



## Distribution of Dental Trauma to Anterior Teeth among Children visiting Kantipur Dental College, Kathmandu Nepal

### Dental Science

**Dr.Parajeeta Dikshit**

Principal investigator and corresponding author, MDS, Assistant professor, Department of Pediatric Dentistry.

**Dr.Senchhema Limbu**

Co - investigator, MDS, Assistant professor, Department of Pediatric Dentistry.

**Dr. Rosina Bhattarai**

Co investigator, PG resident, Community and Public Health Dentistry Department.

### ABSTRACT

**Background:** Traumatic Dental Injuries (TDI) are very significant problem in children and number of studies involving on it is smaller than those on dental caries and periodontal disease. The present study was therefore conducted to assess the distribution of traumatic dental injuries in children as in Nepal there are limited similar research.

**Method and Result:** The study was based on the clinical data of patients, ranging from age 1 to 14 years, examined and treated for different dental injuries to anterior teeth. The result showed a higher prevalence of among males. The primary as well as permanent Maxillary central incisors were most affected. Uncomplicated crown fractures involving dentin were more common in permanent dentition and subluxation in the primary dentition.

**Conclusion:** Education and policies to prevent traumatic dental injuries in children needs to be implemented in Nepal.

### KEYWORDS:

Children, Nepal, Traumatic dental injuries.

### Introduction:

Dental injuries occur throughout life and Traumatic Dental Injuries (TDI) are a very significant problem. The incidence of children reporting with traumatic dental injuries is widely reported worldwide and it is likely to rise in future due to increase in playground activities in school.<sup>1,2</sup> In the developing countries the lack of implementation of prevention and education programs in lead to increase in incidence of TDI.

The most frequent traumatic dental injuries occur between 2 and 4 years and between 8 and 10 years of age in both genders. The trauma occurring in 1 to 3 years old is as a result of psychomotor underdevelopment and poor motor skills that do not allow the child to perform precise and safe movements.<sup>3,4</sup> Dental injuries to the teeth are associated with compromise in functions like chewing and phonetics as well as esthetics leading to social and psychological problems in children.<sup>2,5</sup>

Sex wise distributions of trauma in various studies indicate higher frequency among males as though this difference is not significant in younger aged children.<sup>2,3,4,6</sup>

The teeth most affected by TDI are the maxillary incisors both in the primary as well as permanent dentition.<sup>7</sup> Displacement injuries of teeth being more common in primary teeth and crown or root fractures in the permanent dentition.<sup>6</sup> Trauma to primary teeth can also cause damage to the successive permanent teeth.<sup>5</sup>

The number of epidemiological studies involving the diagnosis of TDI is smaller than that compared to the number of existing studies on dental caries and periodontal disease.<sup>8</sup> There is a dearth of similar studies reporting the situation of TDI in children in Nepal.

This study, therefore aimed to investigate the Distribution of Dental Trauma to anterior teeth among Children Visiting Kantipur Dental College, Kathmandu Nepal

### Aims:

- This study aimed to assess the distribution of trauma to anterior

teeth in children who visited the Pediatric Dentistry department at Kantipur Dental college teaching hospital and research center, Kathmandu between 2015 and 2016.

### Materials and methods:

This retrospective cross sectional study was conducted in the Department of Pediatric Dentistry at Kantipur Dental College teaching hospital and research center in Kathmandu The study was based on the clinical records of 150 children and adolescents aged between 1 and 14 years with traumatic dental injury who visited the hospital between January 2015 to December 2016. The data were derived from the well maintained hospital records by a single author. The study period for recording the data was from 1st January 2017 to 15<sup>th</sup> February 2017. The inclusion criteria for the study sample were all the children reporting with dental injuries to anterior teeth. Irrelevant and incomplete records as well as patients with maxillofacial fractures were excluded from this study. The following information was collected from each patient's file: age, gender, type of injury. Classification of traumatic dental injuries proposed by WHO and modified by Andreasen and Andreasen was used to describe the type of trauma.<sup>9</sup>

The study was approved by the Institutional Review Committee. Descriptive and comparative statistical methods were used and data were analyzed using SPSS version 20. Dental injuries of both primary and permanent dentition were recorded and analyzed separately. Chi-Square Tests were used to compare qualitative data.

### Results:

According to the age distribution, out of 150 children, the highest frequency of TDI was seen in 10 year old children (14%) followed by 2 year old children (11.33%). (Figure 1)

The gender distribution showed males more affected than females with a statistically significant ( $p=0.00$ ) male female ratio of 1.72:1. On comparing the dentition involved with sex it was found that 55.07% males and 44.92% females had TDI in primary dentition and 60% males and 43.6% females had injury in the permanent dentition which was not significant statistically. (Table 1)

Single tooth injuries were more commonly seen than multiple injuries and it was more common in females. In 70.9 females only a single tooth was injured as compared to 49.5% males which was statistically significant. (p=0.034),( Table 2)

The teeth most affected by TDI both in the Primary and Permanent dentition were Maxillary Central Incisors, 67.5% and 63.9% respectively. Canines were least involved in both dentition. None of the permanent canines and 2.77% canines in primary dentition exhibited TDI.( Table 3)

Total number of teeth involved were 241 out of which 32.78 showed subluxation followed by 25.31% and 23.23% complicated and uncomplicated crown fractures respectively. In the permanent dentition the most frequent injury was uncomplicated crown fracture involving dentin (31.57%) and the maxillary central incisors were the involved in 69.69 % cases. In the primary dentition, frequency of subluxation was 39.81%, followed by 21.29% complicated crown fracture and 14.81% intrusion. Avulsion was seen only in 1.5% cases in permanent and 9.25% cases in primary dentition.(Table 4)

When the maxillary and mandibular dentition was compared, it was noted that TDI involving only maxilla were seen in 87.33% cases, involving only mandible were present in 10% cases and both maxilla and mandible were seen in 2.67% cases. This difference was statistically significant.(p=0.00)(Table 5)

**Discussion:**

This retrospective cross sectional study was conducted to know the distribution dental trauma to anterior teeth among Children Visiting a dental college in Kathmandu Nepal. There is a paucity of similar studies conducted on dental trauma in Nepal. The Pediatric Dentistry department at Kantipur Dental College is one among the few centers in Nepal providing specialty dental care for children..

Out of 150 children highest frequency of trauma in primary dentition was seen in 2 year old children and in the permanent dentition TDI was most commonly present in 10 year old children, which were in agreement with many previous studies.<sup>4,8,10</sup>

According to the results, the total gender difference in children suffering from TDI was significant with male female ratio of 1.72:1. This was similar to reports of many other studies<sup>5,6,8,10,11</sup> and maybe attributed to the observation that boys participate more in aggressive as well as contact sports. In primary dentition the difference between trauma in male and female was almost similar (1.22:1) while in permanent dentition the males showed more predominance to TDI (2.37:1). The finding in primary dentition was similar to observation by Bijella M.F. et al.<sup>12</sup>

It was noted in the present study that injuries involving more than one tooth were seen more commonly in males as compared to females. In 70.9 females only a single tooth was injured as compared to 49.5% males, which were statistically significant and was in contrast to findings by Orlando A et al.<sup>5</sup>

The total number of teeth involved was 241 and out of that the maxillary central incisors were the teeth most affected in primary (67.59%) as well as the permanent dentition (63.90 %). The reason for higher prevalence of injuries to maxillary central incisor may be due to the prominence of the teeth and lack of adequate coverage by lips.<sup>2,3</sup> This finding was in agreement with many earlier studies on TDI.<sup>1,2,5,8,13</sup> None of the permanent canines were affected by TDI while 2.77% canines in primary dentition exhibited TDI. A study conducted in Nepal by Adhikari and Gurung<sup>14</sup>, showed similar findings.

When the maxillary and mandibular dentition were compared, it was noted that TDI involving only maxilla were seen in 87.33% cases, involving only mandible were present in 10% cases and both maxilla and mandible were seen in 2% cases. This difference was statistically

significant.(p<0.05)<sup>15</sup>

In the permanent dentition the most frequent injury was uncomplicated crown fracture involving dentin (31.57%) which was similar to reports by Chopra A et al<sup>16</sup> but not in agreement to Rohini et al<sup>15</sup> and Sumanth et al<sup>17</sup> who found enamel fracture as the most common injury. This may be due to the fact that the present study was conducted in a clinical setup where patients report only after symptoms and asymptomatic injuries like fracture involving enamel may be under reported. In the primary dentition, frequency of subluxation was 39.81% followed by 21.29% complicated crown fracture and 14.81% intrusion. A higher frequency of displacement injuries in primary dentition maybe attributed to the young bone that tends to flex rather than fracture. Though there have been debate whether this occurs due to less amount of force created in young children or the composition of supporting dental tissues.<sup>6</sup> Avulsion was rare with only 0.5% cases in permanent dentition and 9.25% cases in primary dentition which was in contrast to the finding by Adhikari and Gurung<sup>14</sup> where they found a higher prevalence of avulsion (21.18%) in Nepal.

**Conclusion:**

This study is one of the few research on the scenario of traumatic dental injuries in children in Nepal. It can be concluded from this study that in Nepal more emphasis has to be given to prevention of traumatic injuries in schools by adoption of preventive and educative program. The study only depicts a small population of Nepal and a study including larger sample size and area is suggested.

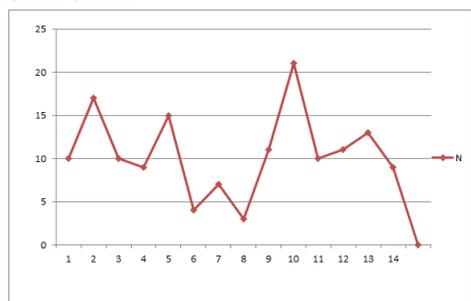
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**Declaration of conflicting interests and funding:**

The authors declare that there are no conflicts of interest or sponsors in the present study.

**TABLES AND CHART**



**Figure 1: Age-wise distribution of individuals.**

	Primary Dentition		Permanent Dentition		P value	Total Participants		P value
	N	%	N	%		N	%	
Male	38	55.07	57	70.37	0.053	95	63.33	0.00
Female	31	44.92	24	29.62		55	36.66	
Total	69	100	81	100		150	100.0	

**Table 1: Distribution of participants according to gender**

No.of.te eth	Male		Female		Total		P value
	N	%	N	%	N	%	
1	47	49.5	39	70.9	86	57.3	0.034
2	32	33.7	14	25.5	46	30.7	
3	6	6.3	2	3.6	8	5.3	
4	10	10.5	0	0.0	10	6.7	
Total	95	100	55	100	150	100	

**Table 2: Number of traumatized teeth per individual**

Tooth involved	Primary		Permanent	
	N	%	N	%
Maxillary Right Central Incisor	36	33.33	46	34.58
Maxillary Right Lateral Incisor	14	12.96	9	6.76
Maxillary Right Canine	1	0.92	0	0
Maxillary Left Central Incisor	37	34.25	39	29.32
Maxillary Left Lateral Incisor	11	10.18	11	8.27
Maxillary Left Canine	1	0.92	0	0
Mandibular Right Central Incisor	2	1.85	8	6.01
Mandibular Right Lateral Incisor	1	0.92	3	2.25
Mandibular Right Canine	1	0.92	0	0
Mandibular Left Central Incisor	2	1.85	12	9.02
Mandibular Left Lateral Incisor	2	1.85	5	3.75
Mandibular Left Canine	0	0	0	0
Total	108	100	133	100

**Table 3: Distribution of traumatic injuries according to individual tooth involved.**

Classification	Primary Dentition		Permanent Dentition		Total	
	N	%	N	%	N	%
Enamel fracture	1	0.92	9	6.7	10	4.14
Enamel and dentin without pulpal involvement	4	3.70	42	31.57	46	19.08
Crown Fracture with pulpal involvement	23	22.22	38	28.57	61	25.31
Crown root fracture	0	0	0	0	0	0
Root fractures	0	0	0	0	0	0
Subluxation	43	39.81	35	26.31	79	32.78
Intrusive luxation	16	14.81	1	0.75	17	7.05
Extrusive luxation	6	5.55	6	4.51	11	4.56
Lateral luxation	5	4.62	0	0	6	2.48
Avulsion	10	9.25	2	1.5	11	4.56
Total	108	100	133	100	241	100.0

**Table 4: Total distribution of specific type of injury**

	N	%	P value
Maxilla only	131	87.33	0.00
Mandible only	15	10	
Both	4	2.66	

**Table 5: Distribution of injured teeth based on the jaw involved.**

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