

## Assessment of Anxiety Levels in Children Undergoing Dental Treatment with and Without Rubber Dam

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### Abstract

**Introduction:** Rubber dam is considered as the gold standard in isolation protocols since decades. But often clinicians consider its use an anxiety and fear evoking stimuli which may hamper their rapport with the child and thereby affect the quality of treatment. This creates a reluctance among the practitioners to use rubber dam in pediatric population.

**Aim:** Assess the subjective and objective anxiety levels in children in age group of 5 - 9 years undergoing dental treatment with rubber dam or cotton roll isolation.

**Method:** The randomized control study was conducted on 62 children in the age group of 5 - 9 years, divided into two groups: group 1 (cotton roll isolation) and group 2 (rubber dam isolation). Anxiety levels were assessed objectively and subjectively using FLACC scale and facial image scale respectively.

**Results:** There was no statistically significant difference among two groups on objective and subjective analysis.

**Conclusion:** This study concludes that use of rubber dam does not significantly affect the anxiety levels in children. Thus considering advantages of using rubber dams, pediatric dentists should consider using it routinely to provide quality dental treatment to the children.

**Keywords:** Rubber Dam; Anxiety; Flacc Scale; Facial Image Scale

### Abbreviation

RD: Rubber Dam

### Introduction

The oral cavity is a complex environment which is surrounded on all sides by hard and soft tissues. Most of the dental materials used are hydrophobic in nature. Hence for the success of any dental treatment a thorough isolated field is mandatory. Rubber dam, cotton roll isolation and saliva ejector are the most commonly used measures for the isolation during dental practice [1]. Rubber dam has been considered as the gold standard in isolation protocols for decades owing to several advantages, such as providing an aseptic environment, minimizing the potential risk of transferring infective microbes between the operator and the patient, and prevents any possible ingestion or aspiration of dental instruments during a dental procedure [2].

Fear and anxiety are the main protagonists for any pediatric dentists. Fear and/or anxiety are recurrent feelings which influences the child's behavior and plays an important role in pain perception [3]. While anxiety is a systemic response to an imminent danger influenced by memory, personal history and social context, fear represents a normal emotional reaction to specific external stimuli considered threatening [4]. Children gets more anxious when they are subjected to various sophisticated instruments.

This creates an apprehension in the mind of the dental practitioners to use rubber dam isolation in children due to fear of their anxiety and thereby destroys the rapport with the child. Clinicians think that using rubber dam increases the time of treatment. However, some authors have found that patients get the impression that the treatment takes place outside of their mouth, so that even children tolerate longer treatments once the rubber dam has been applied [11].

**Materials and Methods**

This randomized clinical trial was conducted on 60 children in the age group of 5-9 years reporting to the department of pediatric dentistry for minor dental procedures.

**Inclusion criteria:**

- Children in the age group of 5 - 9 years.
- Child’s first dental visit.
- Children who had to undergo minor dental procedures like pit and fissure sealant application.

**Exclusion criteria**

- Children who had other dental issues like pulpitis and its sequelae.
- Children with systemic conditions.
- Special children.

The participants will be divided into two groups namely group 1 (study group) and group 2 (control group).

- **Group 1:** In this group minor dental procedures will be done on cotton role isolation method.
- **Group 2:** In this group minor dental procedures will be done on rubber dam isolation.

During the time of rubber dam placement and sealant application, the FLACC scale will be measured by an assistant according to the scale criteria to objectively assess the anxiety levels. After the completion of the procedure the child will be asked to touch on the facial scale corresponding to his/her feelings towards the treatment.

Category	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

**Figure 1:** FLACC scale.  
*F:–Face; L: Legs; A: Activity; C: Cry; C: Consolability.*

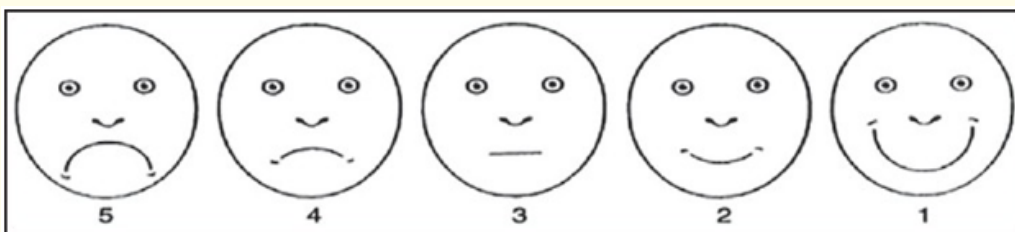


Figure 2: Facial image scale.

The results were analysed using WILCOXANS test.

**Result**

**Cephalometric evaluations**

A total of 62 schildren were selected for the studywith a mean age group of 6.48 (S.D = 1.262) in group 1 and 6.84 (S.D = .969) in group 2.

**Subjective analysis**

For subjective analysis of anxiety in children during the procedure, facial image scale was used.

There was no statistically significant difference between the two groups.

Cs	GRP		Total
	1	2	
1	19	13	32
	61.3%	41.9%	51.6%
2	10	9	19
	32.3%	29.0%	30.6%
3	2	7	9
	6.5%	22.6%	14.5%
Total	31	31	62
	100.0%	100.0%	100.0%

Table 1  
Cs: Child Score.

	CS
Mann-Whitney U	411.500
Wilcoxon W	907.500
Z	-1.066
Asymp. Sig. (2-tailed)	.287

Table 2  
CS: Child Score.

**Objective analysis**

FLACC scale was used for objectively analysing the subject’s anxiety. There was no statistically significant difference between the two groups.

		GRP		Total
		1	2	
MTOT	0	17	12	29
		54.8%	38.7%	46.8%
	1	7	6	13
		22.6%	19.4%	21.0%
	2	7	6	13
		22.6%	19.4%	21.0%
	3	0	3	3
		.0%	9.7%	4.8%
	4	0	1	1
		.0%	3.2%	1.6%
	5	0	2	2
		.0%	6.5%	3.2%
	8	0	1	1
		.0%	3.2%	1.6%
Total		31	31	62
		100.0%	100.0%	100.0%

Table 3

	MTOT
Mann-Whitney U	354.000
Wilcoxon W	850.000
Z	-1.899
Asymp. Sig. (2-tailed)	.058

Table 4

**Discussion**

The quality of every restoration in dentistry primarily depends on the isolation of the operating field as the materials are hydrophobic in nature [5]. Rubber dam has been considered as the gold standard for isolation of the operating field. However, Fuad Abdo Al-Sabri, *et al.* in their study concluded that there is insufficient use of rubber dam among dental students and dental students and there is a requirement for the improvement in their perception towards the use of rubber dam [7]. Leal, *et al.* found that various dental instruments including rubber dam created significant anxiety levels in children which could be the reason for the reluctance of dentists use of rubber dam in pediatric dentistry [8].

There are very few clinical studies which has been conducted to assess the subjective and objective anxiety parameters in children in conjunction with rubber dam during standard routine dental treatments. In this study, we used FLACC (face, leg, activity, cry, consolability) scale and FACIAL IMAGE scale to objectively and subjectively analyse the stress levels of the children respectively [6]. Pit and fissure sealant application was selected in the trial as it induces only a low stress level in both the groups.

In this study, no significant difference was seen in the subjective perception of the child towards the use of rubber dam which was assessed using facial image scale. This is in accordance with a study conducted by Amman, *et al* [1]. In this study no significant difference was seen in the objective analysis of the child's anxiety which was in accordance with the studies done by Amman, *et al.* [1] and Anupam Saha [1]. Anupam Saha, *et al.* in their study found the dental anxiety of children in the age group of 2 - 7 years showed relatively less anxiety levels when compared to children in the older age groups. Amman, *et al.* checked the pulse, breath rate and skin resistance. Their values were in accordance with this study.

One subject was recorded with a score 8 in FLACC during the procedure. However, facial image scale rating was better which could be due to patients acceptance of the material towards the end of the treatment.

The relative acceptance of the children to rubber dam in this age group might be because of 'centration' which will be seen during this age group. During this period the child's understanding is mostly based on what they see and their reaction or comprehension of an object or situation is based on the most compelling and striking feature of the stimulus. Their thoughts are centered only on one salient aspect of the problem or one feature of a multifaceted experience is emphasized in the child's perception [9]. Children, when they are young, show an over-reliance on visual stimuli and tend to focus on that and less on what they "know" or heard. In this study the child might be centered by the euphemism used for the rubber dam as a 'rain coat' where the procedure is done outside the oral cavity. This is in accordance with the study conducted by Anupam Saha., *et al* [1].

## Conclusion

This study concludes that use of rubber dam does not create a significant rise in anxiety levels in children. Thus considering the advantages of using rubber dams, pediatric dentists should be trained adequately in the placement of the device in order to provide a quality dental treatment for the children.

## Disclosure

No financial interests.

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