

# Evaluation of Knowledge of Educators on Dental Avulsion in Two Education Establishments in Manaus

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## Abstract:

The subject assessment of knowledge of educators Children's House Nursery and Municipal School of Basic Education painter Leonardo da Vinci - Manaus-AM on dental avulsion aims to verify if teachers have adequate knowledge about dentoalveolar trauma, as well as the most appropriate conduct before one tooth avulsion frame. The dental trauma is one of the most important oral health problems in childhood, may cause distress and pain as well as physical, psychological distress and other implications such as a tendency to avoid smile, that may affect social relationships. The emergency care for traumatized teeth is recognized as critical to the success of the final treatment. Therefore, before an avulsed tooth in the school environment, the participation of teachers in emergencies can help in providing good care to the injured child, because the quality of the emergency procedures will directly affect the long-term prognosis of avulsed tooth.

**Keywords — Knowledge of educators, Tooth avulsion, Dentoalveolar trauma.**

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## I. INTRODUCTION

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The dental avulsion is the complete withdrawal of the tooth from the alveolus of origin [25]. It constitutes the most important of all dental injuries, causing physical, psychological discomfort, pain, suffering and other complications as a tendency to avoid smiling, exerting negative interference in

social relations causing a decline in the quality of life of the child affected by this trauma [19].

The prognosis of avulsed permanent teeth is directly related to the perfect diagnosis and the quality of immediate care [2]. The maintenance and preservation of the dental organ has been the incessant search of Dentistry since its most rudimentary to the present day. Dental avulsion consists of total displacement of the tooth from its alveolus, which in some cases can cause immediate or late irreparable loss due to the sequelae associated with this trauma, such as root resorption [3]. When related to the dental element, trauma can result in lesion of enamel, dentin, pulp, cementum, periodontal ligament and bone tissue

with partial or total loss of dental units [32]. In addition to the prevalence, so-called risk factors should also be taken into account when studying dental traumatism. The term epidemiologically refers to the likelihood of an unintended event occurring, referring to the possibility of individuals who do not have certain disease but who were exposed to certain conditions to acquire this disease [17].

After the trauma, rupture of the fibers of the periodontal ligament, responsible for root insertion in the bone and root integrity [34]. The state of the pulp and periodontal ligament is of great importance for the healing of avulsed and reimplanted teeth [31]. The literature shows that the main cause of dental trauma is falls, collisions with objects or people, sports practices, stumbling blocks, motor vehicle accidents [30]. Although these lesions occur at any age, they usually affect permanent teeth, especially in the most active age range of 8 to 12 years. The most traumatic tooth is the upper central incisor, approximately 80% of the dental lesions occur in this element, followed by the upper lateral incisors and the lower central and lateral ones [9]. The treatment of this trauma is directed to decrease the effects of the two main complications of the avulsed tooth: insertion damage and pulp infection. The damage to the insertion results from the avulsion lesion and can not be avoided, but an additional damage that must be considered is with the periodontal ligament, it can occur in the time period in which the tooth remains outside the mouth, mainly due to dehydration [9]. Dental reimplantation is the procedure of reinsertion of a tooth into its alveolus, avulsed intentionally or accidentally. Dental reimplantation is the only non-prosthetic treatment that can be performed against a case of avulsion, although the success rate is between 4 and 50%, it should always be performed, as the permanence of the tooth in the alveolus can delay the making of a prosthesis [18].

The dental reimplantation should be performed immediately through the slow insertion to allow the fluid to escape from the socket as well as the continuous pressure for 5 to 10 minutes. If the replacement is a abrupt,

the pressure of the trapped fluid will allow the extrusion. The success of this treatment depends on the integrity of the periodontal ligament [18]. This is only possible if there implantation occurs during an extra-alveolar period of less than two hours before irreversible changes occur [31]. Since immediate reimplantation is not possible, there are several means for storage such as bovine milk, saliva, serum and water. Among these, drinking water is considered unfeasible because it is hypotonic and causes rapid lysis of the cells. Saliva, although more effective than water and better than a dry medium, is more hypotonic than milk, and also has the disadvantage that its application presents the risk of traumatized swallowing of the avulsed tooth as well as containing bacteria. As for the serum, it shows better results than the saliva, it manages to maintain the vitality of the periodontal ligament for 30 minutes [6]. According to Cohen and Burns [9] bovine milk is the most indicated because it presents osmolarity and pH compatible with vital cells, maintaining the effectiveness of the periodontal ligament. Children are more prone to dental avulsion, especially during leisure, play and physical activity in schools [7]. The teachers' knowledge about this type of trauma is necessary for emergency treatment, since they are the ones who are closest at the time of the trauma and can help by providing good care to the injured child.

The importance of technical knowledge about dental avulsion by educators has a high significance, since children who suffer the most from this type of dental trauma are in school stage and during physical activities can suffer falls, collisions, occurring this type of injury. Having the correct knowledge to know how to act in this situation, either by replacing the tooth in its socket or by packing it in the appropriate medium, can mean the difference between failure and success of the dental reimplant [33]. An avulsed tooth may be reimplanted, but this depends primarily on prompt and appropriate first care, which is usually provided by non-health professionals at the site of the accident. For Stokes et al. the treatment in the first 30 minutes offers the best results. The prognosis also depends on the storage medium of the avulsed tooth before reimplantation since when the tooth is

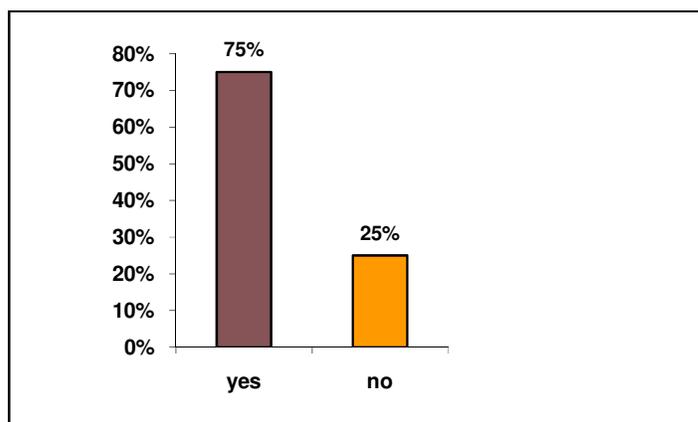
kept in a moist storage medium, such as milk, reimplantation can be done later, and the chances of success are increased and viability of the remaining periodontal ligament on the root surface [12].

## II. METHODOLOGY

The research was carried out in the city of Manaus, capital of the State of Amazonas, located in the Northern Region of Brazil, in the Municipal School of Primary Education Pintor Leonardo Da Vinci (East Zone) The educators (teachers, pedagogues and managers) of the school and nursery in question were evaluated and oriented, being 60 the total of professionals. The project was submitted to the Research Ethics Committee and approved. Data collection took place after authorization from the direction of the Leonardo da Vinci Municipal School of Primary Education and "Casa da Criança" Day Care Center and the approval of the Research Ethics Committee. The data were collected from the answers to a structured questionnaire divided into two parts, after the acceptance with signing of the Informed Consent Term of the educators of the Municipal School of Elementary Education Painter Leonardo da Vinci and Day Care Center "Casa da Criança". The first part of the questionnaire contained questions about the characterization of the teacher as gender, age, time of work as educator. The second part will be about previous experiences, specific questions about dental avulsion and whether the interviewee is prepared to act in front of an avulsed tooth frame. After completing the questionnaire, pamphlets containing information on the subject were distributed. This collection was performed on two occasions, before and after the orientation on avulsion and dental reimplantation. The data obtained were tabulated and sent to a statistician for investigation and displayed in the form of charts and tables, taking into account the knowledge before and after the avulsion / reimplantation orientation and procedures to be performed in the posttrauma, in order to evaluate the acquisition of knowledge of educators.

## III. RESULTS

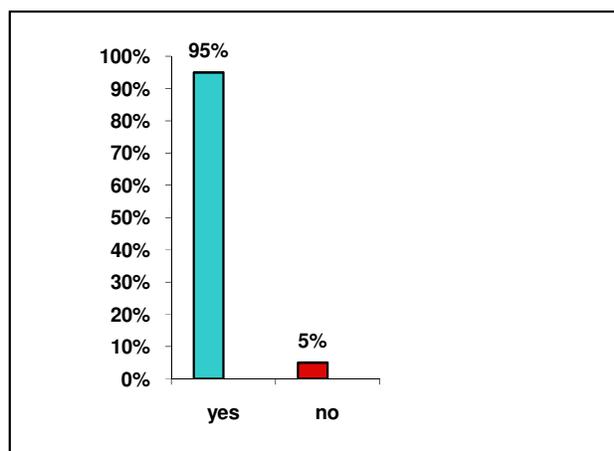
The results of the two questionnaires were carried out in two moments, one in the period of November / 2014 and the other in May / 2015, analyzed in quantitative form, the numbers being given as a percentage, since the number of instruments answered corresponded to the total of valid questionnaires. In the question about the importance of avulsion / reimplantation knowledge in day-to-day work at school, 75% of the yes and 25% of the non-answers were obtained.



Graph 1 - importance of knowledge about avulsion / reimplantation day to day work at school

According to Guedes-Pinto[14], dental avulsion represents approximately 15% of the traumatic lesions in the permanent dentition. The loose structure of the periodontal ligament and the high resistance of the bone tissue surrounding the erupting teeth favor dental avulsion. Immediate reimplantation must occur to allow recovery of tooth functions because the cell and fibers of the periodontal ligament are responsible for root integrity and insertion of the root into the alveolar bone. This is why it is so important that the tooth is rapidly placed in the socket, and if this is not possible, it must be preserved to maintain the vitality of the periodontal ligament and the tooth itself in an aqueous medium such as saliva. Bittencourt et al[7] evaluated the behaviour of teachers regarding the importance of knowledge about dental avulsion, since they spend more time

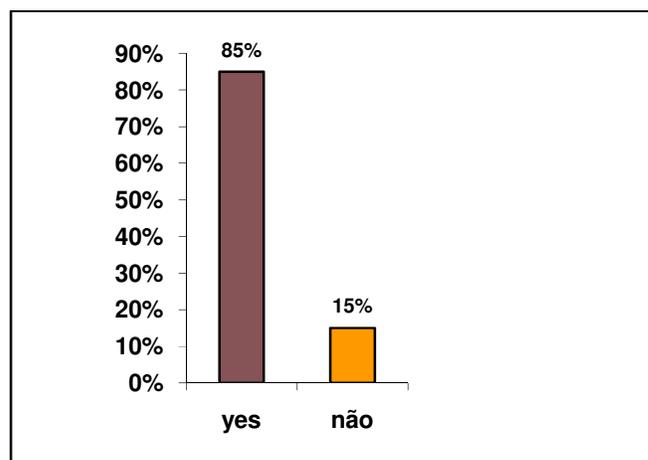
with children in school. The reimplantation has been highlighted as the treatment of choice and to achieve a good prognosis, it is necessary that the reimplantation be performed immediately by the child himself or by lay people. If this is not possible, it is recommended to preserve the tooth in a container containing a moist medium that favors the viability of the periodontal ligament, which is one of the factors that contribute to the success of the procedure. Because of the low age of the majority of students and the psychological aspects of dental loss, reimplantation is justified because, even in the case of failure, it will be a way of delaying complex prosthetic solutions [25]. Regarding the question of receiving guidance on how to proceed in a case of dental avulsion, 95% of the yes and 5% of the non-responses were obtained. The best way to do this is to wash the tooth with saline solution or water, try to replace it in the socket, in the correct position with digital pressure, and seek a dental surgeon as soon as possible [10].



Graph 2 - receive guidance on how to proceed a case of dental avulsion?

The teachers interviewed find it very important to receive guidance from the procedure, since they have not received this training before. Health education is part of public health programs. However, there are limitations in the teaching of educational practices so that the school environment can establish healthy habits related to oral health transmitted by teachers to parents and

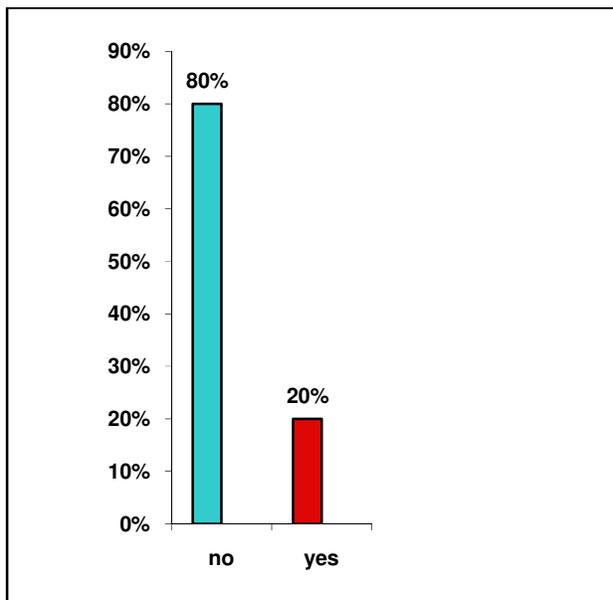
students. In this sense, the role of the educator is highlighted, due to the increasingly early contact with children through nurseries and schools [13]. Considering that dental avulsion often occurs in school during activities and that teachers are the first to have contact with the child, it is important the knowledge of these professionals about the procedure as a way to favour the prognosis of reimplantation [27]. Regarding if it is possible in a case of dental trauma, a tooth completely out of the mouth (avulsion), the answers were favourable that 85% said yes and 15% did not. Dental traumatism is one of the main occurrences of urgency in dentistry. when they affect children, create situations of discomfort, not only for the child himself, but also for his relatives or caregivers, in the case of the teacher who spend a good deal of time with them.



Graph 3 - it is possible in a case of dental trauma, a tooth coming out of the mouth (avulsion)

Prevalence studies of trauma cases favour the conduct of research, the elaboration of educational campaigns and adequate therapeutic behaviour, in order to guide the prevention and manipulation of these emergency situations [28]. The dental avulsion is a type of dental trauma quite frequent in the permanent dentures of children of school age. It consists of total removal of the tooth out of the alveolus and the favourable prognosis or not depends entirely on the period of time the tooth takes to be re-implanted, as well as on the

professional's methods of storage and conduct [4]. Considering that the child spends a great deal of time in school and sports activities are predisposing factors to trauma, a previous study showed the need to include urgent knowledge in the curriculum of these professionals, who are multipliers of information, and this way, positive interference, health promotion and more severe complication prevention [1]. A few studies focused on oral health knowledge, attitudes and practices by educators. The lack of knowledge of this issue leads to the often inadequate implementation of health policies that do not achieve the expected results. When asked if they had already helped a child after the trauma where the tooth suffered dental avulsion the respondents answered in a percentage of 80% answered no and 20% said yes. The teachers' knowledge regarding the management of children with avulsed teeth still leaves much to be desired. The results showed their lack of technical knowledge and did not feel able to provide care in cases of dental avulsion leaving the care of dental surgeons care [8].

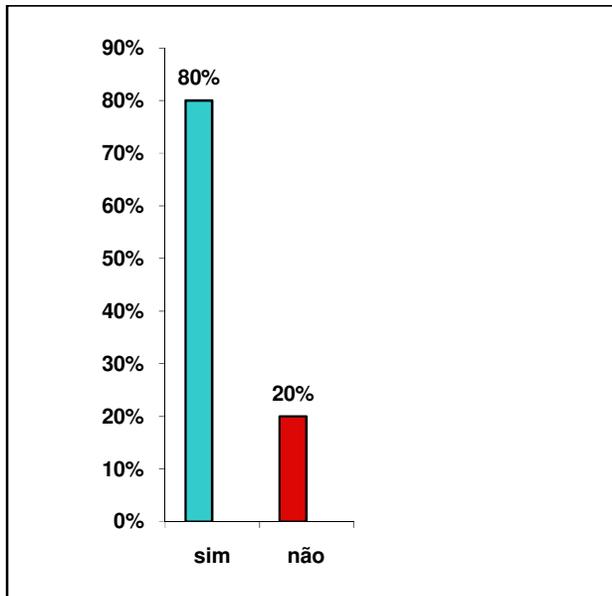


Graph 4 – Have you ever assisted a child after the trauma where the tooth suffered dental avulsion?

Hamilton et al. [16] evaluated the knowledge of lay people and concluded that they did not know

what behavior to adopt in front of an avulsed permanent tooth. Knowledge about first aid, related to avulsion and dental reimplantation, should be inserted in schools. And to achieve this purpose, information should be directed to children, parents or guardians, schools and teachers, as well as to society as a whole. Several studies on teachers' knowledge about dental trauma have shown inadequate knowledge about dental avulsion and first aid. As the school environment is an ideal place to provide oral health care, there is a need for teachers to be better prepared and to demonstrate a better understanding of the behavior to be taken in the face of trauma, minimizing possible harm to the child and the avulsed tooth. Teachers generally have little knowledge about proper behavior in the face of injuries and when these occur they are often directed to doctors, dentists or emergency services without adequate emergency care being provided at the accident site. Generally, it is considered as ideal treatment for a permanent tooth avulsion the immediate reimplantation, causing the least possible damage to the cells of the root surface [11].

As to the question whether it is possible to perform reimplantation on milk teeth, the response of those who answered yes was 80% and not 20%. Among the treatment options for avulsed teeth, dental reimplantation is the most indicated option, and should be done immediately after the incident, even at the place where it occurred and, after that, radical root canal treatment [5]. The success of the reimplantation is dependent on factors such as the time the tooth remains outside the alveolus, the presence of incomplete rhizogenesis, the root treatment dispensed, the way of preserving the tooth until the time of reimplantation, the endodontic conduit and immobilization. Unfortunately, in many cases, immediate reimplantation is not performed, and a period of one to four hours between avulsion and the therapeutic procedure is common [34].



Graph 5 – Do you believe its Possible to reimplanta milk teeth?

The reimplantation performed within the first thirty minutes after avulsion has a very high success rate, but over time the cells of the periodontal ligament lose their vitality and this percentage decreases considerably. As important as the rapidity of placing the tooth back into the alveolus is its means of preservation. Teeth conditioned in a dry environment rapidly lose the vitality of the periodontal ligament, so it must be stored in an aqueous medium or saliva [31]. While literature is unanimous in affirming the efficiency of immediate reimplantation, it is noted that this fact is an exception. Most of the time, the teeth are lost or inadequately maintained, implying severe consequences, leading to pulp necrosis, calcifications and root resorption, which is the main cause of traumatic teeth loss. Among the advantages of reimplantation are esthetics, lower costs and continuation of arcade development during childhood and adolescence [30].

#### Discussion

Several studies have already been carried out to verify if educators possessed technical knowledge in front of an avulsed tooth frame and if there was a need for further clarification through educational

campaigns or other means for this target audience. In the study by Bahrami and Nikbakhsh in Sweden, 80.8% of school staff would contact a dental emergency service or a dentist with an avulsed tooth. In the study by Skeie et al., Knowledge about correct action in case of avulsion was insufficient, since only one-third suggested the ideal approach to reimplant the tooth and then refer the child to a professional in the area [21]. Oliveira [22], in the city of Caruaru-PE, evaluated the teachers' knowledge about dental avulsion. 79 professionals answered a form containing questions about avulsion and procedures to be taken, 47 were male and 32 female. Only 20.3% knew what an avulsed tooth was, but none had studied the subject. The interviewees were told what dental avulsion was and 44.3% said they had seen this type of trauma during their classes. Regarding the procedure to be performed, 100% said they would provide handkerchief or towel for the student to bite and stop bleeding. Regarding the reimplantation, 19% would not know what to do and 81% would rinse the tooth in running water. 86.1% said that treatment should be immediate, 13.9% would choose the dental surgeon as the most suitable treatment and 25.3% would have the doctor as the first choice. 100% of the professionals answered that they would involve the avulsed tooth in paper napkin until the student received the treatment, the authors concluded that the educators interviewed needed information about the subject

In a survey conducted in Kuwait by Al-Asfour et al., The number of teachers who had knowledge of how to clean an avulsed tooth only improved after receiving information on avulsion and dental reimplantation, jumping from 5% to 93% [23]. A study conducted by Bittencourt et al [7], through a questionnaire, with 160 elementary school teachers from private schools in Belém-PA, the educators' knowledge regarding the emergency treatment of children with avulsed teeth was evaluated. The result showed that, in relation to dental reimplantation, only 21.9% would place the tooth in the alveolus; 78.1% did not consider themselves capable of doing so. Among those who answered positively, they questioned what they would do with the tooth before reimplantation, 28.58% would

reimplant it in the alveolus without doing anything, 48.57% would wash in running water and 22.85% would brush gently. To those who answered negatively, they wondered which medium they would store until the child arrived at the dentist, 26.4% would store in an empty container; 20% in container with water; 12% in milk; 18.4% alcohol; 21.6% would wrap it in cloth or paper; 0.8% would throw the tooth out and 0.8% would put in the saliva. The result showed that the majority of educators had knowledge that was not necessary to perform emergency treatment of avulsed teeth. A convenience sample was made by Santos et al [29], with dental academics (8th and 10th semesters); of Physical Education (7th and 8th semesters) and Nursing (5th and 6th semesters), from the Faculty of Agreste of Pernambuco to know the level of knowledge of these academics in the face of avulsion. In the first stage of the research, the data indicated that the knowledge was satisfactory only for dentistry students. However, in the second phase after an expository class on the subject, the level of knowledge for all the students increased significantly.

Research conducted by Hanan and Costa [15], with 311 teachers from the 1st to 4th grade of municipal public schools in Manaus-Amazon on their knowledge of dental avulsion, proportionally distributed among the zones, through a standardized interview, 74.3% were from the females and 25.7% of males. Only 42.9% graduated, with 32.3% graduating in Literature and 67.7% in Pedagogy. 29.9% said they had taken a first-aid course, but only 12.9% had alveolar-tooth trauma and 12.2% had some type of trauma. 61.74% answered that they would provide a towel for the student to bite to stop the bleeding and 18% would tell the student to place the avulsed tooth inside the mouth and take it to the dentist. They were asked about the conservation of the avulsed tooth in the case of not reimplanting it immediately and what would be the conduct to be followed. 10.9% would condition on ice, 58.8% would put in container with tap water, 0.3% in ice water, 19.6% in saline solution, 0.3% in antiseptic solution, 0.3% would put the avulsed tooth in the student's mouth, 6.1% in paper or cloth, 1.3% in a clean plastic bag or container, 1.9%

would throw in the appropriate trash to avoid contamination. After the questionnaires answered, participants were given an informative folder about dental avulsion. The authors concluded that teachers did not possess the adequate technical knowledge for the urgent treatment of dental avulsion, demonstrating the need for further clarification for these professionals.

Araújo et al [3], evaluated the knowledge of parents and educators of public schools in the municipality of São Luis, on dental avulsion. Asked about the behavior adopted in case the tooth was still in the mouth, even out of place, 70% of the parents and 75% of the educators interviewed said they would take the tooth out of the mouth; 22.5% and 22.6% would leave inside the mouth, 7.5% and 2.4% would do the reimplantation. If the tooth were on the floor 80.4% of the parents and 83.3% of the educators would pick up the tooth; 40.9% of the parents and 54.3% of the educators would hold the tooth in any position, 42.2% and 35.7% would get for the crown and 16.9% and 10% for the root. Regarding tooth care, 69.8% of the parents and 52.9% of the educators would clean with water or other liquid, 17.8% and 20% would not clean and 12.4% and 27.1% would clean with cloth or paper. Parents were asked about the mode of transportation if reimplantation was not done, 59.6% would take the tooth wrapped in dry material; 20.4% would be wrapped and soaked in liquid; 11.6% inside a container immersed in some liquid, such as alcohol, water, milk; 6.2% would pack on ice and 2.2% would do otherwise. The same was asked of the educators, 52.9% would take the tooth wrapped in dry material; 40% wrapped and soaked in liquid; 2.9% in a container and immersed in liquid such as water, alcohol, saline or milk and 4.3% would condition it on ice. The authors concluded that the lay population, specifically the parents and educators, do not have basic knowledge to perform the emergency procedures for the child suffering from dental avulsion, that the solution of the problem is in preventive and educational campaigns.

Berti et al [6], carried out researches in the primary level schools of the city of Cascavel-PR on the teachers' knowledge regarding dental avulsion. Eleven were randomly selected by lot and accepted

the pilot study. A questionnaire was divided into two parts: the first one referring to the subject and the second part, questions related to first aid in the face of trauma. 96.05% of the interviewees were female, 39% had access to a first aid course and 9.21% received information on the subject. 53.94% reported that in the event of a fall or collision with any student, they would inspect the mouth to check for trauma. 77.63% said that in case of an avulsed tooth, they would try to locate the tooth if it had fallen to the floor. 65.78% would get the tooth by the crown. In this case, 25% would not clean the tooth, while 72.36% would clean it with water, cloth paper or another form, among them the milk was the most cited. Regarding the theme, 84.21% did not feel prepared for the emergency treatment because they did not have adequate knowledge. As for the replacement of the avulsed tooth in the socket, 32.17% would rinse in tap water, 9.21% would wash in running water, 2.63% would brush the tooth gently, 0.00% would replace the tooth in the socket without doing anything, 44.15% would not know what to do. Of the 76 questionnaires answered, 88.15% would not replace the tooth in the socket and carry it conditioned to the rescue site: 42.13% wrapped in dry material such as tissue, napkin, 32.89% in a container containing liquid, 10, 52% would store in a container without a liquid, 6.57% would carry the avulsed tooth wrapped and soaked in some liquid, 5.26% packaged in ice, 2.63% in the student's hand, and 0.00% in the student's mouth. The interviewees showed that they knew very little about emergency procedures in the case of an avulsed tooth. The authors concluded that more information and training is needed for this public in order to avoid compromising their success in the treatment of this type of trauma.

A survey conducted by Pagliarin et al[24] on physical education teachers' knowledge about emergency dental avulsion care in Santa Maria-RS, through a questionnaire, found that only 23.5% had received prior information about trauma dental. The majority (56.9%) said they would try to locate the avulsed tooth; 15.7% would try to stop bleeding with pressure; 12.7% would reimplant the tooth; 7.8% would call parents or guardians and 6.9% would take the child to the dentist. Of the teachers

who said they tried to reimplant the tooth, 46.5% were not aware of the correct procedures to be performed during implantation and 53.5% agreed with all procedures suggested in the questionnaire. When asked about not reimplanting the tooth, how much extraoral time the same should remain, 51% could not answer; 23.5% said 30 minutes; 13.7% answered 1 hour; 7.8% up to 2 hours and 3.9% believed that time was not a major issue in this type of trauma. The study revealed to the authors a low level of knowledge among the evaluated professionals. Curylofo et al[12], in Ribeirão Preto-SP, studied 52 teachers from four elementary schools, who answered a questionnaire with personal data questions and knowledge about dental avulsion. The participants had a mean of 41 years and 96.2% were female. 73.1% did not know the procedures in case of avulsion tooth; 40.4% had already seen an avulsion at school, of these 23.5% would try to reimplantation; 34.6% would collect the tooth and take the child to the dentist; 9.6% would leave the tooth less than an hour outside the oral cavity. As for storage, 42.6% answered that they would put in dry material such as gauze, cotton and glass container and 13.1% would store it in water or milk, leading the authors to conclude that the interviewees' knowledge of a dental avulsion is inadequate and better training would be necessary to lead to correct emergency treatment.

Monteiro et al[20] evaluated the knowledge of 88 academics of physical education of the State University of Paraíba on knowledge before a dental avulsion. The data were elaborated in the form of descriptive statistics. Most of the academics surveyed did not receive any information on the subject at the undergraduate level, nor had they had any experience on the subject. Regarding the attitude to be taken, most of the academics would give a handkerchief or towel for the victim to bite and control bleeding (37%) and immediately seek a dental surgeon (80.7%). In case the tooth was dirty, the frequent response was that they would wash with saline solution (48%). The most cited storage medium was napkin (32.5%). The authors concluded that there was a lack of technical knowledge for the interviewees. Oliveira et al[22] analyzed the knowledge of the parents / guardians

of children attending the Unimontes children's clinic on dental traumatism. A total of 73 individuals participated. The collection was done through a questionnaire. The majority of respondents stated that they had not received guidance on the conduct to be taken in this type of dental trauma (83.3%) and 91.7% would like to receive information on the subject. 59.7% answered correctly about which service he would look for in this picture (dental office). However, only 8.3% knew how to act in emergency situations in case of fracture and none of them (0.05) knew how to proceed correctly in case of dental avulsion. No significant association was found between the knowledge of the parents / guardians and socioeconomic status and educational level, when the type of service that they would seek in case of dental trauma was evaluated. The authors concluded that there was a lack of information and knowledge on the part of the interviewees regarding emergency care in cases of dental avulsion. It is known that appropriate treatment in the first 30 minutes offers the best prognosis to the avulsed tooth and, therefore, avulsion requires attention and immediate treatment [26].

Among dentoalveolar injuries, dental avulsion is considered the most serious and of worse prognosis, regarding the longevity of tooth maintenance in the dental arch, since the success of the dental reimplantation depends on the patient and avulsion immediately after the trauma. The only treatment for an avulsed tooth is the reimplantation and therefore should be performed, even if the conditions are not always ideal as an attempt to salvage the dental element. An educational lecture was given by the researchers with folders distribution demonstrating on the subject addressed at the end of the application of the questionnaires, and the group studied was evaluated after the lecture. One study has shown that education regarding the treatment of dental avulsion increases the number of right answers and this may improve the prognosis of the avulsed tooth.

#### IV. CONCLUSION

The results found in this article indicate that the teachers' knowledge about dental avulsion is inadequate and the higher qualification of these professionals could lead to correct treatment and better prognosis. According to the objective of the work, it was observed that the teachers do not have basic knowledge to perform the emergency procedures to the child and avulsion tooth. To solve this problem, preventive and educational campaigns should be institutionalized, systematically, having as an educator agent, the dental surgeon.

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