

# Awareness, Attitude and Knowledge of Emergency Management of Avulsed Tooth in Urban India

Dr. Sumita A. Bhagwat, Dr. Akshay Parmar, Dr. Lalitagauri P. Mandke

**Abstract:** ***Aims and Objective:** Dental avulsion is the complete and total displacement of tooth from its socket. An avulsed tooth can possibly be re-implanted. There is a need to spread awareness amongst the population who are unaware of such treatment modalities. The present study aimed at investigating knowledge, attitude and awareness amongst population in Navi Mumbai about emergency management of avulsed tooth. An additional aim was to spread the correct knowledge and emergency protocol to be followed in case of dental avulsion. **Materials and Methods:** A contact survey was conducted with a sample size of 504 patients in the Department of Conservative Dentistry and Endodontics, D.Y Patil University, School of Dentistry, Navi Mumbai regarding their knowledge and awareness about emergency treatment of avulsed over a period of 3 months. Data was tabulated in excel sheet and analyzed using SPSS 22.0 software. **Discussion and Conclusion:** Patients themselves can play an important role in improving the prognosis of the avulsed tooth. Majority of the respondents (95%) were unaware of possibility of re-implantation of avulsed tooth. Almost 88% of female respondent disagreed to self re-implant the avulsed tooth. Majority of males and females said they would visit a dentist for emergency treatment. When asked about the cleaning media to be used to clean the dirty avulsed tooth, 36% of the illiterate respondents preferred to use a toothbrush. About 18% respondents chose ice water as storage medium to carry the avulsed tooth. Irrespective of education level, gender or awareness level of possibility of re-implantation of avulsed tooth, there is a general lack of awareness about the emergency management of avulsed tooth.*

**Keywords:** Avulsion, Emergency treatment, Tooth re-implantation, Survey

## 1. Introduction

Traumatic injuries during childhood are quite common. Dental avulsion has an incidence of 0.5-3% of all traumatic injuries in permanent dentition and 7-13% in primary dentition.<sup>[1-4]</sup> Studies have shown that about 50% of children have their primary or permanent dentition affected by traumatic injuries during their school life<sup>[1]</sup>. Teeth more commonly involved are the maxillary central and lateral incisors. Loss of the maxillary central/ lateral incisors can cause psychological, social, functional and aesthetic repercussion to the patient and thus effect overall growth as a person. It is very important for general population to understand the importance of saving the avulsed tooth and know the emergency management, if situation prevails.

Dental avulsion is defined as the complete and total displacement of tooth from its socket<sup>[8]</sup>. Prognosis of the tooth depends on the viability of the periodontal ligament and time elapsed since the incident took place. Studies done in the past have shown that there is a need to increase the awareness and spread the right knowledge amongst people about tooth avulsion<sup>[9-13]</sup>. This study was aimed at investigating the knowledge and awareness amongst population of a metropolitan city in western part of India about emergency management of avulsed tooth. An additional aim was to spread the correct knowledge and emergency protocol to be followed in case of dental avulsion.

## 2. Materials and Method

A randomized study with a sample size of 504 patients was conducted in Department of Conservative Dentistry and Endodontics over a period of 3 months. Ethical clearance was obtained from the institutional ethical committee. A questionnaire ( Table 1) was formulated to study the awareness and knowledge amongst general population

regarding avulsed permanent teeth. A contact survey was carried out in English/Hindi/Marathi where the investigator was always present to assist the individuals who wished to be a part of this study. Every individual who participated in the survey signed an informed consent form. At the end of the questionnaire, the participants were told the right answers and were educated about the correct protocol to manage dental avulsion in future. Data was collected and tabulated in excel sheet and analysed using IPSS 22.0 software and a comparison was made based on level of education, gender and awareness of possible re-implantation following dental avulsion.

## 3. Results

Table 2 gives the demographic tabulation of the data. Tables 3 to 24 give the frequency distribution of the responses to the questions in the survey and their statistical analysis.

**Table 1: Questionnaire**

Questions	Options
Are you aware of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality?	Yes
	No
How soon do you believe re-implantation of avulsed tooth should be done?	Immediately
	As bleeding stops
	After 1 hour
	The same day
	After few days
Would you attempt to self re-implant the tooth?	Later dental visits
	Yes
Who would you consult in case of an avulsed tooth?	No
	Doctor
	Family member/ Friend/ Neighbour
	Dentist
Are you aware that you have to clean the dirty avulsed tooth?	Other
	Yes
	No

How would you clean the dirty avulsed tooth?	Milk
	Brush
	Salt water
	Water
	Nothing
How would you carry the tooth?	Wrap the tooth in paper/ handkerchief
	Disinfecting solution
	Ice water
	Milk
	Child's mouth/ saliva
	Saline solution
Have you ever received any advice regarding emergency management of avulsed tooth?	Yes
	No
What is the source of your information?	Books
	Media
	Friend/ neighbour
	Doctor/ First-aid
	Others
Are you interested in receiving more information about the emergency management of avulsed tooth?	Yes
	No
Do you agree to the importance of saving the avulsed tooth?	Yes
	No
Do you have previous experience of managing dental avulsion?	Yes
	No
Do you have any previous experience of dental trauma (broken, avulsed, and other)?	Yes
	No

**Table 2:** Demographic data

Variables	Frequency	Percent
Total Respondents	504	100
<b>GENDER</b>		
Male	322	63.9
Female	182	36.1
<b>EDUCATION</b>		
Elementary School	140	27.8
Graduate	96	19
Higher Secondary School	225	44.7
Non-Literate	28	5.5
Postgraduate	15	3

**Table 3:** Frequency distribution of responses for Q.1 Are you aware of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	479	95	95	95
	Yes	25	5	5	100
	Total	504	100	100	

**Table 4:** Comparison of awareness of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality and Education and Gender:

<b>Custom Table</b>					
		Are you aware of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality?			
		Yes		No	
		Count	Column N %	Count	Column N %
Education	Illiterate	2	8.70%	26	5.60%
	Elementary school	5	21.70%	135	29.00%
	Higher secondary	9	39.10%	216	46.40%
	Graduate	7	30.40%	89	19.10%
	Post graduate	0	0.00%	0	0.00%
Gender	Male	16	61.50%	306	64.00%
	Female	10	38.50%	172	36.00%

Chi-square value:

<b>Pearson Chi-Square Tests</b>		
		Value
Education	Chi-square	2.455
	df	3
	p-value	0.483
Gender	Chi-square	0.066
	Df	1
	p-value	0.798

Results are based on nonempty rows and columns in each innermost sub-table.

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is greater than that of 0.05 indicates no association of education ,

**Table 6:** Comparison of belief of promptness of re-implantation of avulsed tooth and Education

**Volume 5 Issue 3, March 2016**

[www.ijsr.net](http://www.ijsr.net)

Licensed Under Creative Commons Attribution CC BY

Gender and Awareness. So we can conclude that the awareness is independent of Education and Gender.

**Table 5:** Frequency distribution of responses for Q.2 How soon do you believe re-implantation of avulsed tooth should be done?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	After 1 hour	20	4.0	4.0	4.0
	After few days	13	2.6	2.6	6.5
	As bleeding stops	172	34.1	34.1	40.7
	Immediately	244	48.4	48.4	89.1
	Later dental visit	22	4.4	4.4	93.5
	The same day	33	6.5	6.5	100.0
	Total	504	100.0	100.0	

		How soon do you believe re-implantation of avulsed tooth should be done?					
Education		Immediately	As bleeding stops	Later dental visit	After 1 hour	The same day	After few days
Illiterate	Count	8	7	4	0	5	4
	%	28.60%	25.00%	14.30%	0.00%	17.90%	14.30%
Elementary school	Count	53	50	12	6	12	7
	%	37.90%	35.70%	8.60%	4.30%	8.60%	5.00%
Higher secondary	Count	110	81	4	11	14	2
	%	49.50%	36.50%	1.80%	5.00%	6.30%	0.90%
Graduate	Count	58	31	2	3	2	0
	%	60.40%	32.30%	2.10%	3.10%	2.10%	0.00%
Post graduate	Count	0	0	0	0	0	0
	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chi-square test value		58.3					
Df		15					
p-value		0.000					

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 7:** Frequency distribution of responses for Q.3 Would you attempt to self re-implant the tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	410	81.3	81.3	81.3
	Yes	94	18.7	18.7	100.0
	Total	504	100.0	100.0	

**Table 8:** Comparison of attempt to self re-implant the tooth and Education

Education	Would you attempt to self re-implant the tooth?		
	Yes	No	
Illiterate	Count	9	19
	%	32.10%	67.90%
Elementary school	Count	34	106
	%	24.30%	75.70%
Higher secondary	Count	38	186
	%	17.00%	83.00%
Graduate	Count	10	85
	%	10.50%	89.50%
Post graduate	Count	0	0
	%	0.00%	0.00%
Chi-square test value		10.826	
Df		3	
p-value		0.013	

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 9:** Frequency distribution of responses for Q.4 Who would you consult in case of an avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dentist	470	93.3	93.3	93.3
	Doctor	30	6.0	6.0	99.2
	Family member/ Friend/ Neighbor	2	.4	.4	99.6
	Other	2	.4	.4	100.0
	Total	504	100.0	100.0	

**Table 10:** Comparison of consultation in case of avulsed tooth and Education

Education	Who would you consult in case of an avulsed tooth?				
	Friends/ Neighb	Doctor	Dentist	Other	
Illiterate	Count	2	7	19	0
	%	7.10%	25.00%	67.90%	0.00%
Elementary school	Count	0	15	124	1
	%	0.00%	10.70%	88.60%	0.70%
Higher secondary	Count	0	7	218	0
	%	0.00%	3.10%	96.90%	0.00%
Graduate	Count	0	0	95	1
	%	0.00%	0.00%	99.00%	1.00%
Post graduate	Count	0	0	0	0
	%	0.00%	0.00%	0.00%	0.00%
Chi-square test value		69.422			
Df		9			
p-value		0.000			

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 11:** Frequency distributions of responses for Q.6 Are you aware that you have to clean the dirty avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	182	36.1	36.1	36.1
	Yes	322	63.9	63.9	100.0
	Total	504	100.0	100.0	

**Table 12:** Comparison of awareness about need to clean an avulsed tooth and Education:

Education	Are you aware that you have to clean the dirty avulsed tooth?		
	Yes	No	
Illiterate	Count	23	5
	%	82.10%	17.90%
Elementary school	Count	93	46
	%	66.90%	33.10%
Higher secondary	Count	129	96
	%	57.30%	42.70%
Graduate	Count	66	30
	%	68.80%	31.20%
Post graduate	Count	0	0
	%	0.00%	0.00%
Chi-square test value		9.743	
Df		3	
p-value		0.021	

\*\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 13:** Frequency distributions of responses for Q.5 How would you clean the dirty avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Brush	126	25.0	25.0	25.0
	Milk	1	.2	.2	25.2
	Nothing	115	22.8	22.8	48.0
	Salt water	11	2.2	2.2	50.2
	Water	251	49.8	49.8	100.0
	Total	504	100.0	100.0	

**Table 14:** Comparison of knowledge about how to clean an avulsed tooth and Education:

Education		How would you clean the dirty avulsed tooth?				
		Water	Milk	Brush	2 things	Salt water
Illiterate	Count	12	1	10	5	0
	%	42.90%	3.60%	35.70%	17.90%	0.00%
Elementary school	Count	57	0	54	23	2
	%	41.90%	0.00%	39.70%	16.90%	1.50%
Higher secondary	Count	107	0	54	61	2
	%	47.80%	0.00%	24.10%	27.20%	0.90%
Graduate	Count	60	0	8	22	5
	%	63.20%	0.00%	8.40%	23.20%	5.30%
Post graduate	Count	0	0	0	0	0
	%	0.00%	0.00%	0.00%	0.00%	0.00%
Chi-square test value		56.118				
Df		12				
p-value		0.000				

\*\*\*\*p-value less than 0.05 indicates significant association.

**Table 16:** Comparison of knowledge of how to carry avulsed tooth and Education:

Education		How would you carry the tooth?						
		Wrap the tooth in paper or handkerchief	Ice water	Milk	Child's mouth/saliva	Disinfecting solution	Saline solution	Fruit juice
Illiterate	Count	18	7	1	0	0	2	0
	%	64.30%	25.00%	3.60%	0.00%	0.00%	7.10%	0.00%
Elementary school	Count	107	24	0	1	4	3	1
	%	76.40%	17.10%	0.00%	0.70%	2.90%	2.10%	0.70%
Higher secondary	Count	164	37	2	4	11	7	0
	%	72.90%	16.40%	0.90%	1.80%	4.90%	3.10%	0.00%
Graduate	Count	56	17	2	3	8	10	0
	%	58.30%	17.70%	2.10%	3.10%	8.30%	10.40%	0.00%
Post graduate	Count	0	0	0	0	0	0	0
	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chi-square test value		29.055						
Df		18						
p-value		0.048						

\*\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 15:** Frequency distributions of responses for Q.7 How would you carry the tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Child's mouth/saliva	11	2.2	2.2	2.2
	Disinfecting solution	26	5.2	5.2	7.3
	Fruit juice	1	.2	.2	7.5
	Ice water	89	17.7	17.7	25.2
	Milk	5	1.0	1.0	26.2
	Saline solution	25	5.0	5.0	31.2
	Wrap the tooth in paper or handkerchief	347	68.8	68.8	100.0
	Total	504	100.0	100.0	

**Table 17:** Frequency distributions of responses for Q.8  
 Have you ever received any advice regarding emergency management of avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	.4	.4	.4
	No	482	95.6	95.6	96.0
	Yes	20	4.0	4.0	100.0
	Total	504	100.0	100.0	

**Table 18:** Comparison of receiving any advice regarding emergency management of avulsed tooth and Education:

Education		Have you ever received any advice regarding emergency management of avulsed tooth?	
		Yes	No
Illiterate	Count	2	26
	%	7.10%	92.90%
Elementary school	Count	4	136
	%	2.90%	97.10%
Higher secondary	Count	5	219
	%	2.20%	97.80%
Graduate	Count	6	89
	%	6.30%	93.70%
Post graduate	Count	0	0
	%	0.00%	0.00%
Chi-square test value		4.579	
Df		3	
p-value		0.205	

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is greater than that of 0.05 indicates no significant association with education.

**Table 19:** Frequency distributions of responses for Q.11 Do you agree to the importance of saving the avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	22	4.4	4.4	4.4
	Yes	482	95.6	95.6	100.0
	Total	504	100.0	100.0	

**Table 20:** Comparison of agreement to importance of saving avulsed tooth and Education:

Education		Do you agree to the importance of saving the avulsed tooth?	
		Yes	No
Illiterate	Count	25	2
	%	92.60%	7.40%
Elementary school	Count	128	12
	%	91.40%	8.60%
Higher secondary	Count	218	7
	%	96.90%	3.10%
Graduate	Count	95	1
	%	99.00%	1.00%
Post graduate	Count	0	0
	%	0.00%	0.00%
Chi-square test value		9.596	
Df		3	
p-value		0.022	

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

**Table 21:** Frequency distributions of responses for Q.12 Do you have previous experience of managing dental avulsion?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	469	93.1	93.1	93.1
	Yes	35	6.9	6.9	100.0
	Total	504	100.0	100.0	

**Table 22:** Frequency distributions of responses for Q.13 Do you have any previous experience of dental trauma (broken, avulsed, and other)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	393	78.0	78.0	78.0
	Yes	111	22.0	22.0	100.0
	Total	504	100.0	100.0	

**Table 23:** Frequency distributions of responses for Q.10 Are you interested in receiving more information about the emergency management of avulsed tooth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	No	15	3.0	3.0	3.2
	Yes	488	96.8	96.8	100.0
	Total	504	100.0	100.0	

**Table 24:** Comparison of interest in receiving more information about the emergency management of avulsed tooth and Education

Education		Are you interested in receiving more information about the emergency management of avulsed tooth?	
		Yes	No
Illiterate	Count	24	4
	%	85.70%	14.30%
Elementary school	Count	131	8
	%	94.20%	5.80%
Higher secondary	Count	222	2
	%	99.10%	0.90%
Graduate	Count	94	1
	%	98.90%	1.10%
Post graduate	Count	0	0
	%	0.00%	0.00%
Chi-square test value		19.968	
Df		3	
p-value		0.000	

\*\*\*p-value less than 0.05 indicates significant association.

**Interpretation:** Since p-value for the chi-square is less than that of 0.05 indicates significant association with education.

#### 4. Legend of Tables

Table 1: Questionnaire

Table 2: Demographic data

Table 3: Frequency distribution of responses for Q.1 Are you aware of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality?

Table 4: Comparison of awareness of possibility of re-implantation of avulsed tooth as part of first-aid in treatment modality and Education and Gender:

Table 5: Frequency distribution of responses for Q.2 How soon do you believe re-implantation of avulsed tooth should be done?

Table 6: Comparison of belief of promptness of re-implantation of avulsed tooth and Education.

Table 7: Frequency distribution of responses for Q.3 Would you attempt to self re-implant the tooth?

Table 8: Comparison of attempt to self re-implant the tooth and Education.

Table 9: Frequency distribution of responses for Q.4 Who would you consult in case of an avulsed tooth?

Table 10: Comparison of consultation in case of avulsed tooth and Education.

Table 11: Frequency distributions of responses for Q.6 Are you aware that you have to clean the dirty avulsed tooth?

Table 12: Comparison of awareness about need to clean an avulsed tooth and Education:

Table 13: Frequency distributions of responses for Q.5 How would you clean the dirty avulsed tooth?

Table 14: Comparison of knowledge about how to clean an avulsed tooth and Education:

Table 15: Frequency distributions of responses for Q.7 How would you carry the tooth?

Table 16: Comparison of knowledge of how to carry avulsed tooth and Education:

Table 17: Frequency distributions of responses for Q.8 Have you ever received any advice regarding emergency management of avulsed tooth?

Table 18: Comparison of receiving any advise regarding emergency management of avulsed tooth and Education:

Table 19: Frequency distributions of responses for Q.11 Do you agree to the importance of saving the avulsed tooth?

Table 20: Comparison of agreement to importance of saving avulsed tooth and Education

Table 21: Frequency distributions of responses for Q.12 Do you have previous experience of managing dental avulsion?

Table 22: Frequency distributions of responses for Q.13 Do you have any previous experience of dental trauma (broken, avulsed, and other) ?

Table 23: Frequency distributions of responses for Q.10 Are you interested in receiving more information about the emergency management of avulsed tooth?

Table 24: Comparison of interest in receiving more information about the emergency management of avulsed tooth and Education:

## 5. Discussion

People themselves can play an important role in improving the prognosis of the avulsed tooth, if they are aware of possibility of reimplanation of avulsed tooth. This not only saves the tooth but also protects the psychological integrity and aesthetic harmony. According to Abeer M et al, a child shows lower self esteem when the aesthetic harmony is insulted by dental trauma<sup>[14]</sup>. The dental trauma can get impregnated in their mind which can form a paradigm that dental treatments are always related to pain. This leads to dental anxiety and apprehension and so a patient avoids dental checkups and treatments.

The present study was designed for patients visiting a dental hospital in metropolitan city because it is quite economical and easily accessible for majority of patients. Also, the city

houses people who have migrated from different cities all over India and so this allows us to survey a diverse section of people. A questionnaire (Table 1) containing set of 13 questions on knowledge and awareness of managing dental avulsion was prepared and a pilot study was conducted to see the reliability and validity of our study. A sample size of 504 patients was surveyed individually so that every patient understood the questions as well as got properly educated.

An avulsed permanent tooth can be re-implanted and so should be retrieved immediately. This not only saves the viability of the tooth but also saves the patient from aspirating the tooth. As per our survey, majority of participants (94.8%) were unaware of possibility of re-implantation of the avulsed tooth (Table 3) but this was independent of gender and education( $p > 0.05$ ) (Table 4) . This was in agreement with previous studies conducted including Toure et al in Morocco, Lin et al in Hong Kong, Sanu O.O et al in Nigeria, Sae-Lim V et al Singapore and P. Prathyush et al in Bangalore where majority of participants were unaware of re-implantation of avulsed tooth<sup>[15-19]</sup>.

About 48% of the respondents agreed to the importance of re-implantation immediately with majority of the graduates in our study following the same notion (Table 5) and since p-value for the chi-square is less than that of 0.05, it indicates significant association with education (Table 6). When asked if they would self implant the tooth, 87.8% of the female respondents and 82% of the participants unaware of possibility of re-implantation, disagreed to it (Table 7) and Since p-value for the chi-square is less than that of 0.05, it indicates significant association with education (Table 8) . This was in line with previous studies conducted where very few respondents agree to self re-implanting the tooth<sup>[20-26]</sup>. Raphael and Gregory had a contradicting result as 2/3 of the respondents in their study would self re-implant the tooth<sup>[9]</sup>.

There is always anxiety compounded with need of the emergency treatment involved for patients who face dental trauma. Despite the disquietude, 93.2% male and 93.4% female respondents said that they would consult a dentist for the treatment (Table 9) and since p-value for the chi-square is less than that of 0.05, it indicates significant association with education (Table 10). Amongst the respondents who were unaware of possibility of re-implantation following dental avulsion, 93.5% said they would visit a dentist in such an emergency. This is in agreement with previous studies conducted<sup>[10, 26]</sup>. It was contradicting to a study conducted by Shashikiran et al<sup>[22]</sup>, where they reported that most rural parents would send their child to a doctor because of lack of dental clinics. This could be associated with education level as 99% graduates in our study would see a dentist. This could also be due to the fact that respondents in our study are the ones visiting a dental institute.

It is necessary to carefully clean the dirty avulsed tooth with an appropriate cleaning medium without damaging the viability of periodontal ligaments. Only few respondents in other studies conducted, knew the correct cleaning media to be used<sup>[14, 20, 23, 24]</sup>. In the present study, 82.1% of the illiterate and 92.3% of the respondents who were aware of possibility of re-implantation agreed that dirty avulsed tooth had to be cleaned before implantation (Table 11) and since

p-value for the chi-square is less than that of 0.05 indicates significant association with education (Table 12).

But there was lack of knowledge about the need for cleaning the avulsed tooth and the correct cleaning method to be used (Table 13). About 63.2% graduates and 53.8% of total respondents who were aware of possible re-implantation would use water as cleaning medium and 35.7% from the category chose to use toothbrush to clean the dirty avulsed tooth. Since p-value for the chi-square is less than that of 0.05, it indicates significant association with education (Table 14).

Cleaning with a toothbrush would damage the viable cells of the periodontal ligament which are capable of regeneration. An ideal storage medium will not only preserve the vitality of periodontal cells but also is easily accessible and available at the accident site<sup>[27]</sup>. Many previous studies<sup>[9, 10, 19, 26]</sup> have demonstrated that there is lack of knowledge about the correct storage medium. In our survey, a mere 0.6% respondents aware of possible re-implantation, chose milk as storage media and about 1% chose child's saliva to be appropriate (Table 15) Since p-value for the chi-square is less than that of 0.05, it indicates significant association with education (Table 16).

The majority of male respondents chose to use dry storage as appropriate medium to carry the avulsed tooth. In fact, level of education showed no difference as 64.3% illiterate, 72.9% higher secondary and 58.3% graduate chose dry storage by wrapping the tooth in a handkerchief or paper as the right option. It was worrisome to see 17.7% respondents chose ice water as the appropriate storage medium. We believe that the choice of selecting a transport medium is based on the ease of availability and hence using cold water or wrapping the tooth in handkerchief or paper is done. One must know that most easily available and suitable storage media are milk, coconut water or child's own saliva. Milk is considered to be most desirable with optimum pH and osmolarity<sup>[28-30]</sup>. Thomas et al showed that tender coconut water is as effective as Hank's Balanced Salt Solution (HBSS) during extra-oral duration of 15-120 minutes<sup>[2]</sup>.

There is lack of awareness of emergency management of saving the avulsed tooth which can be seen clearly as even the 93.7% graduates never received any information regarding emergency management of avulsed tooth (Table 17) but since p-value for the chi-square is greater than that of 0.05 indicates no significant association with education (Table 18). It was good to see that 95.8% of respondents who were unaware of possible re-implantation and 92.6% of the illiterate respondents agreed to the importance of saving avulsed tooth (Table 19) and there was a significant association with education (Table 20).

Majority of respondents irrespective of level of education or gender said they have never had a previous experience of managing dental avulsion (Table 21 and 22). But about 57.7% of the respondents aware of possible re-implantation believed to have managed previous dental avulsion. Very few of the respondents had any previous experience of dental trauma with 38.5% of people aware of possible re-implantation had previous experience of dental trauma.

It was very encouraging to see that 85.7% of illiterate respondents and 99% graduate respondents were interested in receiving more information regarding the management of avulsed tooth (Table 23) and there was a significant association with education ( $p < 0.05$ ) (Table 24). Most of the respondents actively discussed their queries at the end of the survey and were very keen to hear the correct approach for the same.

## 6. Conclusions

Within the confines and limitation of the present study, it was concluded that irrespective of education level, gender or awareness level about possible re-implantation of avulsed tooth, there is a generalised lack of awareness about the emergency management of avulsed tooth even in a big metropolitan Indian city. The importance of saving the natural teeth has faded away because of variety of available prosthesis, but nothing can truly replace what is created by nature. There is a need for dental professionals and civic authorities to spread awareness so that people can not only fearlessly enjoy their childhood but also grow up as confident men and pass on the gene of correct knowledge. The awareness regarding re-implantation will not only save time but also save money for people in the country.

## References

- [1] Andreasen JO, Ravn JJ. Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. *Int J Oral Surg.* 1972;1:235-9.
- [2] Thomas T, Gopikrishna V, Kandaswamy D. Comparative evaluation of maintenance of cell viability of an experimental transport media "coconut water" with Hank's balanced salt solution and milk, for transportation of an avulsed tooth: An in vitro cell culture study. *J Conserv Dent* 2008;11:22-9.
- [3] Govindarajan M, Reddy VN, Ramalingam K, Durai KS, Rao PA, Prabhu A. Prevalence of traumatic dental injuries to the anterior teeth among three to thirteen-year-old school children of Tamilnadu. *Contemp Clin Dent* 2012;3:164-7.
- [4] Ankola AV, Hebbal M, Sharma R, Nayak SS. Traumatic dental injuries in primary school children of South India - a report from district-wide oral health survey. *Dent Traumatol* 2012;29:134-8
- [5] Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Reimplantation of 400 avulsed permanent incisors. 1. Diagnosis of healing complications. *Endod Dent Traumatol* 1995;11:51-8.
- [6] Nuket S, Sule C, Nurhan G. Clinical investigation of traumatic injuries in Yeditepe University, Turkey during the last 3 years. *Dent Traumatolo* 2005;21:4:188-94
- [7] Petti S, Tarsitani G. Traumatic injuries to anterior teeth in Italian schoolchildren: prevalence and risk factors. *Dental Traumatology* 1996;12:6:294-97.
- [8] Grossman's Endodontic Practice, 12<sup>th</sup> edition, Chapter 15 Treatment of Traumatized Teeth, Pg378, Avulsion.
- [9] Raphael SL<sup>1</sup>, Gregory PJ. Parental awareness of the emergency management of avulsed teeth in children. *Aust Dent J.* 1990 Apr;35(2):130-3.

- [10] Ozer S, Yilmaz EI, Bayrak S, Tunc ES. Parental knowledge and attitudes regarding the emergency treatment of avulsed permanent teeth. *Euro J Dent* 2012;6:370-5.
- [11] Panzarini, S. R., Pedrini, D., Brandini, D. A., Poi, W. R., Santos, M. F., Correa, J. P. T. and Silva, F. F. (2005), Physical education undergraduates and dental trauma knowledge. *Dental Traumatology*, 21: 324–328. doi: 10.1111/j.1600-9657.2005.00327.x
- [12] Subhashraj, K. (2009), Awareness of management of dental trauma among medical professionals in Pondicherry, India. *Dental Traumatology*, 25: 92–94. doi: 10.1111/j.1600-9657.2008.00714.x
- [13] Sae-Lim, V., Chulaluk, K. and Lim, L. P. (1999), Patient and parental awareness of the importance of immediate management of traumatised teeth. *Dental Traumatology*, 15: 37–41. doi: 10.1111/j.1600-9657.1999.tb00747.x
- [14] Abeer M, Abdellatif, Salwa A. Hegazy: Knowledge of emergency management of avulsed teeth among a sample of Egyptian parents. *J Advanced Res* 2011;2:157-62.
- [15] Touré B, Benoist FL, Faye B, Kane A, Kaadioui S. Primary school teachers' knowledge regarding emergency management of avulsed permanent incisors. *J Dent (Tehran)* 2011;8:117–22.
- [16] Lin S, Levin L, Emodi O, Fuss Z, Peled M. Physician and emergency medical technicians' knowledge and experience regarding dental trauma. *Dent Traumatol.* 2006;22(3):124–6
- [17] Sanu OO, Utomi IL. Parenteral awareness of emergency management of avulsion of permanent teeth of children in Lagos, Nigeria. *Niger Postgrad Med J.* 2005;12:115–120.
- [18] Sae-Lim V, Chulaluk K, Lim LP. Patient and parental awareness of the importance of immediate management of traumatized teeth. *Endod Dent Traumatol.* 1999;15:37–41
- [19] Prathyusha P, Harshini T, Haripriya B, Pramod IJ, Swathi K, Samyuktha CL. Knowledge and Awareness Regarding Avulsion and Its Immediate Treatment in School Teachers in Bangalore City (South). *Journal of International Oral Health : JIOH.* 2015;7(8):93-97.
- [20] Ozer S, Yilmaz EI, Bayrak S, Tunc ES. Parental knowledge and attitudes regarding the emergency treatment of avulsed permanent teeth. *European Journal of Dentistry.* 2012;6(4):370-375.
- [21] Andersson L, Al-Asfour A, Al-Jane Q. Knowledge of first-aid measures of avulsion and replantation of teeth: an interview of 221 Kuwaiti schoolchildren. *Dent Traumatol.* 2006;22:57–65.
- [22] Shashikiran ND, Reddy VV, Nagaveni NB. Knowledge and attitude of 2,000 parents (urban and rural - 1000 each) with regard to avulsed permanent incisors and their emergency management, in and around Davangere. *J Indian Soc Pedod Prev Dent* 2006;24:116-21.
- [23] Al-Jame Q, Andersson L, Al-Asfour A. Kuwaiti parents' knowledge of first-aid measures of avulsion and replantation of teeth. *Med Princ Pract* 2007;16:274-9
- [24] Santos ME, Habecost AP, Gomes FV, Weber JB, de Oliveira MG. Parent and caretaker knowledge about avulsion of permanent teeth. *Dent Traumatol* 2009;25:203-8.
- [25] Ayodele A, Elizabeth O, Vincent U, Akinwale A. Knowledge of first aid measures of avulsion and replantation of teeth in Nigerian school children. *Internet J Dent Sci* 2009;7.
- [26] Deepa Gurunathan<sup>1</sup>, Tee Jing Loo<sup>2</sup>, Sujatha Somasundaram<sup>3</sup> Knowledge and attitude of parents with regard to avulsed permanent tooth of their children and their emergency management-Chennai Journal of Indian Society of Pedodontics and Preventive Dentistry, Vol. 32, No. 2, April-June, 2014, pp. 97-107
- [27] Ashkenazi M, Marouni M, Sarnat H. In vitro viability, mitogenicity and clonogenic capacity of periodontal ligament cells after storage in four media at room temperature. *Endod Dent Traumatol.* 2000;16:63–70
- [28] Trope M. Clinical management of the avulsed tooth: Present strategies and future directions. *Dent Traumatol.* 2002;18(1):1–11
- [29] American Academy of Pediatric Dentistry- Decision Tree for Management of Avulsed Permanent Tooth
- [30] Blomlöf L. Milk and saliva as possible storage media for traumatically exarticulated teeth prior to replantation. *Swed Dent J Suppl* 1981;8:1-26.