

# Pattern of Tooth Extraction and Use of Space Maintainers in Paediatric Dental Patients in Lagos State University Teaching Hospital, Ikeja

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## Abstract

The primary dentition is essential in the maintenance of normal occlusion in the permanent dentition. Both dentitions enhance aesthetic, speech and are functional in nature. Early loss of the primary dentition necessitates the placement of space maintainers. This study determined the pattern of tooth extraction of patients attending the paediatric dental clinic in Lagos State University Teaching Hospital, Ikeja and the use of space maintainers. A retrospective study carried out using the dental records of patients who attended the Paediatric dental clinic, Lagos State University Teaching Hospital, Ikeja, Lagos. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 20 (IBM, New York). The prevalence of tooth extraction was 49.8% among a population of 410 subjects with a total of 353 extracted teeth. The male to female ratio was 1:1.37. Majority (58.3%) of the subjects had only one tooth extracted. The commonest reason for extraction was retained primary teeth (35.8%). The commonest arch and segment of extraction was the mandible (56.1%) and the anterior teeth (51.0%). The commonest tooth extracted was upper right primary central incisor (7.6%). The most common space maintainer was band and loop. Retained teeth was the most common reason for tooth extraction followed by sequelae of dental caries, caries and trauma. This highlights the need for implementation of oral health prevention policies with regards to the use of fluoride, fissure sealants, silver diamine fluoride increased awareness of safety protocols to mitigate traumatic injuries and introduction of dental health education programs in schools and community.

**Keywords:** Tooth loss, Space maintainers, Reasons for extraction, Tooth mortality, Retained teeth.

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## INTRODUCTION

Tooth mortality in children affects both primary and permanent dentitions. The primary teeth, however, are essential in the maintenance of normal occlusion in the permanent dentition (Esan TA *et al.*, 2009; Setia V *et al.*, 2013). They serve as a template for the eruption of the permanent teeth, maintain esthetics and aid normal speech development. Hence, it is important to ensure these teeth are preserved and healthy in the oral cavity for as long as possible (Esan TA *et al.*, 2009; Olatosi OO *et al.*, 2012). As transition from the primary dentition to permanent dentition occur, children lose their teeth to effect this change

through a process of normal tooth exfoliation (Setia V *et al.*, 2013; Olatosi OO *et al.*, 2012). This phenomenon is physiologic and doesn't raise concern among dentist, parents and stakeholders, however, other causes of tooth loss aside this is of much concern (Olatosi OO *et al.*, 2012; Ashiwaju M *et al.*, 2011). The premature loss of primary teeth can lead to aesthetic and function problems characterised by delayed eruption, drifting, tilting or malpositioning of the permanent teeth which can affect the child psychologically (Esan TA *et al.*, 2009; Onyejaka NK *et al.*, 2021; Samuel SS *et al.*, 2018).

The pattern and reasons for dental extraction varies among different populations based on geographic and racial factors (Esan TA *et al.*, 2009; Mukhopadhyay S *et al.*, 2015). This could partly be attributed to differences in age of the population studied, socioeconomic status, water fluoridation, genetic factors, cultural beliefs, the patient's attitude, and the availability of preventive dental care (Mukhopadhyay S *et al.*, 2015). Several studies have reported that the reasons for tooth extraction in adult population was dental caries, periodontal disease, trauma, orthodontic reasons, neoplasm, cyst (Taiwo AO *et al.*, 2017; Sharif RA *et al.*, 2020; Saheed BD *et al.*, 2013) while in the paediatric population, dental caries and its sequelae, trauma, retained primary teeth have been reported as the common reasons for tooth extraction (Ashiwaju M *et al.*, 2011; Onyejaka NK *et al.*, 2021; Mukhopadhyay S *et al.*, 2015; Taiwo OA *et al.*, 2014; Salim NA *et al.*, 2022).

The preservation of primary dentition till its normal time of exfoliation is one of the most important factor involved in preventive and interceptive dentistry (Dhull KS *et al.*, 2014) because it serves as the best space maintainer for permanent dentition (Setia V *et al.*, 2013). When early loss of primary teeth in children occurs, it is necessary to put preventive measures in place due to the space issues and resulting malocclusion in the permanent dentition that could occur. This led to the concept of space maintainers. A space maintainer is a device used to maintain the space created by the loss of primary tooth or teeth till the eruption of their successors (Albati M *et al.*, 2018). An ideal space maintainer should maintain the entire mesio-distal width of the space created due to early loss of the primary teeth while permitting normal growth of the developing permanent teeth (Varghese NS *et al.*, 2023).

An understanding of the prevalence, pattern and reasons for tooth extraction in a population is of utmost importance for effective implementation of dental care and public health interventions that will influence oral health practices. There have been various studies on the pattern of tooth extraction in paediatric patients in various teaching hospitals in Nigeria (Olatosi OO *et al.*, 2012; Chukwumah N *et al.*, 2014; Eigbobo JO *et al.*, 2014). However, there is none among paediatric dental patients seen in Lagos State University Teaching Hospital, Ikeja.

## METHODOLOGY

### Ethical Clearance

Approval was obtained from the Health Research and Ethics committee of the Lagos State University Teaching Hospital, Ikeja, Lagos with the protocol number LREC/06/10/1927 on 13th September, 2022.

### Study design and population

This was a retrospective study carried out using the dental records of patients who attended the Paediatric dental clinic, Lagos State University Teaching Hospital, Ikeja from January 2018 to May 2022. The Paediatric Dental Unit caters for the oral health needs of all children between ages 0 – 16 years and special needs.

### Inclusion criteria

Dental records of patients who visited the paediatric dental unit with history of tooth extraction within the study time frame.

### Exclusion criteria

Dental records of patients with no history of tooth extraction or with incomplete information with respect to age, gender and details of the tooth extracted.

### Sampling Technique

A non-probability sampling technique was used. A convenience sampling of all patients who visited the paediatric dental unit during the frame were included in the study.

### Data collection

Demographic data, reason for extraction, tooth extracted, arch location were collected from patients' records. The reasons for extraction were categorized according to a modification of the criteria used by two studies (Ashiwaju M *et al.*, 2011; Al-Assadi AH, 2018) into.

- Dental caries - untreated deep carious lesions with unrestorable tooth structure without any symptoms
- Sequelae of caries – symptomatic carious teeth with or without periapical problems like radiolucency, abscess and draining fistula or pathological mobility.
- Trauma - extraction as a result of acute traumatic cause.
- Discolouration – a non- carious tooth with a colour change e.g hypoplasia, pulp necrosis
- Retained primary tooth - primary tooth with erupted succedaneous tooth present in the arch
- Mobile tooth - there is any mobility of the primary tooth associated with pain and/or discomfort during eating.
- Natal tooth - natal and neonatal teeth.

### Statistical analysis

Statistical analysis was done using IBM SPSS software (version 20.0; IBM Corporation, Armonk, NY, USA). Continuous data were presented as means with standard deviation, whereas categorical variables were presented as frequencies and percentages. Descriptive statistics and Chi-square analysis were conducted, and the level of significance was set at 5%.

## RESULTS

A total of 410 subjects were included in this study - 199 (48.5%) males and 211 (51.5%) females, aged 0 – 16 years with a mean age of  $7.3 \pm 3.37$  years. The prevalence of subjects that had extractions was 49.8% (204 subjects) with a total of 353 extracted teeth. The male to female ratio was 1:1.37 (Table 1). The commonest reason for extraction was retained teeth 73 (35.8%) closely followed by sequelae of dental caries 72 (35.3%) (Table 1).

Majority of those who had extraction were aged 7 – 9 years followed by age 4 – 6 years and only one subject was less than 1 year old. This was statistically significant (Table 1). Majority of the subjects 119 (58.3%) had only one tooth extracted followed by 49 (24.0%) subjects who had two teeth extracted (Table 2). The commonest arch was the

mandible (56.1%). The commonest arch segment was the anterior (51.0%) (Table 3).

Majority of the extracted teeth were primary teeth 309 (87.5%) with 44 (12.5%) permanent teeth (Table 3). The commonest extracted primary tooth was upper right central incisor (27) closely followed by the upper left central incisor (24) (Table 3). In the permanent dentition, the lower left first molar (13) was the most frequently extracted tooth, followed by the lower right first molar (11) (Table 3).

Majority (78.6%) of the subjects aged 1 – 3 years had extraction of the primary maxillary incisors while majority (53.6%) of those aged 7 – 9 years had extraction of the primary molars (Table 4). Majority (82.5%) of the retained primary teeth involved the incisors and canines (Table 5). The most common space maintainer was band and loop (Figure 1).

**Table 1: Age and gender distribution of the subjects according to reasons for extraction**

Reasons	Dental caries	Sequelae of caries	Trauma	Discoloration	Retained Tooth	Mobile Tooth	Natal Tooth	Total
<b>Gender</b>								
Male	10	25	12	1	32	5	1	86
Female	19	47	6	2	41	3	-	118
<b>Total</b>	29	72	18	3	73	8	1	204
<b>Age in years</b>								
<1	0	0	0	0	0	0	1	1
1 – 3	3	5	7	1	1	0	0	17
4 – 6	5	15	4	0	28	3	0	55
7 – 9	16	29	2	1	24	3	0	75
10 – 12	4	17	4	0	15	2	0	42
13 – 16	1	6	1	1	5	0	0	14
<b>Total</b>	29 (14.2%)	72 (35.3%)	18 (8.8%)	3 (1.5%)	73 (35.8%)	8 (3.9%)	1 (0.5%)	204 (100%)
P value					0.000			
$\chi^2$					0.00			

\*Fisher’s Exact

**Table 2: Distribution of subjects by number of extracted teeth**

Number of extracted teeth (n)	1	2	3	4	5	6	Total
Number of subjects (n)	119	49	12	21	2	1	204
Percentage (%)	58.3	24.0	5.9	10.3	1.0	0.5	100.0

**Table 3: Distribution of extracted teeth according to tooth type and arch**

ARCH/TOOTH	A	B	C	D	E	1	2	4	6	TOTAL (%)
UPPER RIGHT	27	8	8	16	15	5	1	1	4	85
UPPER LEFT	24	8	6	7	17	2	0	0	6	70
LOWER RIGHT	23	17	8	26	22	0	0	0	11	107
LOWER LEFT	14	20	8	20	15	0	1	0	13	91
TOTAL (%)	88	53	30	69	69	7	2	1	34	353 (100%)
	309 (87.5%)					44 (12.5%)				

**Table 4: Distribution of extracted teeth according to tooth type and age of subjects**

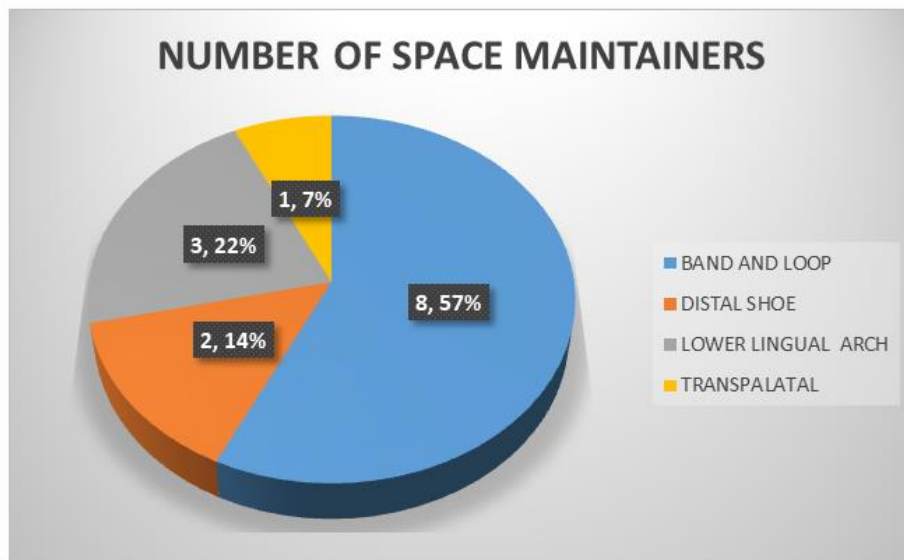
TOOTH TYPE/AGE	<1	1 – 3	4 – 6	7 – 9	10 – 12	13 – 15	Total
UPPER RIGHT	A	-	6	12	7	2	27
	B	-	4	1	3	-	8
	C	-	-	-	4	2	8

TOOTH TYPE/AGE	<1	1 – 3	4 – 6	7 – 9	10 – 12	13 – 15	Total	
	D	-	1	4	10	1	-	16
	E	-	1	4	6	4	-	15
	1	-	-	-	2	2	1	5
	2	-	-	-	-	1	-	1
	4	-	-	-	-	-	1	1
	6	-	-	-	-	1	3	4
<b>UPPER LEFT</b>	A	-	9	7	5	3	-	24
	B	-	3	2	3	-	-	8
	C	-	-	-	2	2	2	6
	D	-	-	3	3	-	1	7
	E	-	-	3	7	7	-	17
	1	-	-	-	-	2	-	2
	6	-	-	-	-	3	3	6
<b>LOWER RIGHT</b>	A	1	-	16	5	1	-	23
	B	-	-	8	8	1	-	17
	C	-	-	4	2	2	-	8
	D	-	3	5	13	4	1	26
	E	-	-	3	12	5	2	22
	6	-	-	-	3	5	3	11
	<b>LOWER LEFT</b>	A	-	-	11	3	-	-
B		-	-	9	6	5	-	20
C		-	-	3	1	4	-	8
D		-	1	6	9	3	1	20
E		-	-	5	7	2	1	15
2		-	-	-	-	1	-	1
6		-	-	-	4	6	3	13
<b>Total</b>		1	28	106	125	69	24	353

**Table 5: Distribution of extracted teeth according to tooth type and reason for extraction**

TOOTH TYPE/REASON	Dental caries	Sequelae of caries	Trauma	Discoloration	Retained Tooth	Mobile Tooth	Natal Tooth	Total	
<b>UPPER RIGHT</b>	A	3	4	7	-	12	1	-	27
	B	4	-	1	1	2	-	-	8
	C	3	1	-	-	3	1	-	8
	D	3	8	-	1	3	1	-	16
	E	6	7	-	-	2	-	-	15
	1	-	-	4	-	-	1	-	5
	2	-	-	1	-	-	-	-	1
	4	-	1	-	-	-	-	-	1
<b>UPPER LEFT</b>	6	-	3	-	1	-	-	-	4
	A	3	-	8	-	13	-	-	24
	B	4	-	1	-	3	-	-	8
	C	1	1	-	-	3	1	-	6
	D	2	2	-	-	2	1	-	7
	E	5	8	-	-	4	-	-	17
	1	-	-	2	-	-	-	-	2
<b>LOWER RIGHT</b>	6	-	5	-	1	-	-	-	6
	A	-	1	-	-	19	2	1	23
	B	-	-	-	-	17	-	-	17
	C	-	1	-	-	7	-	-	8
	D	7	14	-	-	4	1	-	26
	E	4	12	-	-	6	-	-	22
<b>LOWER LEFT</b>	6	2	9	-	-	-	-	-	11
	A	-	-	-	-	12	2	-	14
	B	-	-	-	-	20	-	-	20
	C	-	-	-	-	7	1	-	8
D	4	11	-	-	3	2	-	20	

	<b>E</b>	5	9	-	-	1	-	-	15
	<b>2</b>	-	-	1	-	-	-	-	1
	<b>6</b>	2	11	-	-	-	-	-	13
<b>Total</b>		58	108	25	4	143	14	1	353



**Figure 1: Distribution of space maintainers used by the subjects**

## DISCUSSION

Tooth mortality provides valuable information about the oral health status of an individual as well as the utilization of dental care in a population or community (Samuel SS *et al.*, 2018; Chukwumah N *et al.*, 2014; Bani M *et al.*, 2015). The main aim of providing dental care for a child is to preserve primary or permanent teeth, ensure the development of normal occlusal relationship, aid in speech development and effective mastication as well as provide a better quality of life.

There are several reported reasons for tooth extraction in children, they include dental caries, trauma, orthodontic reasons, over-retention of primary teeth (Samuel SS *et al.*, 2018). These reasons vary according to the cultural and socio - economic status of different populations (Esan TA *et al.*, 2009; Bani M *et al.*, 2015]. In Nigeria, the prevalence of tooth extraction in children ranges from 15.1% to 58.8% (Ashiwaju M *et al.*, 2011; Onyejaka NK *et al.*, 2021; Eigbobo JO *et al.*, 2014), this is similar to this study with a prevalence of 49.8%. This high prevalence in developing countries could be due to the symptomatic dental visit, delayed presentation due to poor dental awareness, poor attitude of parents toward restoration of primary dentition and the out-of-pocket payment system of care employed in Nigeria (Chukwumah N *et al.*, 2014; Omotuyole AS *et al.*, 2023a).

Tooth extraction was performed more among females in this study, this was similar to several studies (Olatosi OO *et al.*, 2012; Onyejaka NK *et al.*, 2021; Chukwumah N *et al.*, 2014). Other studies (Ashiwaju M

*et al.*, 2011; Al-Assadi AH, 2018; Salim NA *et al.*, 2022) revealed that males had more teeth extracted. The findings of this study could be attributed to females being more conscious and expressive about their health. Parents and guardians have also been alleged to care so much for the female gender thereby getting more attention than the males (Oromakinde AE *et al.*, 2021). Majority of the subjects (58.3%) in this study had one tooth extracted. This is similar to various studies (Salim NA *et al.*, 2022; Chukwumah N *et al.*, 2014) but higher than a study (Samuel SS *et al.*, 2018) that reported about half of the subjects (50.6%) had more than two extractions. This high number of multiple extractions could be attributed to the delayed and poor utilization of dental services.

In children, the most common reason for tooth extraction has been reported as dental caries and its sequelae followed by orthodontic reasons (Olatosi OO *et al.*, 2012; Salim NA *et al.*, 2022) or retained teeth (Ashiwaju M *et al.*, 2011; Samuel SS *et al.*, 2018) while other studies reported trauma (Taiwo OA *et al.*, 2014; Eigbobo JO *et al.*, 2014) as the second most common reason. Dental caries being the primary reason was attributed to patients' poor dental health-seeking behavior, presenting when they are in severe pain and the tooth is unrestorable, necessitating an extraction (Taiwo OA *et al.*, 2014; Salim NA *et al.*, 2022). Some studies (Ashiwaju M *et al.*, 2011; Chukwumah N *et al.*, 2014) highlighted an increasing number of primary incisors extracted due to retention and attributed it to more dental visits for aesthetic reasons in the urban areas where the clinics were located. A national survey of children in Nigeria (Esan TA *et al.*, 2009) also

showed that orthodontic consideration was the commonest reason for extraction in South Western region.

In 2021, a study (Onyejaka NK *et al.*, 2021) reported that the commonest reason for tooth extraction was retained tooth followed by dental caries. This is similar to this study which reported retained teeth as the commonest reason closely followed by sequelae of dental caries. This can be attributed to the early eruption of permanent teeth among children with a non-proportionate growth of the jaw resulting in the lingual or palatal eruption of the permanent teeth (Onyejaka NK *et al.*, 2021). It is however notable that dental caries or its sequelae still ranked high as the second reason for extraction in these studies. This is in alignment with some studies (Saheed BD *et al.*, 2013; Omotuyole AS *et al.*, 2023b) who reported that prevalence of caries appears to be increasing in Nigeria. However, with the increasing number of paediatric specialists and available dental care, more restorative treatments are being carried out instead of extractions for carious teeth (Onyejaka NK *et al.*, 2021).

Specific age groups have been reported to have some peculiarities with the pattern and reason for tooth extraction. Several studies (Taiwo OA *et al.*, 2014; Mukhopadhyay S *et al.*, 2015; Bani M *et al.*, 2015; Oromakinde AE *et al.*, 2021) reported that most extractions occurred in the 6-9 years age group due to retained teeth and caries while a study [Esan TA *et al.*, 2009] reported a majority within ages 11–16 years due to caries. Similarly, in this study, majority of those who had extraction were aged 7 – 9 years as a result of sequelae of caries and retained primary teeth. This age bracket (6-9 years) represents the early mixed dentition which is characterized by the permanent incisors which often erupt in lingual relation to their predecessors which are extracted to facilitate proper alignment of permanent incisors (Mukhopadhyay S *et al.*, 2015). Serial extractions are also carried out during this period to reduce or eliminate the need for future orthodontic interventions (Mukhopadhyay S *et al.*, 2015). Another reason could be related to the first and second primary molars and the first permanent molar which have been exposed to the oral environment for a long time and could have untreated carious teeth and are extracted (Oromakinde AE *et al.*, 2021, Omotuyole AS *et al.*, 2023b).

Several studies reported that the age group of 1-5 years was characterized mainly by extraction of maxillary incisors due to trauma (Esan TA *et al.*, 2009; Samuel SS *et al.*, 2018; Oromakinde AE *et al.*, 2021). In this study, majority of the subjects aged 1 – 3 years had extraction of the maxillary incisors as a result of trauma. These finding could be explained by poor balance due to the developing motor coordination commonly seen in children during the first 2 - 3 years of life (Samuel SS *et al.*, 2018; Oromakinde AE *et al.*,

2021). The observations in these age groups emphasizes the importance of instituting targeted preventive measures and early detection of dental caries and also educate parents, guardians and teachers on preventive measures to put in place to mitigate traumatic injuries effectively.

This study concurred with other studies (Mukhopadhyay S *et al.*, 2015; Taiwo OA *et al.*, 2014; Chukwumah N *et al.*, 2014) in identifying the mandible as the most commonly affected arch. This may be due to the fact that mandibular teeth erupt earlier than those in the maxilla. Also, the more pronounced pits and fissures on the mandibular teeth and the effects of gravity makes food debris accumulate more on mandibular teeth. Conversely, a study (Samuel SS *et al.*, 2018) reported nearly 55.6% of extracted teeth were maxillary teeth, whereas 44.4% were mandibular teeth. Similar to some studies (Salim NA *et al.*, 2022; Chukwumah N *et al.*, 2014), the right side of the jaw recorded more extractions 192 (54.4%) than the left side. This is different from a study (Taiwo OA *et al.*, 2014) who reported that more extractions on the left side than the right side.

Majority of the extracted teeth in this study were primary teeth 309 (87.5%) with 44 (12.5%) permanent teeth. Similarly, several studies (Salim NA *et al.*, 2022; Chukwumah N *et al.*, 2014; Eigbobo JO *et al.*, 2014) reported higher numbers in the primary teeth, however, a study (Taiwo OA *et al.*, 2014) reported that permanent teeth 121 (66.9%) were twice frequently extracted than primary teeth 60 (33.1%). The commonest arch segment was the anterior with 171 extracted teeth in the primary dentition, out of which 114 and 17 teeth were extracted due to retained primary teeth and trauma respectively. This is similar to studies (Onyejaka NK *et al.*, 2021; Eigbobo JO *et al.*, 2014) who reported that in the primary dentition, most teeth were extracted in the anterior segment. They attributed it to over-retention of primary teeth and an increase in traumatic injuries caused by falls, fights and road traffic accidents.

In the permanent dentition, the posterior segment had 35 teeth extracted with 29 teeth due to sequelae of caries. This concurs with several studies (Esan TA *et al.*, 2009; Eigbobo JO *et al.*, 2014) while a study [Onyejaka NK *et al.*, 2021) reported that all 30 teeth extracted were in the posterior segment and was attributed to caries and its sequelae. Two studies (Al-Assadi AH, 2018; Oromakinde AE *et al.*, 2021) however reported that more extractions were carried out in the posterior segment than the anterior in both dentitions due to caries and its sequelae.

In this study, the most common tooth extracted in the primary dentition was the upper right central incisor, followed by the upper left central incisor while the upper left canine was the least extracted tooth. This

is similar to a study done in Enugu, Nigeria (Onyejaka NK *et al.*, 2021) that reported that the commonest tooth extracted in primary dentition were the central incisors while the least were the canines attributing it to over-retention of primary teeth. A study (Oromakinde AE *et al.*, 2021) reported that in the primary dentition, the first molars were most frequently extracted while other studies (Olatosi OO *et al.*, 2012; Chukwumah N *et al.*, 2014) reported that the second molars were the most frequently extracted deciduous teeth, mainly due to caries. In the permanent dentition, the lower left first molar was the most frequently extracted tooth, followed by the lower right first molar and least extracted tooth was the first premolar. This agrees with several studies (Onyejaka NK *et al.*, 2021; Oromakinde AE *et al.*, 2021) that attributed it to the prolonged exposure of the first molars in the oral environment.

An ideal space maintainer should preserve the desired mesiodistal dimension of the space, be hygienic, permit normal growth and eruption of the developing permanent teeth, and require low cost in its fabrication (Dhull KS *et al.*, 2014; Albati M *et al.*, 2018). By preserving the space, these appliances facilitate the proper eruption and alignment of permanent teeth, promoting optimal oral health outcomes in pediatric patients. Space maintainers include band and loop space maintainer, lingual arch, palatal arch, transpalatal arch, distal shoe, crown and loop, acrylic dentures, removable distal shoe (Albati M *et al.*, 2018). The choice of a space maintainer depends on the type and number of tooth lost, segment and arch involved (Albati M *et al.*, 2018; Adeyemi AT *et al.*, 2007). The use of space maintainers is contraindicated if radiographically, the succedaneous tooth will erupt within six months or is absent or when the space available is greater than that needed for the succeeding permanent tooth (Albati M *et al.*, 2018). Several studies have shown band and loop space maintainer to be the most commonly used in paediatric dentistry because it is simple to use and affordable (Setia V *et al.*, 2013; Simon T *et al.*, 2012).

In this study, a total of 14 participants had space maintainers fabricated; the most common space maintainer was band and loop followed by lower lingual arch. Though, most of the extracted teeth were anterior teeth which usually do not require maintenance, this number of space maintainers is low compared to the 100 primary molars extracted within the age range of 4 – 9 years in the study. This might be due to the parents declining the use of the space maintainer because of the extra cost and time involved and the inconsistent supply of dental materials needed to fabricate it (Adeyemi AT *et al.*, 2007). The geographical location and availability of orthodontic technicians can also influence the utilization of space maintainers (Adeyemi AT *et al.*, 2007). Therefore, further research is needed to investigate patient long-term outcomes, and cost-effectiveness of different types of space maintainers in different populations.

Extraction of teeth in children have been associated with anxiety, pain and psychological trauma (Esan TA *et al.*, 2009; Al-Assadi AH, 2018). Therefore, the treatment goal should always be to restore and not extract either the primary or permanent teeth. The burden of retained primary teeth, dental caries and trauma as major reasons for tooth extraction in these studies highlight the urgent need for preventive measures. This measures include the implementation of oral health prevention policies with regards to the use of fluoride, fissure sealants, silver diamine fluoride [Azuoro MO *et al.*, 2022] increased dental awareness, increased availability of dental resources, decreased sucrose consumption, introduction of dental health education programs in schools and community.

## CONCLUSION

Retained primary teeth was the most common reason for tooth extraction followed by sequelae of dental caries, caries and trauma. This highlights the need for the implementation of oral health prevention policies with regards to the use of fluoride, fissure sealants, silver diamine fluoride increased awareness of safety protocols to mitigate traumatic injuries and the introduction of dental health education programs in schools and community.

## LIMITATIONS

This study was a hospital-based study so it might not reflect the un-reported cases of tooth loss that could occur in the community. However, the study showed the pattern and reason for tooth extraction carried out in the Paediatric dental clinic in LASUTH. Another limitation was that the study was retrospective and could not consider the socio-economic status and educational level of the parents/guardian which can influence the reason and time of presentation of the subjects for dental care.

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