

## Primarily School Teachers' Knowledge Before and After Teaching First Aid Measures about Avulsed or Broken Permanent Incisor among Children

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**Abstract:** Children spend a considerable amount in school where teachers are the primary caregivers. Children are especially sensitive about missing anterior teeth. Immediate re-plantation of avulsed or knocked out teeth more often contributes to an improved self-image and enhances self-esteem in children. Hence, :**Aim** to assess the primarily school teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor among children. **Design:** *Quasi-experimental research design* was utilized to meet the aim of the study. **Convenient sample** included 184 teachers (study and control group) at 8 primarily public schools in Assuit City. A questionnaire sheet was designed by the researchers were used to collect the essential data. **Results:** more than half of the teachers were females; the mean age and mean years of experience in the study group were  $35.2\pm 6.4$  and  $5.6\pm 3.1$  respectively. Only 10.4% of the teachers received first aid training about avulsed or broken tooth, statistical significant differences were found between the teachers' knowledge in the pre-test and post- test in all items of knowledge ( $P$ -value  $< 0.001$ ). **Conclusion:** the level of teachers' knowledge in study group was improved after teaching first aid measures than those in control group. Before teaching first aid measures the majority of teachers their level of knowledge was unsatisfactory, after teaching first aid measures, the majority was satisfactory knowledge. **Recommendation:** Educational and training programs about avulsed or broken permanent incisor among children for teachers in all schools.

**Key words:** Primarily schools, Teachers, First aid measures, Avulsed, Broken, Permanent Incisor.

### I.

### Introduction

The most endearing quality of a human being is their smile. A 'smile' that shows beautiful, natural teeth is a greatest asset one person can have. Children are especially sensitive about missing anterior teeth and there is often a conscious effort to avoid smiling. The permanent anterior teeth are not only important for esthetics but are also essential for speech (phonetics), mastication, health of supporting tissues and psychological and mental health of children. Hence, immediate re-plantation of avulsed or knocked out teeth (Permanent incisors) more often contributes to an improved self-image and enhances self-esteem in children (Setty, 2011).

Dental avulsion is defined as the complete displacement of tooth out of socket along with severed periodontal ligament with or without fracture of the alveolar bone (Ankola et al., 2012 & Govindarajan et al., 2012). The sooner avulsed permanent teeth are replanted the greater chance for a favorable outcome. Re-plantation of an avulsed tooth is preferably done at the injury site to minimize extra-alveolar time. The tooth is rinsed with cold tap water for ten seconds to remove any gross contaminants and then immediately replanted in its socket. The patient is referred to the dental care facility for stabilization and antibiotic prophylaxis (Schwartz, 2015).

Prompt and pertinent emergency management is not only the responsibility of the dentist but of lay people, such as the parents and the school teachers available at the site of accident. From the available data, it is clear that a high percentage of the parents, school teachers, healthcare professionals, including general dentists have insufficient information on management of traumatic dental injuries (TDIs) (McIntyre et al., 2008). School nurses are in the position to take both proactive and reactive measures to minimize the frequency and consequences of oral injuries (Navarro, 2005).

Children spend a considerable amount of waking hours in school where they are engaged in physical activities. Various studies have revealed that 16% of dental injuries occur in schools (Abdellatif and Hegazy, 2011). As children are incompetent to carry out emergency treatment of an avulsed tooth, the immediate caregivers are teachers. Since, school teachers are likely to be in contact with the child soon after the injury, their knowledge of emergency procedure is critical to ensure a better prognosis of the clinical treatment (Karande et al., 2012).

The school nurse has a key role not only in providing emergency care to students; but also in developing prevention strategies, she has assisted in the education of teachers/school staff, parents/guardians and students in

prevention and early intervention techniques (**Illinois Emergency Medical Services for Children, 2010**). The school nurses promote and maintain optimal student health by: Providing first aid and arranging for assessment and assistance to a child who becomes ill or injured at school, Communicating with parents and guardians when further medical care or attention may be needed, and making referrals as appropriate; Supporting the health curriculum by teaching health lessons to students and/or serving as a resource to classroom teachers; and Educating the school staff about health matters that affect students and/or staff (**Straim, 2015**).

Parents are sometimes concerned about the appearance of their child after he or she loses a permanent tooth. Tooth loss can have an effect on the dental health and personal appearance if not dealt with properly. When lose or one or more permanent teeth extracted, the remaining teeth can drift out of position. This can lead to a change in the bite, and/or decay and gum disease, and change in the personal appearance (**Berry, 2014**).

Since knowledge of primarily school teachers is critical to the prognosis of avulsed tooth, the present study was undertaken to assess the primarily school teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor in children.

### **Significant of the study:**

Tooth avulsion is one of the most serious dental emergencies in children. Often these injuries occur in school and, therefore, the knowledge of schoolteachers regarding the appropriate measures to be taken immediately after tooth avulsion is crucial to good prognosis (**Kaur et al., 2012**). Dental trauma mainly affects the upper central incisors and can lead to a loss of function as well as a negative impact on quality of life, producing psychological and social discomfort, with lowered self-esteem, embarrassment upon smiling and difficulty in relating with others (**Togoo et al., 2011**).

## **II. Aim of the study:**

**The aim of this study** was to assess the primarily school teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor among children.

### **Subjects and Methods:**

**Research design:** Quasi-experimental research design was utilized to meet the aim of the study.

#### **Hypothesis:**

The primarily school teachers' knowledge after teaching first aid measures regarding avulsed or broken permanent incisor in children will be significantly improve in the study group than those in the control group.

**Setting:** The study was conducted at 8 primarily public schools in Assiut City (four schools were in west and four were in east) on April and May 2015.

**Subjects:** The study subjects included all teachers in the selected schools (184 teachers) which divided randomly by a coin into two groups: the study group (the four schools which in the west) and the control group (the four which in the east).

The total number of the study group was 96 teachers and the total number of the control group was 88 teachers.

**Tool for data collection:** A questionnaire sheet was developed based on review of the related literature as **Bhandary and Shetty (2014); Francisco et al., (2015) and Setty, (2011)** to assess the primarily school teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor among children.

- The questionnaire composed of three parts with a total of twenty questions.

**Part- I:** consisted of five questions about the socio-demographic characteristics of the teachers, including gender, age, educational level, their specialty and years of experiences.

**Part- II:** Included five questions about first aid training and experiences of teachers, whether or not they had received any training or advices about dental trauma, dental trauma experiences and the importance of attending educational program about how to deal with avulsed or broken teeth.

**Part- III:** Included ten questions about the knowledge of the teachers about the first aid measures regarding avulse or broken permanent teeth incisor in children.

- A questionnaire containing close-ended questions (multiple-choice questions), and filled by the participants in the presence of the researchers. The questionnaire was written in Arabic language.

#### **Scoring system:**

-Answers to the questions related to the teachers' knowledge were graded as one point being given for the right answer and zero for the wrong answer. The levels of the teachers' knowledge was considered satisfactory if the percent score was more than 65%, and considered unsatisfactory if the percent score was less than 65%.

**Pilot study:** A pilot study was carried out before starting of data collection on (10 %) of the study sample for the purpose to test the clarity, completeness, and to determine the time involvement. According to the results of the pilot study, the needed modification, omissions, and/or additions were done. The pilot study sample was excluded from the study.

-The questionnaire was tested for its validity by 5 experts in the pediatric field where its value was 92.0%.

-Reliability was estimated by Alpha Cronbach's test for the tool and its result was 0.847 (good reliability).

#### **Field work:**

Data collection was done by the researchers on April and May 2015. The study was conducted at 8 primarily public schools in Assiut Governorate (four schools for the study group and four schools for the control group). It was done during the school brake and teachers rest. The researchers interviewed with teachers to obtain the necessary information; the researchers firstly introduced themselves to them and gave them a complete back ground about the study. The researchers gave the participants the questionnaire which was pre-designed in Arabic language and stays with them to clarify any question vague to them. The questionnaire sheet required about 15-20 minutes for filling. Each school was visited three times during the study period.

### **III. Methods for data collection:**

Permission was obtained from the head master of the selected schools to visit it and carry out the study.

- In order to assess the impact of teaching the first aid measures on the primarily school teachers' knowledge we should be at first assess the baseline of teachers' knowledge.

- Each school was visited three times during the study period before and after teaching the first aid measures as the following:

**The 1<sup>st</sup> time:** Throughout this time the researchers firstly introduced themselves and explain the aim of the study to teachers. Informed oral consent for completion of the questionnaire was obtained from each teacher prior to the start of the study.

- After receiving the permission, the researchers collected the teachers' demographic data and assessing their level of knowledge regarding the first aid measures of avulsed or broken permanent incisor (this visit took about one-two hours).

- Ninety six questionnaire sheets were distributed to the study group and eighty eight were distributed to the control group at the pre test to assess the baseline teachers' knowledge regarding first aid measures of avulsed or broken permanent incisor.

- The teachers were invited to complete the questionnaire within 15-20 minutes in the presence of the researchers.

**The 2<sup>nd</sup> time:** Throughout this time the researchers explained and discussed with teachers the first aid measures by using poster and guidelines about avulsed or broken permanent incisor among children at school brake and teachers' rest (this visit took about one-two hours). The contents of the first aid measures were covered through one session in each school. Teaching was implemented through lecture and discussion.

-Teaching the first aid measures was done to the study group only after completion of the pre-test questionnaire.

**The educational poster:** The poster titled Save Your Tooth by **International Association of Dental Traumatology (IADT), (2011)**. This poster translated into 18 languages we selected and used the Arabic language poster.

**Objective of the educational poster and guidelines:** The educational poster and guidelines will improve the teachers' knowledge regarding the first aid measures of avulsed or broken permanent incisor.

**The content of the poster and guidelines:** Its contain knowledge about the immediate action of avulsed or broken tooth, the correct method of cleaning if "avulsed" tooth was covered with dirt, the correct action if the tooth was broken, the correct holding of the tooth, tooth replant back into its socket, and transporting media used when taking tooth to dentist.

- The guidelines were devolved by **Dental Trauma Guide, (2010) and American Association of Endodontists (AAE), (2015)** it included knowledge about the first aid for avulsed teeth & saving a knocked-out tooth.

- Colorful Arabic educational poster with pictures and guidelines was distributed to teachers and leaved at the selected schools.

**The 3<sup>rd</sup> time:** was to assess the teachers' level of knowledge after teaching the first aid measures (this visit took about one hour).

- The pos-test was done two weeks after teaching the first aid measures to assess its impact on the teachers' knowledge.

-The same questionnaire sheet was distributed to both groups (the study group and the control group) at the post-test.

#### **Ethical consideration:**

The data collection was voluntary in nature and strict confidentiality was assured. Explanation of the aim and methodology of the study was done to all teachers by the researchers. The right to refuse to participate in the study was emphasized to the participants.

- In order to increase the compliance, all teachers were personally informed by the researchers about the study and its importance.
- In the current study 3 teachers were refused to participate in the study (from the control group) and the researchers respect their refusal.

### **Statistical analysis:**

The data were tested for normality using the Kolmogorov-Smirnov Z test and Q-Q plot for homogeneity of variances prior to further statistical analysis. Categorical variables were described by number and percent (No, %), where continuous variables were described by mean and standard deviation (Mean, SD). Chi-square and Fisher's exact tests were used to compare between categorical variables, while t-test was used to compare between continuous variables. A two-tailed  $p < 0.05$  was considered statistically significant. All analyses were performed with the IBM SPSS 20.0 software.

## **IV. Results:**

**Table 1:** Illustrated the socio-demographic characteristics of the study and control group, as shown in this table, more than half of the teachers in the study group were females (51.0%), and 63.6% in the control group, nearly two thirds were males. Nearly half of the teachers in the study group (44.8%) and more than half in the control group (54.5%) were aged from 30-39 years, the mean age of the control group was  $33.9 \pm 4.1$  and the mean age of the study group was  $35.2 \pm 6.4$ . More than three fourths of the study and control group were completed their university education (78.1%), and (76.1%) respectively. More than half of the study and control group their years of experience were  $> 5$  years (59.4%), and (56.8%) respectively, the mean years of experience in the study and control group were  $5.6 \pm 3.1$  and  $5.3 \pm 2.8$  respectively. The majority of teachers in the study and control group their specialties were sciences (84.4%) and (85.2%) respectively.

**Table 2:** Presented the first aid training and experiences of the teachers regarding avulsed or broken tooth among the study and control group, as shown in this table, only 10.4% of the teachers in the study group and 20.5% in the control group received first aid training about avulsed or broken tooth. More than one third of the teachers in the study and control group reported that their students experienced an avulsed or broken tooth (37.5%) and (38.6%) respectively. Majority of the study and control group were not received advice on what to do when a permanent tooth was avulsed or broken in an accident (90.6%) and (85.2%) respectively. 68.8% in the study group and 47.7% in the control group were not satisfied with their knowledge on avulsed or broken tooth. The majority of teachers (84.4%) in both groups think that it is important to have an educational program in management of avulsed or broken tooth.

**Figure 1:** Presented the level of teachers' knowledge among study and control group in pre-post test, as shown in this figure, the majority of teachers (93.8%) in the study group and 85.2% in the control group were unsatisfactory knowledge in the pre test while in the post test the majority of teachers (95.8%) in the study group were satisfactory knowledge.

**Table 3:** Showed the relation between the correct answers of knowledge items in pre and post test among the control group, as shown in this table, no statistical significant differences were found between the teachers' knowledge in the pre-test and post-test in all items, the items of lowest answer percent were related to the correct action if avulsed tooth was broken (5.7%), the methods of keeping the tooth until reach the dentist (8.0%), and the immediate action if the child mouth is bleeding and permanent incisor is missing (13.6%).

**Table 4:** showed the relation between the correct answers of knowledge items in pre and post test among the study group, as shown in this table, statistical significant differences were found between the teachers' knowledge in the pre-test and post-test in all items ( $P$ -value  $< 0.001^{**}$ ), the items of lowest answer percent were related to the correct holding of avulsed or broken tooth (2.1%), the immediate action if the child mouth is bleeding and upper front tooth is missing (8.3%), know that the missing permanent tooth replant back into its socket (12.5%) and the methods of keeping the tooth until reach the dentist (13.5%) after teaching first aid measures the correct answers were increased significantly in these items to (95.8%), (90.6%), (94.8%), and (99.0%).

**Figure 2:** Illustrated the urgent time that a dentist's opinion is needed regarding avulsed or broken tooth, as shown in this figure, before teaching first aid measures 60.8% of teachers reported that the urgent time that a dentist's opinion is needed were before next day, after teaching first aid measures the majority (97.9%) of teachers in the study group reported immediately seeking medical opinion.

**Figure 3:** Presented the correct method for holding of the avulsed or broken tooth, as shown in this figure, before teaching first aid measures nearly two thirds of teachers in pre and post test reported that the correct holding of the avulsed or broken tooth were from any part (64.8%) and (65.9%) respectively, after teaching first aid measures the majority (95.9%) in the study group reported that the correct holding were from the crown.

**Figure 4:** Illustrated the transporting media used when taking avulsed or broken tooth to dentist, as shown in this figure, before teaching first aid measures, more than half of teachers in pre and post test in both groups

selected the ice as suitable transporting media for avulsed teeth (51.1%) and (52.3%) respectively, after teaching first aid measures the majority (95.8%) selected the salt saline or milk or saliva as suitable transported media.

**Table (1): Frequency distribution of socio-demographic characteristics of the teachers in the study and control group**

Socio-demographic characteristics	Control (n=88)		Study (n=96)	
	No.	%	No.	%
<b>1- Gender</b>				
Male	56	63.6	47	49.0
Female	32	36.4	49	51.0
<b>2- Age</b>				
<20 years	3	3.4	1	1.0
20 - 29 years	25	28.4	24	25.0
30 - 39 years	48	54.5	43	44.8
40 - 49 years	12	13.6	23	24.0
50 and more years	-	-	5	5.2
<b>Mean age</b>	33.9±4.1		35.2±6.4	
<b>3- Education level</b>				
Complete university	67	76.1	75	78.1
Incomplete university	21	23.9	13	13.5
Others	-	-	8	8.3
<b>4- Years of experience</b>				
<1 year	2	2.3	2	2.1
1-2 years	19	21.6	17	17.7
3-4 years	17	19.3	20	20.8
5 and more years	50	56.8	57	59.4
<b>Mean years of experience</b>	5.3±2.8		5.6±3.1	
<b>5- Specialty</b>				
Arts	13	14.8	15	15.6
Sciences	75	85.2	81	84.4

**Table (2): First aid training and experiences of the teachers regarding avulsed or broken tooth in the study and control group**

First aid training and experiences	Control (n=88)		Study (n=96)	
	No.	%	No.	%
<b>1- Received first aid training on avulsed or broken tooth</b>				
Yes	18	20.5	10	10.4
No	70	79.5	86	89.6
<b>2- Students had previous avulsed or broken tooth</b>				
Yes	34	38.6	36	37.5
No	54	61.4	60	62.5
<b>3- Received advice on what to do when a permanent tooth was knocked out in an accident</b>				
Yes	13	14.8	9	9.4
No	75	85.2	87	90.6
<b>4- Satisfied with your knowledge about avulsed or broken tooth</b>				
Yes	19	21.6	8	8.3
No	42	47.7	66	68.8
Don't know	27	30.7	22	22.9
<b>5- Think that it is important to have an educational program in management of avulsed or broken tooth</b>				
Yes	76	86.4	81	84.4
No	3	3.4	4	4.2
Don't know	9	10.2	11	11.5

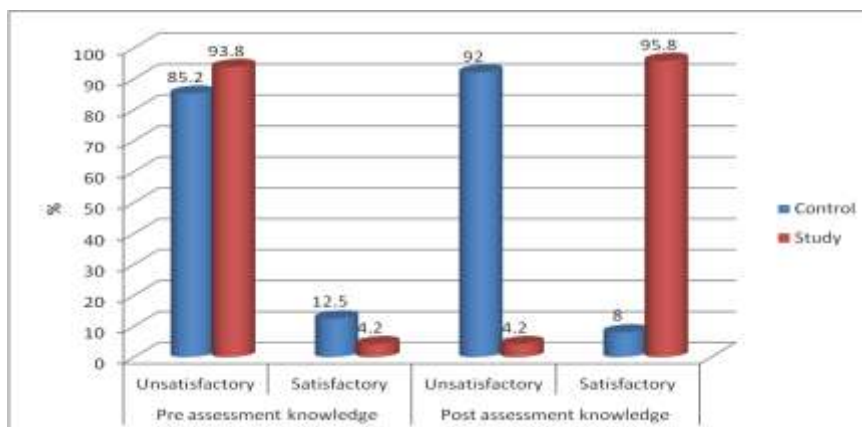


Figure 1: Level of teachers' knowledge among study and control group in pre- post test

Table 3: The relation between the correct answers of knowledge items in pre- post test among the control group (n=88)

Knowledge items	Correct answers of control group				P. value
	Pre-test		Post-test		
	No	%	No	%	
1- The immediate action if the child mouth is bleeding and permanent incisor is missing	12	13.6	14	15.9	0.671
2- The urgent time that a dentist's opinion is needed	22	25.5	22	25.5	0.728
3- The correct method of cleaning if avulsed tooth was covered with dirt	23	26.1	22	25.0	0.863
4- The correct action if avulsed tooth was broken	5	5.7	7	8.0	0.550
5- The methods of keeping the tooth until reach the dentist	7	8.0	9	10.2	0.600
6- The correct holding of the tooth	29	32.9	27	30.7	0.673
7- The permanent tooth replant back into its socket	19	21.6	28	31.8	0.125
8- The primary tooth need to be replanted	23	26.1	21	23.9	0.728
9- The transporting media used when taking tooth to dentist	29	33.0	27	30.7	0.673
10- Tetanus prophylaxis are taken during traumatic injuries	24	27.3	26	29.5	0.738

Table 4: The relation between the correct answers of knowledge items in pre and post test among the study group (n=96)

Knowledge items	Correct answers of study group				P. value
	Pre-test		Post-test		
	No	%	No	%	
1- The immediate action if the child mouth is bleeding and upper front tooth is missing	8	8.3	87	90.6	<0.001**
2- The urgent time that a dentist's opinion is needed	29	30.2	94	97.9	<0.001**
3- The correct method of cleaning if avulsed tooth was covered with dirt	22	22.9	92	95.8	<0.001**
4- The correct action if avulsed tooth was broken	2	2.1	91	94.8	<0.001**
5- The methods of keeping the tooth until reach the dentist	13	13.5	95	99.0	<0.001**
6- The correct holding of the tooth	29	30.2	92	95.9	<0.001**
7- The permanent tooth replant back into its socket	12	12.5	91	94.8	<0.001**
8- The primary tooth need to be replanted	39	40.6	94	97.9	<0.001**
9- The transporting media used when taking tooth to dentist	29	30.2	92	95.8	<0.001**
10- Tetanus prophylaxis are taken during traumatic injuries	35	36.5	88	91.7	<0.001**

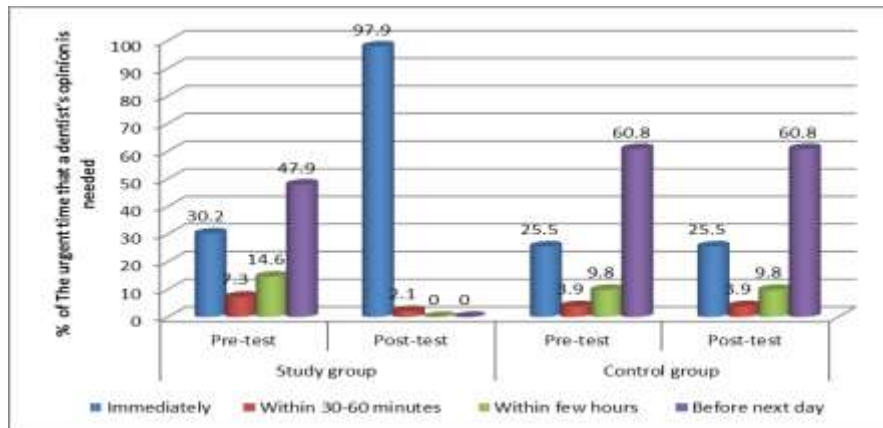


Figure 2: The urgent time that a dentist's opinion is needed among study and control group in pre & post test

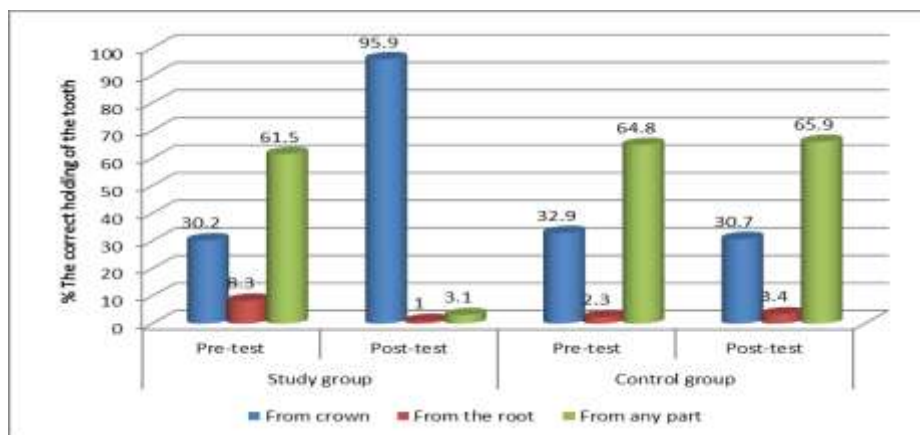


Figure 3: The correct holding of the avulsed tooth among study and control group in pre & post test

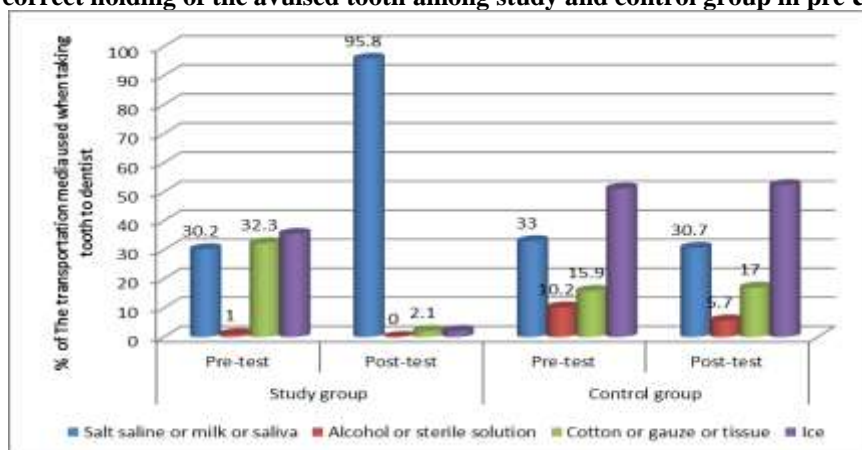


Figure 4: The transporting media used when taking tooth to dentist among study and control group in pre & post test

## V. Discussion

Dental trauma remains one of the important oral health problems in childhood and can cause much pain and distress. It can vary from a minor enamel chip to extensive maxillofacial damage involving the supporting structures and displacement or avulsion of teeth (Abdellatif and Hegazy 2011). Permanent anterior teeth are not only important for aesthetics but also essential for phonetics, mastication, integrity of supporting tissues, psychological and mental wellbeing (Pujita et al., 2013).

The primarily school teachers' knowledge before and after teaching first aid measures (using educational poster and guidelines) about avulsed or broken permanent incisor among children was studied and measured by using self-administered questionnaire.

The poster was used as an educational tool in this study to teach the first aid measures regarding avulsed or broken permanent incisor because it has many advantages, it is relatively cheap, easy to distribute, easy to read, available on the wall, can be seen at any time and no time limit exists, plus using the guidelines.

In the present study more than half of the teachers in the study group were females while in the control group nearly two thirds were males. Nearly half of the teachers in the study group and more than half in the control group were aged from 30-39 years. More than three fourths in both groups were completed their university education. More than half of them their years of experience were > 5 years. The majority of teachers in the study and control group their specialties were sciences (**table 1**). These findings were agreed to the findings of **Francisco et al., (2015) and Pithon et al., (2014)** who stated that most of the participants were female (83%), aged from 20-39 years (62%), with high education (84%), and professional expertise of 5-15 years (41%).

In this study, only few percent of the teachers in the study group and control group received first aid training about avulsed or broken tooth (**table 2**). This result was matched with other study by **Setty, (2011)** which reported that (94.8%) of teachers had first-aid component in their teacher training curriculum, and only (8.0%) teachers had dental first-aid component in their teacher training. Also agreed with **Ahluwalia et al., (2015)** who stated that, more than 70% of teachers had not received any training in first aid methods on emergency management of traumatized tooth.

In the present study more than one third of the teachers in the study and control group reported that their students experienced an avulsed or broken permanent incisor (**table 2**). This result was agreed with other Studies as **Caglar et al., (2005) and Mesgarzadeh et al., (2009)** which stated that, 35.8%, and 47.2%, of teachers, respectively had experienced close encounters with dental trauma.

The finding of the present study showed more than two thirds of the study group and nearly half of the control group was not satisfied with their knowledge on avulsed or broken tooth and the majority of them think it is important to have an educational program on management of avulsed or broken tooth (**table 2**). These results were supported with other study by **Francisco et al., (2015)** who stated that of all professors, 96% would like to be instructed on tooth trauma. Also agreed with the result of **Setty, (2011)** who stated that, majority of the teachers were not satisfied with the knowledge of dental trauma and most of them thought it is important for them to have an educational program in the "management of dental trauma.

The current study revealed that, in pre test the majority of teachers in the study group and control group were unsatisfactory knowledge while in the post test the majority of teachers in the study group were satisfactory knowledge (**Fig., 1**). This finding was in congruence with other study by **Al-Asfour et al., (2008)** who stated that, following administration of a lecture to teachers there was an improvement of 39% to 97% in the general knowledge of avulsion. Also **Mori et al., (2007)** obtained positive results after conducting an educational campaign, with leaflets, posters and lectures for health promotion and expansion of knowledge about dental trauma for professionals in schools.

The reason of unsatisfactory level of teachers' knowledge in the pre-test could be related to the majority of the teachers in this study not attended any first aid training about avulsed or broken tooth.

The correct answered of questions among the study group in pre and post test were showed in **Table (4)**. the percentage of correct answers in the study group increased significantly in the post test after teaching the first aid measures ( $P < 0.001$ ). These results were in accordance with a study done by **Pujita et al., (2013)** who stated that, after an informative promotion it would have been ideal to observe the percentage of improvement in all areas at 90% or above, also agreed with **Arikan and Sönmez (2012)** who stated that, initial responses indicated the knowledge level of teachers to be quite low. Following the distribution of the information leaflet, the rate of correct answers increased for each of the individual questions, and the total scores for the questionnaire increased significantly ( $P = 0.0001$ ).

This study revealed that majority of teachers in pre-test in both groups did not know that permanent tooth replant back into its socket (**Table 4**). This finding was in congruence with **Olatosi et al., (2013)** who reported that, most of the teachers (41.9%) did not know if an avulsed permanent tooth could be replanted.

According to the present study findings the level of teachers' knowledge in study group were improved in post-test after teaching first aid measures than those in pre-test. This finding was similar to the finding of **Young et al., (2014)** who stated that Two-week display of posters improved the knowledge score of teachers by 1.25 ( $p\text{-value} = 0.0407$ ) on average.

The current study revealed that (**fig., 2**), before teaching first aid measures more than half of teachers reported that the urgent time that a dentist's opinion is needed were before next day, after teaching first aid measures in the study group the majority reported immediately seeking medical opinion. This finding was in congruence with other study finding in Karnataka by **Bhandary and Shetty (2014)** who reported that 67.5% responded correctly that they would immediately seek professional help if a permanent tooth has been fallen off from the mouth.



In the current study nearly two thirds of teachers in pre-test answered incorrectly the question related to the correct holding of the avulsed or broken tooth, after teaching first aid measures the majority reported that the correct holding were from the crown (**fig., 3**).

As regard the transferring media for an avulsed or broken tooth, before teaching first aid measures, more than half of teachers in pre and post test in both groups selected the ice as suitable transporting media after teaching first aid measures the majority selected the salt saline or milk or saliva as suitable transporting media, while in the control group no difference (**figure 4**). This result was matched with the result of **Ghadimi et al., (2014)** who stated that before distribution of the educational poster, 50% of teachers in the control group and 66% in the test group preferred milk and saline as storage media for transferring an avulsed tooth. After the intervention, 100% of teachers selected milk and saline as suitable storage media. Also result of **Krishnan B. and Joseph J. (2014)** stated that the Knowledge of teacher about storage media for avulsed permanent teeth was poor.

In the current study, no-intervention (educational poster or teaching the guidelines) in the control group, so the results illustrated that there was no knowledge acquisition and no statistical significant differences related to the correct answers of all questions among control group in pre and post test. This result was agreed with **Ghadimi et al., (2014)** who stated that there was no change in the proportion of correct answers for all questions in the control group.

## **VI. Conclusion:**

Based on the results of the current study, and the research hypothesis, the study concluded:

The primarily school teachers' knowledge was improved significantly ( $P < 0.001$ ) in the study group than those in the control group after teaching first aid measures regarding avulsed or broken permanent incisor in children, particularly on the items related to the primary tooth need to be replanted or not, the methods of keeping the tooth until reach the dentist, the urgent time that a dentist's opinion is needed, the transporting media used when taking tooth to dentist, and the correct holding of the tooth.

## **Recommendations:**

**Based on the results the of current study, it is recommended that,**

- Farther an educational and training program is recommended for the teachers in all schools.
- The study recommended mandatory for all the teachers to have the guidelines on the management of dental injury including the first aid measures regarding of avulsed permanent incisor in their teachers training curriculum.

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