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Dentists' Self-evaluated Ability in Diagnosing and Updating About Pulpotomy

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ABSTRACT

Objective: This study aimed to self-evaluate the knowledge of different dental professionals' profiles in Brazil on diagnosing and indicating pulpotomy in primary teeth and how these groups updated on this theme.
Methods: Three groups (G1: professors, G2: specialists, and G3: professionals) answered an online questionnaire containing 20 questions and returned 416 questionnaires. Data were subjected to Chi-square associative tests and t tests, with $P < .05$.
Results: G1 and G2 reported to indicate pulpotomy, highlighting the tendency of these groups towards seeking updates on this subject. All 3 groups used academic materials for updating. However, G2 had a high demand for updates through congresses, whilst G3 had a high demand for updates through social media (Google and Google Scholar). The most cited indication by G1 and G2 was "accidental pulp exposure" and by G3 was "teeth with extensive carious lesions that have involved the pulp with radiographic confirmation." All 3 groups opted for pulpotomy to keep the tooth in the arch. Thus, G1 and G2 are the groups who are more updated on the subject, using mainly academic materials, which can be associated with the fact that such groups indicated pulpotomy in primary teeth. The lower interest in searching about pulpotomy in G3 can be understood as a nonclinical application of the topic for this group.
Conclusions: Professionals who work directly with paediatric dentistry (professors or specialists) felt more capable of diagnosing and treating cases of pulpotomy. In addition, most of the professionals used scientifically based sources for getting information and actualisation on the subject of pulp therapies.

Introduction

Dental caries in children is a public health issue because it affects thousands, especially in developing countries.[1-3] Besides caries, dental trauma can also involve the pulp, either reversibly or irreversibly.[4,5] Amongst the different vital pulp therapy techniques on primary teeth, pulpotomy is widely used and consists of removing the coronal pulp and maintaining the vital root pulp, thereby maintaining the vital pulp until physiologic tooth resorption.[6-10]

Although pulpotomy of primary teeth has been studied for many years, it still causes many controversies and discussions either due to the difficulty that many dentists have in diagnosing the pulp condition correctly or the doubts regarding the different materials used for capping, protecting, and repairing the pulp remnant.[11-15] Both the diagnosis and the material directly affect the success of the technique.

Due to the continuous discussion on the subject and the different existing protocols for vital pulp therapy, especially pulpotomy, this study aimed to self-evaluate the knowledge

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of different dental professionals' profiles in Brazil in the diagnosis and indications for pulpotomy in primary teeth.

Materials and methods

This study was approved by the Institutional Review Board (Protocol number CAAE 43,951,215.0.0000.5417).

A 20-question self-administered electronic questionnaire was developed based on the inputs of selected researchers in discrete review rounds and was applied to determine the profile of the participant and the knowledge on vital pulp therapies in primary teeth. The questionnaire was hosted online using the Google Forms tool (Appendix 1). Participants were divided into 3 groups: paediatric dentist professors (G1), nonprofessorial paediatric dentist specialists (G2), and other dentists not belonging to any of the previous groups, (G3).

The link containing the questionnaire was sent via email, social media, and communication applications to the paediatric dentistry professors, all paediatric dentists duly registered in the Federal Council of Dentistry, and general dentists/specialists in other areas. The participants remained anonymous.

Data were tabulated and analysed based on their normality and homogeneity. The groups were compared using the Chi-square tests, with a 5% level of significance.

Results

After removing possible duplicated questionnaires, the total number of questionnaires evaluated was 416, of which 91 were from G1, 109 from G2, and 216 from G3.

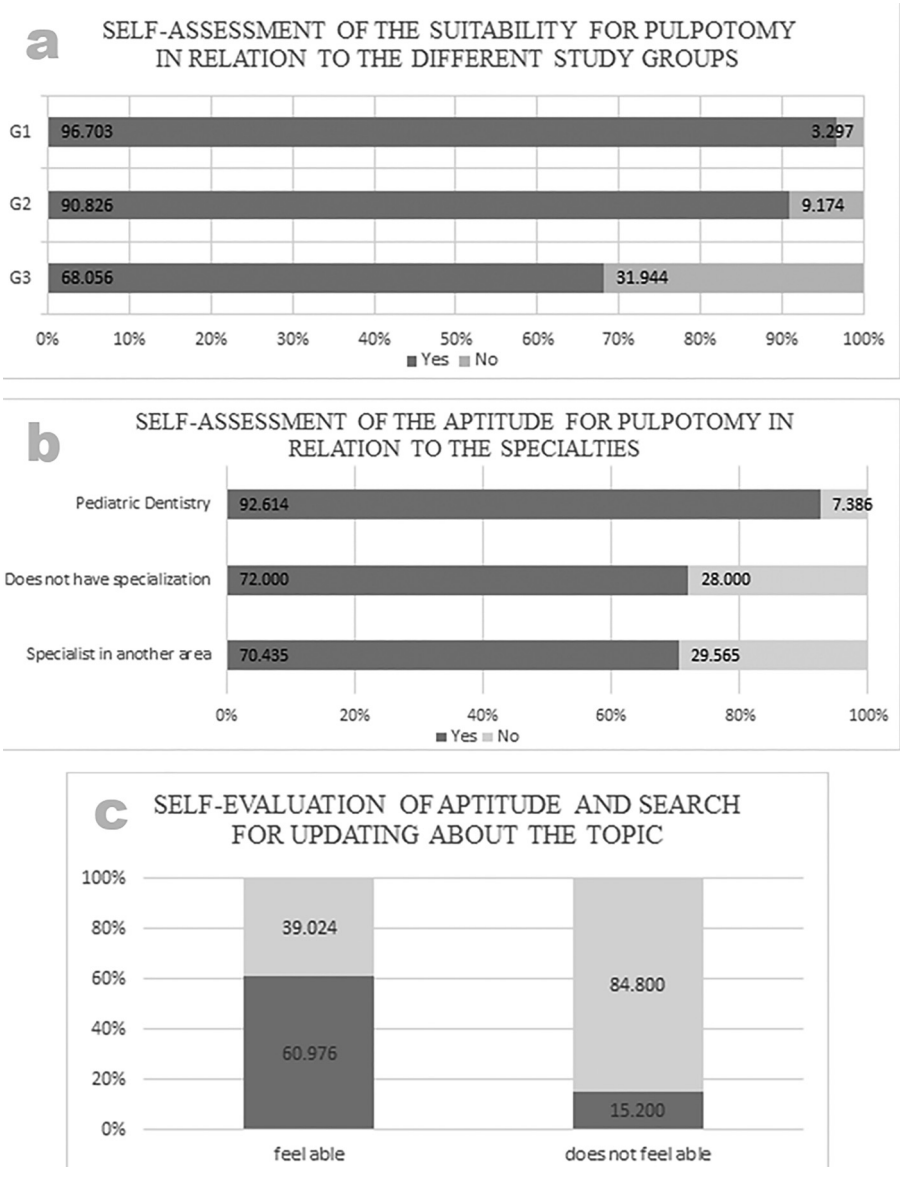

Fig – A, Self-assessment of the suitability for pulpotomy in relation to the different study groups (G1: paediatric dentist professors, G2: nonprofessor paediatric dentist specialists, and G3: other dentists not suitable to any of the previous groups), $P < .05$. B, Self-assessment of the aptitude for pulpotomy in relation to the specialties. C, Self-evaluation of aptitude search for updating about the topic.

Table 1 – Distribution of the different search modes for updating amongst the study groups.

Search mode Group	Does not seek update	Social media	Google	Congresses	Academic material
G1	1.099	8.791	13.187	20.879	100.000
G2	0.000	29.358	35.780	82.569	95.413
G3	18.519	19.907	27.315	31.944	75.463

G1, paediatric dentist professors; G2, nonprofessor paediatric dentist specialists; G3, other dentists not suitable to any of the previous groups.
$P < .001$.

Table 2 – Pulpotomy indication amongst groups.

Diagnoses that lead to pulpotomy indication Group	Teeth with extensive caries, seen only clinically	Teeth with extensive caries and involvement of the pulp chamber without periapical lesion, confirmed on radiograph	Accidental pulp exposure in cavity preparations	Trauma	Others
G1	4	47	54	47	6
G2	3	59	65	37	1
G3	9	109	7	59	0

G1, paediatric dentist professors; G2, nonprofessor paediatric dentist specialists; G3, other dentists not suitable to any of the previous groups.

The question "Do you feel able (theoretically/technically) to indicate pulpotomy in primary teeth?" was associated with the following factors: groups (G1, G2, and G3) (Figure A). G1 and G2 mostly indicated the technique. Specialists in paediatric dentistry mostly self-reported to indicate pulpotomy more than those who have a specialisation in another area or do not have a specialisation (Figure B). Amongst the three groups, those who sought updates on the topic were those who self-reported to indicate pulpotomy (Figure C).

The association of updating search modes with the groups showed that all three groups used academic materials (Table 1). All G1 participants used academic materials, whilst G2 participants had a high demand for updates through congresses, and G3 through social media (Google and Google Scholar).

The association of pulpotomy indication with the groups (Table 2) found that G1 and G2 mostly chose the "accidental pulpal exposure", whilst G3 chose "Teeth with extensive caries and pulp chamber involvement without periapical lesion, confirmed on radiographs". All groups indicated that they would perform the technique for "Maintenance of the tooth in the arch in case of treatment success"(Table 3).

Discussion

The literature reports the most varied aspects of vital pulp therapies in primary teeth; however, the investigation on how the different profiles of dentists would self-evaluate their tendency towards the diagnosis and indication of vital pulp therapies in primary teeth, especially pulpotomy, and how they would be updated on this topic makes this study innovative.[8,16,17]

Amongst vital therapies for primary teeth, pulpotomy is the gold-standard procedure. But there is no consensus on how best to do so, a fact noted in the response to the question "What is the reason or diagnosis that leads to the indication of pulpotomy?", in which most of G1 and G2 answered "Accidental pulp exposure," whilst G3 answered "Teeth with extensive caries and involvement of the pulp chamber without periapical lesion, confirmed on radiography." This result demonstrates that those who work directly with paediatric dentistry tend to be more optimistic about the removal of the decayed tissue, opting for pulpotomy after accidental exposure, and other dentists were more invasive.[8,16,18,19] The importance of maintaining the primary tooth in position until its physiologic exfoliation has consensus in the literature, which is in line with the response obtained when the groups were asked about the motivation for performing the pulpotomy. All groups answered, "Tooth maintenance in the arch in case of successful treatment."[8]

The correct diagnosis is known to be the most important part of the dentist's role, especially in pulp therapies. Paediatric dentistry professors and specialists mostly self-assessed *yes* to the question "Do you feel able (theoretically/technically) to indicate pulpotomy in primary teeth?" Similarly, in

Table 3 – The main reason for pulpotomy indications.

Main reason Group	Eliminate pain	Maintenance of the tooth in the arch in case of treatment success	Only employed in specific cases, such as demonstration and specialisation	Others
G1	20.454%	64.772%	3.409%	11.363%
G2	17.171%	78.787%	2.020%	2.020%
G3	22.448%	71.428%	1.360%	4.761%

G1, paediatric dentist professors; G2, nonprofessor paediatric dentist specialists; G3, other dentists not suitable to any of the previous groups.

India, Nayak et al reported that paediatric dentists and general practitioners act differently when asked about different procedures in primary teeth, with paediatric dentists showing more knowledge.[18,19]

Science has an essential role in dentistry, especially in times of evidence-based dentistry. However, the way in which the different dentists sought such updates was significantly different, as observed through the response to the question "Select the different ways you use to be updated on vital pulp treatments." G1 mostly chose academic material, which was expected since this group is intimately involved in research on the subject.[20] In G2, about 65% use social media and the Google search tool, which highlighted the search for Portuguese instructions performed by experts in the area.[20,21] It is also worth noting that most of the articles available in the databases have paid access,[22] a fact that has a direct influence on the way this group is updated. In G3, about 18.5% of the participants do not seek updates on pulpotomy, probably because they were not executing this procedure in their daily routine. Amongst those who update themselves on the subject, approximately 47% use social media and the Google search tool, probably due to the same reason as in G2.[20,22] These data are similar to the findings of Aldhilan and Al-Haj Ali in 2018,[23] which demonstrated that Saudi Arabian paediatric dentists tend to have more knowledge on primary dentition treatments when compared to general practitioners.[18,19,23,24] Relating the search for updates with the self-assessed ability, it was observed that those who feel more able were also the ones who consume the most content on the subject, which suggests that the lack of self-assessed ability would relate to the lack of interest in being updated.[24,25]

Conclusions

The professionals who work directly with paediatric dentistry (professors or specialists) felt more capable of diagnosing and treating cases of pulpotomy in primary teeth. Although most of the professionals interviewed in the three groups used scientifically based sources, paediatric dentistry specialists and dentists in general should be aware of the importance of evidence-based dentistry. The low clinical utility of pulpotomy in G3 may be the due to the low interest in being updated on this topic.

Conflict of interest

None disclosed.

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APPENDIX 1. Questionnaire used in the research

1 Educational Institution where you did your graduate (full name of the Higher Education Institution [HEI] and acronym):
2 Type of institution:
Public
Private
3 What year did you graduate:
4 What is your greatest academic title?
Graduation
Specialisation
Master's degree
Doctoral degree
5 Do you have a specialisation?
Yes
No
5.1 Specialist title obtained
Acupuncture
Buccomaxillofacial Surgery and Traumatology
Dentistry
TMP and Orofacial Pain
Endodontics
Stomatology
Orofacial Harmonisation
Homeopathy
Implantology
Odontogeriatrics
Paediatric Dentistry
Sports Dentistry
Occupational Dentistry
Forensic Dentistry
Dentistry for Patients With Special Needs
Orthodontics
Functional Jaw Orthopaedics
Oral and Maxillofacial Pathology
Periodontics
Maxillofacial Prosthesis
Dental Prosthesis
Dental Radiology and Imaging
Public Health
5.2 What year did you complete the specialisation?
5.3 Educational institution where you did the specialisation:
6 Do you work as dentist in a clinic outside an HEI?
Yes
No
6.1 If you answered YES in the previous question, this clinic is linked to what type of health service?
Public
Private
Both
7 Are you a professor at any HEI?
Yes
No
7.1 In which HEI do you teach?
7.2 Which subject(s) do you teach?
7.3 Do you do scientific research at your HEI?
Yes
No
8 Do you feel able (theoretical/technically) to indicate pulpotomy in primary teeth?

Yes
No

9 Select the different mode you use to update yourself on vital pulp treatments (you can select more than one option):

I don't seek updates about it
Lives on social media
Paediatric dentists' websites
Social media like Facebook and Instagram
Paediatric dentistry congresses
Search tools like Google
Google Scholar searches
Search for articles in database
Consensus books in paediatric dentistry
Dental books
Guidelines of national and international associations
Others

10 What is the main reason you think it is important to indicate vital pulp treatments?

Elimination of pain
Maintenance of the tooth in the arch in case of successful treatment
Only used in specific cases, such as demonstration and specialisation
Others

11 What is the reason(s) or diagnosis(s) that lead you to indicate pulpotomy (you can select more than one option)?

Teeth with extensive caries, visualised only clinically
Teeth with extensive caries and involvement of the pulp chamber without periapical lesion, confirmed on radiograph
Accidental pulp exposure in cavity preparations
Trauma
Others

12 Which capping material do you use as a first choice when performing a pulpotomy in primary teeth?

Formocresol 1:1
Buckley's formocresol 1:5
Calcium hydroxide
Mineral trioxide aggregate
Ferric sulfate
Others

13 What is your main choice criterion for the capping material of the previous question?

Cost of material
Ease of performing the technique
Biocompatibility of the material used
Clinical and radiographic success

14 Which of the new (experimental) technologies below would you adopt in the future to protect and assist in pulp regeneration (you can select more than one option)?

Photobiomodulation therapy
Deciduous tooth stem cells (SHED)
Electrocoagulators
Scaffolds with biomaterials
I don't know how to say

15 Would you perform radiographic control on a tooth submitted to pulpotomy?

Yes
No

15.1 If you answered YES in the previous question, what frequency of radiographic control would you use in a tooth undergoing pulpotomy (you can select more than one option)?

1 week to 1 month
1 month to 3 months
3 months to 6 months
6 months to 12 months
In every consultation until the exfoliation of this tooth

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