



Knowledge and awareness about aesthetic crowns in children among dental Undergraduates, Postgraduates and General dental practitioners

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Abstract :

Aim: To assess the knowledge and awareness about aesthetic crowns in children among dental undergraduates, postgraduates and general dental practitioners.

Methods: A cross sectional study was conducted on 400 participants who were divided into two groups of 200 each, Group 1- Dental Students (Undergraduates); Group 2- Clinicians (Postgraduates and General Practitioners treating children other than Pediatric Dentists). A questionnaire containing 19 questions regarding the procedures done on the deciduous teeth, different type of crowns available for primary teeth, aesthetic crowns and the procedure for their placement were asked using the computer-generated questionnaire (Google form) which was submitted online. The collected data was subjected to statistical analysis.

Result: The study comprised of 51.8% undergraduates, 31.6% postgraduates and 16.6% general practitioners (Table 1). Full coverage crowns are necessary after a pulp therapy for primary teeth was a finding among 83.1% of the Group1 participants and 88.1 % of the Group 2 participants. Tooth- coloured crowns to their pediatric patients was recommended by 87.8% of the Group 1 participants and 79.4% of the Group 2 participants (Table 2).

Conclusion: *The study concluded that most of the participants had a fair knowledge about aesthetic crowns used in children.*

Keywords -*Aesthetic crowns, General Dental Practitioners, Postgraduates, Undergraduates, Zirconia Crowns,*

I. INTRODUCTION

Primary teeth are important in the life time of an individual. Primary teeth are the best space maintainers for permanent teeth ¹. A healthy oral cavity is a primary requisite for an aesthetic look. Despite the fact that dental caries is highly preventable, it is the common disease of childhood. Dental caries is the most common problem in children of age group 8-11 years, affecting 60% of 5-17 years olds worldwide².

Dental caries leads to destruction of tooth structure. Depending on the level of involvement of tooth, the treatment strategies differ. Parents usually neglect dental caries in children and report to the dental practitioner only when it is too late or when the child develops pain. Most of these teeth would have lost the sound tooth structure and is non restorable with simple restoration, requiring a full coverage restoration in the form of crowns or Hall's technique. According to Morgano et al., the strength of endodontically treated teeth parallels to the remaining dentin. Since the dentinal strength is lowered in endodontically treated primary teeth, it is important to use full coverage restorations in order to have better long-term prognosis.³ Root-filled teeth should always be restored properly as their clinical success depends on the final restorations rather than the endodontic treatment.⁴

The oldest type of crowns are the Stainless- steel crowns introduced by Humphrey in the year 1950 ⁵. They are used for the restoration of the posterior teeth whereas Strip crowns are used to restore the anterior teeth. Though these are the most commonly used full coverage crowns, there are few limitations, primarily being that Stainless- steel crowns are not aesthetic.

In present day, aesthetics is given a lot of importance as it boosts one's confidence. Aesthetic rehabilitation in children plays a role in aesthetics, phonetics and elevates the self - esteem of the child ⁶. There are various options aesthetic crowns that are available in the commercial market for children. Some of them include polycarbonate crowns, pre veneered stainless steel crowns⁶ to name a few. Recently zirconia crowns are also available for pediatric teeth.

Often it is noted that general practitioners and dental graduates fail to recognize the importance of primary teeth. Most of them lack the knowledge of full coverage crowns available for deciduous teeth including the aesthetic ones as well.

Hence, a questionnaire study was designed which intended to evaluate the knowledge and awareness about aesthetic crowns for children among General practitioners, postgraduates of other specialties other than pediatric dentistry.

II. Materials and Methodology

A cross sectional study was conducted on general practitioners, postgraduates mastering in specialty other than Pediatric Dentistry and dental graduates. A total of 400 study participants were included in the study and categorized into two groups depending on inclusion and exclusion criteria.

Inclusion criteria:

1. Undergraduate students who have completed BDS
2. Postgraduate students pursuing any dental specialization other than Pediatric and Preventive dentistry.
3. General practitioners with more than 2 years of experience of treating children (Except Pediatric dentist)
4. Subjects with the knowledge of usage of smart phones and access to internet.

Exclusion Criteria:

1. Non-dental graduates
2. Dental postgraduates pursuing specialization in Pediatric and Preventive dentistry
3. General practitioner with less than 2 years of experience of treating children (Except Pediatric Dentist)

The study was conducted by dividing the participants into two groups of 200 each.

- Group 1- Dental Students (Undergraduates)
- Group 2- Clinicians (Postgraduates and General Practitioners treating children other than Pediatric Dentists)

The questionnaire began with the basic demographic details. Following this, 19 questions regarding the procedures done on the deciduous teeth, different type of crowns available for primary teeth, aesthetic crowns and the procedure for their placement were asked using the computer- generated questionnaire (Google form) which were submitted online. The completely filled questionnaire were subjected to statistical analysis and results were drawn. Statistical Package for Social Sciences [SPSS] for Windows Version 22.0 Released 2013. Armonk, NY: IBM Corp., were used to perform statistical analyses.

III. Results

The study comprised of 51.8% undergraduates, 31.6% postgraduates and 16.6% general practitioners (Table 1). The mean age of the participants was 26 years and the range was between 22- 45 years. Out of this, 94% of the participants had treated paediatric patients. Most of the dentists had performed restorations (40.4%) and extractions (47.8%) in paediatric patient. Only 1.6% of them had performed pulpectomies. A decayed primary tooth can be saved was agreed by 91.9% of the participants and 87.95 % of participants believed that primary teeth can be treated by restoration, extraction, pulpectomy and pulpotomy.

Full coverage crowns are necessary after a pulp therapy for primary teeth was a finding among 83.1% of the Group1 participants and 88.1 % of the Group 2 participants. (Table 2)

In Group 1, 23.2% of the participants agreed that strip crowns can be used for the fabrication of full coverage restorations, followed by 9.9% on stainless steel crowns, 3.3% on zirconia crowns. All the above materials were acceptable to 55.9%, whereas, 7.9% of the Group 1 participants were not aware of the materials used for the fabrication of full coverage crowns. In Group 2, 17.8% of the participants agreed on strip crowns and stainless-steel crowns, 50% of the participants agreed that along with the above two, zirconia can also be used as a material for full coverage restorations. The availability of a tooth- coloured crowns for deciduous teeth was agreed by 55.85% of the Group 1 participants and 79.65% of Group 2 participants (Table 2)

Upon asking about the different aesthetic crowns available for primary teeth 37.5% of the Group1 participants responded with zirconia crowns and 30.6% of the Group 2 participants responded with polycarbonate crowns. According to 89% of Group 1 participants and 98.1% of the Group 2 participants finish lines were different for different types of crowns. The different finish lines and their respective responses are discussed in Table 2.

Tooth- coloured crowns to their paediatric patients was recommended by 87.8% of the Group 1 participants and 79.4% of the Group 2 participants. Out of which, majority of the participants recommended tooth- coloured crowns because of aesthetics followed by parent satisfaction which was then followed by patient satisfaction and lastly the doctor's satisfaction. Few of the participants did not recommend Tooth- Coloured crowns as they required extensive tooth preparation and are not cost effective. (Table 2)

According to, 23.8% of the Group 1 Participants and 43.8% of Group 2 participants tooth- coloured crowns were not suitable for paediatric patients. (Table 2).

Most of the participants believed 6 months follow-up was necessary for the review of the crown, followed by 3 months, 1 month and one year. Very few participants believed no follow up was required for the review. (Table 2)

IV. Discussion

Full coverage restoration is necessary after a pulp therapy, for both primary and permanent teeth. The knowledge of the operating dentist about the procedure and the tooth in concern is very important. Many believe that paediatric dentistry is a miniaturization of the regular adult dentistry but, this is not true in many ways. The anatomy of the primary teeth is very different compared to the permanent one and a thorough knowledge of it can be beneficial for the dentist and the patient.

In the present study, majority of the participants of both the groups agreed that there are several modalities of treatment for primary teeth, including restorations, extractions, pulpectomy and pulpotomy. According to a study done by Aman Moda et al., 40% of the general dentists believed that extraction is the best treatment modality for primary necrotic teeth⁷. Hussain et al., also evaluated the same in their study⁸. In the present study, the most common treatment done by an undergraduate on primary teeth was extraction which was in accordance to a study conducted by Rodd et al., where 87- 99% of the undergraduates had experience of extraction⁹.

In the present study, 83.1% of the undergraduates and 88.1% of the practitioners recommended full coverage restoration following pulp therapy of the primary teeth. In a study conducted by Aman et al., 33% of the general practitioners believed that full coverage restoration is necessary after a pulp therapy of primary teeth out of which 13% knew about stainless steel crowns for primary teeth⁷. In the present study, 81.6% of the participants knew about tooth- coloured crowns other than Stainless steel crowns.

In the present study, the participants suggested Polycarbonate crowns, zirconia crowns and hybrid resin polymer crowns as aesthetic replacement for stainless- steel crowns which was much lesser than the study conducted by Vatsala et.al, 81% of the dentists used zirconia crowns as an alternative to the standard stainless- steel crowns¹⁰.

The commonly used full coverage restoration for anterior teeth are the strip crowns, pedo pearls, pedo jacket, polycarbonate and veneered stainless steel crown¹¹. In the present study, 47.1% of the Group 1 participants and 39.45 of the Group 2 participants suggested the above restorative alternatives for anterior teeth unlike the study conducted by Shahawy et al where 80% of their study participants reported aesthetic full coverage restoration, for anterior teeth, including strip crowns or zirconia which was used and the posterior teeth were restored mostly with zirconia¹².

Majority of the participants agreed that the finish line for the tooth- coloured crowns are different when compared to stainless- steel crown but most of them were unaware of what type of finish line has to be used. In the study conducted by Vatsala et.al, 67% of the participants recommended chamfer finish line for zirconia crowns of deciduous teeth¹⁰.

Most of the participants recommended tooth- coloured crowns because of their aesthetics, which in accordance to a study conducted by Vatsala et.al, where 81.5% of the participants recommended zirconia crowns for aesthetic enhancement.

The main reason of not recommending a tooth- coloured crown was the cost, extensive tooth preparation and lack of clinical knowledge of the dentists.

In the present study, most of the undergraduates and the general practitioners recommended aesthetic crowns. This is because of the revolutionization in the field of paediatric dentistry, improved knowledge of the dentists and the undergraduates because of the curriculum, ease of accessibility to information through internet, social media and other cyberspaces. This can also be attributed to shift of the patients to a more aesthetic requirement.

More studies with inclusion of greater sample number and a larger geographic area can be conducted to assess the knowledge of undergraduates about aesthetic crowns in paediatric dentistry.

V. Conclusion:

Most of the participants of the study including the undergraduates had a fair knowledge about aesthetic crowns used in paediatric dentistry, this is because of the age and experience of the participants, the present curriculum of the undergraduates and also patients shifting their preference to more aesthetic options rather than only the relief of pain.

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Table 1:

Distribution of age group among study participants			
Variable	Category	n	%
Age	21-30 yrs.	298	89.8%
	31-40 yrs.	16	4.8%
	> 40 yrs.	18	5.4%
		Mean	SD

	Mean	25.93	5.13
	Range	22 - 45	

Table 2:

Comparison of participants' responses for the study questionnaire based on the Professional Status using Chi Square Test						
Questions	Responses	UG Students		Graduate & above		p-value
		n	%	n	%	
Have you treated pediatric patients?	Yes	158	91.9%	154	96.3%	0.09
	No	14	8.1%	6	3.8%	
If yes, what all procedures have you done on a paediatric patient?	Restoration	75	47.5%	51	33.1%	<0.001*
	Extraction	83	52.5%	66	42.9%	
	Pulpectomy	0	0.0%	5	3.2%	
	RCT	0	0.0%	5	3.2%	
	Splinting	0	0.0%	3	1.9%	
	All of the above	0	0.0%	24	15.6%	
What all treatments can be done on a primary teeth?	Restoration	15	9.5%	0	0.0%	<0.001*
	Extraction	8	5.1%	5	3.4%	
	Pulpectomy	3	1.9%	0	0.0%	
	Pulpotomy	3	1.9%	0	0.0%	
	Splinting	0	0.0%	3	2.0%	
	All of the above	129	81.6%	140	94.6%	
Can decayed/ grossly decayed primary teeth be treated?	Yes	156	90.7%	149	93.1%	0.42
	No	16	9.3%	11	6.9%	
If yes, then what all treatments can be done?	Extraction	23	13.4%	12	7.5%	<0.001*
	Pulp Therapy	40	23.3%	13	8.1%	
	Both	109	63.4%	135	84.4%	
Are full coverage crowns recommended for primary teeth?	Yes	143	83.1%	141	88.1%	0.20
	No	29	16.9%	19	11.9%	
If yes, what are the different materials used?	Strip Crowns	35	23.2%	26	17.8%	0.06
	Stainless Steel Crowns	15	9.9%	26	17.8%	
	Polycarbonate Crowns	0	0.0%	3	2.1%	
	Zirconia Crowns	5	3.3%	0	0.0%	

Comparison of participants' responses for the study questionnaire based on the Professional Status using Chi Square Test						
Questions	Responses	UG Students		Graduate & above		p-value
		n	%	n	%	
	All of the above	84	55.6%	73	50.0%	
	I'm not sure	12	7.9%	18	12.3%	
Are you aware of any other crowns used in primary teeth other than the Stainless- steel crown?	Yes	147	85.5%	124	77.5%	0.04*
	No	25	14.5%	36	22.5%	
If yes, what are the other crowns available beside Stainless steel crowns?	Polycarbonate Crowns	29	20.4%	11	8.9%	0.07
	Zirconia Crowns	16	11.3%	11	8.9%	
	Hybrid resin polymer crowns	16	11.3%	16	12.9%	
	All of the above	65	45.8%	73	58.9%	
	I'm not sure	16	11.3%	13	10.5%	
Are the crowns other than Stainless steel crowns aesthetic?	Yes	136	79.1%	141	88.1%	0.03*
	No	36	20.9%	19	11.9%	
Are you aware of tooth-coloured crowns available for primary teeth?	Yes	96	55.8%	121	75.6%	<0.001*
	No	76	44.2%	39	24.4%	
If yes, can you name any of the crowns?	Polycarbonate Crowns	15	15.6%	37	30.6%	<0.001*
	Porcelain Jacket Crowns	11	11.5%	16	13.2%	
	Hybrid Resin Polymer Crowns	8	8.3%	13	10.7%	
	Strip Crowns	18	18.8%	29	24.0%	
	Zirconia Crowns	36	37.5%	13	10.7%	
	Preformed Crowns	8	8.3%	0	0.0%	
	Shell Crowns	0	0.0%	13	10.7%	
	Others	0	0.0%	0	0.0%	
What are the different crowns available for anterior teeth?	Strip Crowns	40	23.3%	13	8.1%	<0.001*
	Polycarbonate Crowns	5	2.9%	13	8.1%	
	Pre-veneered stainless-steel crowns	0	0.0%	8	5.0%	
	Zirconia crowns	10	5.8%	20	12.5%	

Comparison of participants' responses for the study questionnaire based on the Professional Status using Chi Square Test						
Questions	Responses	UG Students		Graduate & above		p-value
		n	%	n	%	
	Hybrid resin polymer crowns	5	2.9%	0	0.0%	
	All of the above	81	47.1%	63	39.4%	
	I'm not sure	31	18.0%	43	26.9%	
Are finish lines different for different crowns?	Yes	153	89.0%	157	98.1%	0.001*
	No	19	11.0%	3	1.9%	
What type of finish lines are given for a tooth- coloured crowns?	Shoulder finish margin	27	17.6%	46	29.3%	0.04*
	Chamfer finish margin	46	30.1%	42	26.8%	
	Knife edge finish margin	10	6.5%	15	9.6%	
	I'm not sure	70	45.8%	54	34.4%	
Would you recommend Aesthetic crowns in paediatric patient?	Yes	151	87.8%	127	79.4%	0.04*
	No	21	12.2%	33	20.6%	
If Yes, Why?	Aesthetic	114	66.3%	109	68.1%	0.72
	Patient Satisfaction	56	32.6%	48	30.0%	0.62
	Parent Satisfaction	64	37.2%	44	27.5%	0.04*
	Doctor's Satisfaction	26	15.1%	19	11.9%	0.39
If no, why?	Cost	6	28.6%	10	30.3%	0.28
	Parents not willing	3	14.3%	1	3.0%	
	Extensive tooth preparation	7	33.3%	8	24.2%	
	Not a suitable treatment for paediatric patient	5	23.8%	14	42.4%	
At what interval do you recall a patient with aesthetic crown?	1 Month	34	19.8%	25	15.6%	0.04*
	3 Months	59	34.3%	72	45.0%	
	6 Months	63	36.6%	39	24.4%	
	1 Year	8	4.7%	10	6.3%	
	Follow not required	8	4.7%	14	8.8%	