

A Study to Evaluate the Influence of Audio Visual Modelling Technique on Behaviour Management in Pediatric Patients

Mylavarapu Krishna Sagar¹ Nilotpol Kashyap² Alok Avinash³ Meenakshi Sharma^{4*} Brij Kumar⁵
Harsha Munot⁶

¹PG Student, Department of Pedodontics & Preventive Dentistry, Rungta College of Dental Sciences and Research Centre, Bhilai, India.

²Professor and Head, Department of Pedodontics & Preventive Dentistry, Rungta College of Dental Sciences and Research Centre, Bhilai, India.

³Reader, Department of Pedodontics & Preventive Dentistry, Rungta College of Dental Sciences and Research Centre, Bhilai, India.

⁴Assistant Professor, Department of Pedodontics & Preventive Dentistry, RUHS Dental College & Hospital, Jaipur, India.

⁵PG Student, Department of Pedodontics & Preventive Dentistry, Rungta College of Dental Sciences and Research Centre, Bhilai, India.

⁶PG Student, Department of Pedodontics & Preventive Dentistry, Rungta College of Dental Sciences and Research Centre, Bhilai, India.

ABSTRACT

Background: The child's emotional and behavioral response to dental treatment is a matter of serious concern to the pediatric dentist. Children usually respond to dental visits with some fear and anxiety. Delivery of effective dental treatment to a child patient requires thorough knowledge to recognize dental fear and its management by the application of behavioural management techniques. Audiovisual modeling can be successfully used in pediatric dental practice. The aim of this study is to evaluate the efficacy of modelling technique on behaviour management in pediatric dental patients.

Materials and methods: 100 children between the age of 4 – 10 yrs were selected who did not cooperate during the OPD and then they were shown a video in whom the behaviour change was observed during the subsequent dental visits.

Result: It was observed that most of the children who were not cooperative during their first visit gradually developed a positive attitude during the dental treatment after the video was shown to them.

Conclusion: Audio visual modelling technique can be an effective tool in managing uncooperative children in the dental office.

Keywords: Audio Visual Modelling, Behaviour Management, Frankl Behaviour Rating Scale, Modelling.

INTRODUCTION

A visit to the dental clinic for many children is a very stressful event and it can bring about fear and anxiety in them.¹ These emotions may lead to some behavioural changes during their dental treatment which will subsequently affect the quality of care.² The etiology of the child's dental fear can be multifactorial. Direct and indirect influences of the past experiences of the family member or the child him/herself have been enlisted as a major etiological factor.³ Many techniques for the

management of such dental patients in the dental office have been proposed. But as per various studies, two forms of modelling, live and filmed, have shown to be effective in reducing fear and anxiety in children towards dental treatment.^{4,5} Modelling technique is based on the Social Learning Theory in which the importance of observing and imitating the behaviours, attitudes, and emotional reactions of others is emphasised. Bandura established that modelling or learning by observation worked not only for acquisition of new

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*Correspondence Dr. Meenakshi Sharma.

Department of Pedodontics & Preventive Dentistry, RUHS Dental College & Hospital, Jaipur, India.

Email: dr.mesharma@gmail.com

behaviours but also for reducing undesirable behaviour. The adage rightly goes that modelling allows 'learning without performance'.⁶ The American Academy of Pediatric Dentistry (AAPD) emphasises more on the implantation of non pharmacological behaviour management rather than pharmacological techniques.⁷ It has been established that audio visual modelling, also known as filmed modelling can be equally effective in managing anxious paediatric patients.⁸

This study was undertaken to access the influence of audio visual modelling technique on behaviour management in paediatric patients.

MATERIALS AND METHODS

SOURCE OF DATA: The present study was carried out at the Department of Pedodontics and Preventive Dentistry of Rungta College of Dental Sciences and Research, Kohka Kurud Road, Bhilai, Chhattisgarh.

SAMPLE SIZE: A convenient sample of 100 children who were rated as negative on Frankl behaviour Rating Scale were taken.

ETHICAL CLEARANCE: The proposed study was reviewed by the institutional ethical clearance committee of Rungta College of Dental Sciences and Research and permission was obtained to conduct the study.

INCLUSION CRITERIA:

- 4- 10 years old children.
- Negative rating on Frankl Behaviour Rating Scale.
- Healthy subjects without a past history of dental treatment.
- Accompanied by either parent.
- Were physically and mentally in accordance with the chronological age.

EXCLUSION CRITERIA:

- Definitely Negative, Positive, and Definitely Positive on Frankl Behaviour Rating Scale
- Past history of major medical illness including any disability.
- Mentally disabled children.
- Child has undergone dental treatment previously or has visited a dentist.

- Parents who did not give their consent.

METHOD OF COLLECTION OF SAMPLE

The study was carried out by collecting children from the OPD of the Department of Pedodontics and Preventive Dentistry of Rungta College of Dental Sciences and Research, Kohka Kurud Road, Bhilai, Chhattisgarh, aged 4-10 yrs of chronological age who were rated negative on Frankl Behaviour Rating Scale.

PROCEDURE

Institutional ethical committee approval and informed consent was obtained. The procedure was carried out in 4 steps

Step I: OPD check up was done for the patients. At this stage Frankl Behaviour rating was checked by a panel of doctors who had no idea of the study taking place and those patients or children who exhibited Negative Behaviour were selected for the study. Thus it can be said that all the patients who were selected for the study initially had exhibited negative behaviour. (Figure 1)

Step II: They were sent to the playroom and after half an hour or so when they were found to completely relaxed, they were then directly sent to the audio visual room with the children completely oblivious of the clinical area or procedure. There the children were shown a video of a positive child model who went to her dentist for the first time and also the various procedures of the dental treatment were shown in the video. (Figure 2 and 3)

Step III: The patients were then directed to the clinical area where preventive procedures like restoration or oral prophylaxis or fluoride application was performed on the patients, each procedure being according to the indication or requirement of each patient. (Figure 4) At this stage Frankl Behaviour Rating was checked by the same panel of doctors. After the procedure was performed for each patient, they were given another appointment and were sent off.

Step IV: The patients were subjected to pulp therapy or extraction or root canal treatment, basically which requires administration of a local anaesthetic agent. (Figure 5) Again at this stage, Frankl behaviour rating was observed by the panel

of doctors. Then the subsequent behaviour changes right from the OPD check up to the preventive procedure and then the main procedure was observed and sent for statistical analysis.

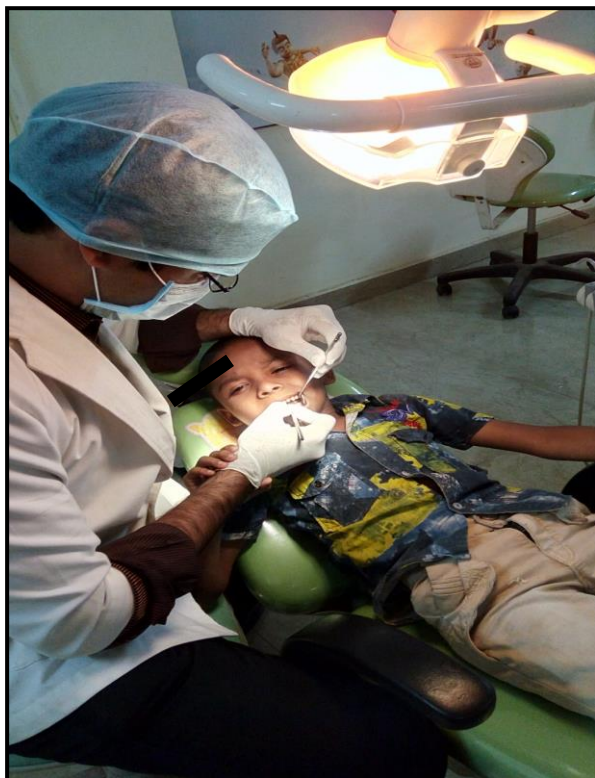


Fig 1: Patient during the OPD (negative behaviour).



Fig 2: Patients watching the audio visual film.



Fig 3: Patients watching the audio visual film.



Fig 4: Restoration being done for the patient (positive behaviour).



Fig 5: patient undergoing pulp therapy (positive behaviour)

STATISTICAL ANALYSIS: The data was subjected to statistical analysis with the consultation of a statistician. The data so obtained was compiled systematically. A master table was prepared and the total data was subdivided and distributed meaningfully and presented as individual table and graph.

Statistical procedures were carried out in two steps.

1. Data compilation and presentation
2. Statistical analysis

Statistical analysis was done using statistical package of social sciences. (SPSS VERSION 16.0; CHICAGO INC.,USA) Statistical test employed for the obtained data in our study was: Chi square test as it was a qualitative analysis

RESULTS

The present study was conducted in the Department of Pedodontics and Preventive Dentistry of Rungta College of Dental Sciences and Research. In the present study, a total of 100 children of 4-10 years who exhibited negative behaviour took part in the study. There were 36 patients who were under the age group of 0-5 years and 64 children who came under the age group of 6-10 years.(Table 1, Graph 1). Out of 100 subjects, 60 were males and 40 were females. (Table 2, Graph2)

When comparing the behaviour of children during the OPD with the behaviour of children of after seeing the video and then undergoing the preventive procedure, 68 children displayed positive behaviour and 2 children displayed definitely positive behaviour while 30 children remained negative behaviour. This indicates that there is highly significant difference in distribution

of negative, positive and definitely positive in both cases. (Table 3)

When comparing the behaviour of children during the OPD with the behaviour of children undergoing the main procedure, 70 children displayed positive behaviour and 2 children displayed definitely positive behaviour while 28 children remained negative behaviour. This indicates that there is highly significant difference in distribution of negative, positive and definitely positive in both cases. (Table 4) When the comparison of behaviour of children during the preventive procedure and during the main procedure was done, it was found that 30 children displayed negative behaviour and 68 children displayed positive behaviour during the preventive procedure but 28 children displayed negative behaviour and 70 children displayed positive behaviour during the main procedure. There was no change in the number of children displaying definitely positive behaviour (2 children) during the preventive and main procedure.(Table 5)

This indicates that there is no statistically significant difference in distribution of negative, positive and definitely positive in both cases.

Of 30 Patients who reported negative during preventive procedures, 12 (40%) patients reported negative and 18 (60%) patients reported positive in main procedure.

Similarly, of 68 patients who reported positive during preventive procedures, 16(23.53%) patients reported negative, 50(73.53%) patients reported positive, 2(2.94%) reported definitely positive in main procedure.(Table 6) No significant association was found between patients reporting in preventive measures and in main procedure (Chi square value=4.33, P=0.11).

Table 1: Distribution of study sample according to the age group.

Age Group	N	%
0-5 years	36	36
6-10 years	64	64
Total	100	100

Table 2: Distribution of study sample according to the gender

Gender distribution	N	%
Male	60	60
Female	40	40
Total	100	100

Table 3: Comparison of the behaviour change of the subjects from the time of OPD to the time of the preventive procedure

	Negative	Positive	Definitely Positive	P value
During OPD	100(100%)	-	-	107.69 P<0.001
During preventive procedure	30 (30%)	68(68%)	2(2%)	

Table 4: Comparison of the behaviour change of the subjects from the time of OPD to the time of the main procedure

	Negative	Positive	Definitely Positive	P value
During OPD	100(100%)	-	-	112.5 P<0.001
During main procedure	28(28%)	70(70%)	2(2%)	

Table 5: Comparison of the behaviour change of the subjects from the time of the preventive procedure to the time of the main procedure

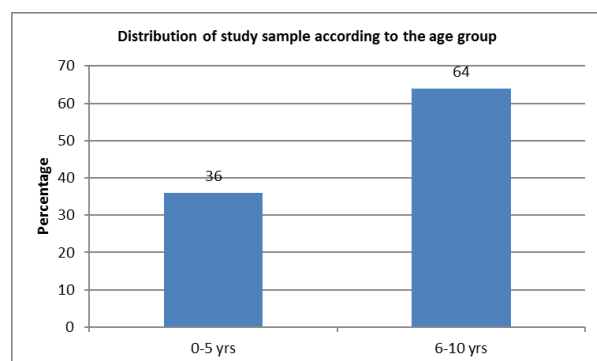
	Negative	Positive	Definitely Positive	P value
During preventive procedure	30 (30%)	68(68%)	2(2%)	Chi square value=0.097 0.95 NS
During main procedure	28(28%)	70(70%)	2(2%)	

Table 6: Comparative evaluation of the number of children remained positive in preventive procedure and turned negative in main procedure and vice versa.

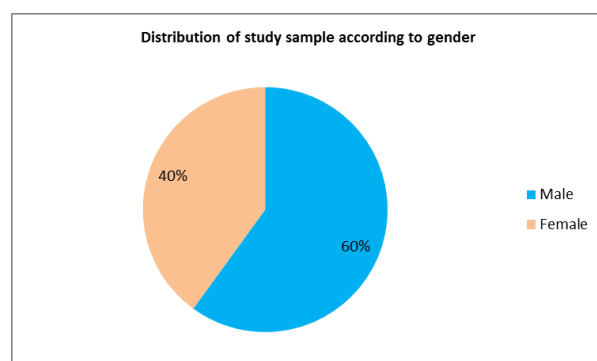
		During main procedure			Total
		Negative	Positive	Definitely Positive	
During preventive procedure	Negative	12(40%)	18(60%)	-	30 (100%)
	Positive	16(23.53%)	50(73.53%)	2(2.94%)	68 (100%)
	Definitely	(0%)	2(100%)	(0%)	2(100%)

	Positive				
Total	14(14%)	35(70%)	2(2%)		100(100%)

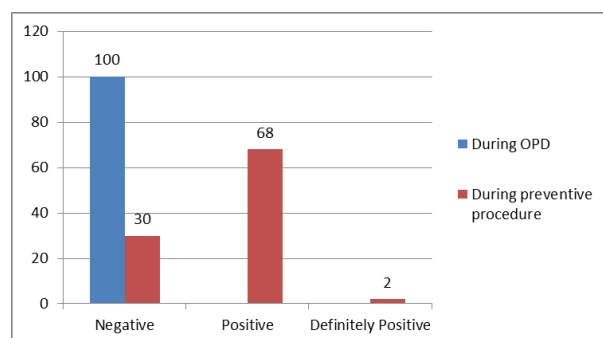
Graph 1: Distribution of study sample according to the age group



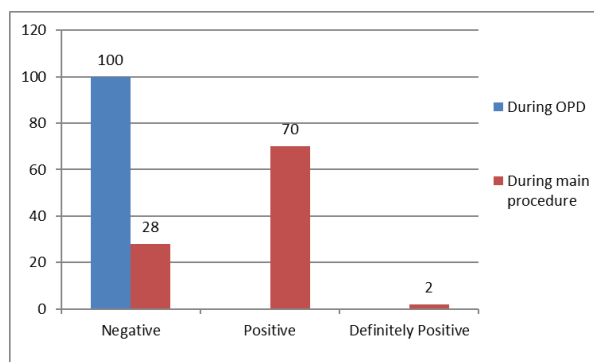
Graph 2: Distribution of study sample according to the gender.



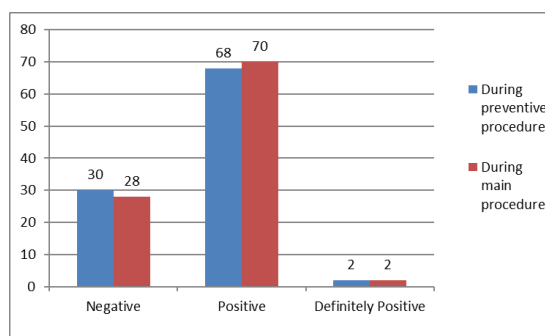
Graph 3: Comparison of the behaviour change of the subjects from the time of OPD to the time of the preventive procedure



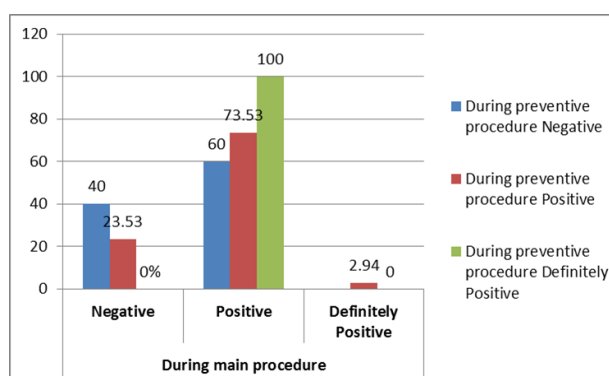
Graph 4: Comparison of the behaviour change of the subjects from the time of OPD to the time of the main procedure



Graph 5: Comparison of the behaviour change of the subjects from the time of the preventive procedure to the time of the main procedure.



Graph 6: Comparative evaluation of the number of children remained positive in preventive procedure and turned negative in main procedure and vice versa.



DISCUSSION

Odontophobia (dental fear) is a “unique phobia with special psychosomatic components that

impact on the dental health of the odontophobic persons".⁹ Carter AE *et al* (2014)¹⁰ enumerated various pathways of general fear and anxiety, they being Cognitive Conditioning, Informative, Visual Vicarious, Verbal Threat and Parental etiology.¹⁰ One of the more reliable and frequently used behavior rating systems in both clinical dentistry and research is the Frankl Scale

1	--	Definitely negative. Refusal of treatment, forceful crying, fearfulness, or any other overt evidence of extreme negativism.
2	-	Negative. Reluctance to accept treatment, uncooperative, some evidence of negative attitude but not pronounced (sullen, withdrawn).
3	+	Positive. Acceptance of treatment; cautious behavior at times; willingness to comply with the dentist, at times with reservation, but patient follows the dentist's directions cooperatively.
4	++	Definitely positive. Good rapport with the dentist, interest in the dental procedures, laughter and enjoyment.

The study was carried out with a sample size of 100 students who were rated negative on Frankl behaviour rating scale. The age group was selected between 4-10 years age group. The reason for selecting the age group was that children below the age group of 4 years would not have been in a position to understand the audio visual shown and the instructions given. This is in accordance with the age group of 4 – 9 yrs which was selected for the study by **Mungara J *et al*(2013)**¹¹.

Out of 100 negative behaved children, 68 children displayed positive behaviour and 2 showed definitely positive behaviour during the preventive procedure. This may be attributed to the fact that the video modelling prompts the learning and behaviour in the child. This is in accordance with the study taken up by **Baghdadi ZD(2011)**⁶.

Also a similar study was carried out by **Paryab M and Arab Z(2014)**¹² where the comparison of efficacy of tell show do versus audio visual modelling technique was made and the audio visual modelling proved to be better than tell show do technique.

Out of 100 negative behaved children, 70 children displayed positive behaviour and the same 2 showed definitely positive behaviour during the main procedure. This may be due to the fact that some children had become accustomed to the dental procedure during the procedure. This is in perfect accordance to the study carried out by **Sharma A and Tyagi R(2011)**¹³ where there was improvement in children's behaviour on subsequent visits.

The improvement during subsequent visits suggests that the experience gained by the child during previous visits helped the child to recognize the nonthreatening aspects of the visits and to deal with stressful dental procedures.¹³ Howitt **JW and Stricker G**¹⁴ also concluded in their study that child's arousal level was reduced as he gained experience in the dental situation. **Venham *et al***¹⁵ have also shown that the behaviour of children improves in subsequent dental visits.

When statistical comparison was done between the behaviour changes of children during the both the clinical procedure (preventive and main), the result was found to be non significant. This was because some children who were negative during the preventive procedure became positive during the main procedure and some who were positive during the preventive turned negative during the main procedure. The reason of children being negative first and positive later is explained earlier. The reason of children being positive during the preventive procedure and negative during the main procedure can be attributed to the fact that that in the preventive procedure, there was not much elicitation of pain but during the main procedure, children got fearful and anxious on seeing and feeling the pain during the administration of local anaesthetic agent. This is according to the study carried out by **Sharma A and Tyagi R(2011)**¹³ where they stated that the gross reason for uncooperative behaviour could be due to pain at the time of treatment. **Holst A and Crossner**

CG¹⁶ and Klingberg *et al*¹⁷ have also established that dental anxiety was more pronounced in younger children (4-6 years) as compared to older children (9-11 years).

CONCLUSION

In this study it was found that change of behaviour was seen from negative to positive in most of the children and at the same time, very few children's behaviour changed from negative to definitely positive. But in some children it was seen that the behaviour remained the same even after watching the video and even after multiple visits. In the end, the video modelling proved to be highly effective in behaviour modification. So at the completion of the study, it is concluded that audio visual modelling technique can be used as an effective way to reduce anxiety and uncooperative behaviour in paediatric dental patients and it also aids the dentist for easy and smooth progress of the dental procedure. The video modelling was found to be very useful and beneficial in managing uncooperative children. It reduces not only the chair side time but also proved to be highly efficient in reducing the anxiety of children regarding the dental treatment.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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