

Evaluation the Effect of Multi-Coloured Versus Traditional Restorative Materials on the Children's Dental Anxiety

Rasha Khalaf Zighair^{1*}, Zainab Juma Jafa²

¹Department of Anbar Health, Fallujah Sector, Iraq

²Department of Pedodontic and Preventive Dentistry, College of Dentistry, University of Baghdad, Iraq

ABSTRACT

Background: Restorative dental care may be an unpleasant procedure for children which seems to be contributing to the development of dental anxiety. The placement of colored restorative material was termed to anticipate the child's positive attitude toward treatment.

Aim: The aim of this study is to evaluate the effect of multicolored restorative materials on the children's dental anxiety level.

Material and Methods: A total of 80 children were selected for this study, aged 8-9 years old from primary schools in Iraq. The children were divided randomly and equally into two groups, the control group (group A) who were received traditional composite material, and the experimental group (group B) who were received colored restorative material. The restorative treatment for both groups was class I for primary lower molars. Dental anxiety was measured for all participants using the Abeer Children Dental Anxiety Scale (ACDAS) before the dental procedure as a baseline score and after the dental procedure.

Result: There was a highly significant decrease in the in ACDAS scores after dental procedure between control and experimental groups. Most children in the present study selected the pink colored restorative material.

Conclusion: The use of multicolored restorative materials might aid in the reduction of children's dental anxiety during the dental procedure.

Key words: Dental anxiety, Children, Colored restorative material, Composite restoration, Colors

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Corresponding author: Rasha Khalaf Zighair
e-mail ✉: rashaziger@gmail.com
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INTRODUCTION

Anxiety can be described as an unpleasant state with an associated fear of dangers from within or an acquired from one's environment. It varies depending on the capacity to imagine [1]. Dental anxiety is one of the most prevalent problems faced in the dental procedure and is a source of complication for the pediatric dentist, avoiding dental visits and reject dental treatment for children [2]. Restorative dental care may be an unpleasant procedure for children because it involves several potentially stressful stimuli, each contributing to the development of dental anxiety [3].

The colored restorative material had been created for children and can be regarded as an active motivating technique in which children considered their dental appointment as engaging experiences in their restoration with different colors [4]. Furthermore, giving the child the chance to select the restoration form or color that would

be put into his teeth might be another successful approach [5]. Color affects a child's life in forms we cannot identify. We can allow children who are anxious and refuse treatment to choose his/her multi-colored restorative materials that could improve child behavior in the dental clinic, especially in younger age groups [6]. Furthermore, colored restoration could be used as an alternative for composite restoration due to clinical rate of success [7].

The aim of this study is to evaluate the effect of placement multicolored restorative materials compared with traditional restorative materials on the dental anxiety level of Iraqi children.

MATERIALS AND METHODS

Study design

The present study had been started after gaining the approval from the ethical and the scientific committee at College of Dentistry/University of Baghdad. The sample was selected among children aged 8-9 years old from primary school who have no previous dental experience and require restorative dental treatment (class I for

primary lower molars with absence of pain, fistula, and, pulpal exposure for selected tooth.

A statistically calculated sample size of 80 children were divided randomly and equally into two groups, the control group (group A) and experimental group (group B), with 40 samples in each group. A random allocation list was generated using a Microsoft excel (Random number generation RNG) program. Details of the procedures and aims of the study were explained to the parents, verbal and signed consent was obtained to approve their acceptance about the participation of their children in the study.

Procedure

The study steps were done by one dentist who used euphemisms and the tell-show do technique to encourage patients for treatment. The caries lesion was removed using a rotatory high-speed hand piece and the cavity was prepared, a standard dental procedure was followed with all participants in both groups. Group A received traditional composite material (restorative kit, CAVEX, Holland BV), and group B received colored flowable composite filling (RAINBOW flow, PPH CERKAMED Wojciech Pawlowski, Poland), after asking the child to choose his/her color preference of restorative material (Figure 1).

Dental anxiety was measured for all participants using the Abeer Children Dental Anxiety Scale (ACDAS) [8] before dental procedure as a baseline score and after the

dental procedure by the same examiner to overcome operator bias.

The collected data were subjected to statistical analysis using the Statistical Package for Social Science (SPSS version 22), at a level of significance set at $P < 0.05$.

RESULTS

The changes in ACDAS scores in both groups before and after the dental procedure were shown in the Table 1. There were lower ACDAS scores after the dental procedure than the baseline readings before the dental procedure.

The intra comparison of ACDAS among control and experimental group revealed that there was a highly significant difference ($P \text{ value} < 0.01$) in the change in ACDAS score from before to after dental procedure as shown in Table 2.

The inter-group comparison of ACDAS by times were shown in Table 3. The mean difference was non-significant ($P \text{ value} > 0.05$) before dental procedure, while highly significant differences ($P \text{ value} < 0.01$) were found after dental procedure.

The distribution of children's color preference for restorative materials is shown in Figure 1. The highest percentage of preference was found for the pink color (30%) and the lowest percentage for orange and yellow (7.5).



Figure 1: Selected restorative materials colors.

Table 1: Statistical description of ACDAS scores between two groups.

Groups	Statistics	ACDAS (anxiety score)	
		Before dental procedure	After dental procedure
A	Minimum	13	13
	Maximum	35	29
	Mean	24.6	22.85

	±SD	4.39	3.779
	Minimum	13	13
	Maximum	30	25
	Mean	23.95	19.425
B	± SD	3.863	3.5

Table 2: Comparisons of ACDAS between times by groups.

(Intra comparison) Pairwise Comparisons				
Measure: ACDAS				
Groups	(I) Time	(J) Time	Mean Difference (I-J)	P Value
A	Before dental Procedure	After dental procedure	1.75	0.008
B	Before dental procedure	After dental procedure	4.525	0

Table 3: Comparisons of ACDAS between groups.

(Inter Comparison) Pairwise Comparisons				
Measure: ACDAS				
Time	(I) Groups	(J) Groups	Mean Difference (I-J)	P Value
Before dental procedure	A	B	0.65	0.484
After dental procedure	A	B	3.425	0

DISCUSSION

Dental anxiety is popular among children in the dental clinic. Younger children have a greater tendency to prefer multicolored restoration over traditional restorative material, thereby making it a useful tool to treat young children in pediatric dentistry [9]. The results of this study showed a highly significant reduction (P value <0.01) in anxiety scores after the completion of the procedure relative to the baseline before the dental procedure for both groups as shown in table (1) and table (2). This is in accordance with de Menezes Abreu et al. and Rayen et al. [10,11]. Low ACDAS scores in both groups at the end of the procedure indicated that children are afraid of unknown dental procedures before treatment and that dental anxiety decrease after dental procedures has been completed [12]. However, there was a highly significant difference in anxiety scores between control and experimental groups after the dental procedure as shown in table (3) which agrees with the findings of [4,6]. This result may be explained by allowing children to select their preferred dental restorative color increase their enthusiasm and cooperation and the child becomes more likely to accept the treatment [13]. Thus,

fear will decrease, and dental care will be approved [14]. Furthermore, the colors may have a positive effect on the behaviors of the child, these colors can contribute to the child's comfort and minimize dental anxiety [15].

The multicolored restorative materials have been available in the market for the restoration of primary teeth with different colors ranged from orange, blue, pink, yellow, green, to purple colors. Most children in the present study selected the pink color as shown in Figure 2. Clinicians have explained experientially how a child's emotional status influences their choice of color [16,17]. Color preferences are related to whether a color causes positive or negative feelings [18]. This may probably be attributed to that the pink color is associated with happy and positive emotion [19,20], as well as having calming effects on the child [21]. Contrary to the findings of this study, Raj and Ganapathy, found from their research, that most children have chosen green color followed by pink color as their favorite colored restorative materials [13], which may be due to a difference in the gender distribution, and colors of restorative material compared to this study.

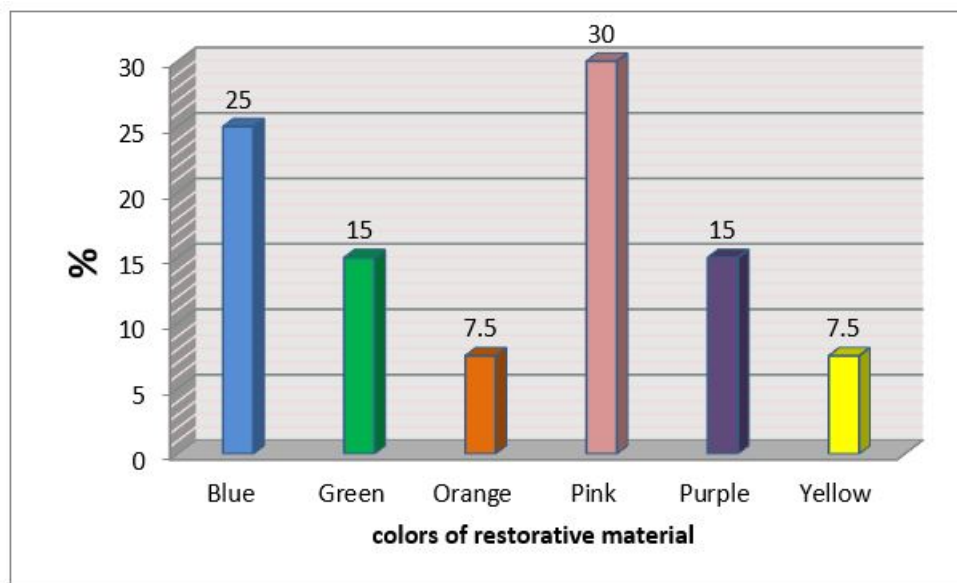


Figure 2: Preference of children for colour of restorative materials.

CONCLUSION

The use of multicolored restorative materials might aid in the reduction of children's dental anxiety during dental procedures especially when child allowed selecting their preferred dental restorative color.

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