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Original Article

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Comparative Evaluation of Impact of Three Different Thaumaturgic Behaviour Modification Techniques in Reduction of Anxiety at Three Different Stages of Cognition in Children Aged 2- 13 Years – A Randomised Clinical Trial

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ABSTRACT

Aim: To assess and contrast the efficacy of thaumaturgic techniques with that of conventional techniques.
Materials and Methods: Three hundred and sixty children aged 2-13 years, identified as manifesting strong-willed behaviour were selected for the study. The children were randomly allocated to one of the thaumaturgic distraction techniques groups. Anxiety was assessed before and after the operative procedure using the facial anxiety scale.
Results: There has been a significant decrease in anxiety on usage of thaumaturgic techniques. The thumb and light trick and book trick significantly reduced anxiety in children aged 2-7 years, the book trick and item prediction trick significantly reduced anxiety in the children aged 7-11 and only the item prediction trick in children aged 11-13 years.
Conclusion: Thaumaturgic methods have been useful in controlling children's conduct throughout a range of age groups. The method of treatment, however, is crucial to its success.

Key Words: *Behaviour management, Dental anxiety, Facial pain rating scale, Pediatric dentistry, Thaumaturgy*

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INTRODUCTION

Behaviour management is just as important for successful treatment of children as are dental knowledge and abilities[1]. Uncooperative behaviour can greatly hamper the delivery of high-quality dental care, increase the risk of damage to the children, and ultimately leave the parents dissatisfied. The recalcitrant kid has been identified as one of the most challenging issues in clinical practice, according to surveys of clinicians [2]. Additionally, some studies showed that almost one in four children (22%) seen by paediatric dentists may have significant management issues [3]. As a result, the professional recognition of these issues considerably increased interest in behaviour management and sparked the creation of a well-recognized armamentarium for child behaviour management among dentists. Additionally, it paved the way for dental professionals to treat behaviour management with the same objectivity and respect as they do other areas of science in dentistry [4].

Dental anxiety is a widespread psychological and intuitive reactivity that is exaggerated in children. Uncooperative behaviour in the dental environment is a behavioural manifestation of anxiety. Such obstinate behaviour may have serious negative effects, such as therapy delays or early termination that lower the standard of care. There are a few methods for controlling disruptive behaviours, but there are none designed specifically for strong willed children [5].

Management of strong-willed children require a great deal of effort and a lot more time. Moreover, parents are becoming increasingly overprotective and indulgent, making it challenging to employ punitive treatments like hand over mouth exercise (HOME) and physical constraints [6]. As a result, pharmacological behaviour management strategies are superior to traditional techniques. There is a need for development of an effective strategy for management of obstinate kids.

In its Guidelines for Behaviour Management, the American Academy of Paediatric Dentistry (AAPD) later supported a number of behaviour management techniques for lowering patient anxiety in dental procedures in the years 1991–1992 [7]. Later, technology prompted reshaping of the traditionally offered solutions for the cooperative child, together with leading research on behaviour management techniques. This opened the way for the development of novel,

non-intrusive behaviour control strategies for children. Dental professionals may effectively manage children with behavioural difficulties and carry out successful treatment in a stress-free atmosphere because to these modern distraction methods' tremendous immersive, engaging, and innovative qualities [8].

In this study, a novel method for controlling strong willed children called thaumaturgy was employed. Isaac Bonewits defined thaumaturgy as "the use of magic for non-religious purposes; the art and science of wonder-working. Thaumaturgy is a tool that allows the dentist to execute necessary procedures while distracting and calming the child.The aim of the study is to assess and contrast the efficacy of thaumaturgic techniques with that of conventional techniques. The present study was undertaken to find out a possible relation between preoperative and postoperative anxiety levels of children. This scientific paper will give an outline on different techniques of thaumaturgy, their usage and the significance of using them as the anxiety level buster.

MATERIALS AND METHODS

The study was undertaken in the Department of Pedodontics and Preventive Dentistry, Indira Gandhi Government Dental College, Jammu. Three hundred and sixty healthy, strong-willed children between the age group 2 years and 13 years requiring dentaltreatment procedures were selected for the study. Only those children with a facial anxiety scale (FAS) score between 3 and 5 were included in this study. Children requiring emergency management and who did not have parental consent were excluded.

The children were categorized into three groups based on their cognitive development, i.e., 2–7, 7–11, and 11–13 years (Table 1).

Each Group was further divided into four groups, i.e., control group, thumb and light trick, book trick, and item trick. A Facial Anxiety Scale Score was recorded before and after local anesthetic administration.

Table 1: Sample Distribution

GROUPS	AGE GROUP		
	2-7 years	7-11 years	11-13 years
Control	30	30	30
Thumb trick	30	30	30
Magic book	30	30	30
Item prediction	30	30	30
TOTAL	120	120	120

Inclusion Criteria

- Children(Males and Females) between 2-14 years of age
- Children with facial anxiety scale (FAS) score between 3 and 5

Exclusion Criteria

- Medically or physically compromised children
- Children requiring emergency management
- Children who did not have parental consent

METHODOLOGY

Phase I

Preoperative anxiety assessment

Measured by facial anxiety scale (Fig. 1) and a particular score was recorded.

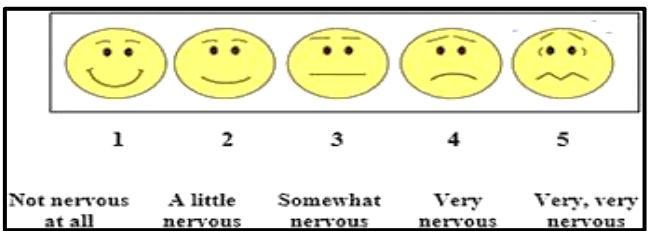

Fig 1: Facial anxiety scale

Phase II

Introduction of Thaumaturgic Aids [9]:

- Thumb and light trick:A thumbcoverincorporated with a lighting devicewas worn on the thumb of the operator and was activated/deactivated at the operator's will. To sustain the subject's interest various artistic movements were performed with it (Fig. 2).

Fig 2: Thaumaturgic aid-thumb sleeve

- Book trick: A colouring book which could display blank pages, black and white images, and coloured images sequentially on the same leaf was displayed to the subject and they were allowed to draw so as to sustain the subject's interest and negotiate with the subject's reasoning capability (Fig. 3).

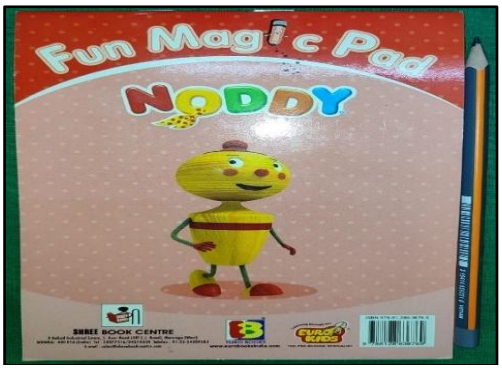

Fig 3: Thaumaturgic aid-magic book

- Item trick: Twelve different items (child safe toys: Animals) were displayed in front of the subject. A card is given to subject before the game having the name of one of the items on it. Item elimination formula was used to periodically eliminate one of these items in every round of the game until one item remained, which is the same item as on the cardgiven to the subject (Fig. 4).

Fig 4: Thaumaturgic aid-animal models

Phase III

Post operative anxiety assessment

Measured by facial anxiety scale and a score was recorded and compared with the pre operative anxiety score.

STATISTICAL ANALYSIS

The obtained data was calculated using relevant statistical tools such as Students t test and ANOVA. Mean results were evaluated statistically using IBM SPSS software 21. *p* value< *0.05* was considered as statistically significant.

RESULTS

The obtained data was calculated using relevant statistical tools such as Students T test. Mean results were evaluated statistically using IBM SPSS software 21. Students t test and ANOVA was used for comparison of the parameters. *P* value < *0.05* was considered as statistically significant.

There has been a significant decrease in anxiety on usage of the thumb and light trick and book trick in the 2–7yearage group, the book trick and item prediction trick in the 7–11year-old age group and only the item prediction trick in the 11-13 year old age group as depicted in the Table 2 and Table 3.

The post operative comparison between all the groups was statistically significant with p value < 0.0001 (Table 2, Fig. 5 and Fig. 6). The intra group comparison of preoperative and post operative values was significant for all the groups in 2–7 year age group, was significant for Magic book and item prediction in 7-11 year age group and was significant for item prediction trick in case of 11- 14 year age group with p value < 0.0001 (Table 2). The pair wise comparison between the control and test groups was also statistically significant with p value < 0.0001 (Table 3).

Table 2: Comparisons between all the groups

Age	Time period	Control		Thumb trick		Magic book		Item prediction		p-value
		M	SD	M	SD	M	SD	M	SD	
2-7 years	Pre-op	4	0	4.05	0.80	4.1	0.7	4.1	0.7	0.946
	Post-op	4	0.63	1.15	0.72	1.6	0.66	2.8	0.6	0.0001*
	p-value	1		0.0001*		0.0001*		0.0001*		
7-11 years	Pre-op	3.8	0.89	3.9	0.72	3.9	0.72	4.2	0.61	0.358
	Post-op	4.2	0.77	3.6	0.50	1.7	0.66	1.8	0.77	0.0001*
	p-value	0.189		0.055		0.0001*		0.0001*		
11-13 years	Pre-op	3.7	0.86	4	0.79	4.2	0.77	3.9	0.72	0.197
	Post-op	4.2	0.77	3.8	0.41	3.9	0.55	1.6	0.68	0.0001*
	p-value	0.149		0.258		0.163		0.0001*		

*Statistically significant

Table 3: Inter group comparison

Age	Control vs Thumb trick (p-values)		Control vs Magic book (p-values)		Control vs Item prediction (p-values)	
	Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op
2-7 years	0.0001*	0.0001*	0.0634	0.0001*	0.0634	0.0001*
7-11 years	0.2555	0.0001*	0.2555	0.0001*	0.0001*	0.0001*
11-13 years	0.0002*	0.0001*	0.0001*	0.0001*	0.0080*	0.0001*

*Statistically significant

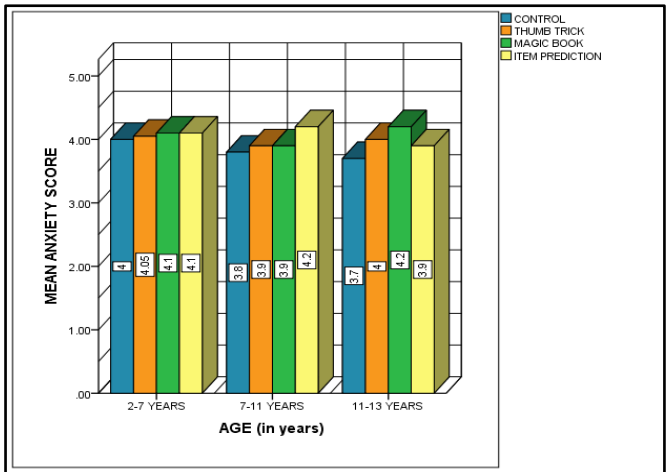

Fig 5: Pre-operative

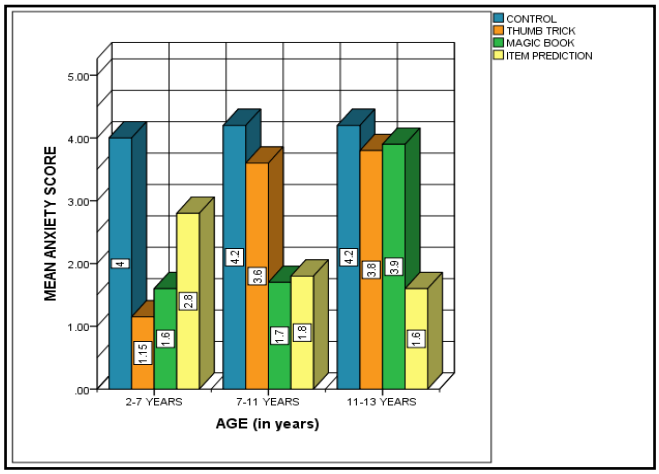

Fig 6: Post-operative

DISCUSSION

The graphical representation of results of the study (Fig. 5 and Fig. 6), conclude that there was a significant positive behavioural change of the subjects toward dental treatment with the use of thaumaturgic techniques. The method that was adopted was greatly influenced by the children's cognitive growth. When the thaumaturgic procedures were applied effectively, the subjects comprehended aptly, since the method was designed particularly for a cognitive age group.

Brain comprises of two hemispheres, the left and the right, and each has distinct role assigned to it. In right-handed people, the left hemisphere is characterized with verbal and voluntary skills. On this side Language, speech analysis, and problem- solving are mediated. The right side is linked with non-verbal skills and emotions. Art and music, are right hemisphere activities. The right hemisphere is also thought to be associated with imagination [10]. As a result, when thaumaturgic procedures are used, the right hemisphere of the brain plays a vital role. Thaumaturgy is defined by Isaac Bonewits as “the use of magic for non-religious purposes; the art and science of wonder-working” [11].

In the 2- to 7yearage group, the thumb and light trick and the book trick lowered anxiety. This is due toright hemisphere being more developed in childrenof this age group. This age group of childrenvisualised light coming and dissipating as a magical occurrence. Similar results were obtained from the book trick's sequential image development. When the local anaesthetic treatment was carried out, the child was pondering over the trick due to thaumaturgic impact. These techniques instilled a positive behaviour and made the children more cooperative. In the 7- to 11-year-old age group, the book trick and item trick significantly decreased anxiety when compared to the thumb trick. The left hemisphere of the brain responsible for semi-logical reasoning, analytical thinking, and verbal skills is matured at this age group. The older the subjects, the more curious they were to understand the reasoning behind the trick, but they were still unable to do so. The respondents remained interested and fascinated during the dental operation since they were unable to figure out the trick.

In the 11- to 13-year-old age group, both hemispheres of the brain are well matured. Any circumstance presented to the children of this age group may be projected using hypothetical reasoning. Hence, only the item trick was effective in reducing the anxiety. The cognitive level and the distracting trick used to divert the subjects played a great role in instilling a positive attitude and resulting in cooperative behaviour in the subjects.

This study employed the FAS, that eliminated chances for operator bias and produced more reliable results as subjects reported the score of anxiety in the first person. Thumb and light trick had to be continued for prolonged periods to maintain desirable behaviour in children of 2-4 age group as they had a shortened attention span.

Peretz and Gluck [12], used a magic book for non-invasive dental examination proceduresto evaluate behaviour change in children between the ages of 3 and 6 years. They used Frankel rating scaleto measure anxiety. However, three thaumaturgic techniques were used in our study at three different stages of cognition and for the measurement of anxiety more reliable subjective assessment tools were used. It resulted in reduction of dental anxiety levels and enhanced positive behaviour in children.

Mili Meghpara [13], Modifications of behaviour management strategies pre- and post-covid-19 scenario: A survey among pediatric dentists regarding conventional techniques like Tell-Show-Do were popular in both pre- and post-COVID-19 times with minor modifications in approach, but conscious sedation and distraction techniques were evaluated to have gained more popularity in the post-COVID-19 times along with exploration of new novel techniques like thaumaturgy.

CONCLUSION

Thaumaturgic methods have been useful in controlling children's conduct throughout a range of age groups. The method of treatment, however, is crucial to its success. In conventional paediatric care, thaumaturgy is utilised as the only effective form of behaviour modification. Thaumaturgy can be used to manage both surgical and non-invasive procedures and change undesirable behavioural patterns into more desired ones. Regardless of the child's attitude toward dental operations, thaumaturgy has demonstrated to be a revolutionary behaviour shaping strategy precisely crafted to improve the clinical outcome of dental therapy.

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