

Parental self-perceived knowledge and attitudes toward emergency management of avulsed permanent teeth in Imphal: A cross-sectional study

ABSTRACT

Introduction: Dental avulsion is one of the dental traumatic injuries commonly affecting children aged between 6 and 12 years. One of the major limitations in obtaining a successful outcome while treating dental avulsions is the lack of knowledge on its first aid management among parents. The present study aims to assess the knowledge and attitude of parents in Imphal toward the emergency management of avulsed permanent tooth using a self-reported questionnaire method.

Materials and Methods: The present cross-sectional study was undertaken among 777 parents of 6–12-year-old children who were recruited through 2 private schools in Imphal. A questionnaire consisting of 14 closed-ended questions used to assess the parental knowledge and attitude on emergency management of avulsed permanent teeth was distributed to the respondents after obtaining official consent from the respective schools and informed consent from the respondents.

Statistical Analysis: Chi-square test was used to assess the association between the results and the educational status, gender, and geographical location of the respondents.

Results: The study revealed that only a fraction of the respondents, i.e., 11.8% gave a positive response on attempting “self-replantation” and higher fractions (76.1%) of the respondents reported to have received no previous information on the emergency management of dental avulsion.

Conclusion: About 96.1% of the respondents showed interest on acquiring knowledge on the emergency management of dental avulsion. This warrants the urgent need on educating the parents on the first aid emergency management of avulsed tooth.

Keywords: Dental trauma, first aid management, self-replantation

INTRODUCTION

One of the major problems encountered by the dentist in the day-to-day practice is traumatic injuries to teeth and their supporting structures during childhood.^[1] Children usually encounter many minor accidents during their play activities, which can result in complete avulsion of teeth. Dental avulsion is the total displacement of tooth out of socket characterized by severed periodontal ligament with or without the involvement of fractured alveolar bone. Tooth avulsion occurs infrequently with multiple teeth and usually involves a single tooth. It is one of the most commonly occurring injuries of the permanent dentition in 8–12-year-old children^[2,3] with the permanent central incisors being commonly affected. The lower jaw

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Received: 10-10-2017, **Revised:** 16-07-2018, **Accepted:** 07-01-2019

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How to cite this article: Ningthoujam S, Gurunathan D, Singh WR, Mall BB. Parental self-perceived knowledge and attitudes toward emergency management of avulsed permanent teeth in Imphal: A cross-sectional study. *Natl J Maxillofac Surg* 2019;10:33-42.

Access this article online	
Website: www.njms.in	Quick Response Code 
DOI: 10.4103/njms.NJMS_64_17	

is reported to be seldom affected.^[4,5] The impenetrable system implicated in tooth avulsion is strongly associated with the incomplete formation of the roots and the lack of resiliency of the periodontal ligament seen at those ages as reported by Andreasen *et al.*^[3] and Oliveira *et al.*^[6] Reports in the literature revealed that the mean prevalence of dental and oral injuries was observed between 14% and 27%,^[7,8] and of all dentoalveolar injuries, dental avulsion occurs at an incidence rate of 0.5%–3% in permanent dentition.^[2,9,10] Other epidemiological studies reported that the prevalence of dental avulsion is three times higher in boys than in girls,^[2,3] the explanation being boys participating more in games and sports of more aggressive nature. Studies have also shown findings that tooth avulsion adversely affected the quality of life in children.^[11,12] It has been reported to impact on the esthetic, functional, and psychological consequences, both for the growing child and the parents.^[9,13] The permanent anterior teeth play a major role in esthetics, and dental avulsion can hugely disrupt the esthetic harmony in children thereby lowering their self-esteem.^[14,15] Various treatment modalities have been presented over the past decades for management of dental avulsions which includes prosthetic replacement of the avulsed tooth, functional appliances, minor orthodontic movements, and immediate reimplantation of the avulsed tooth followed by endodontic treatment. However, immediate reimplantation of the avulsed teeth is considered to be the ideal treatment of choice as it has more psychological benefits than other means of management.^[15,16] The viability of the periodontal ligament on the root surface before reimplantation is the single most important factor in determining the prognosis.^[17] Therefore, preventing dehydration of the root surface during transportation to the dentists using transport medium is critical. Studies have suggested that transportations can be done by placing the avulsed teeth in the buccal vestibule in contact with saliva,^[18] or placing the tooth in saline,^[19] milk,^[20] or wrapped in plastic wrap.^[21] If guardians have adequate knowledge of how to handle and replant an avulsed tooth, it would result in a favorable outcome. Hence, the final prognosis depends entirely on the knowledge of this procedure by the parents^[17] as delayed reimplantation, and unphysiological storage has been reported with a low survival rate of reimplanted tooth.^[22]

Due to lack of awareness among related adults, high percentage of children with dental trauma present late for treatment. Moreover, 41% of dental injuries occur at home^[23] where professional assistance is not readily acquirable. It is important that parents should have adequate knowledge on the emergency management of avulsed permanent tooth as they play a major role in appropriate decision-making and

successful outcome of the treatment.^[24,25] Several studies have reported that the population as a whole, including professionals, have little knowledge on the emergency management of dentoalveolar injuries.^[9,3,26-29]

No previous study is available in the literature regarding the awareness and attitude toward the emergency first aid management of dental avulsion among parents in the state of Manipur despite the magnitude of this problem. The present study aims to assess parental knowledge and attitudes regarding the avulsed permanent tooth and their emergency management in Imphal, the capital city of Manipur.

MATERIALS AND METHODS

We performed a cross-sectional self-administered questionnaire survey on the parents of 6–12-year-old pupils in 2 randomly selected private schools at Imphal, a city with a population of 967,344 as reported in the 2011 census.^[30] The duration of the study was 3 months (September–November 2016).

We used a pretested 14-stemmed closed-ended questionnaire by Raphael and Gregory^[28] which was modified earlier and used by Loo *et al.* in their study in Chennai.^[31] The questionnaire comprised of two parts: the first part contained the general demographic data and the second part includes closed questions on knowledge, attitude, and previous experience in the first aid management of avulsed permanent tooth. Each question was provided with options which contain both correct and incorrect answers. Participants were given instructions to mark the option which they felt as the most appropriate answer. The questionnaire was distributed both in English and regional Manipuri language. The questionnaire was pilot tested ($n = 20$) on parents of one of the schools. Feedbacks were obtained from participants on any difficulty faced by them in the interpretation of questions, and responses were checked. For better understanding, we included an explanation page in English and regional Manipuri language on what is dental avulsion on the first page of the questionnaire.

The study was approved by the Scientific Review Board, Saveetha University Chennai (SRB Ref No: STP/SDPMDS16PED1). The institutional ethical committee clearance was also obtained before the study.

Sampling procedure

We required a sample size of 597 parents for the study which was calculated for a power of 80% and 5% alpha error, based on a previous study.^[32] Since our study was a

self-administered questionnaire study with limitations of low response rate, we aimed at recruiting extra 50% more, which gives the representative sample of 896 individuals. The representative samples of 896 parents were recruited from 2 randomly selected private schools located in two major districts of Imphal city (Imphal West and Imphal East). Official permission was obtained from the authorities of the schools (Director/Principals) after explaining the nature and objectives of the study before the commencement of the study. Participation in the study was solicited through leaflets which included the rationale of the study, declaration of obscurity, and confidentiality of the answers. The questionnaires were completed at home, and it was returned to the research team through their children. Voluntary participation was emphasized, and no incentives were awarded.

We included first to sixth standard students (6–12 years of age falls under these standards). Selection of students was done using simple random sampling method. The teachers in charge distributed the questionnaire in sealed envelope which the students handed to their parents. Each teacher monitored and kept track of each questionnaire, and within a maximum of periods of 2 weeks after administration, the completed questionnaires were collected.

From 896 administered questionnaires, 777 parents agreed to participate in the study, giving a response rate of 86.7%.

Leaflets containing information on the first aid emergency management of avulsed young permanent teeth were distributed to all the respondents, and posters were given to the school authorities. Articles were also published in local newspapers.

Statistical analysis

The data obtained from 777 questionnaires were tabulated, and statistical analysis was performed using SPSS software version 17 (IBM Corp., Armonk, NY, USA). Chi-square test was used to analyze the associations between the results and the gender, educational qualifications, and geographical locations.

RESULTS

Sample characteristics

The study population included 777 parents of children aged 6–12 years of age who were recruited from 2 private schools in Imphal to assess the knowledge and attitude of emergency management of avulsed permanent teeth. Of the 777 parents, 477 (61.4%) were male and 300 (38.6%) were female respondents as shown in Table 1. Majority of the respondents had attained above higher secondary educational status, i.e., 495 (63.7%), and only 69 (8.9%) respondents had attained

Table 1: Frequency distribution of demographic data

Variables	Frequency (%)
Total	777 (100)
Gender	
Male	477 (61.4)
Female	300 (38.6)
Educational qualification	
Elementary school	69 (8.9)
Higher secondary	213 (27.4)
Above higher secondary	495 (63.7)
Geographical location	
Urban	447 (57.5)
Rural	330 (42.5)

elementary school. A total of 447 (57.5%) were from the urban area, and 330 (42.5%) were from rural area.

Distribution of responses for the whole sample

Table 2 depicts the distribution of responses for the whole sample. For the question on “possibility of replantation,” 59.8% answered “yes” while 40.2% of the respondents felt that it is not possible to reimplant an avulsed permanent teeth. Only a fraction of the respondents, i.e., 11.8% gave a positive response on attempting “self-replantation,” while the majority of them, i.e., 60.2% would replant the teeth during the later dental visit. Questions pertaining on cleaning medium majority of the respondents have selected water – 54.4% and saltwater – 37.4% as the most suitable option. However, one positive finding was that only 0.4% of the respondents felt that they will not clean the tooth before replantation. Regarding the question on transport medium, 32.9% felt that disinfecting solution is the most appropriate transport medium while only 4.1% and 9.7% felt that the child’s mouth and milk, respectively, are the most suitable transport medium for avulsed permanent teeth. Out of the total 777 respondents, only 23.9% had received previous knowledge in the first aid management of avulsed permanent teeth with “media” (39.8%) being the main source of information.

As per the present study questions about the attitude of parents toward the emergency management of dental avulsion, a huge number of respondents, i.e., 80.6% felt that it is important to save an avulsed tooth. Again, the majority of the parents, i.e., 96.1% have shown a positive attitude toward receiving information on the emergency management of avulsed permanent teeth. Higher fractions of parents, i.e., 87.9% answered that the first place of contact they would seek out for medical assistance would be the dentists. Around 266 (34.2%) respondents reported with the previous history of dental luxative trauma, of which 71 (26.7%) reported having suffered from dental avulsion. About 33.8% of the respondents with previous avulsion experience revealed that they did not

Table 2: Distribution of response for whole sample toward emergency management of dental avulsion

Questions	Answers	Total (n=777; 100%), n (%)
Questions on knowledge		
1. Possibility of replanting	Yes	465 (59.8)
	No	312 (40.2)
2. Attempting self-reimplantation	Yes	55 (11.8)
	No	410 (88.2)
3. Timing for reimplantation	Immediately	103 (22.2)
	As soon as bleeding stops	30 (6.5)
	Within the first hour	37 (8.0)
	Within the same day	7 (1.5)
	After view days	8 (1.7)
	Dentist visit	280 (60.2)
4. Media for cleaning	Water	253 (54.4)
	Saltwater	174 (37.4)
	Milk	36 (7.7)
	Nothing	2 (0.4)
5. Media for transportation	Dry transport	98 (21.1)
	Disinfecting solution	153 (32.9)
	Ice water	40 (8.6)
	Child's mouth	19 (4.1)
	Milk	45 (9.7)
	Fruit juice	0 (0.0)
	Saline solution	110 (23.7)
6. Any previous knowledge	Yes	186 (23.9)
	No	591 (76.1)
7. Sources, if any	Books	52 (28.9)
	Media	74 (39.8)
	Newspaper	11 (5.9)
	Others	49 (26.3)
Questions on attitude		
8. Need to save the teeth	Yes	626 (80.6)
	No	151 (19.4)
9. First place to contact	Hospital	66 (8.5)
	Doctor	28 (3.6)
	Dentist	683 (87.9)
10. Interest on receiving information	Yes	266 (34.2)
	No	511 (65.8)
Questions on previous luxative injury experience		
11. Previous luxative injury	Yes	266 (34.2)
	No	511 (65.8)
12. If yes, was it avulsed	Yes	71 (26.7)
	No	195 (73.3)
13. Previous management of dental avulsion	Did not look for it	24 (33.8)
	Tooth the teeth to the dentist immediately	47 (66.2)
	Took the teeth in moist condition	0 (0.0)
14. Immediate dental visit	Yes	251 (94.4)
	No	15 (5.6)

look for the tooth after the injury. However, almost all of respondents, i.e., 94.4% reported having taken their children to the dentist after suffering from a dental luxative injury.

Distribution of responses based on demographic variables

When the knowledge variables were associated with the gender of the respondents, it showed that males – 68 (14.6%)

have higher preference on “immediate reimplantation” than females – 35 (7.5%), which was found to be statistically significant ($P < 0.05$) as shown in Table 3. The response on previous injury experiences [Table 3] revealed that the previous avulsion episode was found to be statistically significant between the genders. Significant association was noticed between the educational status of the respondents

Table 3: Distribution of response toward emergency management of dental avulsion based on gender

Questions	Answers	Male (n=477; 61.4%), n (%)	Female (n=300; 38.6%), n (%)	χ^2	P (<0.05 significant)
Questions on knowledge					
1. Possibility of replanting	Yes	283 (36.4)	182 (23.4)	0.137	0.711
	No	194 (25.0)	118 (15.2)		
2. Attempting self-reimplantation	Yes	37 (8.0)	18 (3.9)	1.077	0.299
	No	246 (52.9)	164 (35.3)		
3. Timing for reimplantation	Immediately	68 (14.6)	35 (7.5)	11.569	0.041
	As soon as bleeding stops	17 (3.7)	13 (2.8)		
	Within the first hour	30 (6.5)	7 (1.5)		
	Within the same day	3 (0.6)	4 (0.9)		
	After view days	3 (0.6)	5 (1.1)		
	Dentist visit	162 (34.8)	118 (25.4)		
4. Media for cleaning	Water	151 (32.5)	102 (21.9)	1.541	0.673
	Saltwater	108 (23.2)	66 (14.2)		
	Milk	22 (4.7)	14 (3.0)		
	Nothing	2 (0.4)	0 (0.0)		
5. Media for transportation	Dry transport	55 (11.8)	43 (9.2)	7.969	0.158
	Disinfecting solution	84 (18.3)	68 (14.6)		
	Ice water	24 (5.2)	16 (3.4)		
	Child's mouth	14 (3.0)	5 (1.1)		
	Milk	33 (7.1)	12 (2.6)		
	Fruit juice	0 (0.0)	0 (0.0)		
	Saline solution	72 (15.5)	38 (8.2)		
6. Any previous knowledge	Yes	115 (14.8)	71 (9.1)	0.020	0.888
	No	362 (46.6)	229 (29.5)		
7. Sources, if any	Books	29 (15.6)	23 (12.4)	1.703	0.636
	Media	49 (26.3)	25 (13.4)		
	Newspaper	6 (3.2)	5 (2.7)		
	Others	31 (16.7)	18 (9.7)		
Questions on attitude					
8. Need to save the teeth	Yes	392 (50.5)	234 (30.1)	2.056	0.152
	No	85 (10.9)	66 (8.5)		
9. First place to contact	Hospital	21 (2.7)	7 (0.9)	4.152	0.125
	Doctor	35 (4.5)	31 (4.0)		
	Dentist	421 (54.2)	262 (33.7)		
10. Interest on receiving information	Yes	456 (58.7)	291 (37.5)	0.976	0.323
	No	21 (2.7)	9 (1.2)		
Questions on previous luxative injury experience					
11. Previous luxative injury	Yes	153 (19.7)	113 (14.5)	2.557	0.110
	No	324 (41.7)	187 (24.1)		
12. If yes, was it avulsed	Yes	51 (19.2)	20 (7.5)	8.119	0.004
	No	102 (38.3)	93 (35.0)		
13. Previous management of dental avulsion	Did not look for it	19 (26.85)	5 (7.0)	0.964	0.326
	Tooth the teeth to the dentist immediately	32 (45.1)	15 (21.1)		
	Took the teeth in moist condition	0 (0.0)	0 (0.0)		
14. Immediate dental visit	Yes	144 (54.1)	107 (40.2)	0.40	0.841
	No	9 (3.4)	6 (2.3)		

and the question on the source of information as seen in Table 4. The urban parents, i.e., 435 (56.0%) showed higher interest in acquiring more knowledge on the emergency management of avulsed permanent teeth than the rural parents, i.e., 312 (40.2%) which showed statistically significant association [Table 5].

DISCUSSION

The cross-sectional study was carried out with the aim to assess the knowledge and attitude of parents regarding the emergency management of avulsed permanent teeth in Imphal. Several studies reported in the literature

Table 4: Distribution of response toward emergency management of dental avulsion based on educational status

Questions	Answers	Elementary (n=69; 8.9%), n (%)	Higher secondary (n=213; 27.4%), n (%)	Above higher secondary (n=495; 63.7%), n (%)	χ^2	P (<0.05 significant)
Questions on knowledge						
1. Possibility of replanting	Yes	40 (5.1)	119 (15.3)	306 (39.4)	2.304	0.316
	No	29 (3.7)	94 (12.1)	189 (24.3)		
2. Attempting self-reimplantation	Yes	3 (0.6)	11 (2.4)	41 (8.8)	2.204	0.332
	No	37 (8.0)	108 (23.2)	265 (57)		
3. Timing for reimplantation	Immediately	9 (1.9)	17 (3.7)	77 (16.6)	10.359	0.410
	As soon as bleeding stops	2 (0.4)	6 (1.3)	22 (4.7)		
	Within the first hour	1 (0.2)	11 (2.4)	25 (5.4)		
	Within the same day	1 (0.2)	1 (0.2)	5 (1.1)		
	After view days	1 (0.2)	2 (0.4)	5 (1.1)		
	Dentist visit	26 (5.6)	82 (17.6)	172 (37.0)		
4. Media for cleaning	Water	19 (4.1)	68 (14.6)	166 (35.7)	2.313	0.889
	Saltwater	17 (3.7)	43 (9.2)	114 (24.5)		
	Milk	4 (0.9)	8 (1.7)	24 (5.2)		
	Nothing	0 (0.0)	0 (0.0)	2 (0.4)		
5. Media for transportation	Dry transport	8 (1.7)	32 (6.9)	58 (12.5)	9.920	0.448
	Disinfecting solution	16 (3.4)	43 (9.2)	94 (20.2)		
	Ice water	3 (0.6)	8 (1.7)	29 (6.2)		
	Child's mouth	2 (0.4)	5 (1.1)	12 (2.6)		
	Milk	3 (0.6)	12 (2.6)	30 (6.5)		
	Fruit juice	0 (0.0)	0 (0.0)	0 (0.0)		
	Saline solution	8 (1.7)	19 (4.1)	83 (17.8)		
6. Any previous knowledge	Yes	18 (2.3)	45 (5.8)	123 (15.8)	1.325	0.516
	No	51 (6.6)	168 (21.6)	372 (47.9)		
7. Sources, if any	Books	4 (2.2)	9 (4.8)	39 (21.0)	24.748	0.001
	Media	7 (3.8)	15 (8.1)	52 (28.0)		
	Newspaper	5 (2.7)	3 (1.6)	3 (1.6)		
	Others	2 (1.1)	18 (9.7)	29 (15.6)		
Questions on attitude						
8. Need to save the teeth	Yes	54 (6.9)	172 (22.1)	400 (51.1)	0.257	0.879
	No	15 (1.9)	41 (5.3)	95 (12.2)		
9. First place to contact	Hospital	3 (0.4)	8 (1.0)	17 (2.2)	3.579	0.466
	Doctor	2 (0.3)	17 (2.2)	47 (6.0)		
	Dentist	64 (8.2)	188 (24.2)	431 (55.5)		
10. Interest on receiving information	Yes	68 (8.8)	205 (26.4)	474 (61.0)	1.282	0.527
	No	1 (0.1)	8 (1.0)	30 (2.7)		
Questions on previous luxative injury experience						
11. Previous luxative injury	Yes	27 (3.5)	70 (9.0)	169 (21.8)	0.914	0.633
	No	42 (5.4)	143 (18.4)	326 (41.0)		
12. If yes, was it avulsed	Yes	9 (3.4)	23 (8.6)	39 (14.7)	3.097	0.213
	No	18 (6.8)	47 (17.7)	130 (48.9)		
13. Previous management of dental avulsion	Did not look for it	1 (1.4)	8 (11.3)	15 (21.1)	2.459	0.292
	Tooth the teeth to the dentist immediately	8 (11.3)	15 (21.1)	24 (33.8)		
	Took the teeth in moist condition	0 (0.0)	0 (0.0)	0 (0.0)		
14. Immediate dental visit	Yes	26 (9.8)	63 (23.7)	162 (60.9)	3.404	0.182
	No	1 (0.4)	7 (2.6)	7 (2.6)		

have assessed the knowledge and attitude of parents on emergency management of avulsed teeth.^[1,6,26,28,29] However, to the best of our knowledge, there is no literature which

has reported the study in the northeastern state Imphal, the capital city of Manipur. We have used a simple, direct closed-ended questionnaire.

Table 5: Distribution of response towards emergency management of dental avulsion based on geographical location

Questions	Answers	Urban (n=447; 57.5%), n (%)	Rural (n=330; 42.5%), n (%)	χ^2	P (<0.05 significant)
Questions on knowledge					
1. Possibility of replanting	Yes	269 (34.6)	196 (25.2)	0.049	0.825
	No	178 (22.9)	134 (17.2)		
2. Attempting self-replantation	Yes	31 (6.7)	24 (5.2)	0.056	0.812
	No	238 (51.2)	172 (37.0)		
3. Timing for reimplantation	Immediately	56 (12.0)	47 (10.1)	4.300	0.507
	As soon as bleeding stops	15 (3.2)	15 (3.2)		
	Within the first hour	25 (5.4)	12 (2.6)		
	Within the same day	4 (0.9)	3 (0.6)		
	After view days	3 (0.6)	5 (1.1)		
	Dentist visit	156 (35.7)	114 (24.5)		
4. Media for cleaning	Water	142 (30.5)	111 (23.9)	2.032	0.566
	Saltwater	104 (20.4)	70 (15.1)		
	Milk	21 (4.5)	15 (3.2)		
	Nothing	2 (0.4)	0 (0.0)		
5. Media for transportation	Dry transport	51 (11.0)	47 (10.1)	5.113	0.402
	Disinfecting solution	98 (21.2)	55 (11.8)		
	Ice water	20 (4.3)	20 (4.3)		
	Child's mouth	12 (2.6)	7 (1.5)		
	Milk	25 (5.4)	20 (4.3)		
	Fruit juice	0 (0.0)	0 (0.0)		
6. Any previous knowledge	Saline solution	63 (13.5)	57 (10.1)	0.260	0.610
	Yes	110 (14.2)	76 (9.8)		
7. Sources, if any	No	337 (43.4)	254 (32.7)	6.770	0.80
	Books	26 (14.0)	26 (14.0)		
	Media	43 (23.1)	31 (16.7)		
	Newspaper	10 (5.4)	1 (0.5)		
	Others	31 (16.7)	18 (9.7)		
Questions on attitude					
8. Need to save the teeth	Yes	365 (47.0)	261 (33.6)	0.797	0.372
	No	82 (10.5)	69 (8.9)		
9. First place to contact	Hospital	15 (1.9)	13 (1.7)	3.582	0.67
	Doctor	31 (4.0)	35 (4.5)		
	Dentist	401 (51.6)	282 (36.3)		
10. Interest on receiving information	Yes	435 (56.0)	312 (40.2)	3.924	0.048
	No	12 (1.5)	18 (2.3)		
Questions on previous luxative injury experience					
11. Previous luxative injury	Yes	160 (20.6)	106 (13.6)	1.138	0.286
	No	287 (36.9)	224 (28.8)		
12. If yes, was it avulsed	Yes	48 (19.2)	23 (8.6)	2.246	0.134
	No	112 (38.3)	83 (31.2)		
13. Previous management of dental avulsion	Did not look for it	17 (23.9)	7 (9.9)	0.172	0.678
	Tooth the teeth to the dentist immediately	31 (43.7)	16 (22.5)		
	Took the teeth in moist condition	0 (0.0)	0 (0.0)		
14. Immediate dental visit	Yes	149 (56.0)	102 (38.3)	1.153	0.283
	No	11 (4.1)	4 (1.5)		

Dental avulsion can have major impact on the child's esthetic and functional aspects.^[33-36] The explanation for dislocation of the teeth from its alveolus at younger children may be due to the incomplete radicular formation of central incisors and the lack of resiliency of the periodontal ligament.^[3,6,33] One major requirement for replantation is keeping the

periodontal cells viable that allows healing and a possible pulp revascularization which in turn relies on immediate replantation of the avulsed teeth.^[24,33,37]

Low fractions of the respondent (11.8%) in our study revealed that they would attempt self-replantation, and

only 22.2% of the respondents answered on immediate reimplantation while the majority (60.2%) of the respondents agreed on reimplantation during a later visit. This may be due to possible fear of any negative outcome after self-reimplantation, lack of awareness on reimplantation procedure, and fear from the bleeding that may have avoided the respondents to do the needful as reported in other studies with similar findings.^[14,15,26-28] One primary requirement before reimplantation is to clean the soiled avulsed tooth so as to retain the tooth in a storage medium.^[24,33] To questions pertaining on cleaning media, the present study revealed that plain water (54.4%) was the best cleaning media while only a small fraction (7.7%) of the respondents stated that they would use milk as the cleaning media which is similar to the finding of a study conducted in Chennai.^[31] This may be because a layperson would think of water as the first option that would come in mind for cleaning. The best transport media for the avulsed tooth is the child's mouth preferably the child's tooth alveolus. However, when self-reimplantation is not feasible, other best storage media for pulpal and periodontal healing would be milk, sterile saline solution, and saliva. Our study revealed that majority of the respondents chose disinfecting solution as the most appropriate transport medium (32.9%) followed by saline (23.7%) and dry transport (21.1%), while only 4.1% and 9.7% felt that the child's mouth and milk, respectively, are the most suitable transport medium. The current findings were in accordance with studies by Murali *et al.*^[38] and Loo *et al.*^[31] where the majority of parents reported inappropriate storage media. This reflects that with the use of inappropriate transport media, there is a higher probability of failure rate in saving the avulsed tooth even though higher fractions (59.8%) of the respondents felt that reimplantation of avulsed tooth is possible. Inquiry on previously received information about emergency management of avulsed tooth revealed that a higher percentage of respondents (76.1%) had given a negative response. Respondents with a higher level of education reported to have previously received more information, and the source of information was found to be statistically significant ($P < 0.05$). More than two-third of the respondents, i.e., 626 (80.6%) revealed that it is necessary to save an avulsed tooth despite the fact that nearly half of the respondents had a negative response (40.2%) to the possibility of reimplantation, which is similar to finding by Loo *et al.*^[31] Another finding in accordance with Loo *et al.*^[31] and opposing to study by Shashikiran *et al.*^[15] and Qazi and Nasir^[39] is that a higher fraction, i.e., 683 (87.9%) of our respondents revealed that they would seek assistance from dentists, and very few from doctor – 28 (3.6%) and hospital – 66 (8.5%). No statistically significant differences

were observed between the attitude section with the gender and educational qualification of the respondents. However, statistical significance ($P < 0.05$) was seen between the geographical location and the attitude of interest in receiving more information about emergency management of dental avulsion. Almost two-third of the respondents, i.e., 746 (96.1%) showed positive response in receiving more information on knowledge for first aid emergency management of dental avulsion. Only a small fraction (2.4%) of respondents from above higher secondary education have shown a negative response which is in accordance with findings from a study conducted in Chennai.^[31] Of the total 777 parents, 266 (34.2%) respondents reported with a history of previous luxative injury. From these 266 respondents, dental avulsion was observed in 71 (26.7%) children of the respondents. This finding is higher than other recent studies conducted in Chennai,^[31] Tamil Nadu,^[40] and South India.^[2] None of the respondents with the previous history of dental avulsion revealed that they would take the tooth in moist conditions even though 66.2% of the respondents would take the tooth to the dentist immediately. This finding creates an alarming situation as dry transport of the avulsed tooth may impede the prognosis of the replantation procedure. Around 33.8% of the respondents revealed that they would not look for the avulsed tooth. Retrieval of the avulsed tooth is one of the most crucial factors for accomplishing reimplantation procedure. Reimplantation procedure not only carries more psychological benefits on the growing child than any other treatment modalities^[15,16] but it also avoids the brunt of bearing financial impacts on the parents.^[15,25,26]

Recommendations

The present study was a self-administered questionnaire survey with the requirement of higher literacy rate among respondents; none of our respondents were nonliterate. Therefore, the present study cannot be extrapolated to the general population. Implementation of scoring system was not done for the present study which could have facilitated the comparison of the level of awareness.

CONCLUSION

Within the limitations of the present study, it can be concluded that there is a small degree of awareness on the knowledge of emergency management of avulsed permanent teeth in Imphal. There is a need to train the healthcare professionals to use appropriate communication strategies that can help reduce fear among parents on carrying out self-replantation procedures. There is also a requirement to emphasize the schools to recognize the substance on attaining training

on dental accidents as usually nonprofessional people are present at the site of the accident, and their knowledge can allow them to take a quick decision before the primary professional dental care.

Acknowledgment

We would like to acknowledge the school authorities and the teachers who were in charge of follow-up on the questionnaires.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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