Elementary School Teachers and their knowledge of tooth Replantation.

Introduction:

One out of two children sustained a dental injury. The 7-11-year-old age group is the most commonly affected age range, school professionals should be aware of the importance of immediate treatment procedures in cases of tooth avulsion. It has been shown that when a child reaches school age, accidents at the school, usually falls are the main cause for traumatic dental injuries. Dental trauma can vary from a minor enamel chip to an extensive damage involving the supporting structures and displacement or avulsion of teeth. Avulsed permanent incisors in children should be replanted immediately if possible. However, the prognosis depends on prompt and appropriate emergency management which usually needs to be provided by persons that are going to be present at the time of the injury such as school teachers or parents. Children are exposed to accidents due to their daily activities. Most of them occur at school with dental avulsions fairly common. For this reason, participation of the school teachers in the emergency management is fundamental to provide good care to the injured child. The quality of the emergency management procedures will directly affect the long term prognosis of the avulsed teeth. Children of 7-11 of age and their maxillary incisors are the most affected by dental trauma. More effective communication between dentist and school teachers its need it in order to handle dental emergencies.

Previous studies have documented unawareness of school professionals with respect to emergency procedures for management of avulsed permanent teeth. However, this is not an isolated finding. Other studies have also demonstrated lack of knowledge of school professionals regarding dental trauma. Therefore, there is an oncoming need to establish standard operational procedures about initial treatment of tooth avulsion, in order to increase the prognosis of the affected teeth.

Tooth avulsion “knocked out teeth” is common accident in young children, and most teeth need to be replanted, but the knowledge of teachers in this emergency situation appears to be limited. The purpose of this survey is to collect data about the knowledge of teachers on the emergency management of avulsed teeth after injury.

Materials and Methods:

The research design included all public elementary schools in Broward County school District in Florida. The design involved a participant online survey Monkey. This study was reviewed by the Institutional Review Board of Nova Southeastern University and given “exempt” status. The School Board of Broward County, Institutional Review Board after reviewed the research proposal, approval was granted. Following recommendation of SBBC, Principals of 138 Elementary Schools were contacted by mail, a letter of invitation to participate in this study was sent containing a copy of the District Approval Letter and a copy of the Principal approval Memorandum, name and addresses were obtained from the School Info of Broward County Public Schools Website.
To confirm participation the Principals were requested to send a list of ten (10) e-mail addresses of Elementary School Teachers from 2nd to 5th Grade. The decision reached was based on a strictly voluntary basis.

### Response Summary

<table>
<thead>
<tr>
<th>Gender</th>
<th>Response Frequency</th>
<th>Response Count</th>
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</thead>
<tbody>
<tr>
<td>a. Male</td>
<td>13.8%</td>
<td>4</td>
</tr>
<tr>
<td>b. Female</td>
<td>86.2%</td>
<td>25</td>
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<thead>
<tr>
<th>Age</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<tbody>
<tr>
<td>a. 20-30</td>
<td>20.7%</td>
<td>6</td>
</tr>
<tr>
<td>b. 31-40</td>
<td>37.9%</td>
<td>11</td>
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<tr>
<td>c. 41-50</td>
<td>24.1%</td>
<td>7</td>
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<tr>
<td>d. 51-60</td>
<td>10.3%</td>
<td>3</td>
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<td>e. 61-70</td>
<td>6.9%</td>
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<thead>
<tr>
<th>Is dental trauma a part of the health education curriculum in your school?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<tbody>
<tr>
<td>a. Yes</td>
<td>3.4%</td>
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<tr>
<td>b. No</td>
<td>96.6%</td>
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<tr>
<th>Do you think a tooth can be completely knocked out?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<tr>
<td>a. Yes</td>
<td>86.2%</td>
<td>25</td>
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<tr>
<td>b. No</td>
<td>13.8%</td>
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<th>If yes in question # 4, where did you find out?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<tr>
<td>a. Internet</td>
<td>0.0%</td>
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<tr>
<td>b. School lectures</td>
<td>4.0%</td>
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<tr>
<td>c. Own research</td>
<td>80.0%</td>
<td>20</td>
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<td>d. Your Dentist</td>
<td>16.0%</td>
<td>4</td>
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<tr>
<th>Do you think primary (baby, temporary) teeth should be put back in, after they were knocked out?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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</thead>
<tbody>
<tr>
<td>a. Yes</td>
<td>20.7%</td>
<td>6</td>
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<tr>
<td>b. No</td>
<td>79.3%</td>
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<tr>
<th>Do you think permanent (the teeth you have for the rest of your life) teeth should be put back in, after were knocked out?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<td>a. Yes</td>
<td>69.0%</td>
<td>20</td>
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<tr>
<td>b. No</td>
<td>31.0%</td>
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<tr>
<th>If the tooth has fallen on the ground and is dirty, what would you do?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<tr>
<td>a. You clean it</td>
<td>65.5%</td>
<td>19</td>
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<tr>
<td>b. You don't clean it</td>
<td>34.5%</td>
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<tr>
<th>If you decide to clean the tooth, how would you hold it?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<td>a. With pliers</td>
<td>10.3%</td>
<td>3</td>
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<tr>
<td>b. With your fingers</td>
<td>6.9%</td>
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<tr>
<td>c. You put in a container</td>
<td>82.8%</td>
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<th>If the tooth is knocked out accidentally, When should it be put back in?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<td>a. Immediately</td>
<td>17.2%</td>
<td>5</td>
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<td>b. During the first hour</td>
<td>41.4%</td>
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<td>c. During the first 6 hours</td>
<td>41.4%</td>
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<th>Do you think a tooth can be out of a person's mouth for a longer than an hour if stored in another way than dry storage?</th>
<th>Response Frequency</th>
<th>Response Count</th>
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<td>a. Yes</td>
<td>62.1%</td>
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<td>b. No</td>
<td>37.9%</td>
<td>11</td>
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</table>
What should you do if you cannot (or choose not to) put the tooth back in the mouth?

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<tr>
<th>Response</th>
<th>Frequency</th>
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<td>a. Put in a container with water</td>
<td>40.7%</td>
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<td>b. Put in a container with patient's saliva</td>
<td>11.1%</td>
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<td>c. Put in a container with milk</td>
<td>22.2%</td>
<td>6</td>
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<tr>
<td>d. Put in a container with Hank's balance solution</td>
<td>0.0%</td>
<td>0</td>
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<tr>
<td>d. other</td>
<td>25.9%</td>
<td>7</td>
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Broward County Elementary Public Schools by District

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Results:

138 Elementary School Principals, which correspond to 138 Elementary Schools in Broward County, were contacted via mail and e-mail to participate in the study. Principals were requested to send 10 e-mail addresses in order to conduct the survey. The e-mail address list will be the confirmation for their participation. From 138 Elementary Schools Principals, 114 did not respond, 16 (sixteen) responded that they will not participate, 8 (eight) Principals accepted the invitation and were willing to participate in the study (Fig.1). They sent 10 e-mails address each for a total of 80 which will be the size population. The survey was sent to 80 Elementary School Teachers, 29 respond to the survey, (36.25% Fig. 1). Most participants were females (86.2% Fig. 2) between 31-40 years old (37.9% Fig.3).
Fig. 1

Fig. 2

Fig. 3
When asked if Dental trauma is part of the health education curriculum just 3.4% answered yes and 96.6% answered no. 86.2% think that a tooth can be knocked out, 13.8% don’t. 80% of the participants found that the teeth can be knocked out by their own research. 20.7% think that a primary tooth should be replanted and 79.3% answered no. Regarding permanent teeth 69% answered yes and 31% no. In case of an emergency 65.5% of the school teachers will clean the tooth and 34.5% don’t. 82.8% of the participants will put the tooth in a container. Just 17.2% think that the tooth should be replanted immediately. 62.1% think that a tooth can be out of a person’s mouth for a longer that an hour and 40.7% will put the tooth in a container with water, 11.1% in a containers with patient’s saliva, 22.2% in a container with milk, 0.0% responded in a container with Hank’s balance solution, and 25.9% responded other.

Discussion:

The reported incidence of tooth avulsion ranges from 1% to 16% of all traumatic injuries to the permanent dentition. Tooth avulsion result in damage to the periodontal ligament and cemental layer. The apical neurovascular supply to the pulp is also affected resulting in an altered or total loss of vitality to the tooth and the drying damage has extremely detrimental effects on healing.

Avulsed primary teeth should not be replanted because of the potential for subsequent damage to developing permanent tooth germs. Permanent teeth must be replanted as soon as possible and then to stabilize the replanted tooth in its anatomically correct location to optimize healing of the periodontal ligament and neurovascular supply while maintaining esthetic and functional integrity.

When a tooth is replanted immediately (ideally within 5 minutes) at the scene or when the tooth is stored in appropriate medium (in order of preference: Viaspan, Hank’s Balanced Salt Solution, cold milk, saliva, saline, water) to maintain vitality of the periodontal ligament fibers the case prognosis will improve. Limited tooth storage in a cell compatible medium prior to replantation has produced similar healing results as compared with immediately-replanted teeth. The risk of ankylosis increases significantly with an extraoral dry time of 15 minutes. An extraoral dry time of 60 minutes is considered the point where survival of the root periodontal cells is unlikely.

The single most important factor in the success of replantation is the speed which the tooth is replanted. Children between 7 and 11 years of age are the most commonly affected by dental trauma. Therefore, school teachers must be aware of the importance of emergency treatment and how to proceed in cases of tooth avulsion. School teachers should be instructed to hold the tooth by the crown, wash the root gently in running water or saline and place the tooth back in the socket as traumatically as possible and the patient should be brought to the dental office immediately. If doubt exists, the tooth should be storage in an appropriate medium.
Our findings base in the survey responses indicate that the majority of school teachers are not well versed in tooth replantation in case of dental trauma. School teachers who supervised and care for our children and would be at the time of the site of traumatic dental injuries are in need of education regarding emergency management.

**Limitations:**

The decision to participate in this study was as per mandate of the School Board of Broward County Research Services on a strictly voluntary basis.

**Conclusions:**

Other studies have reported a lack of knowledge in the management of dental trauma by certain groups.

There is a need for increased dental trauma education of school teachers. Informative campaigns and changes in the public school curriculum may serve to prepare these educators in managing cases of traumatic dental injuries.

Educational strategies are required involving both the dental professional and the school teachers to improve communication and follow protocols when facing a case of tooth replantation.

Pamphlets and lectures must be part of the intervention of traumatic dental injuries at the Elementary Schools.

**Acknowledgements:**

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References:
