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ACCEPTANCE OF COLORED COMPOMER AND CONVENTIONAL COMPOSITE RESTORATIONS AMONG CHILDREN AND PARENTS: A SPLIT-MOUTH CLINICAL STUDY

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Abstract

Introduction: Restoring primary teeth is crucial for a child's overall health, psychosocial development, and the appropriate formation of permanent dentition. Colored compomer considered one of the restoration introduced for restoring primary teeth as it has many advantages like fluoride release and superior bonding to tooth Structures, also Children are frequently encouraged to select colored restorative materials and impressed by the novel materials in their oral cavity. As a result, they are keen on improving their overall oral hygiene and developing a positive attitude towards treatment.

Aim of the study: to evaluate the acceptance of colored compomer and conventional composite restorations among children and their parents.

Materials and Methods: A split-mouth, clinical study was conducted on 73 patients with Class I and II caries at the department of pedodontics and oral health Al Azhar university faculty of dental medicine – boys- Cairo, Egypt. 73 Healthy children aged between 5 and 10 years, who were visiting the outpatient clinic, were selected, selection of the restoration side and restoration order was done using cion toss, for colored restoration it considered group I and for conventional composite it considered group II. After that acceptance, the overall treatment and restoration were done and acceptance was evaluated using a questionnaire at the end of the second visit.

Results: about 95.9% of children showed positive experience toward the dental visits while thire parents showed 91.8% acceptance for the visits. For the restoration preference, most of the children prefer colored restoration, while the parents prefer the white conventional restorations.

Conclusion: The findings of this study indicate that colored compomer restorations showed a higher level of acceptance among children compared with conventional composite restorations.

In contrast, parents demonstrated a lower level of acceptance toward the colored materials, while both children and parents reported a positive overall experience with the treatment and dental visit.

INTRODUCTION

Restoring primary teeth is essential for the child's general health, psychological development, and proper development of permanent dentition. Although amalgam was once the most widely used restorative material, its notable limitations in children such as poor esthetics, the need to remove more sound tooth structure, and biocompatibility concerns related to mercury have reduced its acceptability in pediatric dentistry. [1,2] Dentists can now restore primary teeth using a variety of restorative solutions. such as compomer, resin-modified glass ionomer, conventional glass ionomer, and composite resins.

Since esthetics in children is a primary concern nowadays [3], resin composite has become a widely used restorative material in primary dentition due to its favorable esthetic properties, conservative cavity preparation requirements, and reliable adhesive bonding to enamel and dentin, allowing better preservation of sound tooth structure. When proper moisture control and isolation are achieved, composite restorations demonstrate satisfactory clinical performance in Class I and selected Class II cavities. However, their longevity remains influenced by several factors, including operator technique, cavity size, and the child's oral environment [4,5].

Compomers are one of the restorative materials for primary tooth restorations. Introduced to the market in 1993, their usage has been expanded to anterior and posterior primary teeth [6]. Compomers are modified composite materials that integrate the aesthetic and mechanical properties of composite resins with fluoride release and superior adherence to tooth Structures [7,8]. Compomers release fluoride through a mechanism similar to that of normal and resin-modified glass ionomer but with lesser amount. This results in a reduced fluoride release and duration compared to glass ionomers. However, it possesses superior aesthetics, like in resins, and enhanced wear resistance [5]. A good benefit of compomers is their simplicity of handling, and their texture facilitates effortless application and contouring without adhesion or sticking to dental instruments. Consequently, less working time is necessary for completion and final refinement. These attributes are particularly advantageous in children's treatment [9].

Colored compomers have been utilized for the restoration of primary molars. Unlike traditional polyacid-modified resin composites, a small amount of glitter particles are used to provide color effects such as colors of blue and gold [10].

It has been suggested that children could be more cooperative with a better positive attitude toward the dental treatment, as they consider the dental appointment a playful experience following their selection of the color of the restoration. Moreover, the application of multicolored restoration could increase the patient motivation toward their oral health care at home [11].

Since parents are the primary decision-makers for their children's dental treatment. Their preference strongly influences treatment acceptance, cooperation during procedures, and long-term adherence to follow-up [12,13]. Therefore, understanding parental satisfaction helps clinicians evaluate whether these restorations meet family expectations regarding appearance, durability, and child comfort. So the aim of this study is to evaluate the parents' and children's acceptance of tooth-colored compared to conventional restorations.

MATERIALS AND METHODS.

This study was done as a split mouth randomized clinical trial, in the department of pedodontics and oral health at Al-Azhar university faculty of dental medicine – boys – Cairo, Egypt.

Sample size calculation.

Based on the previous study by Honaje et al.[14] The sample size was calculated to be **73 children** including 10% dropout. (α = 0.05, 80% power) the final sample size was determined to be **73 children**, each receiving two restorations, one Twinky Star in one side and one conventional composite restoration in the other side).

Inclusion criteria:

Seventy-three children were selected from the département clinic according to this criterion.

- Age: between 5 and 10 years.
- Bilateral mandibular first or second primary molars affected by Class I or II caries.
- Teeth without pulpal involvement.
- Medically healthy children (ASA I–II).
- Cooperative child [+ve and ++ve according to Frankel scale].

Exclusion criteria

- Teeth presenting with a history or diagnosis of acute or chronic pulpal inflammation
- Children with a known history of allergy or hypersensitivity to dental restorative materials.

Intervention

Seventy-three children with bilateral Class I or Class II carious lesions in primary molars were recruited after their parents were informed about the study and provided written consent.

Randomization was performed twice using a coin toss: first to determine the sequence order of the restorative materials, and again to determine the side on which each material would be applied (left or right side). The side restored with the colored compomer was classified as **Group I**, while **Group II** received conventional composite restorative material. According to the randomization, the restoration type selected for each side was performed during the first visit, and the second visit was scheduled after one week for the restoration for the other side.

Cavity preparation was carried out following adequate isolation with a rubber dam. The caries was then removed with a rotating high-speed handpiece with a No. 330 carbide bur and a sharp spoon excavator. The cavity was carefully inspected to confirm the absence of remaining caries and was then properly cleansed with sterile cotton wet in normal saline. A self-etch adhesive (FGM Bond, FGM Dental Group, Brazil) was utilized in accordance with the manufacturer's instructions.

For both groups, the first group (I) had colored restoration (Twinky Star Voco, Cuxhaven, Germany). And group (II) conventional composite (Filtek Z350 XT; 3M ESPE, St. Paul, MN, USA) layers were applied according to the manufacturer's instructions, maintaining a maximum thickness of 2 mm to facilitate adequate polymerization of the material; each layer received light-cure polymerization for 20 seconds. Occlusion was assessed using articulating paper if necessary. The restorations were completed with diamond finishing burs and disks (3M ESPE, St. Paul, Minn., USA). **[Figure. 1]&[Figure. 2]**

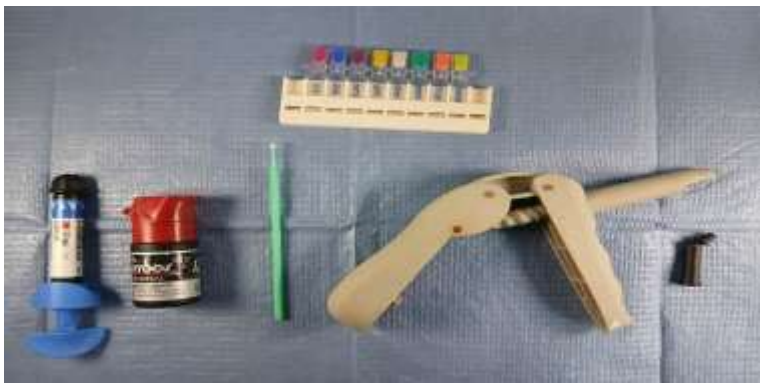

***Figure 1**: **Materials used in the study;** Above: colors shade guide. left to right : conventional composite. Adhesive bond, micro brush, restoration's gun , and colored compomer capsule*

***Figure 2**. **bilateral restorations;** left side: group I compomer blue color restoration. The right side is group II conventional composite white restoration.*

Following completion of the first visit, the child was scheduled for the restoration of the contralateral side one week later, in accordance with the randomization determined by the coin toss.

The acceptance of the children and their parents was assessed after the completion of the dental restoration in the second visit using a questionnaire. The questionnaire was designed by the author to collect the experiences of the

children and parents regarding the dental treatment/restoration provided. A total of three questions were asked to the children, and another set of two questions was posed to the parents.
The questionnaire for children consisted of four sections. The first section collected demographic data, including name and gender. The second section assessed the child's overall experience during the two visits using a Likert scale, and the third recorded the color chosen for the restoration. The fourth section asked the child to indicate their preferred restoration. **[Figure 3].**

Name	
Age	
Gender	
How was your experience about the dental treatment	o Excellent
	o Good
	o Average
	o Poor
	o Very poor
What is the color you choses	o Pink
	o Blue
	o Gold
	o Silver
	o Green
	o Orange
	o Lemon
	o Berry
Which restoration do you prefer more	o White
	o Colored

Figure 3. *children's questionnaire*
The questionnaire for the parent contains only two sections: the first about the evaluation of overall experience during the two visits using a Likert scale and the second for the preferred restoration **[figure 4]**.

How was your experience about the dental treatment	o **Excellent**
	o Good
	o Average
	o Poor
	o Very poor
Which restoration do you prefer more	o White
	o Colored

Figure 4. Parents questionnaire
After data collection, descriptive statistics were first calculated to summarize the data. Frequencies and percentages were used to present categorical variables, such as the type of restoration chosen by children and parents. To examine the association between categorical variables, the chi-square test was applied. All statistical analyses were performed using SPSS (version 27), and a p-value of less than 0.05 was considered statistically significant.
Results.
A total of 73 children (33 males and 40 females) participated in the study, with a mean age of 7.9 (±1.68) years.
The acceptance of the children and their parents was assessed after the completion of the dental restoration procedure; about 84.9% of the total children showed excellent experience, and 11% showed good experience, with a total of 95.9% showing positive experience. **[table.1]**

Table (1) the acceptance of the children toward dental treatment in the two visits.

Score	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Excellent	62	84.9	84.9	84.9
Good	8	11.0	11.0	95.9
Average	2	2.7	2.7	98.6
Poor	1	1.4	1.4	100.0
Very poor	0	0	0	100.0
Total	73	100.0	100.0	

Children were allowed to choose from the different colors of the restorations; they chose from eight colors (pink, blue, berry, gold, silver, green, orange, and lemon). It was found that the most selected color was pink, with a percentage of 38.4%, followed by blue, with a percentage of 26%, as shown in the chart. [**figure 5**]
Also colors selection found to be affected with gender as most of girls select pink colors and males blue color. **[table. 2]**

Table (2) distribution and selection of colors among children in group I.

		COLOR								
		pink	**Blue**	**berry**	**gold**	**silver**	**green**	**Orange**	**lemon**	**Total**
GENDER	**Male**	1	18	3	1	2	5	1	2	33
	Female	27	1	6	4	0	0	1	1	40
Total		28	19	9	5	2	5	2	3	73

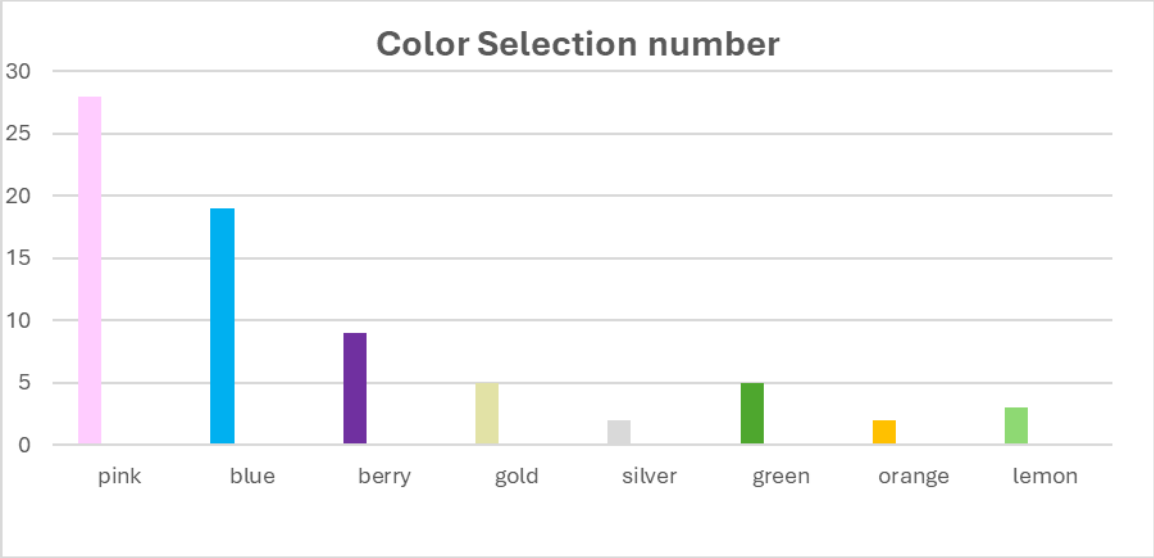

Figure 5. *Bar chart showing the frequency of chosen colors from the different available colors of the restorations.*
For the preference of the colored restoration, children were allowed to choose between the two restorations they had after completion of the treatment; they were asked to choose which one they preferred. Most of children prefer the colored restoration with significant difference compared to white one with percentage of 91.8% from total children as shown in the table.
Table (3) preferences of restoration color among children.

For the parents, they showed an overall high percentage of treatment acceptance, as 68.5% of the parents showed that

	Number	*Percentage*	*P vale*
Colored	67	91.8%	<0.001
White	6	8.2%	
Total	73	100.0	

the experience was excellent and 23.3% found that the visit was good, with an overall positive experience of 91.8%, as shown in the [**table. 4]**
Table (4) the acceptance of the parents toward dental treatment in the two visits.

Score	Frequency	Percent %	Cumulative Percent
Excellent	**50**	**68.5**	**68.5**
Good	**17**	**23.3**	**91.8**
Average	**4**	**5.5**	**97.3**
Poor	**2**	**2.7**	**100.0**
Total	**73**	**100.0**	

For the parents' preference between the two types of restoration, most of the parents chose the white restorations with

		Frequency	Percent	P value
Restoration type	**Colored**	**7**	**9.6%**	<0.001
	White	**66**	**90.4%**	
	Total	**73**	**100.0**	

a high percentage (90.4%) and also significant difference.

Table (5) preferences of restoration's color among parents.

For comparison between children and their parents it was found A statistically significant difference regarding their preferred restorative material ($\chi^2(1) = 98.65$, $p < 0.001$). Children showed a markedly different pattern of selection toward the colored compared to their parents.**[table 6]**

Table (6) differences between children and parents preferences toward dental restorations.

Variable	Parents (%)	Children (%)	P value
Colored restoration selection	9.6%	91.8%	<0.001
White restoration selection	90.4%	8.2%	<0.001

DISCUSSION

The present study evaluated the children's and parents' acceptance toward colored restoration after placement in the primary molars and compared it by the split-mouth method to other conventional white composite restorations.

The present study demonstrated high levels of acceptance toward the dental visit as most of children mark (excellent) in the questionnaire , which can be attributed to the use of tooth-colored (Twinky Star) restorations as all of the participants was their first time to try this filling. Children were allowed to choose the color of their fillings, which likely increased their engagement and positive experience. Also, parents reported satisfaction, toward the two visits reflecting their approval toward the dental treatment, as they feel their children's comfort during treatment. These findings suggest that allowing children to participate in the selection of restorative materials can enhance overall acceptance and improve the dental experience for both patients and parents [15].

A study by *Melebari,* et al [16] coincide with these results as they concluded that The use of the multicolored restoration improve the oral hygiene status of children and aid in motivating their attitude during dental visit particularly younger age groups. Also, a study by *Mascarenhas AN et al.* [17] found that patients who select colored restorations show lower anxiety levels and positive behavior compared to the group who opted for conventional composite restoration.

Among the tooth-colored restorations, pink was the most frequently chosen color, followed by blue. This preference may reflect common color choices among young children, as pink is usually often associated with playfulness and appeal, and associated with girls who generally prefer pink, and they were more numerous in the sample, while blue is a familiar and liked color among boys [18].

In this study, parents predominantly preferred white restorations, while children tended to choose colored options. This difference likely reflects differing priorities: parents often focus on esthetics that resemble natural teeth and long-term oral health outcomes, whereas children are more influenced by fun and engaging aspects, such as bright colors and the ability to personalize their fillings.

Conclusions

The findings of this study indicate that multicolored compomer restorations achieved a notably higher level of acceptance among children compared with conventional tooth-colored composite restorations. In contrast, parents demonstrated a lower level of acceptance toward the colored materials, showing a clear preference for the conventional white restorations. Despite these differences, both children and parents reported a positive overall experience with the

treatment and dental visits, highlighting the value of engaging child-friendly approaches while still addressing parental expectations.

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