Conclusion: This retrospective study provides valuable insights into the prevalence and demographic characteristics of pediatric oral pathologies. By understanding the prevalence of conditions in this population and recognizing differences in distribution compared with those cited in other studies, we highlighted the importance of considering regional and demographic influences. Further prospective studies are needed to investigate factors that may contribute to these variations.

1. Introduction

Oral pathologies in children have consistently been important concerns, and early diagnosis and management have always been the goals of enhanced medical care for them (Taweevisit et al., 2018; Aly et al., 2022). The differences in rates of diagnosis of lesions in children and the general population are due to changes in the nature of tissues as children grow and develop. A wide range of illnesses fall under the umbrella of oral and maxillofacial pathologies, some of which, like geographic tongue, herpes labialis, and aphthous ulceration, can be identified solely by their clinical manifestations. However, for lesions such as leukoplakia, exophytic growths, and bone lesions, an incisional or excisional biopsy is required to make a conclusive diagnosis of the pathologies (Huang et al., 2019).

The primary concerns of dental professionals who treat children are the treatment of caries and the effects of trauma to deciduous teeth; they far overshadow other oral cavity pathologies observed in children (Shulman, 2005; Yáñez et al., 2016; Hong et al., 2019). Oral lesions (OLs) among children are not as unusual or few in number as many clinicians believe. In children, the prevalence of OLs ranges from 4.1 % to 69.5 %. There is a scarcity of epidemiologic study data and knowledge about OLs in relation to minors' genders and ages (Hong et al., 2019; Bessa et al., 2004). This disparity varies by geographic origin, growth period in children, and various methods employed in the research (Yáñez et al., 2016; Hong et al., 2019; Owczarek-Drabińska et al., 2022).

Retrospective studies of oral biopsy specimens in children have been reported from America (Shulman, 2005; Yáñez et al., 2016), Egypt (Aly et al., 2022), Australia (Huang et al., 2019), Asia (Thailand, Taiwan, and China) (Chen et al., 1998; Taweevisit et al., 2018; Yao et al., 2022), Africa (Lawoyin, 2000), and Jordan (Al-Khateeb et al., 2003). Only a few studies focusing on epidemiologic data in Saudi Arabia have reported the frequency of oral and maxillofacial pathologies in adolescents and pediatric patients (Andreasen et al., 1986; Al Yamani et al., 2011). These studies differed in terms of age grouping, race, and data collection period (Andreasen et al., 1986; Lawoyin, 2000; Shulman, 2005; Salian & Shetty, 2019; Aly et al., 2022; Yao et al., 2022).

* Corresponding author at: Oral Diagnostic Sciences Department, King Abdulaziz University Faculty of Dentistry, P.O. Box 80209, Jeddah 21589, Saudi Arabia.
E-mail address: nmadi@kau.edu.sa (N.O. Binmadi).

https://doi.org/10.1016/j.sdentj.2024.03.004
Received 17 October 2023; Received in revised form 31 January 2024; Accepted 5 March 2024
Available online 6 March 2024

The most common oral soft tissue pathologies encountered in pediatric patients vary from one geographic region to another. A study in Saudi Arabia reported that reactive lesions, such as pyogenic granulomas and fibromas, are the most common, followed by mucus extravasation phenomena in salivary gland pathologies (Qannam, 2015). Similarly, in Thailand, reactive lesions were more common than tumors, tumor-like pathologies, or dental cysts (Taweevisit et al., 2018). According to a study conducted in Australia, mucoceles were the most common, followed by dentigerous cysts, hemangiomas, and pyogenic granulomas (Huang et al., 2019). However, in India, it was found that the most frequent pathology was cysts, followed by reactive lesions, non-odontogenic tumors, odontogenic tumors, and fibro-osseous lesions (Salian & Shetty, 2019). A study done in Poland reported one unusual finding: the most common OLs were aphthous ulcers and mucoceles, but the third most common lesion differed between genders. Morsicatio buccarum was the third most common pathology in boys but the least common in girls; where papilloma was the third most common lesion (Jones & Franklin, 2006). Malignancies were rare among biopsies, and the few cases reported included non-Hodgkin lymphoma, rhabdomyosarcoma, and squamous cell carcinoma (Qannam, 2015).

The most common site for oral mucosal lesions in young children reported in various studies was the lip, followed by the tongue, gingiva, buccal mucosa, jaw, palate, floor of mouth, salivary gland, and lymph nodes (Qannam, 2015; Taweevisit et al., 2018; Huang et al., 2019; Owczarek-Drabińska et al., 2022). One notable difference was that in the Saudi population, the gingiva was the most common site compared with other regions of the oral cavity (Qannam, 2015). The mandible was by far the most common site for dental pathologies, and the lower lip for salivary gland pathologies. Males were more severely affected than females. Cystic lesions, on the other hand, were more common in females than other types of lesions (Hong et al., 2019; Huang et al., 2019; Salian & Shetty, 2019; Owczarek-Drabińska et al., 2022; Yao et al., 2022). One anticipated factor was that patients with a lower socioeconomic status had a higher prevalence of OLs. School-aged children had more histopathology specimens reported than preschoolers (Yao et al., 2022).

The study's goal was to assess the prevalence of OLs in pediatric patients ranging in age from 0 to 18 years, diagnosed by biopsy in the oral pathology department in one academic center in Saudi Arabia, and to look into any possible relationship between the presence of the different types of OLs and the demographic data.

2. Methods

A retrospective study was carried out in the oral pathology central laboratory, King Abdulaziz University Faculty of Dentistry and University Dental Hospital, Jeddah, Saudi Arabia, on patients 18 years of age or younger over a 10-year period (January 2012 to December 2022). Each patient's diagnosis, age, gender, and site of lesion were extracted from the laboratory's files and tabulated in Microsoft Excel for the descriptive analysis. The diagnosis was limited to the 11 diagnostic groups of dental pathologies, reactive lesions, benign neoplasms, infectious diseases, odontogenic cysts, odontogenic tumors/hamartomas, bone pathologies, salivary gland pathologies, normal tissue, malignant neoplasms, and miscellaneous pathologies (Jones & Franklin, 2006, Prosdócimo et al., 2018). The study participants were categorized into three different age groups: 0–6 years, >6–12 years, and >12 years (Taweevisit et al., 2018).

The data were digitized, processed, and categorized in tables using the software Statistical Package for Social Sciences (SPSS, Windows version 24) and Microsoft Office Excel (Windows version 2021). The statistical analysis used descriptive statistics for absolute and percentage frequencies for the categorical variables and for numerical variables. The statistical significance was set at a p-value of less than 0.05. The Ethics Committee of the Institution approved this study (protocol number:103-05-23).

3. Results

Out of the 1523 reported cases, a total of 183 different lesion diagnoses were made in the in the study participants aged between 0 and 18 years. These included benign neoplasms such as benign spindle cell tumors, myofibromas, and lymphangiomas, each of which accounted for 0.6 % of the total diagnoses. Bone pathologies such as benign fibro-osseous lesions, cemento-ossifying fibromas, and central giant cell granulomas were found, with central giant cell granulomas being slightly more common at 1.1 %. The most common pathologic category was odontogenic cysts at 28.4 %. Dental pathologies were more diverse (15.3 %), with periapical granulomas being the most common at 7.7 % of the total diagnoses. The main infectious disease found was squamous papilloma (2.7 %). Both of the diagnosed malignant neoplasms, chondroblastic osteosarcoma and rhabdomyosarcoma, were unique, each at 0.6 % of the total diagnoses. Miscellaneous pathologies varied widely, but chronic inflammation was the most common at 3.8 %. Odontogenic cysts were quite prevalent, with dentigerous cysts and radicular cysts both accounting for 6.6 % of the total diagnoses. In the odontogenic tumors/hamartomas category, odontoma was the most common at 4.4 %, followed by ameloblastoma at 3.8 %. Reactive lesions were diverse (13.1 %), with pyogenic granuloma being the most prevalent (4.9 %). The most common diagnosis for all lesions was primary mucocele (salivary gland pathology) at 12 %. Normal tissue was found in 1.6 % of the total diagnoses **(**Table 1**)**.

In our study, the most common location of lesions was the mandible, with a comparable distribution between males (46.2 %) and females (44.6 %; p =.829). The maxilla was the next most prevalent location, with lesions observed in 16.5 % of males and 18.5 % of females (p =.722). Lower lip lesions were more commonly found in females (16.3 %) than in males (11 %; p =.295), while the buccal mucosa had more frequent occurrences in males (6.6 %) compared with females (2.2 %; p =.169). The presence of lesions in multiple locations was more common in males (4.4 %) than in females (1.1 %; p =.211). For the remaining locations, including the tongue, gingiva, vestibule, skin, retromolar area, floor of the mouth, hard palate, upper lip, and submandibular region, the distribution was relatively comparable between both genders, with no significant differences (p >.05), as shown in Table 2 and Fig. 1.

The mandible was the most common location across all age groups (42.9 % for 0–6 years, 42.9 % for >6–12 years, and 48.2 % for older than 12; p =.77). Lower lip lesions were more common in younger age groups (21.4 % for 0–6 years and 19 % for >6–12 years) compared with the oldest group of > 12 years and above (7.1 %; p =.03). Maxillary lesions increased with age (14.3 %, 11.9 %, and 23.5 %, respectively, in the three groups; p =.13). As for the locations of the lesions, the buccal mucosa, multiple locations, tongue, and gingiva were more common in the >6–12 years age group (p =.25, 0.19, 0.26, 0.11, respectively, in the three groups). Lesions of the retromolar area, skin, vestibule, floor of mouth, upper lip, hard palate, and submandibular area showed no significant age group differences. Notably, submandibular lesions only appeared in the youngest group (7.1 %; p =.08), as shown in Table 3.

The most common type in both genders was odontogenic cysts, with a prevalence of 34.1 % in males and 26.1 % in females (p =.24). Other common types included reactive lesions and dental pathologies in both genders, with rates of 13.3 % and 12.1 %, respectively, in males and 13 % and 18.5 %, respectively, in females (p =.98 for reactive lesions, p =.23 for dental pathologies). Notably, salivary gland pathologies were significantly more common in females than males (18.5 % vs. 5.6 %; p =.007). The occurrence of benign neoplasms, odontogenic tumors/hamartomas, miscellaneous pathologies, bone pathologies, infectious diseases, normal tissue, and malignant neoplasms showed no significant gender differences (p =.121, 0.43, 0.31, 1.00, 1.00, 0.62, and 1.00, respectively) **(**Table 4**)**.

The most common type across all groups was odontogenic cysts (21.4 % in children 0–6 years, 27.4 % in children >6–12 years, and 34.1 % in

Table 1
Distribution of clinical diagnoses and types of lesions.

Type of lesion	Diagnosis	Total (n = 183)
Benign neoplasms (n = 3, 1.6 %)	Benign spindle cell tumor	1 (0.6 %)
	Myofibroma (infantile myofibromatosis)	1 (0.6 %)
	Lymphangioma	1 (0.6 %)
Bone pathologies (n = 7, 3.8 %)	Benign fibro-osseous lesion	1 (0.6 %)
	Cemento-ossifying fibroma	1 (0.6 %)
	Central giant cell granuloma	2 (1.1 %)
	Cherubism	1 (0.6 %)
	Fibrous dysplasia with chronic osteomyelitis	1 (0.6 %)
	Ossifying fasciitis	1 (0.6 %)
Dental pathologies (n = 28, 15.3 %)	Connective tissue with tooth fragments	1 (0.6 %)
	Hyperplastic dental follicle	6 (3.3 %)
	Disrupted root structure	1 (0.6 %)
	Enamel hypoplasia	1 (0.6 %)
	Periapical abscess with granulation tissue	2 (1.1 %)
	Periapical granuloma	14 (7.7 %)
	Pulp calcification	1 (0.6 %)
	Pulp polyp	2 (1.1 %)
Infectious diseases (n = 6, 3.3 %)	Actinomycosis	1 (0.6 %)
	Squamous papilloma	5 (2.7 %)
Malignant neoplasms (n = 2, 1.1 %)	Chondroblastic osteosarcoma	1 (0.6 %)
	Rhabdomyosarcoma	1 (0.6 %)
Miscellaneous pathologies (n = 18, 9.8 %)	Abscess with giant cell reaction	1 (0.6 %)
	Chronic inflammation	7 (3.8 %)
	Connective tissue fragments with cholesterol granuloma	1 (0.6 %)
	Connective tissue with follicular epithelium	1 (0.6 %)
	Epithelial erosion with mild chronic inflammation	1 (0.6 %)
	Active periodontal lesion	1 (0.6 %)
	Granulation tissue and hemorrhage	1 (0.6 %)
	Granulation tissue and chronic inflammation	1 (0.6 %)
	Insufficient specimen	1 (0.6 %)
	Orocutaneous fistula	1 (0.6 %)
	Pericoronitis	1 (0.6 %)
	Scar tissue	1 (0.6 %)
Odontogenic cysts (n = 52, 28.4 %)	Calcifying odontogenic cyst	1 (0.6 %)
	Dentigerous cyst	12 (6.6 %)
	Eruption cyst	1 (0.6 %)
	Inflamed dentigerous cyst	10 (5.5 %)
	Inflamed odontogenic cyst	11(6.0 %)
	Odontogenic keratocyst	5 (2.7 %)
	Radicular cyst	12 (6.6 %)
Odontogenic tumors/ hamartomas (n = 18, 9.8 %)	Ameloblastoma	7 (3.8 %)
	Central odontogenic fibroma	2 (1.1 %)
	Odontoma	8 (4.4 %)
	Odontogenic myxoma	1 (0.6 %)
Reactive lesions (n = 24, 13.1 %)	Bone trabeculae with reactive woven bone/inflamed fibrous tissue	1 (0.6 %)
	Chronic osteomyelitis	1 (0.6 %)
	Fibrous hyperplasia	2 (1.1 %)
	Giant cell fibroma	1 (0.6 %)
	Gum pulp	1 (0.6 %)
	Irritational fibroma	4 (2.2 %)
	Peripheral giant cell granuloma	1 (0.6 %)
	Peripheral ossifying fibroma	3 (1.6 %)
	Pyogenic granuloma	9 (4.9 %)
	Arteriovenous malformation and hyperplastic (reactive) lymph node	1 (0.6 %)
Salivary gland pathology (n = 22, 12 %)	Mucocele	22 (12.0 %)
Normal tissue (n = 3, 1.6 %)	Normal tissue	3 (1.6 %)

Table 2
Distribution of lesion locations by gender.

Location of lesion	Male (n = 91)	Female (n = 92)	Total (n = 183)	*p*-value
Buccal mucosa	6 (6.6 %)	2 (2.2 %)	8 (4.4 %)	0.169
Multiple locations	4 (4.4 %)	1 (1.1 %)	5 (2.7 %)	0.211
Mandible	42 (46.2 %)	41 (44.6 %)	83 (45.4 %)	0.829
Maxilla	15 (16.5 %)	17 (18.5 %)	32 (17.5 %)	0.722
Vestibule	2 (2.2 %)	1 (1.1 %)	3 (1.6 %)	0.621
Lower lip	10 (11.0 %)	15 (16.3 %)	25 (13.7 %)	0.295
Skin	2 (2.2 %)	1 (1.1 %)	3 (1.6 %)	0.621
Retromolar area	2 (2.2 %)	0 (0.0 %)	2 (1.1 %)	0.246
Tongue	3 (3.3 %)	3 (3.3 %)	6 (3.3 %)	1.00
Floor of mouth	0 (0.0 %)	3 (3.3 %)	3 (1.6 %)	0.246
Upper lip	0 (0.0 %)	1 (1.1 %)	1 (0.5 %)	1.00
Gingiva	2 (2.2 %)	6 (6.5 %)	8 (4.4 %)	0.278
Hard palate	2 (2.2 %)	0 (0.0 %)	2 (1.1 %)	0.246
Submandibular region	0 (0.0 %)	1 (1.1 %)	1 (0.5 %)	1.00

children >12 years and over; p =.53). Dental pathologies and reactive lesions were also common in all groups (p =.06 and 0.84, respectively). Notably, salivary gland pathologies were significantly more common in the >6–12 years age group (19 %; p =.026). Similarly, bone pathologies were significantly more prevalent in the 0–6 years age group (21.4 %; p =.023). Benign neoplasms were only observed in the younger age groups (14.3 % in the 0–6 years group and 1.2 % in the >6–12 years group; p =.008). The occurrence of odontogenic tumors/hamartomas, miscellaneous pathologies, infectious diseases, normal tissue, and malignant neoplasms showed no significant age group differences (p =.92, 0.69, 0.26, 0.41, and 0.36, respectively) (Table 5**).**

4. Discussion

In this study conducted in Saudi Arabia, the aim was to determine the prevalence of OLs in pediatric patients aged 0–18 years, diagnosed by oral and maxillofacial pathology consultants at the oral pathology laboratory. The findings revealed a total of 183 different lesion diagnoses. Variations in sample size, study design, and geographic location may cause differences in prevalence. In this investigation, the most frequent finding—odontogenic cysts—accounted for 28.4 % of all diagnoses. This was in line with a prior study that found odontogenic cysts to be highly prevalent in pediatric populations (Salian & Shetty, 2019). Dental pathologies had a diverse range of diagnoses, with periapical granuloma being the most common at 7.7 % of the total diagnoses. This finding was consistent with a previous study that identified periapical granulomas as a common dental pathology in pediatric patients (Jones & Franklin, 2006). Differences in prevalence might be attributed to varying dental health practices and access to dental care among countries. In our study, mucocele was the most frequently diagnosed entity (12 % of all lesions). This was consistent with other research that identified mucocele as the most often diagnosed OL in pediatric patients (Prosdócimo et al., 2018; Taweevisit et al., 2018; Huang et al., 2019). Bone pathologies were also observed in our study, with benign fibro-osseous lesions, cemento-ossifying fibromas, and central giant cell granulomas being the most notable. With 1.1 % of all diagnoses, central giant cell granulomas were slightly more common. These findings were in line with studies examining bone diseases in pediatric patients (Puri et al., 2007; Aly et al., 2022).

Regardless of age or gender, the mandible was found to be the most common location in this study. This finding was consistent with previous studies conducted in different countries (Salian & Shetty, 2019; Aly et al., 2022). The high prevalence of mandibular lesions may be attributed to the higher density of bone in this area, making it more susceptible to various pathologies. Lower lip lesions were shown to be more common in younger age groups, with the oldest group having the lowest prevalence. This discrepancy may be explained by age-related

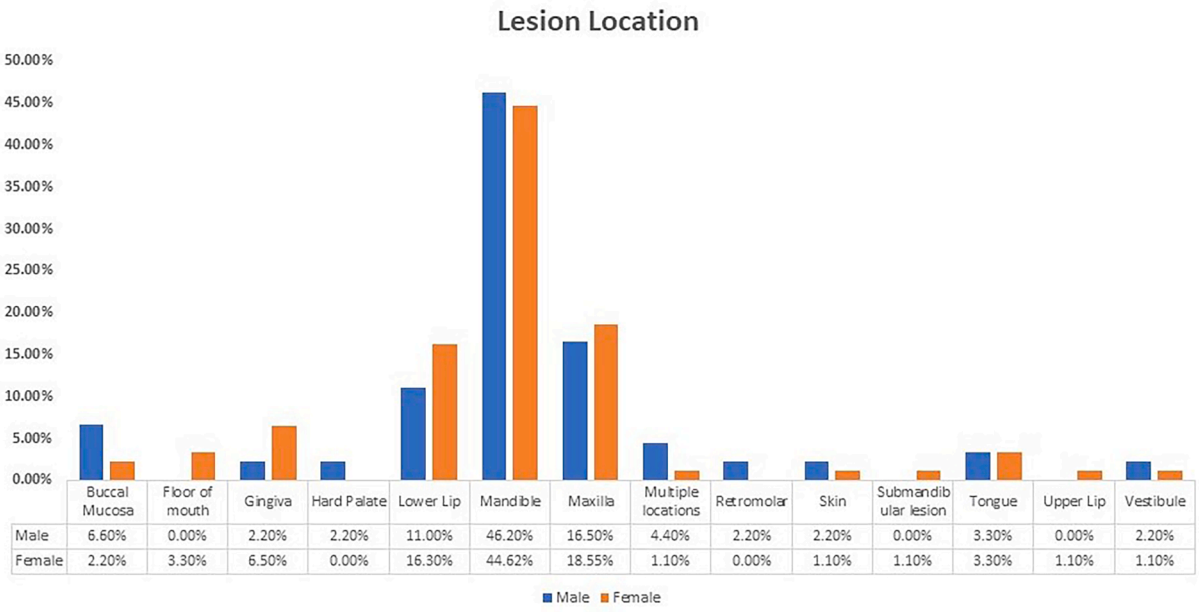

Fig. 1. The distribution of lesion locations according to the patient's gender.

Table 3
Distribution of lesion locations by age group.

Location of lesion	0–6 years (n = 14)	>6–12 years (n = 84)	>12 years (n = 85)	Total (n = 183)	*p*-value
Buccal mucosa	0 (0.0%)	6 (7.1%)	2 (2.4%)	8 (4.4%)	0.25
Multiple locations	1 (7.1%)	3 (3.6%)	1 (1.2%)	5 (2.7%)	0.19
Mandible	6 (42.9%)	36 (42.9%)	41 (48.2%)	83 (45.4%)	0.77
Maxilla	2 (14.3%)	10 (11.9%)	20 (23.5%)	32 (17.5%)	0.13
Vestibule	0 (0.0%)	2 (2.4%)	1 (1.2%)	3 (1.6%)	0.70
Lower lip	3 (21.4%)	16 (19.0%)	6 (7.1%)	25 (13.7%)	0.03
Skin	0 (0.0%)	1 (1.2%)	2 (2.4%)	3 (1.6%)	1.00
Retromolar area	0 (0.0%)	0 (0.0%)	2 (2.4%)	2 (1.1%)	0.57
Tongue	0 (0.0%)	5 (6.0%)	1 (1.2%)	6 (3.3%)	0.26
Floor of mouth	0 (0.0%)	3 (3.6%)	0 (0.0%)	3 (1.6%)	0.21
Upper lip	0 (0.0%)	0 (0.0%)	1 (1.2%)	1 (0.5%)	1.00
Gingiva	1 (7.1%)	1 (1.2%)	6 (7.1%)	8 (4.4%)	0.11
Hard palate	0 (0.0%)	1 (1.2%)	1 (1.2%)	2 (1.1%)	1.00
Submandibular region	1 (7.1%)	0 (0.0%)	0 (0.0%)	1 (0.5%)	0.08

Table 4
Distribution of lesion types by gender.

Lesion Type	Male (n = 91)	Female (n = 92)	Total (n = 183)	*p*-value
Reactive lesions	12 (13.3 %)	12 (13.0 %)	24 (13.1 %)	0.98
Dental pathology	11 (12.1 %)	17 (18.5 %)	28 (15.3 %)	0.23
Odontogenic cysts	31 (34.1 %)	24 (26.1 %)	55 (30.1 %)	0.24
Salivary gland pathology	5 (5.65 %)	17 (18.5 %)	22 (12.2 %)	**0.007**
Benign neoplasms	3 (3.3 %)	0 (0.0 %)	3 (1.6 %)	0.121
Odontogenic tumors/ hamartomas	10 (11.1 %)	7 (7.6 %)	17 (9.3 %)	0.43
Miscellaneous pathologies	11 (12.2 %)	7 (7.6 %)	18 (9.8 %)	0.31
Bone pathologies	4 (4.4 %)	4 (4.3 %)	8 (4.4 %)	1.00
Infectious diseases	3 (3.3 %)	3 (3.3 %)	6 (3.3 %)	1.00
Normal tissue	2 (2.2 %)	1 (1.1 %)	3 (1.6 %)	0.62
Malignant neoplasms	1 (1.1 %)	1 (1.1 %)	2 (1.1 %)	1.00

Bold font indicates statistical significance.

behaviors, such as younger children's higher rates of lip-biting and trauma (Huang et al., 2019). On the other hand, maxillary lesions became more common as the age increased. This may be related to the eruption and growth of permanent teeth in the maxillary region, which may raise the risk of diseases and lesions in this region (Akay et al., 2015). Regarding the other specific locations of lesions, the buccal mucosa, multiple locations, tongue, and gingiva were more common locations in the >6–12 years age group. This finding could be explained by the increased exposure of these areas to potential irritants, such as tobacco, certain foods, or oral hygiene practices, and as children become older they could develop diverse habits.

This study had several limitations. Its reliance on biopsy-diagnosed cases raises the possibility of a selection bias. The small sample size, the limited stratification of the age range, and the fact that the study was conducted in a single center could affect the generalizability of the findings. This study utilized a cross-sectional design over a certain time. A longitudinal study that followed patients over time would offer great insights into the progression of pediatric oral lesions. Additionally, to obtain a broader perspective on demographic differences, it is recommended to conduct a multicenter study involving various regions in Saudi Arabia. This approach will allow for a more comprehensive understanding of the population. Despite these limitations, this study provides valuable insights into the prevalence and distribution of OLs in pediatric patients in Saudi Arabia. Overall, this study's results have clinical and practical implications that can contribute to better diagnoses, efforts for treatment planning, public health initiatives, patient education, and future research directions in the field of pediatric oral health.

5. Conclusion

This study provides valuable insights into the prevalence and relationship of OLs in pediatric patients in Saudi Arabia. The findings demonstrate variations in the distribution of OL types compared with other studies, emphasizing the importance of considering regional and demographic influences. To explore the underlying factors contributing to these differences, further research is required.

Table 5
Distribution of lesion types by age group.

Lesion Type	0–6 years (n = 17)	>6–12 years (n = 79)	>12 years (n = 85)	Total (n = 181)	*p*-value
Reactive lesions	2 (14.3 %)	10 (11.9 %)	12 (14.1 %)	24 (13.1 %)	0.84
Dental pathologies	0 (0.0 %)	10 (11.9 %)	18 (21.2 %)	28 (15.3 %)	0.06
Odontogenic cysts	3 (21.4 %)	23 (27.4 %)	29 (34.1 %)	55 (30.1 %)	0.53
Salivary gland pathologies	1 (7.1 %)	16 (19.0 %)	5 (5.9 %)	22 (12.2 %)	**0.026**
Benign neoplasms	2 (14.3 %)	1 (1.2 %)	0 (0.0 %)	3 (1.6 %)	**0.008**
Odontogenic tumors/ hamartomas	1 (7.1 %)	7 (8.3 %)	9 (10.6 %)	17 (9.3 %)	0.92
Miscellaneous pathologies	2 (14.3 %)	7 (8.3 %)	9 (10.6 %)	18 (9.8 %)	0.69
Bone pathologies	3 (21.4 %)	3 (3.6 %)	2 (2.4 %)	8 (4.4 %)	**0.023**
Infectious diseases	0 (0.0 %)	5 (6.0 %)	1 (1.2 %)	6 (3.3 %)	0.26
Normal tissue	1 (7.1 %)	1 (1.2 %)	1 (1.2 %)	3 (1.6 %)	0.41
Malignant neoplasms	0 (0.0 %)	2 (2.4 %)	0 (0.0 %)	2 (1.1 %)	0.36

Bold font indicates statistical significance.

6. Declarations

Ethical approval and consent to participate: Ethical approval was issued by the Research Ethics Committee of King Abdulaziz University, Faculty of Dentistry ethics (Protocol No. 103–05-23).

Availability of data materials: Data generated or analyzed during this study are available upon request from the corresponding author.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Nada O. Binmadi: Conceptualization, Validation, Formal analysis, Writing – original draft, Writing – review & editing, Resources, Supervision, Project administration. **Hebah AlDehlawi:** Conceptualization, Methodology, Investigation, Data curation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Akay, M.C., Zeytinoğlu, M., Simşek, B., et al., 2015. Multidisciplinary management of benign jaw tumors in children: a textbook of advanced oral and maxillofacial surgery. M. H. Motamedi, London. IntechOpen. 2, 273–304.

Al Yamani, A.O., Al Sebaei, M.O., Bassyoni, L.J., et al., 2011. Variation of pediatric and adolescent head and neck pathology in the city of Jeddah: a retrospective analysis over 10 years. Saudi Dental J. 23, 197–200. https://doi.org/10.1016/j.sdentj.2011.09.002.

Al-Khateeb, T., Al-Hadi Hamasha, A., Almasri, N.M., 2003. Oral and maxillofacial tumours in north Jordanian children and adolescents: a retrospective analysis over 10 years. Int. J. Oral Maxillofac. Surg. 32, 78–83. https://doi.org/10.1054/ijom.2002.0309.

Aly, M.M., Abdul-Aziz, M.A.M., Elchaghaby, M.A., 2022. A retrospective analysis of oral and maxillofacial pathological lesions in a group of Egyptian children over 21 years. BMC Oral Health 22, 2. https://doi.org/10.1186/s12903-021-02037-6.

Andreasen, J.O., Pindborg, J.J., Hjörting-Hansen, E., et al., 1986. Oral health care: More than caries and periodontal disease: a survey of epidemiological studies on oral disease. Int. Dent. J. 36, 207–214.

Bessa, C.F., Santos, P.J., Aguiar, M.C., do Carmo, M.A., 2004. Prevalence of oral mucosal alterations in children from 0 to 12 years old. J. Oral Pathol. Med. 33 (1), 17–22.

Chen, Y.K., Lin, L.M., Huang, H.C., et al., 1998. A retrospective study of oral and maxillofacial biopsy lesions in a pediatric population from southern Taiwan. Pediatr. Dent. 20, 404–410.

Hong, C.H.L., Dean, D.R., Hull, K., et al., 2019. World Workshop on Oral Medicine VII: relative frequency of oral mucosal lesions in children, a scoping review. Oral Dis. 25 (Suppl 1), 193–203. https://doi.org/10.1111/odi.13112.

Huang, G., Moore, L., Logan, R.M., et al., 2019. Retrospective analysis of South Australian pediatric oral and maxillofacial pathology over a 16-year period. J. Invest. Clin. Dent. 10, e12410.

Jones, A.V., Franklin, C.D., 2006. An analysis of oral and maxillofacial pathology found in children over a 30-year period. Int. J. Paediat. Dent. 16, 19–30. https://doi.org/10.1111/j.1365-263X.2006.00683.x.

Lawoyin, J.O., 2000. Paediatric oral surgical pathology service in an African population group: a 10 year review. Odonto-Stomatol. Trop. (Trop. Dental J.). 23, 27–30.

Owczarek-Drabińska, J.E., Nowak, P., Zimoląg-Dydak, M., et al., 2022. The prevalence of oral mucosa lesions in pediatric patients. Int. J. Environ. Res. Public Health 19. https://doi.org/10.3390/ijerph191811277.

Prosdócimo, M.L., Agostini, M., Romañach, M.J., et al., 2018. A retrospective analysis of oral and maxillofacial pathology in a pediatric population from Rio de Janeiro-Brazil over a 75-year period. Med. Oral Patol. Oral y Cirugia Bucal. 23, e511–e517. https://doi.org/10.4317/medoral.22428.

Puri, A., Agarwal, M.G., Shah, M., et al., 2007. Giant cell tumor of bone in children and adolescents. J. Pediatr. Orthop. 27, 635–639. https://doi.org/10.1097/BPO.0b013e3181425629.

Qannam, A., 2015. The pattern of diagnosis of oral soft tissue biopsies in Saudi Arabian children and adolescents. J. Pakistan Dental Assoc. 24, 93–99.

Salian, V., Shetty, P., 2019. Clinicopathologic trends in pediatric oral biopsies: a 10-year institutional archival study. Int. J. Appl. Basic Med. Tes. 9, 44–48. https://doi.org/10.4103/ijabmr.IJABMR_253_18.

Shulman, J.D., 2005. Prevalence of oral mucosal lesions in children and youths in the USA. Int. J. Paediatr. Dent. 15, 89–97. https://doi.org/10.1111/j.1365-263X.2005.00632.x.

Taweevisit, M., Tantidolthanes, W., Keelawat, S., et al., 2018. Paediatric oral pathology in Thailand: A 15-year retrospective review from a medical teaching hospital. Int. Dent. J. 68, 227–234. https://doi.org/10.1111/idj.12380.

Yáñez, M., Escobar, E., Oviedo, C., et al., 2016. Prevalence of oral mucosal lesions in children. Int. J. Odontostomatol. 10, 463–468. https://doi.org/10.4067/S0718-381X2016000300013.

Yao, H., Song, Q., Zhang, Q., et al., 2022. Prevalence of oral mucosal lesions in children in Xiangyun of Yunnan, China: a cross-sectional study. Ital. J. Pediatr. 48, 15. https://doi.org/10.1186/s13052-022-01209-6.