

# Knowledge of Brazilian Dentists about Dentoalveolar Trauma Care and their Experiences during the COVID-19 Pandemic

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## ABSTRACT

**Objective:** To assess dentists' knowledge from Minas Gerais, Brazil, about dentoalveolar trauma (DT) and their experiences during the COVID-19 pandemic. **Material and Methods:** An online questionnaire with 34 questions was applied to collect personal data, professional training, self-assessment of experience/knowledge about DT, experience in care provided during the social distancing, and knowledge/conduct. The specific responses were evaluated based on the guidelines of the International Association of Dental Traumatology (IADT). Descriptive analysis and Pearson's chi-square test were performed. The level of significance was set at  $p \leq 0.05$ . **Results:** Most professionals (97.7%) had received information on DT, and only 4.6% of the participants considered their knowledge poor or very poor. However, 92.7% felt the need for more information on the subject. Regarding experiences during the pandemic, 55.7% provided trauma care during that period. Forty percent of the consultations were performed in person, and 33.3% of the professionals noted an increase in cases during the pandemic; 56.6% reported that the frequency did not change. The overall mean number of correct answers about DT was  $5.29 \pm 2.11$ , indicating an acceptable level of knowledge. The mean percentage of hits for the specific questions was 44.1%. **Conclusion:** Although the level of knowledge of the dentists evaluated was acceptable, some aspects were deficient, with the need for more information about the IADT guidelines.

**Keywords:** Tooth Injuries; Knowledge; Dentists; COVID-19.

## Introduction

Dentoalveolar trauma (DT) is a dental emergency characterized as a significant public health problem due to its high prevalence and functional and aesthetic consequences [1-2]. DT can result in the fracture and displacement of teeth, crushing of the bone, or fracture and soft tissue injuries, including contusions, abrasions, and lacerations [2-3]. Most DT occurs in childhood; however, adolescents and adults can also be affected [4]. The most frequent causes include falls, sports activities, cycling, and traffic accidents [2,5,6]. However, this frequency varies based on the environment and countries' behavioral and cultural diversity [6,7].

Due to the Coronavirus disease 2019 (COVID-19), caused by SARS-CoV-2, it was necessary to adopt social distancing measures, which caused the population to remain at home most of their days to prevent the spread of the disease, causing substantial impacts to health care [8,9]. Changes in the lifestyle and requirements of modern society can lead to the emergence of new DT patterns [6]. A systematic review showed evidence of fewer traumatic events in dental emergencies during the COVID-19 pandemic. This drop may be due to social isolation, reduced risk factors for trauma, reduction of violence, less practice of sports with physical contact, and reduction in outdoor activities [9]. On the other hand, the increase in domestic violence rates in the country, mainly victimizing women, children, and adolescents, may increase the frequency of physical assaults in the etiologic panorama of DT [10]. Other studies have shown that accidental falls were the leading cause of DT during the pandemic; however, bicycle/scooter falls were frequent [11-13]. Thus, social distancing measures could have influenced the frequency, etiology, and types of DT during the pandemic period [10,12].

Traumatic dental injuries have significant functional and psychological impacts on the quality of life of affected individuals and their families [1,14]. The prognosis of individuals with DT depends on early and adequate care [2,15], with dentists being the leading professionals responsible for ensuring sufficient management [16]. Therefore, it is crucial to recognize pandemics' effect on dental emergencies to facilitate patient support mechanisms and care management strategies for dental professionals and allocate resources appropriately where they are most needed [12]. Besides this, studies assessing dentists' knowledge about DT can help decision-making regarding health policies, including health education strategies [14].

Thus, this study aimed to evaluate the level of knowledge of dentists from Zona da Mata, Minas Gerais, Brazil about DT, based on the 2020 guidelines of the International Association of Dental Traumatology (IADT) [3,17-19] and their experiences in DT care during the implementation of social distancing measures in response to the COVID-19 pandemic.

## Material and Methods

### Study Design and Ethical Clearance

This was a cross-sectional study with a convenience sample approved by the Human Research Ethics Committee of the Federal University of Juiz de Fora (CAAE: 40073120.0.0000.5147).

### Sampling

A combination of convenience and snowball sampling was used to recruit participants, i.e., dentists who work in the Zona da Mata region, Minas Gerais, Brazil, registered in the Regional Council of Dentistry of Minas Gerais (CRO-MG). Data was collected from March to May 2021, and the participants signed an informed consent form. Sample power calculation was carried out through the software G\*Power Statistics (G\*Power, version 3.1.9.7, Düsseldorf, Germany).

### Data Collection

The individuals were invited to answer a structured self-administered questionnaire developed in Portuguese by the researchers based on a previous study [4] and reviewed by two experts in the field. A pilot study was conducted with 40 dentists not included in the final sample to evaluate the instrument used. The analysis of data generated from the pilot study indicated no need for significant changes in the questionnaire or methodological adaptations for the main study. The questionnaire was prepared on the Google Forms platform (Google Inc., Menlo Park, CA, USA), and the link was sent to dentists working in the study region through the social networks Instagram, Facebook, and WhatsApp. Participants were encouraged to distribute the research to their colleagues in social media groups. Dentists who did not answer the complete questionnaire were excluded from the study.

The final questionnaire consisted of 34 multiple-choice questions (Q) divided into three parts: part I (Q1-Q14), personal data, dental surgeon education and self-assessment regarding their experience and knowledge about DT in general; part II (Q15-Q22), experiences in DT care during the period of social distancing due to COVID-19; and part III (Q23-Q34), knowledge about DT in general and the main behaviors regarding these types of injury. The answers to the 12 specific questions of part III were rated as correct or incorrect based on the 2020 IADT guidelines [3,17-19]. The level of knowledge was assessed using the scoring system described previously [20]. Each correct answer was assigned 1 point, with a maximum possible score of 12 points. These scores were categorized as either low (0-3), acceptable (4-6), good (7-9) or very good (10-12) [20].

#### Data Analysis

The data were statistically analyzed using the Statistical Package for the Social Sciences, version 21.0 (SPSS Inc., Chicago, IL, USA). Data analysis included descriptive statistics, and Pearson's chi-square test was used to assess the relationship between correct answers to the DT questions (Q23-Q34) and length of professional experience (Q4), self-assessment of knowledge about DT in general (Q11), number of DT cases treated (Q10), knowledge of the guidelines for the evaluation and management of DT developed by the IADT in 2020 (Q12) and the search for knowledge about DT during the COVID-19 pandemic (Q21). The significance level was set at  $p \leq 0.05$  for the statistical analyses.

#### Results

A total of 219 dentists participated in the study. The power of the sample ( $n=219$ ) for this study was 98.9% ( $1-\beta=0.989$ ), with a type  $\beta$  error of 0.05, a minimum effect of 0.30 and  $\beta/\alpha=1$ . Most professionals worked in the private sector (85.4%), followed by the public sector (27.4%) and in the academic field (16.0%), with some working in more than 1 type of service. Regarding training, 59 participants (27%) reported no specialty. Among the specialists, orthodontics ( $n=49$ ; 22.4%) and pediatric dentistry ( $n=23$ ; 10.5%) were the most represented among the respondents. Table 1 provides the demographic characteristics of the dentists in the sample.

**Table 1. Demographic characteristics of participants.**

Variables	N	%
Age		
20 to 29 years	103	47.0
30 to 39 years	48	21.9
40 to 49 years	40	18.3
50 or over	28	12.8
Gender		
Female	150	68.5
Male	69	31.5
Years of professional experience		
Less than 10 years	130	59.4

More than 10 years	89	40.6
Maximum level of professional training		
Undergraduate degree in Dentistry	59	27.0
Specialization in Dentistry	103	47.0
Master's degree in Dentistry	34	15.5
PhD in Dentistry	23	10.5

Table 2 presents the data regarding the participants' evaluation of their knowledge about DT and their experiences in DT care. When asked about learning about DT, the vast majority of participants had received information through their undergraduate program (n=205; 93.6%), postgraduate program (n=88; 40.2%), and reading scientific articles and books (n=95; 43.4%). Only 4.6% (n=10) of the participants considered their knowledge about DT poor or very poor. However, 92.7% felt the need to obtain more information on the subject. A large portion reported being unaware of the 2020 IADT guidelines (86.3%) and the “ToothSOS” applicative (92.7%), which was developed to assist professionals in the management of DT.

**Table 2. Data on the participants' self-assessment of knowledge and experiences in dentoalveolar trauma care.**

Variables	N	%
Received information on dental trauma		
Yes	214	97.7
No	5	2.3
Knowledge about dental trauma		
Very Good/Good	122	55.7
Fair/Poor/Very poor	97	44.3
Knowledge of the 2020 IADT guidelines		
Yes	30	13.7
No	189	86.3
Knowledge of the “ToothSOS” applicative		
Yes	16	7.3
No	203	92.7
Need for more information about dental trauma		
Yes	203	92.7
No	16	7.3
Number of treated cases of dental trauma		
Between 0 to 10 cases	161	73.5
More than 10 cases	58	26.5

In the section on DT experiences during the COVID-19 pandemic, 55.7% of dentists reported providing care or guidance on DT during this period. Among these, approximately 80% treated up to five patients with DT. The age groups most frequently treated for DT were children in early childhood (37.9%) and adults (28.8%). Regarding care or guidance, 64.8% (n=79) of consultations/treatments were conducted in person, and 31.1% (n=38) occurred remotely first (by telephone) followed by face-to-face care. The most frequent types of injuries were crown fractures (n=107; 48.9%), soft tissue injuries (n=50; 22.8%), root fractures (n=42; 19.2%), and luxations (n=37; 16.9%).

Regarding the frequency of DT cases during the pandemic, 33.4% of respondents noted an increase in the frequency of cases during the period, 10% registered a decrease in the number of cases, and 56.6% reported no change in the frequency. When asked about the search for knowledge about DT during the pandemic, most dentists (69.4%) reported not having sought knowledge on the subject during this period. Among those seeking knowledge, 61% reported using articles and books as sources, and 45.5% obtained information through social networks. Regarding the specific DT questions, the mean percentage of correct answers by the participants was 44.1%, and the overall mean number of correct answers was  $5.29 \pm 2.11$ , indicating an acceptable level of knowledge.

Table 3 shows the percentage of correct answers for each question based on the IADT guidelines (2020). Among the 12 specific questions, 8 had less than 50% correct answers and 5 had less than 35%, including the questions about: endodontic treatment in cases of subluxation in permanent teeth in which the pulp sensitivity test is negative (48.4%); the best time to start endodontic treatment of a permanent tooth with incomplete root formation that was avulsed and replanted (46.1%); the best approach in case of crown fracture involving enamel and dentin with exposure of pulp tissue in permanent teeth with complete root formation (42,0%); the best option for first dental care in case of avulsion of permanent teeth (33.8%); the best solution for transporting an avulsed permanent tooth (31.5%); indication of endodontic treatment in cases of intrusion of a permanent tooth with complete root formation (31.1%); ideal type and duration of splinting in cases of permanent tooth avulsion without associated bone fracture (22.8%); and the ideal type and duration of splinting in case of lateral luxation of a permanent tooth with alveolar bone fracture (13.2%).

**Table 3. Questions about dentoalveolar trauma care, with correct answers based on the 2020 IADT guidelines.**

Question	Correct Answers N (%)
Q23: The best option for first dental care in case of avulsion of permanent teeth is:	74 (33.8) Correct answer: Immediate replantation at the accident site
Q24: The best option for first dental care in case of avulsion of deciduous teeth is:	134 (61.2) Correct answer: Do not replant the tooth
Q25: What is the best solution for transporting an avulsed permanent tooth?	69 (31.5) Correct answer: Milk
Q26: The best time to start endodontic treatment of a permanent tooth with incomplete root formation that was avulsed and replanted is when there is clinical and radiographic evidence of pulp necrosis.	101 (46.1) Correct answer: True statement
Q27: The best time to start endodontic treatment of a permanent tooth with complete root formation that suffered avulsion and was replanted within 1 hour is up to 2 weeks after replantation.	111 (50.7) Correct answer: True statement
Q28: In cases of permanent tooth avulsion without associated bone fracture, what would be the ideal type and duration of splinting?	50 (22.8) Correct answer: Flexible splint for 1 to 2 weeks
Q29: In case of root fracture in the middle third of permanent teeth, what should be done?	132 (60.3) Correct answer: Follow-up the case with sensitivity testing and radiographic control and endodontically intervene only if the tooth presents clinical and radiographic evidence of necrosis
Q30: When intrusion of a permanent tooth with complete root formation occurs, there is a potential risk of tooth loss due to external resorption. Endodontic treatment is indicated in all cases because revascularization is unlikely to occur.	68 (31.1) Correct answer: True statement
Q31: In cases of subluxation in permanent teeth with a negative pulp sensitivity test, endodontic treatment should be started immediately.	106 (48.4) Correct answer: False statement
Q32: The most important fact to be considered in a case of crown-root fracture in a permanent tooth, in addition to the existence or lack of pulp exposure, is the extension of the fracture in the apical direction.	193 (88.1) Correct answer: True statement
Q33: In the case of crown fracture involving enamel and dentin with exposure of pulp tissue in permanent teeth with complete root formation, what is the best approach?	92 (42.0) Correct answer: If possible, perform direct pulp capping or pulp curettage or pulpotomy
Q34: In the lateral luxation of a permanent tooth with alveolar bone fracture, what would be the ideal type and duration of splinting?	29 (13.2) Correct answer: Rigid splinting, four weeks

There was a statistically significant relationship between years of professional experience and questions Q23 ( $p < 0.001$ ), Q27 ( $p = 0.006$ ), Q28 ( $p = 0.029$ ), Q32 ( $p = 0.005$ ), Q33 ( $p = 0.016$ ) and Q34 ( $p = 0.012$ ). Knowledge of the IADT guidelines was statistically related to questions Q23 ( $p = 0.015$ ), Q24 ( $p = 0.023$ ), Q25 ( $p = 0.019$ ), and Q28 ( $p = 0.004$ ). The search for knowledge about DT during the pandemic was significantly related to questions Q25 ( $p = 0.005$ ), Q28 ( $p = 0.046$ ), and Q29 ( $p = 0.022$ ). The number of DT cases treated by the dentists was significantly related to questions Q23 ( $p = 0.013$ ), Q24 ( $p = 0.047$ ), Q27 ( $p = 0.015$ ), Q32 ( $p = 0.001$ ), Q33 ( $p = 0.028$ ) and Q34 ( $p = 0.007$ ). There was also a statistically significant relationship between dentists' perception of their knowledge of DT and questions Q23 ( $p = 0.002$ ), Q28 ( $p = 0.021$ ), and Q29 ( $p = 0.001$ ). These results are presented in detail in Table 4.

**Table 4. Relationship between correct answers to the DT questions (Q23-34) considering the independent variables: years of professional experience; knowledge of the guidelines for the evaluation and management of dentoalveolar trauma (DT) developed by the IADT in 2020; search for knowledge about DT during the COVID-19 pandemic; number of DT cases treated; self-assessment of knowledge about DT in general.**

Questions	Years of Professional Experience			Knowledge of the 2020 IADT Guidelines			Sought Knowledge about Dentoalveolar Trauma during the COVID-19 Pandemic			Number of DT Cases Treated			Knowledge about DT		
	Less than 10 years (n=130)	More than 10 years (n=89)	p-value	Yes (n=30)	No (n=189)	p-value	Yes (n=67)	No (n=152)	p-value	Up to 5 cases (n=126)	More than 5 cases (n=93)	p-value	Good/very good (n=122)	Fair/poor/very poor (n=97)	p-value
	N (%)	N (%)		N (%)	N (%)		N (%)	N (%)		N (%)	N (%)		N (%)	N (%)	
Q23	30 (23.07)	44 (49.43)	<0.001*	16 (53.30)	58 (30.52)	0.015*	26 (38.80)	48 (31.58)	0.297	34 (26.98)	40 (43.01)	0.013*	52 (42.62)	22 (22.68)	0.002*
Q24	76 (58.46)	58 (65.16)	0.317	24 (80.00)	110 (58.20)	0.023*	47 (70.15)	87 (57.24)	0.071	70 (55.56)	64 (68.82)	0.047*	78 (63.93)	56 (57.73%)	0.349
Q25	44 (33.84)	25 (28.08)	0.368	15 (50.00)	54 (28.57)	0.019*	30 (44.78)	39 (25.66)	0.005*	41 (32.54)	28 (30.11)	0.702	41 (33.61)	28 (28.86)	0.453
Q26	57 (43.84)	44 (49.43)	0.415	18 (60.00)	83 (43.91)	0.101	34 (50.75)	67 (44.08)	0.362	54 (42.86)	47 (50.54)	0.260	60 (49.18)	41 (42.27)	0.308
Q27	56 (43.07)	55 (61.79)	0.006*	16 (53.30)	95 (50.26)	0.755	34 (50.75)	77 (50.66)	0.990	55 (43.65)	56 (60.21)	0.015*	64 (52.46)	47 (48.45)	0.556
Q28	23 (17.69)	27 (30.33)	0.029*	13 (43.30)	37 (19.57)	0.004*	21 (31.34)	29 (19.08)	0.046*	23 (18.25)	27 (29.03)	0.060	35 (28.69)	15 (15.46)	0.021*
Q29	82 (63.07)	50 (56.17)	0.306	20 (66.67)	112 (59.26)	0.441	48 (71.64)	84 (55.26)	0.022*	74 (58.73)	58 (62.36)	0.587	85 (69.67)	47 (48.45)	0.001*
Q30	41 (31.53)	27 (30.33)	0.850	9 (30.00)	59 (31.22)	0.894	22 (32.83)	47 (30.92)	0.705	40 (31.75)	28 (30.11)	0.796	36 (29.51)	32 (32.99)	0.580
Q31	56 (43.07)	50 (56.17)	0.057	16 (53.30)	90 (47.61)	0.561	27 (40.30)	79 (51.97)	0.111	54 (42.86)	52 (55.91)	0.056	64 (52.46)	42 (43.30)	0.178
Q32	108 (83.07)	85 (95.50)	0.005*	27 (90.00)	166 (87.83)	0.733	62 (92.54)	131 (86.18)	0.180	103 (81.75)	90 (96.77)	0.001*	111 (90.98)	82 (84.54)	0.143
Q33	46 (35.38)	46 (51.68)	0.016*	12 (40.00)	80 (42.33)	0.810	28 (41.79)	64 (42.10)	0.965	45 (35.71)	47 (50.54)	0.028*	55 (45.08)	37 (38.14)	0.301
Q34	11 (8.46)	18 (20.22)	0.012*	6 (20.00)	23 (12.17)	0.240	11 (16.42)	18 (11.84)	0.357	10 (7.94)	19 (20.43)	0.007*	21 (17.21)	8 (8.25)	0.052

\*Statistically Significant; Chi-square test.

## Discussion

During health crises, such as the COVID-19 pandemic, which imposed restrictions on dental health services, it is important to monitor and confirm equitable access to essential dental care [21]. Thus, during those times, the rapid dissemination of new guidelines and service changes depended on the flexibility and efficiency of the services and the team. Therefore, dental care focuses on managing emergency conditions that require immediate attention to relieve pain and the risk of infection, such as in cases of DT [22-24]. In our study, during the COVID-19 pandemic, most dentists reported that they provided care for or guidance on DT. Most reported having the initial consultation in person, others reported having first contact by telephone, remotely, followed by face-to-face care, and a minority reported having provided all care remotely.

Although most patients were treated in person, a large proportion of the population fears the pandemic and is reluctant to leave the house, with even less desire to go to dental offices [22,25]. As an alternative to face-to-face consultations, teledentistry has been adopted and includes management and diagnosis, remote triage services, and education on medications and oral health. Although it is not a substitute for face-to-face consultation, teledentistry was beneficial. It may be helpful for dentists to provide different management approaches in public health emergencies [24-26].

Most dentists reported that the frequency of DT did not change during the pandemic. However, the literature presents conflicting results regarding the frequency of DT cases during this period. Wu et al. [27] found that emergency dental visits, including cases of DT, increased during the pandemic. For Faccini et al. [26], the cases for which there was an increase in emergency services may be explained by the unavailability of routine/elective dental care. Other studies observed a decrease in emergency care, including treatment for DT, during the pandemic period compared to pre-pandemic periods [12,21-26,28]. Notably, this reduction in cases is likely justified by the lockdown, which may have reduced activities that lead to DT. In addition, the inability of patients to access care and the fear of people regarding leaving their homes to seek care may have led to a decrease in the reporting of traumatic injuries during this period [12,22,25].

In addition to the experience of the dentists regarding the care of patients with DT during the pandemic, the results of this study revealed that the dentists who participated had acceptable knowledge about traumatic dental injuries, as determined by the average number of correct answers to the 12 specific questions about DT. Using a similar questionnaire, with responses based on the 2012 IADT guidelines, a study in southern Brazil found a moderate level of knowledge [4], and another study in Australia found a good level of knowledge [20]. However, other studies in Brazil [29,30], Lithuania [31], and Turkey [14] found a low level of knowledge among dentists. In addition, a systematic review and meta-analysis that evaluated the global knowledge of dentists about DT revealed insufficient knowledge among dental professionals; however, the studies being assessed needed uniformity in methodology and well-designed questionnaires [32]. Despite the acceptable result, the participants' average percentage of correct answers was 44.1%, and among the 12 specific questions, 8 had less than 50% correct answers, and 5 had less than 35%, demonstrating deficiency in some areas. Questions with lower percentages of correct answers were discussed separately in the following paragraphs.

For the question about the best option for dental care in cases of permanent tooth avulsion, most chose to replant in a dental office; however, the 2020 IADT indicates that replantation should be performed at the accident site, and this option was selected by only 33.8% of participants. In a study by Baginska and Wilczynska-Borawska [33], this question also had a high rate of incorrect answers. However, Jadav and Abbott [20] found a percentage of correct answers of 83.9% for this question. Avulsion is the most severe DT diagnosis, and the

prognosis depends on the implementation of appropriate emergency management procedures, with immediate replantation being the most appropriate treatment [18].

According to the participants, the best solution for transporting an avulsed permanent tooth would be the patient's saliva (38.4%), followed by milk (31.5%) and saline solution (29.7%). The 2020 IADT guidelines advocate using milk as the ideal solution [18]. A study conducted in China also observed that participants had little knowledge of milk as a means of transport for avulsed teeth, and most dentists believed that saliva or saline solution was the best storage medium [34].

The questions about the type and duration of splinting after an episode of DT yielded the greatest variety of responses. Regarding splinting indicated for permanent tooth avulsion without associated bone fracture, 22.8% of the respondents chose a flexible splint for two weeks, consistent with the recommendations of the IADT [18]. Low knowledge on this issue was also observed in studies by Zhao and Gong [34] and Baginska and Wilczynska-Borawska [33], in which most dentists chose to immobilize the teeth for more extended periods, which could lead to a greater risk of ankylosis and resorption [35].

Participants were also asked about the indication of splinting for cases of luxation with the presence of bone fracture, and only 13.2% were correct when they opted for a rigid splint for four weeks. According to current IADT guidelines, in the case of luxation, a flexible splint should be the option of choice; however, when there is a fracture of the marginal bone or alveolar wall, an additional splint is needed. Despite this finding, the guidelines need to specify what is meant by 'additional splinting,' and there is still confusion about a flexible splint and a rigid splint. Thus, this issue requires further research and clarification [20].

Approximately half of the participants considered the following statement false: endodontic treatment should be performed in all cases of permanent tooth intrusion with complete root formation. Only 31.1% answered the question correctly, and 18.8% could not answer it, a result similar to that found by Jadav and Abbott [20]. The statement is true because intrusive luxations are related to dental ankylosis and external root resorption and can result in tooth loss, which can be avoided during endodontic treatment [3,4].

Dentists with more than ten years of experience (years since graduation) had significantly more correct answers than did dentists with less than ten years of experience, and this result was similar to those reported for the study by Hartmann et al. [4], who observed that dentists with 10 to 19 years of experience had more knowledge than did professionals with less experience. Jadav and Abbott [20] also found a correlation, although not significant, between knowledge and time since graduation, with older dentists achieving higher scores. In contrast, previous studies have reported an inverse relationship, with younger professionals having higher levels of knowledge [12,14,29,30,33].

Similar to other authors [4,20,30], in this study, there was an association between prior experience treating DT and a more significant number of correct answers to specific questions, and this result was statistically significant for some questions, such as replantation of deciduous and permanent teeth and the best time for endodontic treatment of avulsed teeth, demonstrating that clinical experience has a fundamental role in the knowledge of professionals.

Higher percentages of correct answers were also obtained from dentists who self-rated their knowledge about DT as good or very good; the lowest scores were recorded by dentists who self-rated their knowledge about DT as fair, poor, or very poor. This association is consistent with the results of previous studies [4,14,20,31] that found that more excellent self-reported knowledge was associated with a more significant percentage of correct answers.

Although most respondents considered the self-reported knowledge about DT to be good or very good, and only 4.6% rated their knowledge as poor or very poor, most dentists (86.3%) needed to learn the 2020 IADT guidelines. Other studies also showed low knowledge about protocols for managing DT [29,34]. The IADT, using the best evidence in the available literature and discussions by experts in the field, developed guidelines to provide information for immediate or emergency care for DT [19]. This study showed that the dentists who knew the current IADT guidelines had a higher percentage of correct answers to the specific questions about DT.

Despite a perception of the need to seek more information about DT, most professionals did not seek knowledge on the subject during the COVID-19 pandemic. The search for this knowledge was associated with more correct answers to specific questions. This fact strengthens the need for updated knowledge on the subject, as is also suggested by other authors [4,14,31,34].

This study has some limitations. Due to the low participation rate, the results cannot be fully generalized to the Brazilian population. In addition, participants may need to adequately remember their experiences in treating patients with DT. However, a strength of the study is that the selected group consisted of dentists from different cities, different institutes, and all types of specialties. In addition, this is the first study to assess the level of knowledge about DT in this region and the first Brazilian study to address DT experiences during the pandemic.

The limitations of dentists' knowledge regarding the management of DT are a worldwide problem and require the development of public health strategies to improve the skills of these professionals [4]. Therefore, it is necessary to train dentists and ensure that all dental professionals apply contemporary, internationally recognized, and evidence-based guidelines for the management of DT [31,34,36,37,38]. These results herein highlight the need for continuing education in DT and wide dissemination of the IADT guidelines, including undergraduate courses in Dentistry, *latu* and *stricto sensu* postgraduate courses, professional updating courses or lectures on the subject so that dentists can access the most current guideline in cases of clinical demands of dental trauma.

## Conclusion

Most of the dentists evaluated provided care for or guidance on DT during the social distancing period during the COVID-19 pandemic and reported that the frequency of DT did not change. In addition, knowledge about DT is adequate but notably deficient in some aspects, emphasizing the need to provide dentists with more information supported by the IADT guidelines.

## Authors' Contributions

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## Conflict of Interest

The authors declare no conflicts of interest.

## Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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