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PEDIATRIC DENTISTS' KNOWLEDGE AND ATTITUDE ABOUT TRAUMATIC DENTAL INJURIES IN PRIMARY TEETH IN THE FEDERAL DISTRICT, BRAZIL.

CONHECIMENTO E ATITUDES DE ODONTOPEDIATRAS DO DISTRITO FEDERAL SOBRE TRAUMATISMOS DENTÁRIOS EM DENTES DECÍDUOS.

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Resumo

Objetivo: Este estudo teve como objetivo avaliar o conhecimento e a atitude dos odontopediatras sobre trauma dental (DT) em dentes decíduos no Distrito Federal, Brasil. Além disso, avaliar a correlação entre o conhecimento adequado e o tempo de formação do odontopediatra. **Métodos:** Foi aplicado um questionário eletrônico dividido em duas partes. A primeira era composta por 8 questões sobre o perfil do dentista e a segunda era composta por 15 questões que avaliavam o nível de conhecimento e atitude dos odontopediatras em relação ao TD em dentes decíduos. Os dados obtidos por meio dos questionários foram tabulados em planilha Excel e realizada análise descritiva, para obtenção das frequências relativas e absolutas das respostas. O teste qui-quadrado foi utilizado para analisar a associação entre os acertos e o tempo de experiência dos dentistas (p<0,05). **Resultados:** Dos 104 questionários enviados, 49 foram respondidos, sendo 93,9% dos participantes do sexo feminino e com idade entre 25 e 55 anos. Um total de 71,4% dos odontopediatras tinham mais de 10 anos de formados. Apenas 20,4% tinham mais de uma especialidade e a maioria trabalhava em consultório particular (63,3%). De acordo com as respostas, 73,33% das questões atingiram mais de 50% de acertos. Observou-se diferença estatisticamente significativa (p<0,05) entre os profissionais em diferentes tempos de formação, embora com mais acertos para aqueles com muito tempo de formação. **Conclusões:** Os odontopediatras do Distrito Federal, Brasil possuem bom conhecimento e atitude sobre o TD, porém, necessitam de atualizações periódicas independente do tempo de formação.

Palavras-Chave: Atitude; Dente Decíduo; Conhecimento; Odontólogos; Traumatismos Dentários.

Abstract

Objective: This study aimed to evaluate the pediatric dentists' knowledge and attitude about traumatic dental injuries (TDI) in primary teeth in Federal District, Brazil. Also, to evaluate the correlation between adequate knowledge and the time of graduation of pediatric dentists. **Methods:** An electronic questionnaire assigned into two parts was applied. The first consisted of 8 questions about the dentist profile, and the second consisted of 15 questions that assessed the level of knowledge and attitude of pediatric dentists concerning TDI in primary teeth. The data obtained through the questionnaires were tabulated in an Excel spreadsheet and a descriptive analysis was performed, to obtain the relative and absolute frequencies of the answers. Chi-square test was used for analysing the association between the correct answers and the dentists' years of experience (p<0.05). **Results:** Of the 104 questionnaires sent, 49 were answered, with 93.9% of the participants being female and between 25 and 55 years old. A total of 71.4% of pediatric dentists were over 10 years after graduation. Only 20.4% had more than one speciality, and the majority worked in private practice (63.3%). According to the answers, 73.33% of the questions reached more than 50% of correct answers. A statistically significant difference (p < 0.05) was observed among professionals with different years of experience, with a higher number of correct answers among those who had been graduated for a longer period. **Conclusions:** Pediatric dentists in the Federal District, Brazil have good knowledge and attitude about TDI, however, they need to update themselves periodically regardless of the time of graduation.

Keywords: Attitude; Deciduous tooth; Dentists, Knowledge; Tooth injuries.

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Introduction

Traumatic dental injuries (TDI) are defined as an injury to the teeth and/or other hard and soft tissues of the oral cavity and adjacent structures [1]. TDI is a global public health problem, with a prevalence of 22.7% in primary teeth [2]. In Brazil, according to a recent systematic review, the prevalence in the primary dentition is estimated to be approximately 35% [3]. Another study carried out in Brazil showed that in a centre specialised in dental trauma, the prevalence in children was 29.24% of all reported cases [4]. Regarding the peak

age of occurrence of TDI in the primary dentition, children between 1 and 3 years of age are most affected [5], as this is the age at which motor coordination develops and these children begin to have greater independence [6].

Some of the aetiological factors include falls, collisions, blows with objects, physical violence, traffic accidents, and physical activities [7]. One of the most affected groups is children, as they are more prone to falls and collisions [7]. A Swedish study of with children aged 0 to 17 years investigated individual risk factors and found that children who were more sociable, active or had caring parents had fewer cases of TDI. On the other hand, children who were less sociable, less active or whose parents had a low level of education had more cases of TDI. In other words, temperament and socialisation influence the occurrence of these injuries [8].

TDI has a negative impact on the oral health-related quality of life of children and their families. However, appropriate treatment and follow-up after TDI can reduce these negative effects, regardless of the severity of TDI or type of treatment [9]. In addition to psychosocial problems, TDI causes financial problems, as the cost of treatment is high and, depending on the severity of the injury, can extend over a lifetime [10].

There are several types of TDI of different complexities, with a wide range of procedures to be performed. In recent years, treatment protocols have changed due to the development of new techniques, new materials, and a richer and more consistent theoretical content taught in universities. One of the tools for investigating the conduct and knowledge of different types of injuries is evidence-based guidelines such as those of the International Dental Traumatology Association (IADT), which increase the chances of success in the diagnosis and treatment of these injuries [11]. Recently, an update of these guidelines was performed to guide a comprehensive approach to the complex management of all TDI [12].

Despite the many advances in the field of dental traumatology, there is still a lack of acquaintance with TDI, both among dental professionals and in the general population [13]. In addition to dentists' lack of knowledge, the diagnosis and treatment of these injuries are complex and difficult to resolve, leading to inappropriate treatment decisions that result in functional, aesthetic and/or financial loss to the patient [14].

A limited number of studies have investigated the knowledge of the management of TDI in primary teeth; this dentition is often neglected because it remains in the mouth for only a few years. For this reason, it is necessary to assess the knowledge and attitude of dentists about TDI, especially pediatric dentists, concerning this dentition, since it is of great importance in the child's life for maintaining the masticatory and aesthetic function, besides being the guide for the eruption of permanent teeth [15]. Conducting studies on the knowledge of how, when and where TDIs occur happens is extremely important, both for health professionals - who can better inform patients and ensure effective care and treatments, especially in the most severe cases - and for the population - most of these accidents occur in the school and family environment and the actions taken by those responsible for the accident are crucial for prognosis [16].

As an accurate diagnosis and an adequate treatment plan are crucial for the successful treatment of TDI, this study aimed to investigate, through an electronic questionnaire: 1. the level of pediatric dentists' knowledge and attitude of pediatric dentists in Federal District, Brazil about TDI in primary teeth and 2. the association between the time of graduation with the management of TDI.

Methods

Ethical aspects

This study was approved by the local Ethical Committee (Approval number: 23243419.6.0000.0030). As it is a long-distance survey using online digital resources, the electronic informed consent form was inserted at the beginning of the questionnaire and the participants should agree or disagree before answering the questions. Only the participants who agreed with the informed consent form had access to the questionnaire. The preservation of the identity of the professionals who agreed to participate in the research was ensured.

Study design and population

This cross-sectional study was conducted in Brasília, Federal District (Brazil), using an electronic questionnaire to assess knowledge about TDI in primary teeth. All pediatric dentists with updated registration at the Brazilian Association of Pediatric Dentistry of the Federal District (ABOPED/DF) were invited to participate in the research. For pediatric

dentists to be included in this study, they had to fulfil the following inclusion criteria: both genders who agreed to participate in the research and independent of time since graduation. Regarding the exclusion criteria, professionals who are not in physical and mental conditions to answer the questionnaire or who are on vacation were excluded.

For the sample size calculation, the proportion of pediatric dentistry was considered, with a 95% confidence interval, a 5% alpha level, and an average knowledge percentage of 91.67%, based on a previous study [17]. The sample size was calculated to be 56 professionals (www.openepi.com/SampleSize).

Preparation of the questionnaire and application

A self-administered, closed, and structured questionnaire was elaborated and based on the questionnaire described by Ravikumar et al. (2017) [15] and recommendations of the IADT guidelines published in 2012 [11]. The original questionnaire had been previously validated. However, to ensure linguistic and contextual appropriateness following the translation from English to Portuguese, the questionnaire was reviewed by specialists in Pediatric dentistry and dental trauma. Revisions were made based on their feedback to enhance clarity and accuracy. The final version was established following a consensus process involving these experts.

The second part of the questionnaire was composed of questions with simulations of common clinical cases of TDI in the primary dentition; it contained all the necessary information for the dentist to have a better view for a more cohesive answer.

The questions were multiple-choice objectives and contained four to five response options with conduct that the dentist would have in a given clinical situation, with only one correct answer. This part of the questionnaire contained 3 domains: questions 1 to 4 were about avulsion cases, questions 5 to 8 were about fractures, and questions 9 to 15 were about luxation.

The questionnaire was applied through the free digital platform https://docs.google.com/forms/u/0/, also known as Google Forms, and sent to the participants' email addresses and through the WhatsApp application. The questionnaires were sent in January 2020 and the responses were accepted until April 2020.

Questionnaires were sent out weekly as a reminder in order to maximise the number of respondents. This type of instrument was used because pediatric dentists would not be disturbed at work during office hours. It was also possible to avoid embarrassment during the interview.

Data analysis

Data obtained from the questionnaires were entered into an Excel spreadsheet and subsequently imported into Stata software, version 11.0 (StataCorp, College Station, TX, USA). Descriptive statistical analyses were performed to obtain the absolute and relative frequencies of the responses. The chi-square test was used to assess the association between the questionnaire responses and the participants' years of professional experience ($p < 0.05$).

Results

A total of 104 questionnaires were sent. Of these, 49 were answered, a percentage of approximately 47.11% of the response. The number of respondents obtained (n = 49) was considered sufficient to ensure the statistical representativeness of the results. Two of the pediatric dentists who received the questionnaire claimed that they were not able to answer it. One of the pediatric dentists' e-mails was not recognized by the digital platform; consequently, the pediatric dentist did not receive it. Of the 49 responses obtained, 93.9% were from female participants. The age of participants ranges from 25 to 55 years old.

Most pediatric dentists had more than 10 years of professional experience, corresponding to a percentage of 71.4%, while 18.4% had between 5 and 10 years and 4.1% had between 3 and 5 years. As far as the specialties are concerned, 79.6% have only pediatric dentistry, while 20.4% have studied other specialties, such as orthodontics and periodontics, in addition to pediatric dentistry. Regarding the participants' education level, 28.6% had a master's degree and 26.5% had a doctoral course.

The majority of pediatric dentists reported working in private practice (63.3%), 16.3% work in the public service, 16.3% work in university, and 4.1% work in other areas of employment. Regarding the educational institution attended by dentists, 61.2% studied dentistry at a public university and 38.8% at a private university (Table 1).

Table 1 - Sampling characteristics of pediatric dentists in the Federal District who answered the questionnaire (n = 49).

	n	%
Gender		
Male	3	6.1
Female	41	93.9
Age		
25-34 years	16	32.6
38-44 years	11	22.5
46-55 years	22	44.9
Higher education		
Dental specialties	22	44.9
Master's degree	14	28.6
Doctor's degree	13	26.5
Dental Specialists		
Pediatric dentistry	39	79.6
Pediatric dentistry + other	10	20.4
Time since graduation		
1-2 years	3	6.1
3-5 years	2	4.1
5-10 years	9	18.4
more than 10 years	35	71.4
Area of employment		
Private office	31	63.3
University	8	16.3
Public service	8	16.3
Not applicable	2	4.1
Type of university		
Private	19	38.8
Public	30	61.2

Table 2 contains the information corresponding to the responses of pediatric dentists in comparison with the correct answers. In this table, it can be identified that Question 14 (A 3-year-old child reports with intrusive luxation of the central incisor and the apex of the root not displaced with developing tooth germ, what will be the ideal treatment?) obtained the greatest number of correct answers, which corresponds to 100%. However, question 13 (A 3-year-old reports with lateral luxation with severe occlusal interference and displacement from the crown to the vestibular, what will be the ideal treatment?) had the least number of correct answers, which corresponds to 26.5%.

Table 2. Dentists' responses compared to the correct answers (n = 49).

Question	Answers	n (%)	Correct
Question 1- Can avulsed deciduous teeth be replanted?	Yes	3 (6.1)	46
	No	46 (93.9)	
Question 2- Is there a recommended age for replantation of avulsed primary teeth?	2-4 years	2 (4.1)	42
	>4 years	- (0.0)	
	No defined age	3 (6.1)	
	It cannot be replanted	42 (85.7)	
	Other	2 (4.1)	
Question 3- Common reasons for avulsion of deciduous teeth	Short roots	5 (10.2)	24
	Short roots and resilient alveolar bone	24 (49.0)	
	Short crown	- (0.0)	
	All of above	13 (26.5)	
	No answer	7 (14.3)	
Question 4- Is there any difference in the management of avulsed primary and permanent teeth?	Yes	48 (98.0)	48
	No	1 (2.0)	
	I don't know	- (0.0)	
Question 5- A 2.5-year-old child reports with a crown fracture involving pulp, what will be the ideal treatment?	Pulpectomy and dressing with HC	35 (75.1)	35
	Pulpectomy	12 (24.5)	
	Extraction	- (0.0)	
	I'm not sure about treatment	1 (2.0)	
	No answer	1 (2.0)	
Question 6- A 2.5-year-old child reports with a crown fracture extending to only cervical region of the root, what will be the ideal treatment?	Pulpectomy	8 (16.3)	28
	Fragment removal with pulpotomy	11 (22.5)	
	Extraction	28 (57.2)	
	I'm not sure about treatment	1 (2.0)	
	No answer	1 (2.0)	
Question 7- A 4-year-old child reports with root fracture with no coronal fragment displaced, what will be the ideal treatment?	Replacement and containment of the coronary fragment	39 (79.6)	39
	Extraction of the coronary fragment	2 (4.1)	
	Extraction of the coronary and apical fragment	5 (10.2)	

	I'm not sure about treatment	1 (2.0)	
	No answer	2 (4.1)	
Question 8- A 4-year-old child reports with root fracture with coronal fragment displaced, what will be the ideal treatment?	Replacement and containment of the coronary fragment	17 (34.7)	17
	Extraction of the coronary fragment	23 (46.9)	
	Extraction of the coronary and apical fragment	9 (18.4)	
	No answer	- (0.0)	
Question 9- A 4.5-year-old child reports with a mobile upper central incisor with bleeding from gingival crevice, what will be the ideal treatment?	No action, wait and watch	40 (81.6)	40
	Pulpectomy	- (0.0)	
	Extraction	1 (2.0)	
	I'm not sure about the treatment	3 (6.1)	
	No answer	5 (10.3)	
Question 10- A 2.5-year-old child reports with a extrusive luxation of the upper central incisor with <3 mm, what will be the ideal treatment?	Pulpectomy	- (0.0)	46
	Careful replacement, wait and observe	46 (93.9)	
	Extraction	- (0.0)	
	I'm not sure about the treatment	3 (6.1)	
Question 11- A 5.5-year-old child reports with of extrusive luxation in the upper central incisor with more than 3 mm, what will be the ideal treatment?	Careful replacement	7 (14.3)	39
	Pulpectomy	- (0.0)	
	Extraction	39 (79.6)	
	I'm not sure about the treatment	2 (4.1)	
	No answer	1 (2.0)	
Question 12- A 3-year-old child reports with a lateral luxation without occlusal interference, what will be the ideal treatment?	Allow spontaneous repositioning of tooth	40 (81.6)	40
	Pulpectomy	- (0.0)	
	Extraction	6 (12.1)	
	I'm not sure about the treatment	3 (6.1)	
Question 13- A 3-year-old reports with lateral luxation with severe occlusal interference and displacement from the crown to the vestibular, what will be the ideal treatment?	Careful replacement combined with palatine-buccal compression and splint	32 (65.3)	14
	Pulpectomy	- (0.0)	
	Extraction	14 (28.6)	
	I'm not sure about the treatment	2 (4.1)	
	No answer	1 (2.0)	
Question 14- A 3-year-old child reports with intrusive luxation of the central incisor and the apex of the root not displaced with developing tooth germ, what will be the ideal treatment?	Let the tooth spontaneously reposition	49 (100.0)	49
	Surgical repositioning and pulpectomy	- (0.0)	
	Extraction	- (0.0)	
	I'm not sure about the treatment	- (0.0)	
Question 15- A 3-year-old child reports with intrusive luxation of the central incisor and the apex of the root displaced with developing tooth germ, what will be the ideal treatment?	Let the tooth spontaneously reposition	23 (46.9)	23
	Pulpectomy	- (0.0)	
	Extraction	25 (51.0)	
	I'm not sure about the treatment	1 (2.0)	

Table 3 shows data on the relationship between years of experience and correct answers. It can be observed that that there was a statistically significant difference ($p < 0.05$) between years of experience and correct answers for questions 4 and 12.

Table 3. Relation of time since graduation with correct answers to each question (n= 49).

Question	Up to 5 years n (%)	>5 years N (%)	p
Question 1- Can avulsed deciduous teeth be replanted?	5 (10.9)	41 (93.2)	0.547
Question 2- Is there a recommended age for replantation of avulsed primary teeth?	5 (11.9)	37 (88.1)	0.921
Question 3- Common reasons for avulsion of deciduous teeth	3 (12.5)	21 (87.5)	0.215

Question 4- Is there any difference in the management of avulsed primary and permanent teeth?	4 (8.3)	44 (91.7)	**0.003**
Question 5- A 2.5-year-old child reports with a crown fracture involving pulp, what will be the ideal treatment?	4 (11.4)	31 (88.6)	0.954
Question 6- A 2.5-year-old child reports with a crown fracture extending to only cervical region of the root, what will be the ideal treatment?	3 (10.7)	25 (89.3)	0.990
Question 7- A 4-year-old child reports with root fracture with no coronal fragment displaced, what will be the ideal treatment?	3 (7.7)	36 (92.3)	0.338
Question 8- A 4-year-old child reports with root fracture with coronal fragment displaced, what will be the ideal treatment?	1 (5.9)	16 (94.4)	0.402
Question 9- A 4.5-year-old child reports with a mobile upper central incisor with bleeding from gingival crevice, what will be the ideal treatment?	4 (10.0)	36 (90.0)	0.206
Question 10- A 2.5-year-old child reports with a extrusive luxation of the upper central incisor with <3 mm, what will be the ideal treatment?	5 (10.9)	41 (89.1)	0.547
Question 11- A 5.5-year-old child reports with of extrusive luxation in the upper central incisor with more than 3 mm, what will be the ideal treatment?	4 (10.3)	35 (89.7)	0.926
Question 12- A 3-year-old child reports with a lateral luxation without occlusal interference, what will be the ideal treatment?	3 (7.5)	37 (92.5)	**0.003**
Question 13- A 3-year-old reports with lateral luxation with severe occlusal interference and displacement from the crown to the vestibular, what will be the ideal treatment?	3 (21.4)	11 (78.6)	0.422
Question 14- A 3-year-old child reports with intrusive luxation of the central incisor and the apex of the root not displaced with developing tooth germ, what will be the ideal treatment?	5 (10.2)	44 (89.8)	-
Question 15- A 3-year-old child reports with intrusive luxation of the central incisor and the apex of the root displaced with developing tooth germ, what will be the ideal treatment?	4 (16.0)	21 (84.0)	0.388

Discussion

This study aimed to obtain information about the knowledge and attitude of pediatric dentists in the Federal District (Brasília, Brazil) to identify whether this knowledge is sufficient for the accurate diagnosis and appropriate management of TDI in primary teeth. In addition, the relationship between the correct answers and the time since graduation of these professionals was analysed. The results showed that the professionals obtained an average of 81.65% correct answers to the avulsion questions, an average of 61.65% correct answers to the fracture questions and an average of 73.17% correct answers to the luxation questions.

Dental avulsion is responsible for 7 to 13% of all lesions in primary teeth, with the upper incisors being the most affected teeth [18]. Question 1 of the questionnaire addressed the replantation of avulsed primary teeth and obtained a large percentage of correct answers (93.9%), therefore, there was a consensus among professionals that replantation should not be done. A study found a correct-response rate of 70.37% for pediatric dentists and this rate was statistically different from other dentists [19]. There are case reports of replanted primary teeth showing both positive outcomes while others demonstrated negative consequences [20]. These reports raise doubts about the correct management of avulsed primary teeth, especially when compared to the conduct in permanent teeth, since depending on the conditions, replantation is indicated.

However, question 4 on the difference in the management of deciduous and permanent tooth avulsions was one of the questions with the highest correct response rate in the study (98%), demonstrating that professionals had sufficient knowledge, in line with previous findings (91.67%)

[19]. Therefore, because replantation generates potential damage to the deciduous tooth and the successor permanent tooth at the time of trauma or at the time of replantation, together with the weak level of evidence on the benefits of the procedure, it is not indicated [20, 21]. According to the IADT Guidelines, the recommendation is not to perform the replantation of deciduous tooth [11] and these recommendations remain in the Guidelines published in 2020 [12].

To our knowledge, a limited number of studies assessed this question between specialists. The knowledge of management of avulsion among general dental practitioners was evaluated previously. The majority of professionals suggested replantation of avulsed primary teeth independent of qualification and years of experience. This finding revealed a contrasting opinion concerning our results [22].

Question 10, which dealt with the case of a 2.5-year-old child who suffered a 3mm extrusive luxation on the central incisor, a high rate of correct response (93.9%) which would be to carefully reposition the tooth and follow up according to the 2012 IADT guidelines [11]. However, in the new IADT Guidelines, the recommended treatment would be just to wait for the spontaneous repositioning of the tooth when there is no occlusal interference [12]. This treatment was not one of the response options present in the study. The ideal treatment decisions for the child require knowledge about the risk of subsequent complications; the dentist should always analyse the possibility of long-term complications after the trauma, such as pulp necrosis and infection with periapical inflammation, which can affect the formation of the permanent tooth before starting treatment [23].

Question 14 reports the case of a 3-year-old child who suffered an intrusive luxation of the central incisor without displacement of the root apex towards the germ of the permanent tooth. This question got 100% correct answers. Question 15, which presents the case of a 3-year-old child who suffered an intrusive luxation with a displacement of the root apex towards the germ of the permanent tooth, left the participants divided about the treatment, where 51.0% answered that the treatment tooth extraction would be correct and 46.9% answered that the appropriate treatment would be spontaneous tooth repositioning. According to the 2012 IADT Guidelines [11], the recommendation would be the extraction of teeth that had their apex suffered displacement of the root apex towards the germ of the permanent tooth; however, in the Guidelines published in 2020 [12], the adequate conduct was changed.

The current recommendation is to wait for the tooth to spontaneous repositioning, since it is possible a re-eruption of the intruded primary teeth. The procedure performed during extraction could cause additional damage to the tooth germ, in addition, there is no evidence that extraction right after the trauma minimises the injury to the germ of the permanent tooth [12]. This doubt in the response of pediatric dentists may be due to the complexity of the trauma and fear of causing possible damage to the germ of the permanent tooth, such as crushing of the fibers of the periodontal ligament, the neurovascular bundle, and the alveolar bone, in addition to the possibility of deciduous teeth presenting healing complications in intrusion, such as pulp necrosis, enamel discoloration, root resorption, ankylosis and pulp canal obliteration [24]. A worst finding was answered in a similar question (87.96%) [19].

One of the questions that obtained the lowest rate of correct answers was question 8, which addressed the case of a child who suffered trauma with an apical root fracture with displacement of the coronary fragment, this rate was 34.69%. In contrast, a previous result for this question was 94.44% [19]. A study that verified the clinical and radiographic sequelae of traumas revealed that coronoradicular fractures had the highest rate of clinical consequences, with 86.4% of the analysed teeth, and 66.7% of the teeth with root fracture had radiographic sequelae [25]. This result illustrates that the professionals' difficulty in deciding on treatment can have negative consequences for the affected tissues, as also observed by participants of our study.

Luxation injuries occur frequently in the primary dentition, [23] but the issue that addressed this type of trauma had the lowest success rate. Question 13, which refers to the case of a child who suffered lateral luxation with severe occlusal interference and displacement from the crown to the vestibular, was correct by 28.57%. Most participants (65.3%) answered that the best treatment would be gentle repositioning combined with palatine-vestibular compression and splint. A low correct-response rate was obtained previously (42.59%)[18]. However, according to the IADT Guidelines of 2012 [11] and 2020 [12], the best treatment option is extraction, as there is severe occlusal interference.

Performing the repositioning can cause a high risk of pulp necrosis and infection, which can make treatment more time-consuming and

uncomfortable for the child; we have to consider the high risk of periapical inflammation having the potential to damage the germ of the permanent tooth. Therefore, trying to maintain the tooth is not always the best option [23].

When considering the time since professionals graduated, a positive relationship with knowledge is expected. There was a statistically significant difference between professionals with different years of experience in relation to questions 4 and 12. Pediatric dentists with more than 5 years of experience answered most questions more assertively. However, an opposite result demonstrates that there is no statistically difference in relation to the correct answers of professionals and different years of experience [19]. It can be speculated that pediatric dentists, regardless of their years of experience, have good knowledge regarding the diagnosis and management of different types of TDI; however, regular updates of their knowledge are recommended.

In the literature, few studies are found about the level of knowledge of professionals in relation to TDI in children, most of them are related to the management of permanent teeth. The issues present in this study were by the 2012 IADT Guidelines [11], but in 2020 the guidelines were updated. This update took place after a comprehensive review of the literature and discussions in working groups that contained experienced researchers and dentists from different specialties.

In these new guidelines, the authors value a more conservative approach, aiming at the comfort and conservation of the traumatized tooth. In addition, the authors express the need and importance of a clinical approach by a specialized team for better management of children and treatment prognosis [12]. A recent study has shown that pediatric dentists have unsatisfactory general attitudes and practices, especially with regard to educating parents about TDI. This knowledge should be taught to assist in emergency care and prevention of trauma in primary care children [26].

There were 104 pediatric dentists with updated registration at the Brazilian Pediatric Dentistry Association of the Federal District. For all of them, the questionnaire was sent via e-mail at the beginning of January 2020 and the responses were accepted until April 2020. The questionnaires were sent weekly as a reminder to acquire the largest possible number of responses at the end of the survey. Another strategy used for the greatest number of responses was sending the questionnaire via the WhatsApp application. The low percentage of forms answered by pediatric dentists was one of the limitations of the study. Less than half of the pediatric dentists (47.1%) contacted responded to the forms. One of the participants declared that he was not able to answer the questionnaire for the reason of declaring himself with a lack of knowledge in the area, despite being an expert. Thus, the low adherence to the study may have been due to the complexity of the theme, which may have inhibited pediatric dentists in some way because more in-depth knowledge is required to resolve the questionnaire.

Another important limitation of this study was the low number of studies that assess the level of knowledge of pediatric dentists regarding TDI in primary teeth. Most studies assess the knowledge of teachers, parents and caregivers, and general dental surgeons. This is because pediatric dentists are expected to have more in-depth knowledge, as they are directly involved in the care of children. Thus, despite the low representativeness of the sample, the present study shows that the professionals had good knowledge and attitudes towards the management of traumatized teeth, and at the same time highlighted the deficiencies that most of them had in a particular type of trauma and clinical situation.

Despite the good performance of pediatric dentists in this research, it is important to keep in mind that that continuous dental education on TDI in primary dentition is necessary to update the knowledge and attitudes of these professionals. Further studies can be conducted to assess the treatment decisions of paediatric dentists based on the new guidelines.

Conclusion

It is concluded that pediatric dentists in the Federal District of Brazil have good knowledge and attitudes regarding TDI; however, they need to update their knowledge periodically, regardless of their time since graduation.

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Conflict of interest

The authors declare no conflicts of interest.

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