# Knowledge and Attitudes Toward Dental Avulsion of Public and Private Elementary Schoolteachers

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#### ABSTRACT

**Purpose:** The purpose of this study was to evaluate and compare the knowledge and attitudes toward dental avulsion of public and private elementary schoolteachers.

**Methods:** the study was performed by applying a questionnaire in a sample composed of 95 elementary schoolteachers (46 from public schools and 49 from private schools). The questionnaire comprised 9 questions and was pretested before final implementation.

**Results:** Thirty-nine percent of private schoolteachers and 15% of public schoolteachers witnessed at least 1 case of dental avulsion at the school (P=.009). Ninety-two percent and 62% of private and public schoolteachers, respectively, admitted the possibility of an avulsioned tooth to be reimplanted (P<.001). Both responses were statistically different when school type (public or private) was considered. Only 27% of private schoolteachers and 11% of public schoolteachers knew the procedures to be taken in cases of avulsed teeth, and more than 95% of all teachers did not feel capable of executing tooth reimplantation. The study showed no statistical difference between private and public schoolteachers' knowledge.

**Conclusions:** Teachers and other professionals involved in children's care and supervision must be correctly and well informed about dental avulsion, its consequences and the correct procedures to be performed in such cases.

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Traumatic dental injuries have been one of the most important oral health problems in childhood, and their prevalence may be even higher than dental caries and periodontal disease.<sup>1</sup> Several studies have demonstrated that 20% of the permanent teeth of 7- to 11-year-olds had been involved in some type of traumatic accident, most of which involved anterior teeth.<sup>2-5</sup> Additionally, trauma intensity and direction and the periodontal ligament structure in children have favored the occurrence of dental avulsion.<sup>2</sup>

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Dental avulsion has been defined as the complete displacement of a tooth from its alveolus. It is one of the most critical clinical conditions for children due to its great impact on quality of life. Accordingly, dental avulsion may lead to aesthetical complications, lower masticatory efficiency, difficulties in phonation, and even social and psychological problems.<sup>2,3</sup>

Regarding avulsed teeth, some emergency measures must be taken to keep the periodontal ligament vital, increase the chances for a successful reimplantation, and maintain the dental alveolus. The reimplantation procedure of the avulsed teeth has been recommended to be performed within 30 minutes after trauma. Until that time, the teeth must be kept in a proper storage media and a dentist should be contacted immediately.<sup>6</sup>

Although dental reimplantation prognosis has depended on the immediate and appropriate management given to avulsed teeth, the first-aid care procedures are normally performed by laypeople, such as family members and schoolteachers who are close to the child at the moment of the trauma.<sup>7,8</sup>

Schoolteachers have frequently dealt with cases of dental trauma in schools. Some studies, however, indicate a lack of knowledge about handling dental avulsion and correctly referring the child to a specialized dental care center.<sup>4,5,7,9-15</sup> A study by Sae Lim assessed the knowledge of Singapore teachers about avulsed teeth and showed that 63% of the teachers admitted that they lacked appropriate information on this subject.<sup>9</sup> In other Brazilian studies, evaluating knowledge about dental trauma have concluded that teachers and parents based their actions more on personal insights than on standard protocols when facing dental avulsions.<sup>8,10</sup> Other studies<sup>4</sup> have discussed the need to create awareness campaigns and teach about the techniques for managing avulsed teeth.

Brazilian public education has been relatively depreciated. Accordingly, it has not offered the same working conditions as private schools. Generally, private schools have offered better education standards since they have provided an appropriate basis to students and teachers. Private schoolteachers have tended to enjoy better incomes, work more years, and be stimulated to take continuing education and postgraduation courses.

Based on the need for immediate actions intended for better tooth reimplantation prognosis, the purpose of this study was to evaluate and compare the knowledge of and attitudes about dental avulsion among private and public elementary schoolteachers of the city of Curitiba, Brazil.

#### **METHODS**

The present study was executed by administering a questionnaire to a sample of 100 elementary schoolteachers in Curitiba, capital city of the state of Parana, Brazil. Fifty public schoolteachers and 50 private schoolteachers from Curitiba were randomly selected. All had been teaching 7- to 11-year-olds. Prior to this study application, 2 of the authors visited the schools and explained the nature and objectives of this present study to the teachers who agreed to participate in the survey. The study's voluntary nature was emphasized, and its strict confidentiality was assured. After that, each participant completed a free informed consent form. The questionnaire was pretested in a similar teacher population and applied after approval from the Institutional Review Board of Ribeirão Preto University, Ribeirão Preto, Brazil.

The questionnaire comprised only 1 open and 9 closed questions that were divided into 2 sets. The first set of questions (nos. 1 to 3) was intended to obtain a personal profile of the teachers. The second set (nos. 4 to 9) evaluated knowledge of and first-aid procedures for dental avulsion. The participants were asked to return the questionnaires after 7 days.

Results were expressed in percentages for each question, and statistical analysis was performed using a chisquare test with a significance level of .05.

#### RESULTS

A total of 95 schoolteachers (46 from public and 49 from private schools) returned the questionnaire, for a 95% response rate. One private and 4 public school-teachers did not return the questionnaire within a week. Consequently, their questionnaires were excluded from the sample. Over 80% of the respondents were females and all respondents were at least 23-years-old.

Private schoolteachers (51%) showed more years of teaching since graduation than public schoolteachers (22%), and they also attended more postgraduation courses (86%) than public schoolteachers (61%).

Table 1 shows the teachers' personal profile. After analyzing the first set of questions, only working experience and postgraduation course attendance presented statistically significant differences (P=.004) between private and public schools.

The answers to the second part of the questionnaire, which investigated teachers' knowledge on first-aid procedures after a dental avulsion, are presented in Table 2. Sixty-one percent of public schoolteachers and 85% of private schoolteachers had never witnessed a case of dental avulsion (P=.009). Most schoolteachers were not capable of providing appropriate first-aid care if dental trauma occurred, since 73% and 89% of private and public schoolteachers, respectively, did not know how to proceed in dental avulsion cases (P=.04).

When asked about the emergency care procedure of choice in such cases, more than 70% of respondents of both school types would take the child to a hospital emergency room instead of calling the child's parents or legal guardian or performing tooth reimplantation (P=.02).

It is important to note that 98% and 96% of private and public schoolteachers, respectively, did not feel

Table 1. Den	nographic Characteristics of
Scho	polteachers According to
Scho	pol Type (N=95)

Demographic data	Private school N (%)	Public school N (%)	P-value†	
Respondents	49 (100)	46 (100)		
Age (ys)				
Median±(SD)	41.0±8.2	39.5±9.5	NS	
Range	23-62	23-58		
Gender				
Female	42 (86)	39 (85)	NS	
Male	7 (14)	7 (15)		
Ys since graduation*				
<1	0 (0)	2 (4)		
1-10	8 (16)	20 (44)	.004	
10-20	16 (33)	14 (30)		
≥20	25 (51)	10 (22)		
Postgraduation courses*				
Yes	42 (86)	28 (61)	.005	
No	7 (14)	18 (39)		

\* Statistical difference according to chi-square and Fisher's exact test. † NS=nonsignificant.

capable of executing a tooth reimplantation, if necessary. Teachers were also asked about the immediate proper care of avulsed teeth needed after the trauma. In both private and public schools, water was chosen as the best storage medium for preserving the teeth. Milk (23%) and paper napkins (24%) were the second choice in private and public schools, respectively. Plastic bags were chosen by 12% and 20% of private and public schoolteachers, respectively. Teachers also indicated ice, alcohol, distilled water, saline solution, placing the tooth under the tongue, and discarding the tooth as options for managing the avulsed teeth and storage medium. Some of the teachers (4% of booth schools), reported that they did not know the answer to this question.

## DISCUSSION

Dental avulsion in 7- to 11-year-olds can be a relatively common occurrence. Since children spend part of their day in school, teachers are the most likely responsible adults to first manage dental trauma cases.

Some studies have discussed the teachers' knowledge on first-aid procedures in cases of teeth avulsion,<sup>4,5,9-11</sup> while others have specifically discussed physical education teachers' knowledge. This is because, during their classes, the student could be more exposed to oral and facial traumas.<sup>12-15</sup> Past studies have demonstrated that teachers have had insufficient knowledge of first-aid care for dental avulsion, which was corroborated by this study's results among both types of schools. Correspondingly, in this study, almost 90% of the public schoolteachers reported that they would not know how to proceed in dental avulsion cases.

In Brazilian schools, there is currently a quality education standard and many differences exist between public and private schools. This fact could be seen in the responses obtained from the teachers and their profiles in each type of school. In the present study, private schoolteachers (51%) had 20 or more years of working experience while 44% of public schoolteachers had 1 to 10 years experience, against a mean of 6.8 working years related by literature.9 Theoretically, if teachers presented more years of working and degrees, the probability of witnessing a dental avulsion case and knowing the correct procedures to be followed would be higher. In this study, the percentages of teachers who witnessed tooth avulsion cases were 39% for private schoolteachers and 15% for public schoolteachers. Other studies reported 23% to 25%, regardless of school type.<sup>4,9</sup> On the other hand, this present study demonstrated that, although private schoolteachers more frequently witnessed a dental avulsion, their knowledge about emergency care was similar to public schoolteachers.

Regarding procedures to be followed in case of dental avulsion, most teachers (75%) would take the child to a hospital emergency room. Similar results have been found in several reports.<sup>5,10,11,14-16</sup> Some studies have reported that 50% to 60% of teachers would seek an emergency service as soon as possible.<sup>9,11,14,15</sup> It is important to note that, in this present study, approximately 6% of public schoolteachers would execute the tooth reimplant vs 20% of private schoolteachers.

Concerning tooth reimplantation, this present study demonstrated that 62% of public schoolteachers and 92% of private schoolteachers knew that this procedure could be performed. Theoretical information on reimplantation, however, did not seem to assure that the procedure would be practically successful. More than 95% of teachers did not feel capable of performing tooth reimplantation. Other studies have also reported that 75% to 80% of teachers had not been capable of executing this procedure.5,6 A study evaluated the knowledge of intermediate schoolteachers from Kuwait before and after being informed about the immediate and proper dental first-aid steps to be taken at the time of trauma. The authors concluded that a lecture followed by discussion seemed to be an efficient method to increase the knowledge on dental trauma and on how it could be treated. General knowledge about tooth avulsion and reimplantation improved from 39% to 97%, and knowledge about avulsed permanent and primary teeth increased from 8% to 71%.17

#### Table 2. Teachers' Knowledge About Dental Avulsion According to School Type

Questions	Answers	Private school N (%)	Public school N (%)	P-value‡
	Yes	19 (39)	7 (15)	.009
1. Have you ever witnessed a case of dental avulsion?*	No	30 (61)	39 (85)	
	Yes	13 (27)	5 (11)	.04
2. Do you know how to proceed in a case of dental avulsion?*	No	36 (73)	41 (89)	
	Call legal parent	2 (4)	9 (20)	.02
<ol> <li>What is the emergency care procedure of choice in a case of dental avulsion?*</li> </ol>	Take to emergency rooms and hospitals	37 (76)	34 (74)	
	Reimplant tooth	10 (20)	3 (6)	
	Yes	45 (92)	29 (62)	<.001
4. Is it possible to reimplant avulsed teeth?	No	4 (8)	17 (38)	
	Yes	1 (2)	2 (4)	NS
5. Do you feel able to reimplant a tooth?	No	48 (98)	44 (96)	
	Water	16 (33)	13 (28)	
	Napkin paper	7 (14)	11 (24)	
6. Where can you keep avulsed teeth when waiting for proper care?	Milk	11 (23)	5 (11)	NS
	Plastic bag	6 (12)	9 (20)	
	Other†	9 (18)	8 (17)	

\* Statistical difference according to chi-square and Fisher's exact test.

† Other=ice, alcohol, distilled water, saline solution, under the tongue, discard the tooth, do not know.

*†NS=nonsignificant*.

The ideal treatment for avulsed teeth is generally thought to be immediate reimplantation with minimal further damage to root surface's cells.3 Before reimplantation, the tooth should be cleaned with saline solution only when visible dirt would be observed. During this procedure, the tooth should be held by the crown and the root surface should be gently washed.<sup>8,10</sup> A study showed that, although teachers had indicated that their attitude toward carrying out this procedure would not be assured, they had been taught how to properly preserve the avulsed teeth and facilitate the child's immediately referral to an appropriate source of care.<sup>5</sup> It is worth noting that some countries have provided specific training in dental first-aid care for elementary schoolteachers, but this has not been a routine in Brazilian elementary schools.5,11,16

Regarding the type of storage medium for keeping avulsed teeth, only 11% to 23% of respondents correctly identified milk as the best choice. This result was also reported in other studies.<sup>7</sup> As shown in Table 2, the relatively high percentage (18% and 17% of private and public schoolteachers, respectively) of respondents who marked the option "others" reflected the poor information of some schoolteachers on this subject. It should be noted that some of the answers given by the schoolteachers were not totally incorrect, such as saline solution and saliva (under the tongue). Although these have not been considered the best storage media for storing teeth until reimplantation, they would be a much better choice than ice and alcohol. Some studies have demonstrated that, even among dentists there had not been a consensus on how the avulsed teeth should be stored.<sup>1,18</sup> Westphalen et al.<sup>19</sup> however, demonstrated that dentists from Curitiba were well informed about tooth avulsion.

Besides schoolteachers, parents, especially mothers, and babysitters must be well informed about dental trauma to better handle childrens' dental emergencies. The literature have reported, however, that mothers were not capable of correctly acting in these cases, since they had based their attitudes more on personal insights than on acquired knowledge, reflecting the need for a more effective communication between dentists and parents.<sup>8,20</sup>

# CONCLUSIONS

Based on this study's results, it can be concluded that public and private schoolteachers from Curitiba, Brazil, have poor knowledge of the correct procedures that must be followed in dental avulsion cases. Although they have considered tooth reimplantation, they do not feel capable of performing the procedure by themselves. Teachers and other professionals involved in children's care and supervision must be correctly and well informed about dental avulsion, its consequences and correct procedures to be performed in such cases. First-aid care training and qualifying courses for schoolteachers must be required in any elementary school.

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