



**Original article**

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# Degree of knowledge of dental trauma among primary school teachers in the Community of Madrid

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## ABSTRACT

**Aim:** To analyze the degree of knowledge and mode of action of Primary Education teachers in a traumatic dentoalveolar emergency during school hours.

**Methods:** A validated questionnaire with 10 multiple choice questions was applied to 159 teachers. It evaluated the knowledge about emergency and traumatic dental injuries among primary school teachers. Public, charter and private schools in the Community of Madrid participated.

**Results:** More than half of the sample have basic knowledge of course of action. 84% can distinguish between temporary and permanent teeth. 67.92% believe that the tooth must be returned to its original position, although only 13.84% would reimplant it.

**Conclusions:** It is necessary to raise awareness about the importance of the initial actions after dental trauma in order to reduce post traumatic sequelae.

## KEYWORDS

Trauma questionnaire; Dental trauma; Teacher training.

## INTRODUCTION

Currently, the second most common cause of dental office visits is dental trauma, the first being tooth decay. Most injuries occur in the upper anterior teeth, which can cause mastication problems, problems with diction due to the interposition of the tongue or fingers, and psychological implications both if the trauma occurs at very early ages or in pre-adolescence.<sup>1,2</sup> Andreasen found a prevalence of 30% of lesions in the primary dentition and 22% in the permanent dentition.<sup>3</sup> In turn, Sánchez and García Godoy found a prevalence of 28.4% in children between 3 and 13 years old.<sup>4</sup> Gallego and Martínez obtained a prevalence of 17.4% between 11 and 14 years old in their study<sup>5</sup>; García-Pérez et al. Reported a higher prevalence of 21.65% between 8 and 11 years of age, more frequently in the male sex.<sup>6</sup> In Spain, in the work by Zaragoza et al., published in the book by García Ballesta et al., the authors found an incidence of dental trauma of 5.6% in school children aged 6-12 years.<sup>2</sup>

The etiology of dental trauma varies depending on the age: in the first years of life children begin to walk and run, so they occur at home and daycare. During school age, traumas are due to falls and collisions in schools; and in adolescence the main cause is usually due to the practice of higher intensity and risky sports in schools and sports facilities.<sup>3,7</sup>

Other predisposing factors are Angle Class II, increased prominence, lip incompetence and mouth breathing.<sup>6,8</sup>

The prognosis and evolution of traumatized teeth will depend directly on immediate and correct attention from parents or schoolteachers at the time of the accident. It is necessary that these actors have a basic understanding about action protocols since these accidents should always be treated as an emergency, going immediately to the dentist's office to make a proper diagnosis and to implement the appropriate therapeutic approach, thereby helping to reduce post-traumatic sequelae.<sup>8</sup>

In the published literature, we can find studies carried out in countries such as Iran, Cuba, China, Brazil and Paraguay, among others, in which they have analyzed the knowledge that schoolteachers have about dental trauma. All come

to the common conclusion that teachers do not have adequate or sufficient knowledge to act correctly in this type of emergency. These studies have also been carried out on parents and hospital medical personnel, arriving at the same results.<sup>9,10</sup>

The aim of this paper is to analyze the level of knowledge of primary school teachers in schools of the Community of Madrid when faced with a traumatic dental emergency situation. In addition, the paper seeks to raise awareness about the importance of immediate action and to make known a basic action.

## MATERIALS AND METHODS

A descriptive cross-sectional study was carried out in 13 public, charter and private schools in the Community of Madrid. The final sample consisted of 159 questionnaires made to primary school teachers. Participation by the teaching staff was voluntary and anonymous.

The questionnaire identified the sex of the adult, age, level of education and years of professional experience. It consisted of 2 blocks with a total of 10 multiple-choice questions with one correct answer -in some questions there was another option that could be considered "acceptable"- on knowledge and emergency primary care when faced with a dental trauma. The answers were based on the 2015 dental trauma protocols published by the American Association of Dental Injuries (AADI), as follows: 0 points for the wrong answer, 1 point for the acceptable answer, 2 points for the correct answer.<sup>10</sup> This questionnaire was previously validated in other international published articles. The data obtained were analyzed statistically by means of descriptive analysis<sup>11</sup> (Annex).

## RESULTS

159 primary school teachers participated in the study, 133 women (83.65%) and 26 men (16.35%), with an average age of 40 years. The level of education for the majority of those surveyed was Diploma (n = 88), followed by Graduates (n = 55). The professional experience of the respondents ranged from 1 to 40 years (6 = 13.71 years).

The first Clinical Case in the survey presented the case of a 9-year-old boy who broke two upper teeth. Faced with this situation, the teachers had to identify the type of dentition and the treatment that the situation would require. 84% answered correctly that they are probably permanent teeth (Figure 1), and 58% answered that they would pick up the pieces of broken teeth and with their parents would send the child quickly to the nearest dentist (Figure 2).

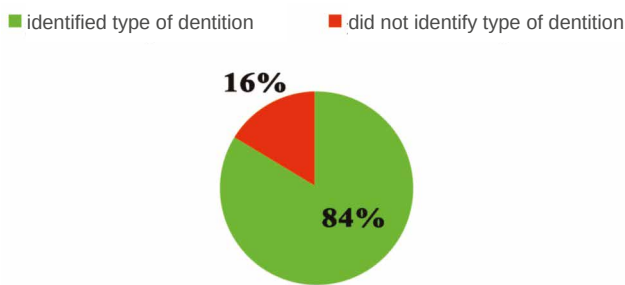


Figure 1. Clinical Case 1 (Answers): Identification of the type of dentition: temporary or permanent.

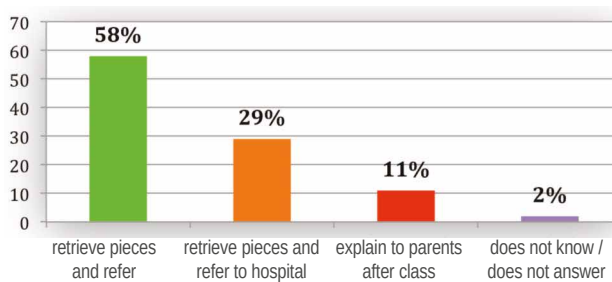


Figure 2. Clinical Case 1: distribution of results on the measures that the teaching staff would adopt when faced with dental trauma in permanent dentition.

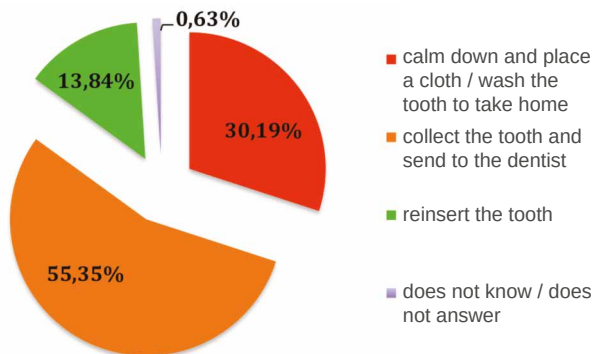


Figure 3. Distribution of the answers according to the measures to be carried out after a dental avulsion in permanent dentition.

The second case report presented the situation in which a 13-year-old girl suffers from dental avulsion of an upper tooth: 55.35% answered that she would pick up the tooth and take the child to the dentist. However, the option of reimplanting the avulsed tooth at the time of the accident was only pointed out by 13.84% of the teaching staff (Figure 3).

In the block of questions on knowledge of the management of an avulsed permanent tooth, the fourth question tried to discern whether the teacher would reposition an avulsed tooth in the child's mouth, resulting in 23% of those who indicated they would (Figure 4). On the other hand, 66.67% know that an avulsed temporary tooth cannot be repositioned in the mouth (Figure 5), and 77.36% are aware that the child has to go immediately to the nearest dentist due to the importance of the loss of a tooth, or in the first 30-60 minutes after avulsion (Figure 6) (Questions 4-6).

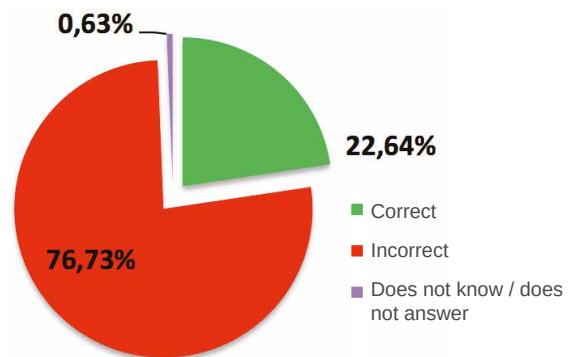


Figure 4. Response to question number 4 of the questionnaire.

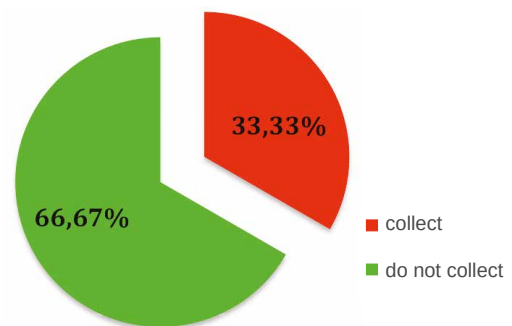


Figure 5. Response to question 5 of the questionnaire

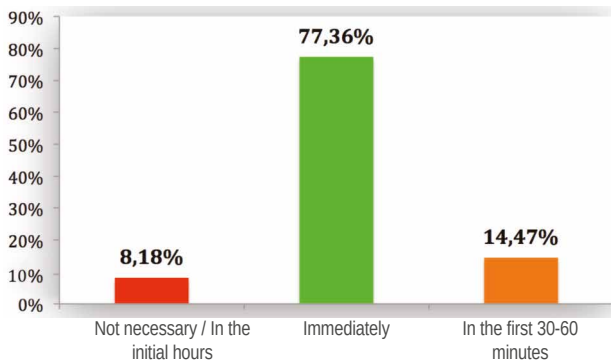


Figure 6. Response to question 6 of the questionnaire.

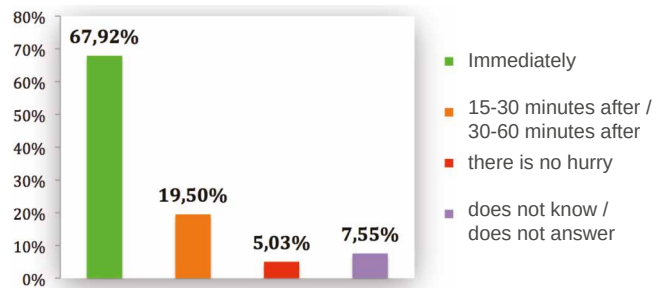


Figure 8. Response to question 8 of the questionnaire.

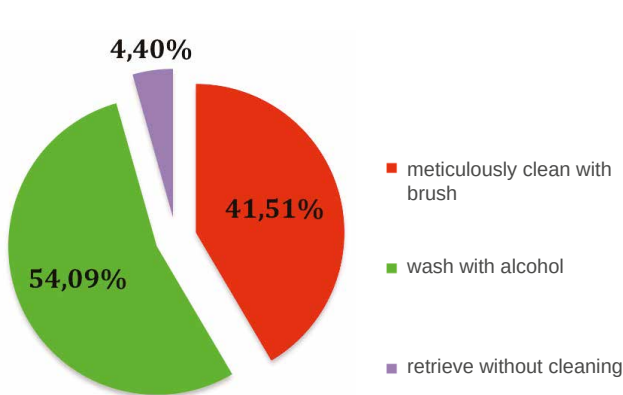


Figure 7. Distribution of responses according to the means used to wash an avulsed tooth before reimplanting it.

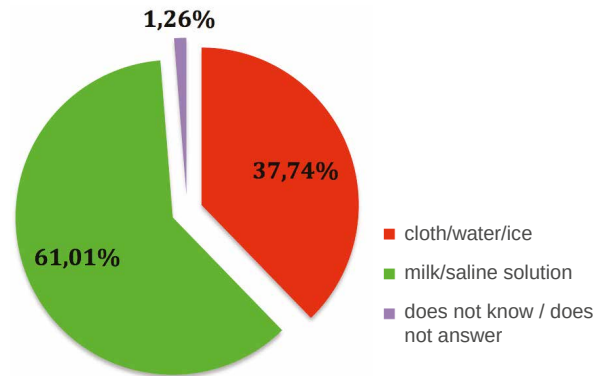


Figure 9. Distribution of responses according to the storage medium chosen to transport the avulsed tooth.

If they had to reimplant a tooth, only 54.09% would first clean it with water; the remaining percentage would clean it meticulously with a brush, with alcohol or would not clean it (Question 7) (Figure 7).

In the eighth question: “When do you think the tooth should be replaced to its original position?”, 67.92% of teachers replied immediately after the injury, and 19.50% would reimplant it between 15 and 60 minutes later (Figure 8).

Regarding the means of transport to carry the avulsed tooth, 61.01% would transport it in milk or saline and 37.74% in water, ice or in a handkerchief (Question 9) (Figure 9).

All the teachers surveyed (100%) responded to the last question that, in the event of a dental trauma, they would immediately go to the nearest dentist.

Finally, a final section was added that allowed any teacher who would like to write down any suggestion. Most of

the schools surveyed recognized that the knowledge they possess on the subject is insufficient and that they would like to receive information on the action protocol for these dental emergency situations.

## DISCUSSION

With this study, we wanted to assess the degree of knowledge about dental trauma among a group of teachers from the population of Madrid.

After carrying out a review of the published literature, we have found studies conducted in countries such as Sweden, the United States, Iran, Cuba, China and Brazil, where they would go with the child to the dentist); In the study conducted by Mori in Brazil<sup>13</sup>, 18.8% would reimplant the tooth and 60.6% would seek a dentist. In other works such as Bahrami’s, 54% would not reimplant the tooth and

80.8% would go to the dentist, and in the McIntyre study, the percentage of teachers who would go with the child to the dentist is somewhat higher, 87%.<sup>14,15</sup>

Research has been carried out on the knowledge of parents, medical professionals and teachers. Works similar to this one, carried out exclusively on primary school teachers, are those of Bahrami in Sweden, McIntyre in the United States, Chan in Hong Kong, Cabañas in Latin America, Azeredo in Brazil, among others (Table).<sup>10,13-15</sup>

In the case of trauma to the upper teeth in a 9-year-old child, 84.28% of the teachers who participated in our study were able to identify permanent and temporary teeth. This is a high percentage compared to the study conducted by Azeredo in Brazil, in which only 41.5% recognized the upper teeth of an 8-year-old child as permanent dentition.<sup>16</sup>

In this situation, 57.86% of the professors surveyed picked up the pieces of broken teeth and, together with their parents, would send the child to the nearest dentist. This result is very similar to that reported in the studies carried out by Gallego (63.2%) and Cuesta (58%)<sup>6</sup>, both carried out on teachers in Cuba.<sup>7,12</sup>

In the case of dental avulsion of a permanent tooth, 13.84% of teachers surveyed would reimplant the tooth and 55.35% would go to the nearest dentist immediately; meaning, a percentage that was too low, taking into account the importance of reimplantating a permanent tooth in the mouth quickly after a dental emergency.

This attitude has been observed in other works such as that of Cabañas in Paraguay<sup>9</sup> (6.38% would reimplant the tooth and 84.40%

Regarding the reimplantation of the avulsed tooth, prior to carrying it out, 54.09% of the professors would wash it

**TABLE. SUMMARY OF THE MOST RELEVANT STUDIES CARRIED ON TEACHERS CONSULTED IN THE BIBLIOGRAPHY.**

AUTHORS	COUNTRY	NUMBER OF SUBJECTS	PROFESSION	LEVEL OF KNOWLEDGE
Cabañas et al., 2013 <sup>9</sup>	Paraguay	141	Teachers of Primary Education, 1 <sup>st</sup> cycle, 2 <sup>nd</sup> cycle and Physical Education.	<ul style="list-style-type: none"> <li>Moderate knowledge in 50%.</li> <li>Regular conduct in 47%.</li> </ul>
Raof et al., 2012 <sup>16</sup>	Iran	422	Teachers of Primary Education.	Inadequate level of knowledge regarding dental trauma.
Gallego, 2009 <sup>7</sup>	Cuba	49	Physical Education Teachers.	Insufficient knowledge and skills on immediate actions when faced with trauma.
Chan et al., 2001 <sup>17</sup>	China	166	Secondary School Physical Education Teachers	Inadequate knowledge when faced with dental trauma.
Azeredo et al., 2016 <sup>11</sup>	Brazil	205	High school teachers.	<ul style="list-style-type: none"> <li>They are not trained to act correctly when faced with a dental emergency.</li> <li>The knowledge they possess has no scientific basis.</li> </ul>
Cuesta et al., 2009 <sup>12</sup>	Cuba	58	Teachers of Primary and Secondary Education	The level of knowledge to carry out immediate management and abilities when faced with trauma are insufficient

with water and

41.51% would clean it thoroughly with a brush or alcohol, since they believe that it is necessary to disinfect before re-introducing it into the oral environment, according to the final comments; this is an incorrect procedure since the fibers of the periodontal ligament would be eliminated, fundamental for improving the viability of the reimplantation. In the studies reviewed, such as those by Gallego<sup>7</sup>, Raoof<sup>16</sup> and Chan<sup>17</sup>, we found response variations from 40.8% to 66.3% in which the respondents would wash the tooth with water.

As stated in the IADT and Save a Tooth™ protocols, the ideal solution for transporting an avulsed permanent tooth is Hank's balanced solution. This medium is not mentioned in any of the articles reviewed, since the questionnaires only reflect the most accessible media in the school environment.

As for the means of transport they would choose to transport the tooth to the dentist, 61.01% of the surveyed population would immerse it in milk or saline and 37.74% in water, ice or a handkerchief. We found differences with studies such as those of Gallego<sup>7</sup>, Cabañas<sup>9</sup>, Raoof<sup>16</sup> and Chan<sup>17</sup>, since in all of these the majority answered that they would transport the tooth on a paper napkin or handkerchief (30.6%, 40.4%, 42 % and 31.9%, respectively).

Valdepeñas et al., recently published in 2016 a work similar to this research, but carried out on primary healthcare personnel: doctors, dentists, nurses and dental hygienists; in relation to the immediate management of dental trauma at the accident site, all the groups presented limited knowledge, except for the group of dentists, who obtained an adequate result. However, they found that 92% of dentists had inadequate notions about updated protocols in primary care in consultation for dental trauma and its follow-up.<sup>18</sup>

All the aforementioned studies, including ours, indicate that the level of knowledge of schoolteachers on the subject treated is inadequate and insufficient, as well as lacking the ability to act in the correct manner. Therefore, they recommend increasing knowledge about the action protocol in these cases. In addition, the teachers

are aware of this and claim they need to have more information as indicated in the final comments of the questionnaire (Table). Public entities should be informed of the existence of protocols in cases of trauma, which can be accessed freely through the web, public hospitals, public hospitals, scientific dental societies, and that they represent a primary resource.

## CONCLUSIONS

More than half of the teachers surveyed have basic knowledge on how to act when faced with trauma, but not correct and adequate knowledge, although 100% are aware that in the event of dental trauma, it is necessary to go immediately to the nearest dentist.

We want to all attention to the need to provide training courses to primary school teachers in order to raise awareness of the importance of quick and appropriate initial action, to reduce sequelae and post-traumatic risks associated with these dental emergencies.

## APPENDIX

### QUESTIONNAIRE ON KNOWLEDGE OF DENTAL TRAUMA BY PRIMARY SCHOOL TEACHERS

- |                 |                                      |                                      |
|-----------------|--------------------------------------|--------------------------------------|
| SEX             | <input type="checkbox"/> Male        | <input type="checkbox"/> Female      |
| AGE             | <input type="checkbox"/> 25-30 years | <input type="checkbox"/> 30-40 years |
|                 | <input type="checkbox"/> 40-50 years | <input type="checkbox"/> ≥50 years   |
| EDUCATION LEVEL | <input type="checkbox"/> Diplomate   | <input type="checkbox"/> Graduate    |
|                 | <input type="checkbox"/> Doctorate   | <input type="checkbox"/> Master's    |

PROFESSIONAL EXPERIENCE / TEACHING YEARS:

.....  
 SCHOOL:.....

CIRCLE THE OPTION THAT YOU CONSIDER CORRECT FROM THE FOLLOWING 10 QUESTIONS.

#### CASE I

During recess, a 9-year-old boy was hit in the face with a soccer ball. 2 upper teeth were broken.

- 1) Are those upper teeth that have been broken likely to be temporary (milk) or permanent (definitive)?:

- a. Temporary (milk) teeth.
  - b. Permanent (definitive) teeth. c. I do not know.
- 2) Which of the following measures would you consider the most appropriate?:
- a. Pay no mind, rinse with water only.
  - b. Collect the pieces of broken teeth, and after classes, get in touch with their parents to explain what happened.
  - c. Collect the pieces of broken teeth and with their parents quickly send the child to the nearest dentist.
  - d. Collect the pieces of broken teeth and with their parents quickly send the child to a nearby hospital emergency room.

**CASE II**

During class change, a 13-year-old girl falls down the stairs and hits her mouth. Your mouth is bleeding and you can see that there is a missing upper tooth, which has completely left the mouth (dental avulsion).

- 3) What would you do?:
- a. I would calm the girl and provide a handkerchief to bite to stop the bleeding.
  - b. I would wash the tooth and give it to the girl to take it home.
  - c. I would pick up the tooth and take the child to the dentist. d. I would reposition the tooth in its original site in the mouth.

**KNOWLEDGE OF MANAGEMENT OF AN AVULSED TOOTH**

- 4) Would you replace a tooth in its place that due to a blow has completely left the mouth (dental avulsion)?:
- a. Yes b. No
- 5) In the case of a milk tooth that has left the mouth due to a blow (dental avulsion), Do you think it should be reimplanted?:
- a. Yes b. No
  - c. I do not know
- 6) If a permanent tooth, as a result of a blow, has left the mouth (dental avulsion), when would it be advisable to go to the nearest Dentist?:
- a. It is not necessary to go to the Dentist. b. Immediately.
  - c. In the first 30-60 minutes after the accident. d. In the first hours after the accident.
- 7) Suppose you decide to replace the tooth that has come out of its place in the mouth in its original place. Before picking it up, what would you do with it?:
- a. I would clean it thoroughly with a brush. b. I would wash it with water.
  - c. I would wash it with alcohol.
  - d. It would not be necessary to clean it, would be

- reimplant it without doing anything else.
- 8) When do you think that reimplantation of the tooth in its original place should be done?:
- a. Immediately.
  - b. At 15-30 minutes after the blow.
  - c. At 30-60 minutes after the blow.
  - d. There is no hurry to reimplant.
- 9) Assuming that the tooth is not repositioned in its original place immediately, what means of storage or transport would you use to transfer the tooth to the dentist?:
- a. A handkerchief. b. Water
  - c. Milk.
  - d. Saline solution e. Ice.
- 10) In summary, when faced with any dental trauma, when would you advise going to the nearest Dentist?:
- a. It is not necessary to go to the dentist.
  - b. As soon as possible.
  - c. In the first week after the accident.

WE APPRECIATE YOUR COOPERATION IN THIS KNOWLEDGE QUESTIONNAIRE.

If you want to add or suggest anything, you can point it out below.

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