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EVALUATING THE EFFECTIVENESS OF COMBINED BEHAVIOUR MANAGEMENT TECHNIQUES IN YOUNGER CHILDREN FOR REDUCING DENTAL ANXIETY.

Dental Science

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ABSTRACT

Aim: To evaluate and compare the effectiveness of Tell-Show-Do (TSD), TSD combined with pre-appointment and TSD combined with video modelling to reduce the anxiety in children of age 4-6 years.

Methods: Dental fear and anxiety were evaluated using modified Modified Child Dental Anxiety Scale faces version ($MCDAS_f$) and Child Fear Survey Schedule – Dental Subscale (CFSS-DS) in 60 children aged 4-6 years. They were equally divided into three groups of 20 samples each for TSD, TSD combined with pre-appointment and TSD combined with video modelling. Their anxiety levels were recorded before and after behaviour management and the recorded data was subjected to statistical analysis using Wilcoxon signed-rank test.

Result: Combining TSD with video modelling showed good results among the three groups.

Conclusion: The results of the present study suggest that combined behaviour management techniques for reducing anxiety in children have a better result rather than a single procedure alone.

KEYWORDS

Tell-Show-Do, Pre-appointment procedure, Video modelling, $MCDAS_f$, CFSS-DS.

INTRODUCTION

Paediatric dentistry deserves a special place in the dental profession. Children and adolescents comprise a group of individuals signifying a considerable variation in age, competence, maturity, personality, temperament and emotions, experience, oral health, family background, culture etc., which influence their ability to survive with dental treatment. Children's dental anxiety and behaviour management problems (BMP) are concurrent with many factors of both internal and external origins. Dental anxiety of foreign origin has been pronounced as a simple conditioned phobia evolving from direct or indirect negative dental experiences.[1,2,3,4,5] Whereas dental anxiety of internal source, also categorized as a personality trait or endogenous anxiety, includes components related to the person rather than directly associated with dental care.[3,6,7]

Studies[1,4,5,8,9,10] have shown that the first dental visit is an essential variable in the subsequent development of children's attitudes or beliefs about dentists and dental treatment. Hence early recognition of dental anxiety among children is necessary for appropriate patient management and successful treatment because if it is not managed, it will possibly continue to adulthood. Some children are robust and tolerant in stressful situations and are not likely to present problems to the treating dentist, while others are vulnerable and may need various behaviour management techniques to feel at ease and to cooperate to dental treatment.[11]

There have been many measurements to assess anxiety in children, such as Frankl scale, physiological measures (e.g. pulse rate, basal skin response and muscle tension), projective techniques (e.g. children's dental fear picture test), and psychometric scales. Frequently used subjective measures are multiple, and single-item self-reporting questionnaires like the CDAS, MCDAS, DFS, and CFSS-DS have been shown to be reliable and valid in various languages.[12] Hence in the present study, we used the above questionnaires to measure anxiety levels.

Materials and methodology

Clearance was obtained from the institutional ethical committee and informed written consent was obtained from the parents of the children.

Inclusion criteria:

Children within the age of 4 to 6 years and first dental visit, primary molars with enamel caries, no history of pain and tenderness, radiographic evidence of intact lamina dura, no signs of internal or external root resorption were included.

Exclusion criteria:

Medically compromised patients, patients who decline to participate in the study, sharp continuous pain, fistula, abscess, swelling of the soft and periodontal tissues, pathological mobility, a large carious lesion with radiographic pulp exposure, radiographic diagnosis of inter-radicular or periapical radiolucency were excluded.

Methodology:

The study sample consisting of 60 children of age 4-6 years who met the above inclusion criteria were randomly divided into three groups of 20 each. Anxiety was measured using two questionnaires, i.e., modified $MCDAS_f$ and CFSS-DS immediately after entering the department. Three types of behaviour management techniques were performed separately for each group, as shown below. The total treatment procedure was performed by a single operator. The teeth were then restored with composite material without local anaesthesia. After completing the treatment procedure, once again to assess the anxiety levels during treatment, the children were asked to fill the questionnaire of modified $MCDAS_f$ and CFSS-DS for the second time.

Group I: TSD

Only Tell-Show-Do was performed, which is a fundamental principle used in paediatric dentistry. Here the child is gradually introduced to the instrument or procedure.

Group II: **TSD combined with pre-appointment**

Children accompanied by the parents who attended for a general check-up to the OPD were given a counselling for preparing their child for the first visit. On the first visit, only parents were counselled, and on the second visit after two days, children underwent TSD procedure followed by the treatment.

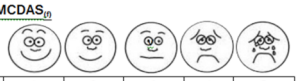
Group III: **TSD combined with video modelling**

Video modelling (filmed modelling) was performed in these children showing a five and half minute video of a six-year-old cooperative child undergoing restorative treatment procedure along with Tell-Show-Do procedure.

Scales used in the present study

1. Modified MCDAS$_f$ scale

Modified MCDAS$_{(f)}$



How do you feel about						
1	Going to the dentist generally	1	2	3	4	5
2	Having your teeth looked at	1	2	3	4	5
3	Having your teeth scraped and polished	1	2	3	4	5
4	Having an injection inthe gum	1	2	3	4	5
5	Having a filling	1	2	3	4	5
6	Having a tooth taken out	1	2	3	4	5

The Modified Child Dental Anxiety Scale (MCDAS) was developed by **Wong HM, Humphris GM and Lee GT (1998)**[13] based on Corah's Dental Anxiety Scale (CDAS).[14]

In the present study, the last two procedures (DGA, and RA) in MCDAS$_f$ scale were not included so as to minimize the complexity, and it was further modified by omitting the last two questions (from 8 questions to 6 questions). The total score of this modified MCDAS$_f$, range from 5 (little or no anxiety) to 30 (extreme anxiety).[15]

2. Shorter version of CFSS-DS scale

DENTAL ANXIETY SCALE-(CFSS-DS)

		Not afraid	Little afraid	Fairly afraid	Quite afraid	Very afraid
1	Having teeth taken out					
2	Injections					
3	The dentist drilling					
4	Meeting the dentist					
5	Having someone look into your mouth					
6	Having your teeth cleaned					
7	People in white uniform					
8	Having to open your mouth wide					

The Dental Subscale of Children's Fear Survey Schedule (CFSS-DS) was developed by **Cuthbert and Melamed** (1992),[16] consisting of 15 items and each item can be given scores ranging from "not afraid at all (1)" to "very much afraid (5)" which provides a total score range of 15 to 75. CFSS-DS contains some items that are minimally related to dentistry, such as "doctors", "going to the doctor", "a stranger touching you". Hence an 8 – itemed shorter version of the scale, derived from the CFSS-DS, by the exclusion of unrelated items, has recently been validated by many authors.[17,18,19] So in our present study, to reduce the cumbersome of filling a detailed questionnaire, a shorter form of CFSS-DS was taken. The total score of the shorter form of CFSS-DS ranges from 5 (not afraid at all) to 40 (very much afraid).

At the end of the study, data obtained were tabulated and statistically analysed in all three groups using Wilcoxon signed-rank test that calculates mean, S.D & Z-score of pre and postoperative values. Analysis performed for modified MCDAS$_f$ and modified CFSS-DS pre and postoperatively across gender was presented as mean + standard deviation using a Mann-Whitney test for all three groups. Between groups, analysis was done using Kruskal-Wallis test. Mann-Whitney test was done to analyze differences between two groups. For statistical significance, p values, less than 0.05 were considered.

RESULTS

The following results were obtained for all three groups.

Table 1: Descriptive statistics of pre and post anxiety scores and percentage reduction in anxiety using modified MCDASf and CFSS-DS scales using TSD.

TSD	Min	Max	Mean ±SD	% Reduction	Mean Ranks	Z score	P Value
MCDASf							
Pre	9.00	18.00	14.65±2.65	15.01	9.00	-3.652	<0.001*
Post	9.00	16.00	12.45±2.25		0.00		
CFSS-DS							
Pre	10.00	31.00	19.10±5.29	17.80	8.43	-3.311	0.001*
Post	10.00	20.00	15.70±2.93		2.00		

Significant at p< 0.005

Data obtained for percentage reduction between pre and post restorative treatment procedure for modified MCDASf was 15% and for CFSS-DS was 17.80% for TSD techniques, which showed a significant difference before and after application of the technique in table 1.

Table 2: Descriptive statistics of pre and post anxiety scores and percentage reduction in anxiety using MCDAS$_f$ and CFSS-DS scales in TSD combined with Pre-appointment.

TSD+ Preappointment	Min	Max	Mean ±SD	% Reduction	Mean Ranks	Z score	P Value
MCDAS$_f$							
Pre	9.00	21.00	14.10±3.21	12.05	9.36	-3.294	0.001*
Post	8.00	15.00	12.40±2.32		2.50		
CFSS-DS							
Pre	10.00	27.00	16.55±4.50	10.57	8.97	-3.206	0.001*
Post	10.00	22.00	14.80±3.17		9.50		

The above table showed 12.05% reduction in anxiety levels for MCDAS$_f$ and 10.57% for CFSS-DS between before and after treatment which was significant.

Table 3: Descriptive statistics of pre and post anxiety scores and percentage reduction in anxiety using MCDAS$_f$ and CFSS-DS scales in TSD combined with video modelling.

TSD+ video Modelling	Min	Max	Mean ±SD	% Reduction	Mean Ranks	Z score	P Value
MCDAS$_f$							
Pre	6.00	18.00	12.95±3.63	32.43	9.00	-3.632	< 0.001*
Post	6.00	13.00	8.75±2.04		0.00		
CFSS-DS							
Pre	11.00	31.00	18.90±5.12	42.59	10.50	-3.930	<0.001*
Post	8.00	15.00	10.85±1.98		0.00		

But whereas table 3 showed a huge reduction in percentage of anxiety when TSD was combined with video modelling ie., 32.43% for MCDAS$_f$ and 42.59% for CFSS-DS.

Table 4: Descriptive statistics of pre and post anxiety scores of MCDAS$_f$ among three groups. When MCDAS$_f$ values were observed for before and after treatment among all three groups, there was statistically significant difference between TSD and TSD combined with video modelling (p<0.001) and between TSD combined with pre-appointment and TSD combined with video modelling (p <0.001) and percentage reduction of 29.71% and 29.43% for MCDAS$_f$ and 30.89 % and 26.68 % for CFSS-DS were observed respectively in table 4 and table 5.

Groups		Mann Whitney U Score	P value	% Reduction
MCDAS$_f$ (Pre)				
TSD	TSD+Pre appointment	171.00	0.423**	
	TSD+video modelling	146.00	0.141**	
TSD+Pre appointment	TSD+video modelling	166.50	0.362**	
MCDAS$_f$ (Post)				
TSD	TSD+Pre appointment	198.50	0.967**	0.40%
	TSD+video modelling	44.50	<0.001*	29.71%
TSD+Pre appointment	TSD+video modelling	47.00	<0.0001*	29.43%

Table 5: Descriptive statistics of pre and post anxiety scores of CFSS-DS among 3 groups.

Groups		Mann Whitney U Score	P value	% Reduction
CFSS-DS (Pre)				
TSD	TSD+Pre appointment	143.50	0.125**	
	TSD+video modelling	191.00	0.807**	
TSD+Pre appointment	TSD+video modelling	144.50	0.132**	

CFSS-DS (Post)				
TSD	TSD+Pre appointment	161.50	0.295**	5.73%
	TSD+video modelling	35.50	<0.001*	30.89%
TSD+Pre appointment	TSD+video modelling	55.50	<0.0001*	26.68%

DISCUSSION

Dental anxiety has been identified in the international classifications of medical conditions under the section 'specific phobia'.

Hence it is always safe to assess the problems of the children, which would help in diagnosing dental fear in children more effectively and selecting the proper line of treatment. An anxious child in dental clinic poses a problem not only for himself but also for the family and dentist. Moreover, outcomes associated with the poor oral health may be grave. Unpleasant dental experiences occur more frequently in anxious and recalcitrant children as opposed to non-anxious children.

In the present study, girls had higher anxiety when compared with the boys who had been reported in other studies also.[2,20,21,22] But contrary to the present study there have been observed in other studies that boys had higher anxiety levels when compared with the girls and whereas different studies showed that gender might not predict dental anxiety by itself, but interaction with the other variables could predispose children to the problem.

With this shifting concept of treating children with behaviour management problems and current status of anxiety, the present study was designed to evaluate the effect of TSD, TSD combined with pre-appointment procedure and TSD combined with video modelling on anxiety in 4 – 6 years old children and also to assess effectiveness of three groups in reducing anxiety for younger age group children.

TSD technique is considered as the backbone of the child's education and behaviour guidance and is commonly used in the first appointment. Several epidemiological inquiries have revealed its positive effect on the reduction of dental anxiety. Hence in this study, other behaviour management techniques were combined with TSD to evaluate the effectiveness of the combined behaviour management procedures.

In this study, there was no significant difference between TSD and TSD combined with pre-appointment. Similar findings were observed in other studies.[23,24] In contrast to the above-mentioned finding, other studies have shown home preparation for the dental visit had better result than directly introducing the child to the clinic without prior training. Whereas a significant difference was observed between TSD and TSD combined with video modelling and between TSD combined with pre-appointment and TSD combined with video modelling. Similar observation was found concerning other studies.[25,26,27,28]

The reduction of fear in TSD combined with video modelling may be due to the observation of a filmed model that depicted positive behaviour during dental treatment and was, in turn, verbally and materially reinforced for cooperation in the modelling film. Exposure to the modelling film may familiarize the children to the sights, sounds and procedures that they will be subjected to. Hence the threat of unknown was reduced among these children, which intern has reduced their anxiety and negative responses toward an unfamiliar situation by fear extinction.

At the conference of the American Academy of Paediatric Dentistry 2003, several general principles were established to gauge the validity of behaviour-management techniques. These principles allowed us to assess the efficacy of video modelling technique used in this study as follows.[25]

- **Effectiveness:** It is the potential of the method to manage children's behaviour in the dentist's office. Children prepared with TSD combined with video modelling showed a higher percentage of anxiety reduction than children who were ready with TSD and TSD combined with the pre-appointment procedure.
- **Social validity:** Is the acceptance of the technique by parents, as well as public perception. Children accepted this procedure better than other group children.
- **Risks:** Associated with the method were reduced to a very greater extent.
- **Cost:** There was no cost application, and the time spent was least because children had understood the treatment procedure by the video.[25]

CONCLUSION

TSD, combined with video modelling, appeared to be effective and efficient at reducing dental anxiety, especially in younger children (4-6yrs) and has a significant impact on the acceptance of treatment. So TSD combined with video modelling can be made binding for children of 4-6yrs age group.

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