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Research Article

Evaluation of Knowledge Among Dentists About Atraumatic Restorative Treatment in Turkey

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Abstract

Dental caries is a multifactorial disease resulting from the interaction of various factors such as diet, oral hygiene, host immunity, and dental structure. Despite advancements in preventive strategies, it remains a prevalent global health issue, affecting billions of individuals worldwide. Atraumatic Restorative Treatment (ART) is a minimally invasive approach that involves the removal of carious tissue using hand instruments and the restoration of cavities with high-viscosity glass ionomer cement. This technique serves as a significant alternative, particularly for individuals with limited access to dental care, young children, and patients with special needs. The aim of this study is to assess the attitudes and behaviors of pediatric dentists and practitioners from other dental specialties toward ART.

Keywords: atraumatic restorative treatment, dental caries, minimally invasive approach

Türkiye'deki Diş Hekimlerinin Atravmatik Restoratif Tedavi Konusundaki Bilgi Düzeylerinin Değerlendirilmesi

Öz

Diş çürüğü, diyet, ağız hijyeni, konak bağışıklığı ve diş yapısı gibi çeşitli faktörlerin etkileşimiyle ortaya çıkan multifaktöriyel bir hastalıktır. Küresel olarak yaygın bir sağlık sorunu olan bu hastalık, gelişmiş önleme stratejilerine rağmen dünya genelinde milyarlarca insanı etkilemeye devam etmektedir. Minimal invaziv bir yaklaşım olan Atravmatik Restoratif Tedavi (ART), el aletleri kullanılarak çürük dokunun uzaklaştırılması ve yüksek viskoziteli cam iyonomer siman ile restorasyon yapılmasını içerir. Özellikle diş tedavisine erişimi kısıtlı bireyler, küçük çocuklar ve özel gereksinimli hastalar için önemli bir alternatif sunar. Bu çalışmanın amacı, pediatrik diş hekimleri ve diğer uzmanlık alanlarındaki diş hekimlerinin ART'ye yönelik tutum ve davranışlarını değerlendirmektir.

Anahtar Kelimeler: atravmatik restoratif tedavi, diş çürüğü, minimal invaziv yaklaşım

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1. Introduction

Dental caries represents a multifactorial condition shaped by the interplay of several critical determinants, including a cariogenic diet, oral hygiene behaviors, host immune responses, dental structural integrity, and the activity of cariogenic microorganisms. Notably, Streptococcus mutans, Streptococcus sobrinus, and Lactobacillus species are recognized as pivotal agents in the pathogenesis of this disease (Loesche, 1986). These bacteria reside within the dental biofilm that they contribute to forming on the surfaces of teeth. Through their metabolic activities, they produce acid by-products, which play a significant role as etiological factors in the development of dental caries (Stephan, 1944). In recent years, substantial progress has been achieved in the prevention of dental caries progression. Nevertheless, dental caries continues to be one of the most widespread chronic conditions globally (Pitts, 2018). Approximately 2 billion people are affected by caries in permanent teeth, while 514 million children experience caries in their primary dentition (World Health Organization, 2022) For his reason, the primary objective in the management of dental caries is to inhibit the development of new lesions and halt the progression of existing carious defects (Foley, 2006).

Recent insights into the mechanisms of dental caries formation and progression have brought about notable shifts in management strategies. A significant limitation of operative treatment is the enlargement of cavity preparations guided by the "extension for prevention" principle. The advent of ultra-high-speed rotary instruments in the 1950s further amplified cavity sizes, ultimately compromising the structural integrity of the tooth (Hunter et al., 1995). In modern dental practice, even in cases of cavitation, the minimally invasive dentistry (MID) approach has become the standard of care, emphasizing the preservation of dental tissue with minimal intervention. A core principle of MID is the minimization of healthy tissue removal, prioritizing the maintenance of structural integrity (Mount, 2005). In MID, the standard approach to treating cavitated carious lesions involves the removal of infected enamel and dentin, the preservation of affected dentin, and the completion of the restoration using an optimal material (J. E. Frencken et al., 2012).

Atraumatic Restorative Treatment (ART), integrating caries prevention with restorative care, exemplifies the principles of MID(Hunt, 1994). ART was first conceptualized by Dr. Frencken in 1991. This technique was developed as a response to the challenges of providing restorative care in populations with limited access to dental services(J. Frencken & Makoni, 1994). In 1994, the World Health Organization (WHO) officially recognized ART as a method characterized by the removal of demineralized carious tissue using hand instruments alone, followed by the placement of a restorative material.(Giacaman et al., 2018). The restorative material selected must be capable of establishing a chemical bond with both enamel and dentin (Saber et al., 2019). In ART, high-viscosity glass ionomer (HVGIC) cements are regarded as the ideal material for cavity restoration(World Health Organization, 2019). Hand instruments are utilized in this technique due to their significant advantages, including enabling treatment accessibility for all populations, preserving tooth structure through minimal trauma and limited cavity preparation, cost-efficiency, ease of sterilization that reduces cross-infection risk, minimal pain obviating the need for local anesthesia, and a high level of patient acceptance(Dr. JoDr. E. van Frencken & Amerongen, 1997).

The ART technique can be applied as an interim treatment for cavitated dentin caries during the initial dental visits of young children, particularly as a preparatory session. It is indicated for children with limited cooperation, those with mental and/or physical disabilities, bedridden children confined to their homes, and children at high risk of caries to prevent the progression of carious lesions(Yogesh Garg et al., 2015; C. J. Holmgren et al., 2013). The application of this technique is contraindicated in cases where the carious lesion has extended to the pulp, there is a documented history of abscess or fistula associated with the affected tooth, the patient’s medical history indicates pain suggestive of pulp infection, the tooth exhibits mobility, or the carious lesion cannot be adequately removed using hand instruments(A. Ablal, 2022; Pilot, 1999).

The objective of this survey study is to assess the attitudes and behaviors of pediatric dentists and practitioners from other dental specialties toward ART, while also aiming to enhance their knowledge on the subject. Enhancing dentists' expertise in ART is anticipated to contribute to improved care for children, individuals with special needs, and patients in underserved areas with limited access to dental treatment.

2. Material and Method

The study obtained ethical approval from the University of Health Sciences Scientific Research Ethical Committee. This was a cross-sectional study conducted among pediatric dentists and dentists from other specialties in Turkey. The study utilized a pretested, web-based questionnaire consisting of 20 items (Table 1.). The questionnaire was designed in two sections: the characteristics of the physicians and the evaluation of attitudes and behaviors related to ART.

***Tablo 1**. Survey questions*

Question	**Options**
Gender:	Female, Male
Age:	20-30, 30-40, 40-50, 50-60, 60+
Workplace:	Private Practice, Private Clinic, Public Sector, Private Hospital, University Hospital, Not Working
Years Since Graduation:	0-9, 10-19, More than 20 years
Title:	Prof. Dr., Assoc. Prof. Dr., Assistant Prof. Dr., Specialist, Dentist, Research Assistant, PhD/Specialty Student
Specialty/PhD Area:	Oral and Maxillofacial Surgery, Oral and Maxillofacial Radiology, Endodontics, Orthodontics, Pediatric Dentistry, Periodontology, Prosthodontics, Restorative Dentistry, No Specialty/PhD
Do you have knowledge about ART?	Yes, No, Unsure
Where did you acquire your knowledge about ART? (You may select more than one option.)	Undergraduate education, PhD education, Conferences, congresses, Online training, Internet, Academic publications, In-service training, Other: ...
Have you ever performed ART?	Yes, No
Do you believe ART is a successful treatment alternative?	Yes, No, No opinion
It is not mandatory to remove all carious dentin in ART:	True, False, No opinion
In ART, carious tissue is removed using ..... (You may select more than one option.)	Sharp excavator, High-speed aerator, Low-speed aerator, Handpiece, No opinion
Anesthesia is not required in ART:	True, False, No opinion
The patient can eat immediately after the procedure.	True, False, No opinion
ART reduces dental anxiety.	True, False, No opinion
ART is a treatment option preferred for ..... teeth: (You may select more than one option.)	Anterior, Posterior, No opinion
ART is a treatment option that can be applied to .....: (You may select more than one option.)	Primary teeth, Permanent teeth, No opinion
In ART, the restoration material used is .....: (You may select more than one option.)	Conventional Glass Ionomer, Composite, Compomer, Temporary filling material, Resin-Modified Glass Ionomer, Amalgam, Stainless Steel Crown, No opinion
ART is a treatment method that facilitates the control of carious infection.	True, False, No opinion

Select the correct statements regarding ART: (You may select more than one option.)	Can be applied in the presence of abscess and fistula, Can be used as an interim treatment for children with high caries risk Requires conservative cavity preparation Is a high-cost treatment method No opinion

The statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics, including frequencies and percentages, were used to summarize the characteristics of the dentists. The Chi-Square Test was conducted to compare responses to statements concerning knowledge and experiences related to ART based on dentists' areas of specialization and years of professional experience. Significance levels were set at 0.05 and 0.01 for all analyses.

3. Findings

3.1. Descriptive Characteristics of Dentists

The questionnaire was completed by a total of 355 dentists working across various provinces in Türkiye. Table2 presents the descriptive characteristics of the dentists who participated in the study.

Tablo 2. *The descriptive characteristics of the dentists who participated in the study characteristic*

Characteristic	Category	n	%
Gender	Male	79	22.3
	Female	276	77.7
Age	20-30 years	192	54.1
	30-40 years	46	13.0
	40-50 years	34	9.6
	50-60 years	83	23.4
Years of Service	0-9 years	224	63.1
	10-19 years	29	8.2
	20 years or more	102	28.7
Title	Dentist (Dt.)	126	35.5
	Doctorate/Residency Student	88	24.8
	Specialist	29	8.2
	Research Assistant	55	15.5
	Assistant Professor	22	6.2
	Associate Professor	5	1.4
	Professor	30	8.5
Specialization	Pediatric Dentistry	137	38.6
	Other Specialties	218	61.4
Institution	Not Employed	20	5.6
	Public Sector	194	54.6
	Private Sector	141	39.7

Women constituted 77.7% of the dentists, while men accounted for 22.3%. In terms of age distribution, 54.1% were in the 20-30 age group, 13% were aged 30-40, 9.6% were aged 40-50, and 23.4% were aged 50-60. Regarding years of professional experience, 63.1% of the dentists had 0-9 years of experience, 8.2% had 10-19 years, and 28.7% had 20 or more years of experience.

In terms of professional titles, 35.5% of the dentists were general practitioners 24.8% were doctorate or residency students, 8.2% were specialists, 15.5% were research assistants, 6.2% held the title of Assistant Professor,1.4% were Associate Professors and 8.5% were Professors.

With respect to specialization, 38.6% of the dentists worked in pediatric dentistry, while 61.4% practiced in other specialties. Regarding the distribution of employment institutions, 5.6% reported being unemployed, 54.6% worked in public institutions, and 39.7% were employed in the private sector.

3.2. Comparison of Dentists' Descriptive Characteristics Based on Areas of Specialization

Table 3 presents a comparison of the descriptive characteristics of dentists categorized by their areas of specialization.

Tablo 3. *Descriptive characteristics of dentists categorized by their areas of specialization*

Variables Related to ART	**Pediatric Dentistry (n:137)**	**Other Specialties (n:218)**	**p**
Gender			
Male	7 (5.1%)	72 (33.0%)	0.000**
Female	130 (94.9%)	146 (67.0%)	
Age			
20-30 years	82 (59.9%)	110 (50.5%)	0.000**
30-40 years	33 (24.1%)	13 (6.0%)	
40-50 years	13 (9.5%)	21 (9.6%)	
50-60 years	9 (6.6%)	74 (33.9%)	
Years of Service			
0-9 years	106 (77.4%)	118 (54.1%)	0.000**
10-19 years	16 (11.7%)	13 (6.0%)	
20 years or more	15 (10.9%)	87 (39.9%)	
Title			
Dentist (Dt.)	3 (2.2%)	123 (56.4%)	0.000**
Doctorate/Residency Student	44 (32.1%)	44 (20.2%)	
Specialist	12 (8.8%)	17 (7.8%)	
Research Assistant	49 (35.8%)	6 (2.8%)	
Assistant Professor	10 (7.3%)	12 (5.5%)	
Associate Professor	4 (2.9%)	1 (0.5%)	
Professor	15 (10.9%)	15 (6.9%)	
Institution			
Not Employed	4 (2.9%)	16 (7.3%)	0.000**
Public	101 (73.7%)	93 (42.7%)	
Private	32 (23.4%)	109 (50.0%)	

*p<0.05; **p<0.01, Categorical data: Chi-Square Test.

Significant differences were observed in gender, age, years of service, professional title, and workplace distribution among dentists based on their areas of specialization (p<0.05). Regarding gender distribution, 94.9% of pediatric dentistry specialists were women, compared to 67.0% of dentists in other specialties (p<0.01). The proportion of male participants was significantly higher in other specialties (33.0%) compared to pediatric dentistry specialists (5.1%).

In terms of age distribution, 59.9% of pediatric dentistry specialists were in the 20-30 age group, while this proportion was 50.5% in other specialties. However, in the 50-60 age group, the proportion of dentists in other specialties (33.9%) was considerably higher compared to pediatric dentistry specialists (6.6%).

With respect to years of service, the majority of pediatric dentistry specialists (77.4%) had 0-9 years of experience. Conversely, in other specialties, the proportion of dentists with 20 or more years of experience was significantly higher at 39.9%.

Regarding professional titles, research assistants accounted for 35.8% of pediatric dentistry specialists, while in other specialties, the highest proportion (56.4%) held the title of general dentist (Dentist/Dt.). The proportion of doctorate/residency students was 32.1% among pediatric dentistry specialists, compared to 20.2% in other specialties.

In terms of workplace distribution, the majority of pediatric dentistry specialists (73.7%) were employed in public institutions, whereas 50.0% of dentists in other specialties worked in the private sector. The proportion of unemployed individuals was 2.9% among pediatric dentistry specialists and 7.3% in other specialties.

3. Comparison of Knowledge and Experience Regarding ART Based on Areas of Specialization

Table 4 compares dentists' knowledge and experience regarding ART across different areas of specialization. A significantly higher proportion of pediatric dentistry specialists (97.8%) reported having knowledge about ART compared to dentists in other specialties (74.8%). The proportion of pediatric dentistry specialists who lacked knowledge (0%) or were uncertain (2.2%) was significantly lower than that of dentists in other specialties (5.5% and 19.7%, respectively) ($p<0.05$).

Pediatric dentistry specialists primarily acquired their knowledge through undergraduate education (62.0%) and academic publications (18.2%), whereas dentists in other specialties more frequently cited sources such as the internet (14.7%) and conferences/congresses/online training (13.3%) ($p<0.05$).

Regarding prior experience, 91.2% of pediatric dentistry specialists reported having performed ART, compared to 46.3% of dentists in other specialties. The proportion of those who had not performed ART was significantly lower among pediatric dentistry specialists (8.8%) than in other specialties (53.7%) ($p<0.05$).

A majority of pediatric dentistry specialists (89.8%) considered ART to be a successful treatment alternative, whereas this view was held by 63.3% of dentists in other specialties. The proportion of pediatric dentistry specialists who were uncertain (2.9%) or held a negative opinion about ART (7.3%) was significantly lower than that of dentists in other specialties ($p<0.05$).

Tablo 4. *Comparison of knowledge and experience regarding atraumatic restorative treatment based on areas of specialization*

Variables Related to ART	Pediatric Dentistry (n:137)	Other Specialties (n:218)	p
Knowledge of ART			
Yes	134 (97.8%)	163 (74.8%)	0.000**
No	0 (0.0%)	12 (5.5%)	
Uncertain	3 (2.2%)	43 (19.7%)	
Sources of ART Knowledge			
Undergraduate Education	85 (62.0%)	128 (58.7%)	0.000**
Postgraduate Education	24 (17.5%)	6 (2.8%)	
Conferences/Congresses/Online Training	3 (2.2%)	29 (13.3%)	
Internet	0 (0.0%)	32 (14.7%)	
Academic Publications	25 (18.2%)	19 (8.7%)	
In-Service Training	0 (0.0%)	4 (1.8%)	
Previous ART Experience			
Yes	125 (91.2%)	101 (46.3%)	0.000**
No	12 (8.8%)	117 (53.7%)	
Belief in ART as a Successful Treatment Alternative			
Yes	123 (89.8%)	138 (63.3%)	0.000**
No	10 (7.3%)	29 (13.3%)	
Uncertain	4 (2.9%)	51 (23.4%)	
Removal of All Carious Dentin is Not Necessary in ART			
Correct	126 (92.0%)	155 (71.1%)	0.000**
Uncertain	2 (1.5%)	14 (6.4%)	
Incorrect	9 (6.6%)	49 (22.5%)	
Method of Carious Tissue Removal in ART			
Sharp Excavator	133 (97.1%)	199 (91.3%)	0.073
Low-Speed Handpiece	3 (2.2%)	4 (1.8%)	
Rotary Instrument	0 (0.0%)	5 (2.3%)	
No Removal	1 (0.7%)	2 (0.9%)	
Uncertain	0 (0.0%)	8 (3.7%)	
No Need for Anesthesia in ART			
Correct	129 (94.2%)	147 (67.4%)	0.000**
Uncertain	5 (3.6%)	25 (11.5%)	
Incorrect	3 (2.2%)	46 (21.1%)	

ART Reduces Dental Anxiety			
Correct	137 (100.0%)	193 (88.5%)	0.000**
Uncertain	0 (0.0%)	17 (7.8%)	
Incorrect	0 (0.0%)	8 (3.7%)	
Preference of Teeth for ART			
Anterior	1 (0.7%)	11 (5.0%)	0.000**
Posterior	85 (62.0%)	83 (38.1%)	
Both Anterior/Posterior	50 (36.5%)	95 (43.6%)	
Uncertain	1 (0.7%)	29 (13.3%)	
Applicability of ART			
Primary Teeth	27 (19.7%)	50 (22.9%)	0.000**
Permanent Teeth	1 (0.7%)	10 (4.6%)	
Both Primary and Permanent Teeth	109 (79.6%)	137 (62.8%)	
Uncertain	0 (0.0%)	21 (9.6%)	
ART Facilitates Control of Caries Infection			
Correct	132 (96.4%)	176 (80.7%)	0.000**
Incorrect	5 (3.6%)	13 (6.0%)	
Uncertain	0 (0.0%)	29 (13.3%)	

*p<0.05; **p<0.01, Categorical data: Chi-Square Test.

A total of 92.0% of pediatric dentistry specialists agreed that the statement *"It is not mandatory to remove all carious dentin in ART"* is correct, compared to 71.1% of dentists in other specialties. The proportion of those who disagreed or were uncertain about this statement was significantly higher among dentists in other specialties (p<0.05).

A total of 97.1% of pediatric dentistry specialists preferred the use of a sharp excavator for ART, compared to 91.3% of dentists in other specialties. While no significant differences were observed regarding other methods (low-speed handpiece, rotary instrument), it is noteworthy that none of the pediatric dentistry specialists selected the response *"uncertain"* (p>0.05).

Regarding the necessity of anesthesia in ART, 94.2% of pediatric dentistry specialists considered the statement *"Anesthesia is not required in ART"* to be correct, compared to 67.4% of dentists in other specialties. The proportion of those who believed this statement to be incorrect was significantly higher in other specialties (p<0.05).

Regarding the statement *"ART reduces dental anxiety,"* all pediatric dentistry specialists (100%) believed this statement to be correct, compared to 88.5% of dentists in other specialties. Those who disagreed or were uncertain about this statement were exclusively found in other specialties (p<0.05).

As for the preferred use of ART, 62.0% of pediatric dentistry specialists reported that ART is primarily used for posterior teeth, compared to 38.1% of dentists in other specialties. The use of ART for anterior teeth was more commonly reported by dentists in other specialties (p<0.05).

When considering the statement *"ART can be applied to both primary and permanent teeth,"* 79.6% of pediatric dentistry specialists agreed, compared to 62.8% of dentists in other specialties. The proportion of dentists with no opinion was significantly higher in other specialties (p<0.05).

For the statement *"ART facilitates control of caries infection,"* 96.4% of pediatric dentistry specialists agreed, compared to 80.7% of dentists in other specialties. Those who disagreed or were uncertain were more prevalent in other specialties (p<0.05).

Continuation of Tablo 4. *Comparison of knowledge and experience regarding atraumatic restorative treatment based on areas of specialization*

Variables Related to ART	Pediatric Dentistry (n:137)	Other Specialties (n:218)	p
Correct Statements About ART			
Applicable in the presence of abscess and fistula	0 (0.0%)	8 (3.7%)	0.000**
Can be used as interim treatment in high caries risk children	94 (68.6%)	118 (54.1%)	
Requires conservative cavity preparation	4 (2.9%)	22 (10.1%)	
Interim treatment for high caries risk children and requires conservative cavity preparation	39 (28.5%)	50 (22.9%)	
Interim treatment for high caries risk children and is a costly method	0 (0.0%)	2 (0.9%)	
Uncertain	0 (0.0%)	18 (8.3%)	
Materials Used in ART			
Conventional/ High Viscosity Glass Ionomer	137 (71.7%)	166 (48.0%)	-
Composite	0 (0.0%)	16 (4.6%)	

Compomer	2 (1.0%)	31 (9.0%)	
Temporary Filling Material	2 (1.0%)	18 (5.2%)	
Resin-Modified Glass Ionomer	20 (10.5%)	64 (18.5%)	
Amalgam	4 (2.1%)	21 (6.1%)	
Stainless Steel Crown	26 (13.6%)	18 (5.2%)	
Uncertain	0 (0.0%)	12 (3.5%)	
Total	191 (100.0%)	346 (100.0%)	

*p<0.05; **p<0.01, Categorical data: Chi-Square Test.

Correct statements and restoration material preferences regarding ART among dentists based on their areas of specialization (Table 3). Among pediatric dentistry specialists, the statement *"It can be used as an interim treatment in high caries risk children"* was considered correct by 68.6%, compared to 54.1% in other specialties. The statement *"It can be applied in the presence of abscess and fistula"* was accepted as correct only by dentists in other specialties (3.7%). Furthermore, no pediatric dentistry specialists selected the response *"uncertain,"* whereas this response was observed in 8.3% of dentists from other specialties.

Regarding restoration material preferences, *conventional glass ionomer* cement (GIC) was the most frequently chosen material among pediatric dentistry specialists (71.7%), compared to 48.0% in other specialties. The use of *stainless steel crowns* was more common among pediatric dentistry specialists (13.6%) than in other specialties (5.2%). These findings suggest that pediatric dentistry specialists possess greater knowledge about ART and exhibit more distinct preferences for restoration materials.

4.Discussion

When dental caries progresses and remains untreated, the lesions can cause pain and infection, adversely affecting the child's overall quality of life(Kassebaum et al., 2015). Dental fear and anxiety are among the primary factors that contribute to the avoidance of dental treatments. ART is a caries removal technique that utilises hand instruments exclusively, without the requirement for local anaesthesia. Conversely, traditional methods for caries removal involve the use of rotary instruments under local anaesthesia. This conventional approach is both costly and impractical for application in all patients. The absence of noise, vibration, and pain during ART procedures significantly enhances treatment acceptance, particularly in paediatric patients(Leal et al., 2009) . Despite its advantages, the ART technique may be perceived as time-consuming and physically demanding for practitioners, particularly as it cannot be applied to teeth without cavitation. Initially developed to improve oral health in underserved communities, the ART approach has since evolved into a globally recognised option for caries management(Holmgren et al., 2013b) .

In our survey, 97.8% of pediatric dentistry specialists reported having knowledge about ART, compared to 74.8% in other specialties. Among pediatric dentistry specialists, 91.2% reported having previously performed ART, compared to 46.3% of dentists in other specialties. In the study examining the willingness of U.S. pediatric dentists to use ART with their patients, the results demonstrated that pediatric dentists are more likely to utilise ART with young and uncooperative children(Kateeb et al., 2014).

In our survey, 62% of pediatric dentists and 58.7% of dentists from other specialties reported acquiring their knowledge about ART during their university education. It was also observed that dentists from other specialties more frequently accessed information about ART through sources such as the internet (14.7%) and conferences/congresses/online training (13.3%). A survey conducted among program directors in the United States found that 66% reported providing clinical training on ART; however, only 14% indicated that they offered this training frequently(Kateeb et al., 2013). Based on the information obtained from the participants, we suggest that this treatment option could be more frequently incorporated into the curriculum.

In our survey, 89.8% of pediatric dentistry specialists considered ART to be a successful treatment alternative, whereas this proportion was 63.3% among dentists from other specialties. In a study conducted by Prokshi et al. on 100 children aged 3 to 8 years, the ART method was applied to primary molars with single-surface carious lesions, using GIC for restoration. Follow-ups at 6 and 12 months reported success rates of 98% and 97%, respectively(Prokshi et al., 2022). Furthermore, another study revealed that 92% of children expressed a preference for receiving the same treatment method after undergoing ART. Additionally, the success rates for single-surface restorations were reported as 99% at the one-year follow-up and 92% at the three-year follow-up(C. J. Holmgren et al., 2000).

A total of 92.0% of pediatric dentistry specialists and 71.1% of dentists from other specialties indicated that the complete removal of carious dentin is not necessary. Furthermore, 97.1% of pediatric dentistry specialists preferred the use of a sharp excavator as a method for caries removal, whereas this preference was observed in 91.3% of dentists from other specialties. ART approach is based on the principle of removing infected, demineralised dentin while preserving dentin with remineralisation potential, thereby protecting healthy tooth structure and preventing unnecessary material loss(Schriks & Van Amerongen, 2003). Caries is removed exclusively with hand instruments and without the need for local anesthesia. The use of hand instruments during ART procedures eliminates noise, vibration, and pain, thereby facilitating treatment acceptance among pediatric patients (Leal et al., 2009). Furthermore, the absence of the need for anesthesia provides additional comfort for pediatric patients. In our survey, 94.2% of pediatric dentist stated that anesthesia is not required for ART, whereas this percentage decreased to 67.4% among dentists from other specialties. A study conducted with 200 children aged 6 to 8 years compared ART to traditional caries removal methods, assessing patient discomfort

through the Venham Scale. The findings revealed that the majority of patients in the ART group reported a sense of comfort during the procedure, whereas the majority of those in the traditional method group reported experiencing discomfort(Goud et al., 2012).

The survey results indicate that while pediatric dentistry specialists demonstrate a higher level of knowledge in selecting materials for treatment, there is no complete consensus regarding material choice. Regarding restoration material preferences, conventional GIC/ HVGIC was selected by 71.7% of paediatric dentistry specialists, in contrast to 48.0% among dentists from other specialties. Initially, due to the application of the ART technique in field settings, conventional GIC was regarded as the ideal material, given its fluoride release properties. Subsequently, more durable, harder, and easily condensable high-viscosity formulations were developed and have since become preferred in treatment(Kanik et al., n.d.). According to the findings of a meta-analysis, the average annual failure rates for single-surface ART restorations using HVGIC were reported as 5% in the first three years and 4% in the first five years(de Amorim et al., 2012) .Proper indication is of critical importance when performing ART. It was observed that all pediatric dentists unanimously agreed that the presence of an abscess or fistula contraindicates the treatment. However, 3.7% of dentists from other specialties were found to consider ART applicable even in the presence of an abscess or fistula. ART is a cost-effective treatment method.

In conclusion, pediatric dentistry specialists have been observed to possess a higher level of knowledge and expertise in the application of ART compared to general dentists. Fear and anxiety related to dental care remain among the primary factors leading to the avoidance of dental treatments. In cases where a child experiences high levels of anxiety and traditional methods cannot be effectively employed, having knowledge about ART is of critical clinical importance. Viewing ART solely as a low-cost treatment option intended for underserved areas is a misguided perspective. In clinical practice, applying ART with proper indications and techniques will be to the benefit of the child.

5.References

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