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Cross-sectional questionnaire study assessing the practice of pulp therapy in primary teeth among Pediatric dentists and General dentists in Dakshina Kannada

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Abstract:
Background: The long-term oral health of young children is directly impacted by the treatment choices made by dentists about primary teeth. Unfortunately, many primary teeth remain untreated due to a lack of knowledge among dental practitioners, which causes early exfoliation compromising arch integrity.
Aim: The aim of this present survey is to evaluate the knowledge, attitude, and practice of pulp therapy among general and pediatric dentists in Dakshina Kannada. It seeks to explore the variations, current trends, and preferences in pulp therapy procedures employed by the dental professionals, highlighting the diversity of approaches within the field of dentistry.
Methods: A cross-sectional questionnaire study was conducted through Google Forms which included closed-ended, multiple-choice questions. This questionnaire featured four case scenarios with clinical and radiographic data and was sent to various general and pediatric dentists throughout the district. The study comprised of 67 general dentists and 52 pediatric dentists. The data was then analyzed using SPSS 23 software.
Results: A notable and statistically significant difference was seen in the understanding of pulp therapy procedures for primary dentition between the two groups.
Conclusion: The study concluded that negligence towards primary teeth may result from a lack of pediatric dentistry training and inexperience in treating children.
Keywords: Primary dentition, Pulp therapy, Pediatric dentists, General dentist

Introduction:

Maintaining a deciduous tooth until its natural exfoliation is key for ensuring proper permanent dentition. Dental caries is characterized as an infectious and transmissible disease and it stands as the most prevalent chronic disease in dentistry (Nayak et al., 2010). Lack of proper dental care and inadequate oral hygiene frequently leads to the development of caries and other dental abnormalities in children and young adults (Waterhouse et al., 2011). Untreated dental caries can cause pulpal involvement (Patil et al., 2016).

Pulp therapy in permanent dentition differs significantly from that of primary dentition due to the morphological and anatomical differences between the two. Dental clinicians often face challenges while diagnosing and considering treatment options for deep carious lesions that is in proximity to the pulp. Factors such as the rate of spread of caries, lesion depth, quality of dentin, clinical symptoms, clinician expertise, and accurate diagnosis play vital roles in directing the selection of treatment in such cases (Nayak et al., 2017).

Contradictory to the conventional approach of traditional indirect pulp capping (IPC), which involves the complete removal of infected dentin while retaining the affected dentin, the recently advocated technique of indirect pulp therapy (IPT) has gained recognition. IPT is preferred for its ability to minimize trauma to the pulp and preserve tooth vitality (American Academy of Paediatric Dentistry, 2007); Orhan et al., 2010). Reduction of the bacterial count is seen as this procedure involves the incomplete removal of carious dentin, followed by the application of a biocompatible material on the carious lesion (Mcdonald et al., 2000).

Certain dental clinicians adopt a more radical approach in deep carious lesions in which the pulp is likely to be exposed, through either pulpectomy or pulpotomy (Farooq et al., 2000). The clinical diagnosis depends on factors such as the chief complaint along with the history of the presenting illness, past dental history, and both clinical and radiographic examinations.

In such cases, the decision for pulpotomy, pulpectomy, or extraction depends on factors like pulp vitality, the existence or lack of pathology, restorability, and the anticipated duration until the physiological exfoliation of the tooth. It is essential to maintain the integrity of the arch form by ensuring the preservation of the primary tooth until its permanent successor erupts (Togoo et al., 2012).

Pediatric endodontic procedures pose a significant challenge in dentistry. The appropriate diagnosis and treatment plan of pulpal pathology are pivotal factors for successful endodontic therapy in the primary dentition (Razieh et al., 2020). The primary objective of endodontic treatment is the thorough elimination of microorganisms in the root canal and to prevent post-treatment reinfection.

The success of pulpectomy depends on the dentist's approach and skill, the method and quality of instrumentation, irrigation, disinfection, and proper obturation (Raiyani et al., 2015). Achieving comprehensive cleaning through chemo-mechanical instrumentation in primary teeth is challenging due to its intricate morphology. This challenge is addressed by meticulous chemo-mechanical preparation of the canals, followed by obturation (Togoo et al., 2012).

The perception that root canals in primary teeth are intricate and the fear of causing potential harm to the permanent tooth bud many primary teeth despite pulpal involvement remain untreated. Incomplete treatment also results from either difficulty in child cooperation or lack of dentist knowledge (Acharya, 2018).

Consequently, due to these concerns, various dental practitioners prefer extraction as a treatment of choice for primary teeth with pulpal involvement. Premature extraction of primary teeth can disrupt arch length, leading to mesial drift of permanent teeth and subsequent malocclusion. Ideally, teeth with pulp involvement should be retained, maintaining the arch form, functionality, and a disease-free state (Karthikeson and Vignesh, 2019).

Variations in treatment options between pediatric dentists and general dentists are observed (Togoo et al., 2012). Consequently, it is important for the general dentists to recognize the significance of their role in pulp therapy for primary teeth. They should be acquainted with suitable intra-canal medicaments, materials for final restoration, and when to refer cases to a pediatric specialist (Bargale et al., 2019).

Methods:

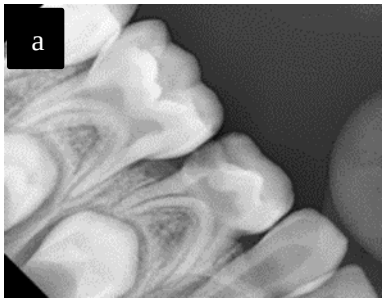
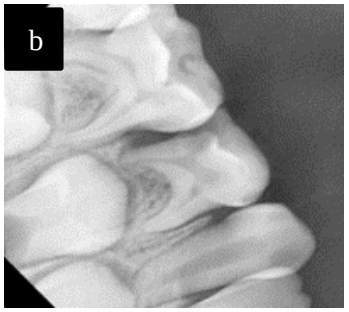
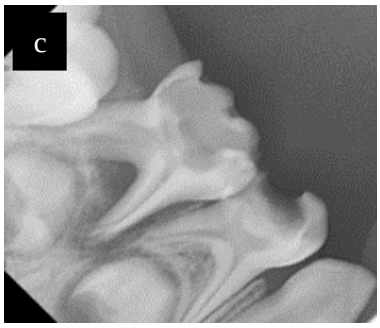
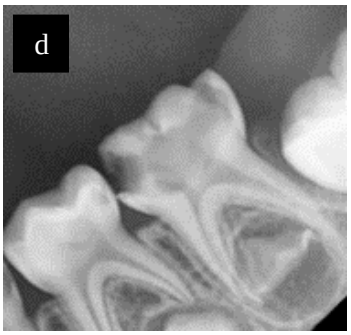
A cross-sectional questionnaire was distributed to evaluate the knowledge, attitude and practice of pulp therapy in primary teeth among general and dentists in Dakshina Kannada. The sample was selected through convenience sampling, and the questionnaire that was created using Google Forms, was distributed to participants through social media.

The participants who did not provide informed consent or who did not complete the questionnaire were excluded from the study. A total of 119 dentists participated in which 67 were general dentists and 52 were pediatric dentists. The objective of the study was explained to the participants after which they were requested to fill out and submit the questionnaire [Table 1].

The questionnaire comprised of two sections. The first section gathered demographic information such as gender, practice type, and years of experience. The second section presented four case scenarios, asking them to select the most favoured treatment choice for each.

Each of case scenarios included a radiograph of a carious primary molar accompanied by a clinical description. [Figure 1] The questionnaire was assessed for content validity by pediatric dentists and academics in the field of pedodontics and the questionnaire contents were considered valid to proceed with the study. Data from Google forms was entered into excel sheets and SPSS 23 software was used to determine inferential analysis.

Figure 1: Images depicting the case scenarios used for the questionnaire

Case Scenario no 1	Case Scenario no 2
	
Case Scenario no 3	**Case Scenario no 4**
	

Results:

The present study included 119 participants of which 52 were pediatric dentists and 67 were general dentists.

A majority of the pediatric and general dentists were found to be females (80.8% and 58.20% respectively). (46.2%) of pediatric dentists worked in private teaching hospitals and (42.3%) were practising consultants and 88.1% of all general dentists practiced in private clinics. When considering years of experience, most pediatric and general dentists had 0-10 years of experience (80.8% and 91% respectively).

For case 1, majority of the pediatric dentists (46.2%) chose pulpotomy as their treatment of choice while 53.7% general dentists chose pulp capping. [Table 2]

In case scenario 2, (57.7%) pediatric dentists answered pulpectomy without stainless steel crown as the treatment choice whereas general dentists chose extraction with space maintainer (49.3%). [Table 2]

Majority pediatric dentists (50%) and general dentists (53.7%) chose Pulpectomy (Access opening + drainage) on the same visit followed by administration of systemic antibiotics as the treatment option for case scenario 3. [Table 2]

Table 1: Table showing the questionnaire and options included

CASE SCENARIOS AND QUESTIONS	OPTIONS
Case 1: a radiograph [Figure 1a] was provided with the following clinical scenario: A cooperative 7-year-old boy presented with deep proximal caries in the primary mandibular first molar. There is a history of transient pain on eating and drinking. Complete caries removal might result in pulp exposure. Radiographic examination wrt 84 revealed radiolucency involving enamel, dentin and approximating pulp suggestive of reversible pulpitis.	Pulp capping Pulpotomy Pulpectomy Can't say
Case 2: a radiograph [Figure 1b] was provided with the following clinical scenario: A cooperative 9-year-old girl presented with a complaint of pain in the primary mandibular first molar which was mild, dull, intermittent and gradual in onset. Intra oral examination reveals a disto-occlusal carious lesion. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin and pulp on the distal aspect. Interdentally, bone loss is seen in the distal aspect suggestive of chronic irreversible pulpitis with apical periodontitis wrt 84.	Pulpectomy with stainless steel crown Pulpectomy without stainless steel crown Extraction with space maintainer Extraction without space maintainer
Case 3: a radiograph [Figure 1c] was provided with the following clinical scenario: A 4-year-old boy (definitely positive) presented with a complaint of extra oral swelling on the lower right side of the face which was non tender on palpation. The parent and child give a history of pain which was moderate, intermittent, and gradual in onset. Intra oral examination reveals a Class I dentinal carious lesion associated with a dento-alveolar abscess wrt 85. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin and pulp. Periapical and furcal radiolucency is seen suggestive of chronic irreversible pulpitis with periapical abscess wrt 85.	Pulpectomy following administration of systemic antibiotics Extraction on the same visit followed by systemic antibiotics Systemic antibiotics followed by extraction on next visit Pulpectomy (Access opening+drainage) on the same visit followed by administration of systemic antibiotics
Case 4: a radiograph [Figure 1d] was provided with the following clinical scenario: A 5-year-old boy reported with a complaint of pain in the primary left second mandibular molar for 2 days which was moderate, continuous and sudden in onset. The pain is aggravated at night and is not associated with fever or swelling. Clinical examination reveals Class 1 dentinal carious lesion wrt 75. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin and pulp suggestive of acute exacerbation of chronic irreversible pulpitis wrt 75.	
The only treatment option is pulpectomy?	Agree Disagree I don't know
Which of the following techniques would you choose for pain control?	Inferior alveolar nerve block Pulp devitalizing agent Intra-pulpal anesthesia
Which of the following instrument would you use to perform pulpectomy?	K-file only K-file+H-file Rotary Both manual and rotary
Which of the following methods would you use for working length determination?	Radiographic method Tentative working length determination by using pre-operative radiograph Apex locator
Which of the following methods would you use for working length determination?	Normal saline only Chlorhexidine + Saline Sodium hypochlorite + Saline Hydrogen peroxide + Saline
Which of the following Isolation technique would you prefer?	Cotton rolls Suction tip Rubber dam Cotton rolls + suction tip
Which of the following Obturating materials would you prefer?	Zinc oxide eugenol Calcium hydroxide Calcium hydroxide + iodoform Endoflas
Which of the following materials would you use to place the final restoration?	Glass ionomer cement Amalgam Composite Stainless steel crown

Table 2: Table depicting the responses of participants for case scenarios 1, 2 and 3

Case Scenario 1: A cooperative 7-year-old boy presented with deep proximal caries in the primary mandibular first molar. There is a history of transient pain on eating and drinking. Complete caries removal might result in pulp exposure. Radiographic examination wrt 84 revealed radiolucency involving enamel, dentin and approximating pulp suggestive of reversible pulpitis.		
Pulp capping	General dentists	53.7%
	Pediatric dentists	23.1%
Pulpotomy	General dentists	25.4%
	Pediatric dentists	46.2%
Pulpectomy	General dentists	20.9%
	Pediatric dentists	15.4%
Can't say	General dentists	0
	Pediatric dentists	15.4%
Case Scenario 2: A cooperative 9-year-old girl presented with a complaint of pain in the primary mandibular first molar which was mild, dull, intermittent, and gradual in onset. Intra oral examination reveals a disto-occlusal carious lesion. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin and pulp on the distal aspect. Interdentally, bone loss is seen in the distal aspect suggestive of chronic irreversible pulpitis with apical periodontitis wrt 84.		
Pulpectomy with stainless steel crown	General dentists	20.9%
	Pediatric dentists	15.4%
Pulpectomy without stainless steel crown	General dentists	7.5%
	Pediatric dentists	57.7%
Extraction with space maintainer	General dentists	49.3%
	Pediatric dentists	26.9%
Extraction without space maintainer	General dentists	22.4%
	Pediatric dentists	0
Case Scenario 3: A 4-year-old boy (definitely positive) presented with a complaint of extra oral swelling on the lower right side of the face which was non tender on palpation. The parent and child give a history of pain which was moderate, intermittent, and gradual in onset. Intra oral examination reveals a Class I dentinal carious lesion associated with a dento-alveolar abscess wrt 85. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin and pulp. Periapical and furcal radiolucency is seen suggestive of chronic irreversible pulpitis with periapical abscess wrt 85.		
Pulpectomy following administration of systemic antibiotics	General dentists	10.4%
	Pediatric dentists	19.2%
Extraction on the same visit followed by systemic antibiotics	General dentists	3%
	Pediatric dentists	19.2%
Systemic antibiotics followed by extraction on next visit	General dentists	32.8%
	Pediatric dentists	11.5%
Pulpectomy (access opening + drainage) on the same visit followed by administration of systemic antibiotics.	General dentists	53.7%
	Pediatric dentists	50%

Table 3: Table depicting the responses of participants for case scenario 4

Case Scenario 4: A 5-year-old boy presented with a complaint of pain in the primary left second mandibular molar for 2 days which was moderate, continuous, and sudden in onset. The pain is aggravated at night and is not associated with fever or swelling. Clinical examination reveals Class 1 dentinal carious lesion wrt 75. Radiographic evaluation reveals an ill-defined radiolucency involving enamel, dentin, and pulp suggestive of acute exacerbation of chronic irreversible pulpitis wrt 75.		
The only treatment option is pulpectomy.		
Agree	General dentists	86.6%
	Pediatric dentists	96.2%
Disagree	General dentists	13.4%
	Pediatric dentists	3.8%
Which of the following techniques would you choose for pain control?		
Inferior alveolar nerve block	General dentists	25.4%
	Pediatric dentists	69.2%
Pulp devitalizing agent	General dentists	56.7%
	Pediatric dentists	0
Intra-pulpal anesthesia	General dentists	17.9%
	Pediatric dentists	30.8%
Which of the following instrument would you use to perform pulpectomy?		
K-file only	General dentists	28.4%
	Pediatric dentists	16%
K-file + H-file	General dentists	7.5%
	Pediatric dentists	20%
Rotary	General dentists	0
	Pediatric dentists	4%
Both manual and rotary	General dentists	64.2%
	Pediatric dentists	60%
Which of the following methods would you use for working length determination?		
Radiographic method	General dentists	26.6%
	Pediatric dentists	61.5%
Tentative working length determination by using pre-operative radiograph	General dentists	50%
	Pediatric dentists	26.9%
Apex locator	General dentists	23.4%
	Pediatric dentists	11.5%
Which of the following methods would you use for working length determination?		
Normal saline only	General dentists	57.8%
	Pediatric dentists	11.5%
Chlorhexidine + Saline	General dentists	17.2%
	Pediatric dentists	46.2%
Sodium hypochlorite + Saline	General dentists	25%
	Pediatric dentists	42.3%
Hydrogen peroxide + Saline	General dentists	0
	Pediatric dentists	0
Which of the following Isolation technique would you prefer?		
Cotton rolls	General dentists	3%
	Pediatric dentists	0
Suction tips	General dentists	0
	Pediatric dentists	0

Rubber dam	General dentists	11.9%
	Pediatric dentists	53.8%
Cotton rolls + Suction tips	General dentists	85.1%
	Pediatric dentists	46.2%
Which of the following Obturating materials would you prefer?		
Zinc oxide eugenol	General dentists	34.3%
	Pediatric dentists	34.6%
Calcium hydroxide	General dentists	19.4%
	Pediatric dentists	3.8%
Calcium hydroxide + iodoform	General dentists	40.3%
	Pediatric dentists	34.6%
Endoflas	General dentists	6%
	Pediatric dentists	26.9%
Which of the following materials would you use to place the final restoration?		
Glass ionomer cement	General dentists	64.2%
	Pediatric dentists	15.4%
Amalgam	General dentists	4.5%
	Pediatric dentists	0
Composite	General dentists	0
	Pediatric dentists	0
Stainless steel crown	General dentists	31.3%
	Pediatric dentists	84.6%

In case scenario 4, both pediatric dentists (96.2%) and general dentists (86.6%) agreed that pulpectomy is the only treatment option.

With respect to pain control, a large portion of pediatric dentists (69.2%) chose Inferior alveolar nerve block as the pain control method and 56.7% general dentists picked pulp devitalizing agent as the preferred pain control method. Majority of the pediatric dentists (60%) and general dentists (64.2%) chose both manual and rotary instrumentation for pulpectomy. Concerning the determination of working length, (61.5%) of pediatric dentists employed the radiographic method, while 50% of general dentists utilized pre-operative radiographs to establish a tentative working length. Majority general dentists (57.8%) used normal saline as irrigation solution. 46.2% of pediatric dentists used a combination of chlorhexidine and saline whereas 42.3% used sodium hypochlorite along with saline.

With respect to isolation technique, cotton rolls and suction tips were recommended by 85.1% of all general dentists whereas 53.8% pediatric dentists recommended rubber dams and the remainder used cotton rolls and suction tip. Regarding the choice of obturating material, an equal percentage of pediatric dentists (34.6%) opted for zinc oxide eugenol and a combination of calcium hydroxide with iodoform. Majority of general dentists (40.3%) favored the combination of calcium hydroxide and iodoform as their chosen obturating material.

(84.6%) pediatric dentists chose placement of stainless-steel crown as their preferred final restoration while most general dentists (64.2%) chose glass ionomer cement as the preferred final restoration. [Table 3]

Discussion:

The fundamental challenge of dental pulp, which defies direct visualization, adds complexity for clinicians. It requires a thorough understanding of the patient's history, clinical symptoms, signs, and the implementation of vitality tests to formulate an accurate diagnosis and treatment plan (American Academy of Pediatric Dentistry, 2021). This challenge is particularly pronounced among pediatric patients, considering their limited ability to give specific information regarding their symptoms. The diagnosis depends on a comprehensive approach including a detailed history,

clinical examination, and radiological assessment. To obtain a successful outcome in pediatric endodontics it is contingent to restore healthy periodontal tissues, prevent pathological root resorption, and preserve the primary tooth in an infection-free state to retain the space for the eruption of its permanent successor (Acharya, 2018).

In this current study, a comparative analysis was conducted to evaluate the knowledge, attitude and practice of general dentists and pediatric dentists in the treatment of deep carious primary teeth, using four different case scenarios presented through a structured questionnaire. Significant differences were observed in the treatment preferences between general and pediatric dentists.

Treatment of deep carious lesions depend on various radiological and clinical variables, including involvement of pulp, restorability of the affected tooth, pulp vitality, periapical inflammation, and the anticipated time until tooth exfoliation. The affected tooth may present vitality (exhibiting no symptoms and normal response to the vitality tests), have an inflamed vital pulp with potential for healing (reversible pulpitis), have an inflamed vital pulp that is unlikely to heal, or have a non-vital pulp (necrotic pulp) (Wazgar et al., 2019).

Majority of the respondents in this study were both knowledgeable and were willing to perform the appropriate pulp therapy on paediatric patients. This demonstrates how dentists are aware of the need to save primary teeth to maintain the structural integrity of the arch.

Choice of treatment should be individualised for each patient taking into consideration multiple factors such as the vitality of the pulp, portion of the pulp involved (e.g. coronal versus radicular portions), presence or absence of reversible/irreversible pulpitis, presence or absence of necrotic pulp, state of the surrounding alveolar and soft tissues, and the presence or absence of infection, fistulae, abscesses, or underlying cysts. In case scenario 1, while 53.7 percent of general dentists preferred pulp capping, majority of pediatric dentists (46.2%) preferred pulpotomy. The reasons provided by the general dentists for choosing pulp capping are greater than 1mm remaining dentinal thickness, pulp does not look involved and no history of nocturnal pain. Majority of the pediatric dentists diagnosed it as reversible pulpitis and chose pulpotomy as the treatment option based on pain history, radiolucency approximating pulp, and absence of periapical infection.

The success rates of several pulpotomy procedures decreases over time from 90% or more initially (6 –12 months) and declining to 70% or less after 3 years or more. However, formocresol and ferric sulfate pulpotomy exhibit significantly lower long-term success rates for treatment of deep caries compared to IPT. Another consideration in the choice of using IPT or pulpotomy is the early exfoliation of pulpotomized teeth. More than 35% of formocresol pulpotomies exhibit significant earlier exfoliation (>6 months) than non-pulpotomized teeth, whereas IPT-treated teeth exfoliate normally (Coll, 2008).

Results for case scenario 2 showed that 49.3 percent general dentists preferred extraction with a space maintainer, whereas 57.7% of paediatric dentists selected pulpectomy without a stainless-steel crown. The reasons provided by majority of general dentists suggesting extraction followed by space maintainer are eruption status of permanent successor, dental age and bone loss. Majority of the pediatric dentists chose pulpectomy without stainless steel crown over extraction because they think natural tooth is the best space maintainer, root formation of the permanent tooth bud is not more than one-third, more than 1mm bone coverage is present and that stainless steel crown will not be effective but infact might lead to food lodgement because of interdental bone loss.

The best space maintainer that can effectively maintain the integrity of the arch is the primary tooth itself. Pediatric dentists have more insight into space management and would always prefer saving the tooth unless it is absolutely indicated for extraction. Timely, satisfactory and consistent dental care maintains the primary teeth in a healthy state until its normal exfoliation. Dental restorations in the primary dentition, especially the molars involving the proximal caries, should be restored to their full mesio-distal diameter for the prevention of space loss and the maintenance of arch length. Influencing factors considered are dental age of the patient, amount of bone covering the unerupted tooth, timing of emergence of permanent teeth, resorption of primary teeth, periapical and furcal radiolucencies (Wilson et al., 2014). Pediatric dentists would most

often consider all these factors before tailoring the treatment plan.

In case scenario 3, majority of the pediatric dentists (50%) and general dentists (53.7%) chose Pulpectomy (Access opening + drainage) on the same visit followed by administration of systemic antibiotics as the treatment choice. They chose pulpectomy considering the age of the patient and the eruption status of the first permanent molar.

Around 32.8% general dentists and 11.5% pediatric dentists suggested extraction in combination with antibiotics to avoid the spread of infection to the permanent tooth bud because of the presence of furcal and periapical abscess and poor prognosis of pulpectomy.

In case scenario 4, both pediatric dentists (96.2%) and general dentists (86.6%) agreed that pulpectomy is the only treatment option.

The most prevalent method for anesthetizing mandibular primary teeth is the inferior alveolar nerve block injection known for its ability to induce relatively prolonged anesthesia. However, it is important to note that this method can potentially cause damage to soft tissues (Tudeshchoie et al., 2013). In our study, 62.9% of pediatric dentists and 25.4% of general dentists chose this technique for local anesthesia. However, strangely 56.7% and 17.9% general dentists suggested using pulp devitalizing agent and intra-pulpal anaesthesia respectively. None of the pediatric dentists recommended using pulp devitalizing agent but 30.8% of them suggested intra-pulpal anaesthesia.

Majority of the pediatric dentists (60%) and general dentists (64.2%) chose both manual and rotary instrumentation for pulpectomy. This survey findings revealed a reduced inclination toward using only rotary instrument during pulpectomy procedures. 28.4% of the general dentists and 16% of the pediatric dentists suggested using only K files. Ahmed.,2014 proposed that during chemo-mechanical preparation, stainless steel hand files typically not larger than size 30 should be used cautiously to prevent instrument breakage. The usage of flexible files is advised in S shaped and curved canals. Rotary Nickel Titanium (NiTi) files have been shown to significantly decrease the time required for instrumentation of the root canals in primary teeth (Patil et al., 2016).

Regarding working length determination, majority of pediatric dentists (61.5%) used the radiographic method and 50% of the general dentists used pre-operative radiograph to determine a tentative working length. Use of apex locator in working length determination was minimal and most preferred taking radiographs. However, considering the limitations of radiographic interpretation and increased risk of over-instrumentation in cases of unevenly resorbed roots and subsequent overfilling, the use of electronic apex locators is recommended regardless of the stage of root resorption (Acharya, 2018).

To reduce the microbial load in root canals, chemical irrigants such as sodium hypochlorite and chlorhexidine are commonly employed for ensuring minimal bacterial decontamination. The Amercian Academy of Pediatric Dentistry (AAPD) suggests the use 1% sodium hypochlorite solution as an irrigating solution to ensure the reduction in bacterial count (Bargale et al., 2019). Majority general dentists (57.8%) opted for normal saline as irrigation solution whereas 46.2% of pediatric dentists chose a combination of chlorhexidine and saline, and 42.3% used sodium hypochlorite along with saline. Moradi and Haghgoo., 2018 concluded in their study that normal saline can be used as an alternative to nano silver solution and sodium hypochlorite. However, sodium hypochlorite revealed the highest antimicrobial effectiveness against Enterococcus faecalis. In this survey, cotton rolls and suction tips were recommended by 85.1% of all general dentists whereas 53.8% pediatric dentists recommended rubber dams and the remainder used cotton rolls and suction tip. The primary reason for general dentists to refrain from the use of rubber dam could be due to inadequate knowledge and training. Shashirekha et al, 2014 suggested that the time saved by operating in a clean field with good visibility may compensate for the time invested in applying the rubber dam.

Following extensive irrigation, the canals are obturated using a biocompatible resorbable material such as calcium hydroxide, nonreinforced ZOE, and iodoform based pastes and, commercially available obturation pastes. While evaluating the obturating material of choice, an equal

percentage of pediatric dentists (34.6%) chose zinc oxide eugenol and a combination of calcium hydroxide with iodoform whereas most general dentists (40.3%) chose the combination of calcium hydroxide and iodoform as their preferred obturating material.

Since calcium hydroxide and iodoform combination fulfils most of the ideal requirements of an obturating material including its resorption rate, majority of the respondents might have opted for it. However, when utilised in primary teeth presenting with hyperemic pulp, root canal filling materials containing calcium hydroxide may encounter pulpal tissue remnants triggering a cascade of inflammatory root resorption.

Although zinc oxide eugenol has been the preferred material for obturation in primary teeth, recent studies reveal certain drawbacks. These include issues like failure of extruded material to resorb at the periapical region due to hardening, alterations in the path of eruption of the succedaneous teeth, cementum and bone necrosis along with potential enamel defects in permanent successors. Given the disadvantages of zinc oxide eugenol, Endoflas, a more recent material was introduced to balance the drawbacks of one material with the benefits of another. It is a combination of zinc oxide eugenol, calcium hydroxide and iodoform, having a resorption rate similar to that of the tooth (Rajshekar et al., 2018). In our study, 26.9% of the paediatric dentists chose Endoflas while only 6% of the general dentists opted for Endoflas suggesting that most general dentists lack complete knowledge about obturating materials and most of the pediatric dentists have not updated themselves about the recent ones.

A primary tooth that has undergone pulpectomy requires restoration to prevent microleakage and ensures the sealing. The AAPD supports the use of various restorative options like stainless-steel crown (SSC), amalgam, composite and glass ionomer cement (GIC). Stainless steel crowns may be the optimal treatment choice for restoration of endodontically treated primary teeth in terms of durability, longevity, and full-coronal coverage (American Academy of Pediatric Dentistry., 2013). In our study, majority of pediatric dentists (84.6%) chose placement of stainless-steel crown as their preferred final restoration while most general dentists (64.2%) chose glass ionomer cement as the preferred final restoration.

General dentists appear to be less inclined towards the recently introduced techniques, often relying on conventional methods. To ensure effective treatment of primary teeth, they should familiarize themselves with the latest materials used in paediatric dentistry and should recognise when to refer a child to a pediatric dentist. Patil et al. concluded that the general dentists and those of other specialties should regularly perform pulp therapy in primary teeth emphasizing the need to frequently update their knowledge about endodontic procedures in primary teeth (Patil et al., 2016).

Conclusion:

In this study, we can infer that while general dentists keeping up with evolving trends in paediatric dentistry, majority of them still require education regarding the significance of primary teeth and the benefits of preserving them in the arch until the eruption of the permanent teeth. Pediatric dentists on the other hand need to update themselves about the newer materials and possess an understanding of the advantages it holds over the conventional methods to provide effective pulp therapy, reduce the negative outcomes, and improve the prognosis of the tooth allowing it to exfoliate at the right time.

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