Comparing the Impact of Various Play Therapy Techniques in Reducing Dental Anxiety in Children Aged 5 to 8 Years – Randomized Clinical Trial

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Abstract

Aim: *To check the effectiveness of play therapy modality such as drawing and colouring employed in dental anxiety reduction in children.*
Materials and methods: *A total of 48 subject between the age 5–8 years and were randomly divided into 2 groups. Group A: Intervention (Drawing & Colouring) group and Group B: non-intervention group. Pre and postoperative frankl's behaviour rating scale, visual analogue scale (VAS) and FLACC scales are measured.*
Results: *Significantly reduced anxiety levels were observed in Group A (drawing & colouring group) when compared to Group B.*
Conclusion: *Play therapy such as drawing and colouring is a useful and effective measure among children emotional status also it is easier and familiar technique which can be employed in the dental setting.*

Keywords: *Dental Anxiety, Behavioural management, Play therapy*

1. INTRODUCTION

Dental anxiety and fear are the most important challenges faced in paediatric dentistry. The main cause for severe anxiety can be due to previous incidence of traumatic dental procedure and unawareness of new things happening. Proper assessment of paediatric procedural distress is essential to clinical striving targeted during invasive dental procedures in children. [1, 2] Dental fear is associated with present situation and immediate stimulus to specific object whereas dental anxiety is uncertain and not an immediate stimulus, but both are experienced as same emotional response. There are numerous methods employed to evaluate the behaviour

status of the children and their attitude towards dental treatment and various anxiety measurement scales are present which are useful in predicting the necessity for the behaviour modification. [2, 3]

Behaviour modification is an attempt to modify the human emotions and behaviour in an effective way and it is utmost necessary for children with negative impact on dental treatment because of fear, anxiety, and distress. There are various behaviour modification techniques present and one among them are play therapy. [1,3]

Play therapy can be defined as an interpersonal process wherein a trained therapist systematically applies the curative powers of play to help the clients resolve their current psychological difficulties and help prevent future ones. [4, 5] Play has a significant purport for physical, psychological, and psychosocial development in children and considered as a universal behaviour and inherent mode of self-expression. Play facilitates the expression of a number of cognitive, affective, and interpersonal processes important in creativity which can be assessed through verbal and behavioural expressions. [6, 7]

To avoid those pre and postoperative distress in children, graphology method such as handwriting, drawing and signature, which accords in predicting children psychological status. Among this drawing and colouring gained popularity, also which helps majorly in distraction during and after dental treatment. Drawing is inexpensive, and nonthreatening method in children and an assessment tool, which was widely used by clinicians, as early as 1920s by Goodenough and later by Koppitz. [1, 6, 8, 9]

On this background, the present study was aimed to evaluate the relevancy of children's drawings and colouring as an indicator to measure children's anxiety levels comparing to our previous standards such as FLACC, VAS and Frankl's scales in the dental setting. Hence, in this study, it was hypothesized that children's drawings and colourings can be an absolutely certain assessment tool for evaluating child's anxiety at pre, during and post conventional paediatric dental procedures.

2. MATERIALS AND METHODS

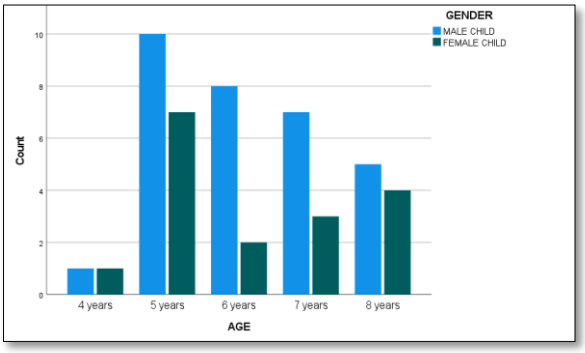
A total of 48 samples which was randomly sub grouped into 2, Group A: intervention (drawing and colouring) (n=24) and Group B: non-intervention (n=24). Before starting the study informed consent was obtained from individual's parents and also by institutional ethical committee. Children reporting to the outpatient department of Paediatric & Preventive Dentistry, Tagore Dental College & Hospital meeting the inclusion criteria will be selected for the study. Children between 5-8 years of age, caries at least one on their lower teeth without any other systemic illness were included in the study. Children having history of pain, traumatic previous dental experience and with any other systemic illness or needed with any special care were excluded in the study.

Preoperatively, in the waiting area the behaviour of the child will be assessed by Frankl's behaviour rating scale and heart rate will be measured using pulse oximeter. The child will be given with visual analogue scale chart and the findings will be recorded. Then the children will be randomised into two groups – Group A and Group B. Group A, will be provided with paper and crayons and will be asked to draw a dental scenario. In Group B, no interventions will be made. Patients will be sitting alongside their parents in the waiting area not more than 15 minutes. Once the patient is on dental chair, Frankl's behaviour rating scale, visual analogue scale and heart rate will be measured. Restoration of lower teeth will be done and during the procedure heart rate and FLACC scale will be evaluated. The collected data were entered in Excel sheet and will be statistically analysed using SPSS software version 22.0. Descriptive analysis was done and inter-grouping comparison was analysed using chi-square test.

3. RESULT

The present study included 48 participants with 24 each in intervention and non-intervention groups. The mean age of the study participants was 6.15±1.22 years ranging from 4 to 8 years. There were 31 males (64.6%) and 17 females (35.4%) participants. The study included 2 participants aged 4 years (4.2%), 17 participants aged 5 years (35.4%), 10 participants aged 6 years (20.8%), 10 participants aged 7 years (20.8%) and 9 participants aged 8 years (18.8%). The graph 1 depicts the distribution of study population based on age and gender.

Graph 1: Distribution of study population based on age and gender



A score of 3 in Frankl's scale was reported by more than 20 participants in both the groups and a mild pain was reported by majority participants in both the groups when measured using Visual Analog Scale (VAS) at waiting area and in dental chair. A significant difference was observed between the groups when measured using Frankl's scale and VAS. Most participants had a heart rate of 96-110 beats per minute in the group A while majority of the participants in the group B had their heart rate to be between 80-110 beats per minute in waiting area and dental chair. Tables 1 and 2 shows the distribution of study population based on their pain and heart rate at waiting area and in dental chair.

Table 1: Distribution of study population based on their pain and heart rate at waiting area

	Score	Intervention		p-value
		Group A	Group B	
Frankl's Scale	2	0(0)	3(6.3)	0.030*
	3	20(41.7)	21(43.8)	
	4	4(8.3)	0(0)	
Visual Analogue Scale	Mild	20(41.7)	22(45.8)	0.047*
	Moderate	0(0)	2(4.2)	
	None	4(8.3)	0(0)	
Heart Rate	80-95	8(16.7)	11(22.9)	0.657
	96-110	13(27.1)	11(22.9)	
	111-125	3(6.3)	2(4.2)	

*Statistically significant at $p<0.05$, Chi-square test

Table 2: Distribution of study population based on their pain and heart rate in dental chair

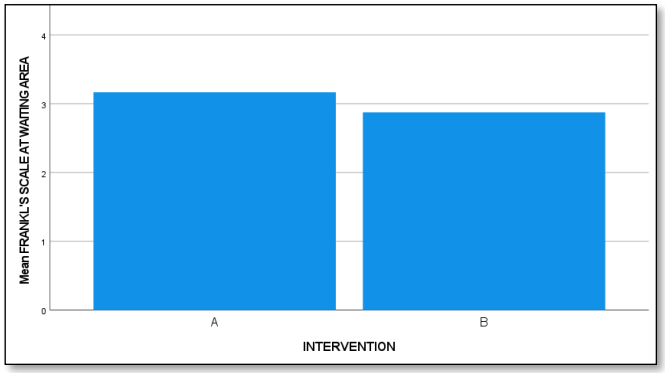
	Score	Intervention		p-value
		Group A	Group B	
Frankl's Scale	2	0(0)	6(12.5)	0.006*

	3	20(41.7)	18(37.5)	
	4	4(8.3)	0(0)	
Visual Analogue Scale	Mild	19(39.6)	17(35.4)	0.018*
	Mild-moderate	1(2.1)	1(2.1)	
	Moderate	0(0)	6(12.5)	
	None	4(8.3)	0(0)	
Heart Rate	80-95	17(35.4)	10(20.8)	0.058
	96-110	7(14.6)	11(22.9)	
	111-125	0(0)	3(6.3)	

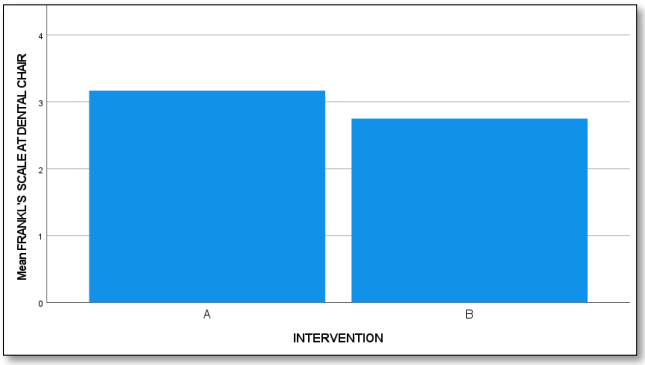
*Statistically significant at p<0.05, Chi-square test

The mean Frankl's scale score at waiting area of group A was 3.17±0.381 and group B was 2.88±0.338. At dental chair, the mean Frankl's scale score was reported as 3.17±0.381 and 2.75±0.442 by participants of group A and B, respectively. The graphs 2 and 3 depict the mean Frankl's score at waiting area and dental chair.

Graph 2: Mean Frankl's score at waiting area



Graph 3: Mean Frankl's score in dental chair



The heart rate reduced to 80-95 beats per minute in most of the participants in group A while the heart rate remained between 96-110 in majority of the study participants in group B. a FLACC score of 1 was reported by half of the participants in group A and score 2 was reported by 10 participants in group B. Pain was not reported by 5 participants (10.4%) in group A. But none of the participants in group B reported that they do not experience pain. A significant difference was observed between both the groups based on heart rate and FLACC score. Table 3 shows the distribution of study population based on their pain and heart rate during procedure.

Table 3: Distribution of study population based on their pain and heart rate during procedure

	Score	Intervention		p-value
		Group A	Group B	
Heart Rate	80-95	19(39.6)	4(8.3)	<0.001*
	96-110	5(10.4)	13(27.1)	
	111-125	0(0)	7(14.6)	
FLACC	0	5 (10.4)	0 (0)	<0.001*
	1	12 (25)	1 (2.1)	
	2	6 (12.5)	10 (20.8)	
	3	0 (0)	6 (12.5)	
	4	1 (2.1)	2 (4.2)	
	5	0 (0)	1 (2.1)	
	6	0 (0)	4 (8.3)	

*Statistically significant at p<0.05, Chi-square test

4. DISCUSSION

Behaviour management techniques plays a vital role in paediatric dentistry and is the most important challenge faced is the children's cooperation during dental treatment. A direct and applicable measure of anxiety could therefore, yield pertinent data on the complicated and partially invisible fears influencing the child patient. [6, 8, 9, 10]

As, Colouring is one of the educational game tools because it leverages the child's development and encourage children's activities and creativity and also, most effective way in reducing stress. Among all the dental procedures, mandibular caries with class I was selected because of its non-invasiveness and easily treated without application of any other type of behaviour modification technique. [10, 11]

According to the results of the present study, it reveals that drawing and colouring has high correlation with frankl scale. These finding were in accordance with the result of Clatworthy et al. (2011) and Tiedeman et al, (2014), who studied the emotional status of hospitalized children and was also similar to study by Sheskin's et al, shown to be a sensitive measure for child's anxiety. Hsu and Feng et al, (2015) examined colouring in children treated in PICU and showed a successful report in helping children to overcome the stress felt by hospitalization. [12, 13]

Mathur et al 2017 used stress markers in children's drawings and correlated them with the Frankl behaviour rating scale to evaluate dental anxiety and found that Frankl scale scores were highly correlated with stress markers in children's drawings. Aminabadi et al 2011 also found that drawing is a worthwhile measure to identify children's emotional status. Torriani et al 2014 analysed children's drawings regarding their perception of dental treatment and oral health. [14]

According to the previous study results, they reported that drawing could be used as a better measure in analysing children's emotions and expectations about dental treatment. In our study, it was observed that children easily used drawing as a self-projective tool to express their feelings they experienced during dental treatment. Hence, drawing can be considered as a perfect legitimate method for self-expression. [13, 15, 17]

Studies analysing the children's approach during dental treatment with the aid of their drawing skill have reported that children comfortability to use drawings as self-projective tool also for expressing their emotions. These studies have also reported the drawings as the impeccable method for exhibiting the distress, anxiety, and fear pertinent to dental treatment. The assessment of children drawings in our study also showed that the children were more comfortable expressing their feelings through drawings. Drawings are significant natural non-verbal tool for broadcasting their distress. [14, 15]

Heart rate is the easier and simplest biological parameter and an increased heart rate is the most common physiological indicator for anxiety as it is also used widely in various studies. Furlan et al. and Carillo-Diaz et al suggested that monitoring heart rate has shown to provide a compelling measure of dental anxiety in children. [18] Therefore, in the current study heart rate was used to foresee the effectiveness of this interventions in reducing dental anxiety. In the present study, the heart rate was found to be reduced to 80-95 beats per minute in most of the participants in group A while the heart rate remained between 96-110 in majority of the participants in group B with the higher significance of $P<0.001$.

On comparing the anxiety scales between the two groups, there was significant difference between the groups, on evaluating the frankl's ($p=0.030$) and visual analogue scale ($p=0.047$) at the waiting area. On the dental chair the anxiety levels were also significant with frankl's scale ($p=0.006$) and visual analogue scale ($p=0.018$). During the procedure there was higher inter grouping significant absorbed ($p<0.001$). with the present result it can be stated that the intervention group had major positive difference when compared to non-interventional group, which shows the effective behaviour management in reducing anxiety among children. And it can be a used as a valuable method in managing distress.

LIMITATIONS

In our study, only 48 samples were evaluated further studies with increasing the sample size and including various parameters with various play therapy are required to assess the anxiety of the children before the beginning of the dental treatment as well as after each treatment session.

5. CONCLUSION

Dental anxiety/fear has an adverse effect in building a positive dental attitude or behaviour in children. Children's drawings can be widely used to assess the dental anxiety in a dental setting also it decreases dental anxiety and can be used efficiently to improve their conformity. Hence, it can be stated that drawing is a suitable assessment tool for learning about the child's notions and conscience.

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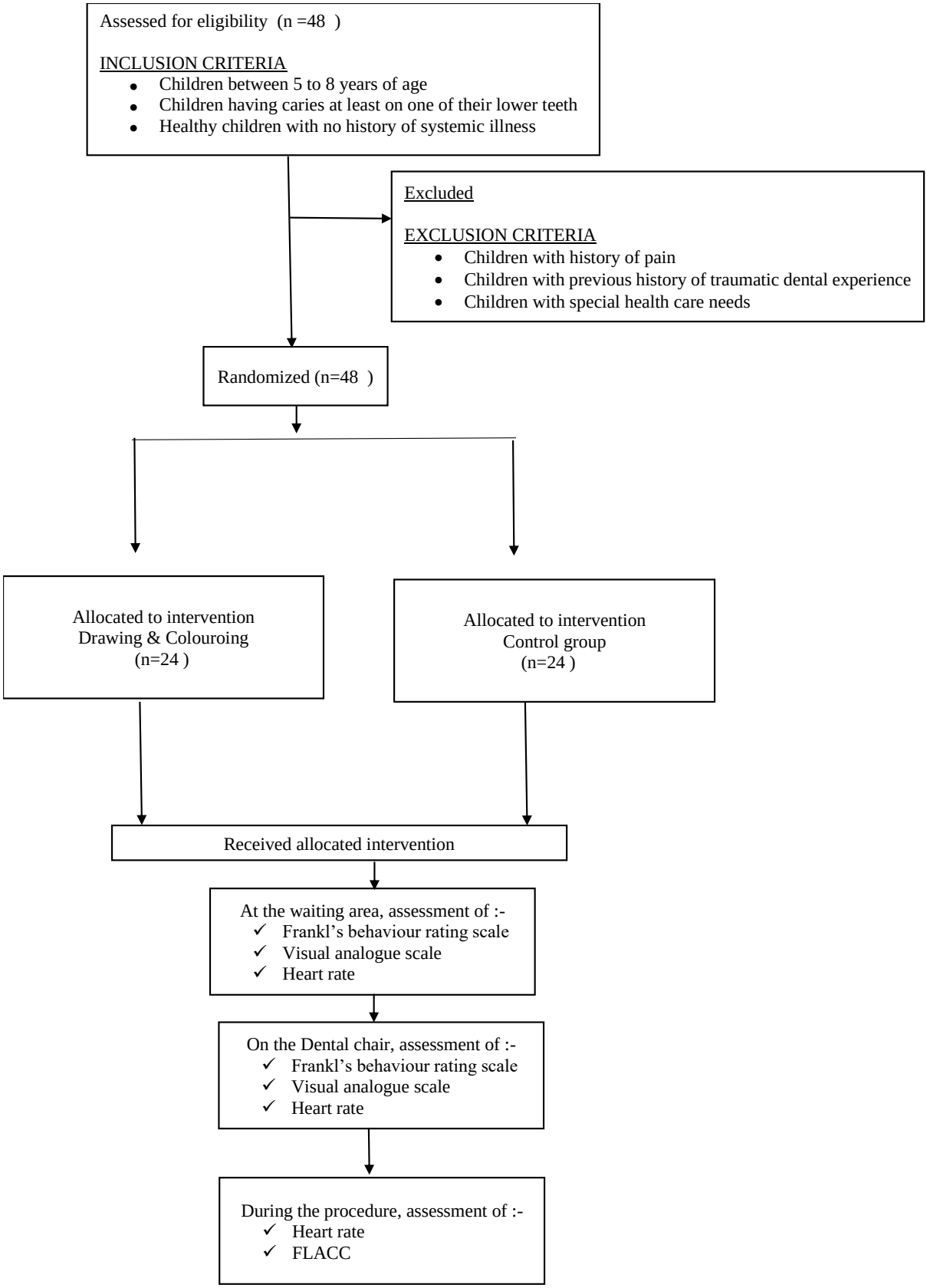
Assessed for eligibility (n =48)
INCLUSION CRITERIA
Children between 5 to 8 years of age
Children having caries at least on one of their lower teeth
Healthy children with no history of systemic illness
Excluded
EXCLUSION CRITERIA
Children with history of pain
Children with previous history of traumatic dental experience
Children with special health care needs
Randomized (n=48)
Allocated to intervention
Drawing & Colouroing
(n=24)
Allocated to intervention
Control group
(n=24)
Received allocated intervention
At the waiting area, assessment of :-
✓ Frankl's behaviour rating scale
✓ Visual analogue scale
✓ Heart rate
On the Dental chair, assessment of :-
✓ Frankl's behaviour rating scale
✓ Visual analogue scale
✓ Heart rate
During the procedure, assessment of :-
✓ Heart rate
✓ FLACC