



## ASSESSMENT OF DENTAL ANXIETY IN CHILDREN AND MOTHERS DURING FIRST DENTAL VISIT

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### ABSTRACT

**Introduction:** Anxiety and fear are common in routine dental practice. Physiological changes in the body such as changes in the heart rate, blood pressure and oxygen saturation are inevitable results of anxiety.

**Aim And Objectives:** To evaluate the behavior changes in children aged 4-6 years and correlate the physiological variations in children and their mothers during first dental visit, and assess the influence of maternal anxiety on child's anxiety.

**Materials And Methods:** 60 children of 4-6 years accompanied by their mother visiting the Department of Paedodontics and Preventive dentistry for the first time were selected. Frankle's behavior rating scale was used to record behavior of children. The blood pressure and heart rate was measured with digital blood pressure and heart rate monitor with wrist cuff and oxygen saturation with pulse oximeter and same were used to evaluate the physiological variations in the mother.

**Result:** Significant Changes in systolic blood pressure and heart rate in children ( $p=0.0001$ ,  $p=0.0001$ ) were observed while waiting and on completion of the procedure with gradual lowering of blood pressure and heart rate after procedure ( $p=0.0001$ ). Mothers were anxious while waiting and less anxious after procedure ( $p=0.0001$ ,  $p=0.0001$ ).

**Conclusion:** Majority of the children exhibited high anxiety initially while waiting. The anxiety gradually diminished after procedure which was observed through their positive behavior. Maternal anxiety was high while waiting which gradually lowered after procedure the procedure. Hence concluded that maternal anxiety does have some impact on the child's anxiety at least initially.

### KEYWORDS :

#### INTRODUCTION:

Anxiety is usually classified as a disorder of neurotic nature and is often related to context of stress, with symptoms that may include worries, motor tension and even autonomic hyperactivity<sup>[1]</sup>. The word emotion is not only related to joy, anger, fear, or sympathy but encompasses a whole lot of feeling and their interaction.<sup>[2]</sup> Prediction of any uncomfortable situation invokes a feeling of fear which can be grouped as anxiety.

Anxiety related to dental treatment is well known. Dental anxiety is multifactorial, and is far more complex than can be explained by a single contributing factor. There is quite variation in international literature for prevalence of childhood dental anxiety in different population and age group i.e 3% to 43%.<sup>[3,4,5]</sup> Usually the common perception in relation to dental treatment is pain and discomfort, and their perception affects the behavior of pediatric dental patient. Dental anxiety presents a challenge to the child, parents and the dental team. This leads to difficulty in behavior management, avoidance of dental care, and poorer oral health outcomes<sup>[6]</sup>. So to overcome these problems and provide appropriate diagnosis and treatment and to instill a positive attitude toward dental treatment in children it is necessary to assess dental anxiety.<sup>[7]</sup>

Dental anxiety is a complex phenomenon that is influenced by personality characteristics, fear of pain, traumatic dental

experiences in childhood and dentally anxious family members or peers<sup>[14,15]</sup>. Parental and child dental fear has a significant relation<sup>[16]</sup>. Children are also prone to anxiety as of adults and the possible reason behind their development of anxiety is from peer communication of reported bad experiences or even from threats that parents make.<sup>[17]</sup> So the clinical and psychological management becomes more difficult due to different understanding levels of children. Lee et al. suggested that the anxious behavior of adults during dental treatment may have been acquired through childhood fears, which would therefore require dentists to properly handle child patients.<sup>[18]</sup>

Mothers are usually blamed for the child's anxiety. However sequel reaction of parental dental anxiety on their children dental anxiety is a controversial issue among researchers. According to Goettems ML et al, Leal AM et al, Tong HJ et al<sup>[8,9,10]</sup> there is a direct relation whereas according to Ten Berge M et al, Cox IC et al cannot confirm the finding.<sup>[11,12]</sup> Presence of anxious people around children may be the reason for the development of anxiety in them<sup>[13]</sup>. Unavoidable result of anxiety is changes in the physiological parameters like heart rate, blood pressure and oxygen saturation. Afferent fibers carry stressful stimuli from sense organs to the CNS. From there adrenal medulla is directly stimulated through preganglionic sympathetic fibers which in turn releases several stress hormones like adrenaline and this increases the blood pressure.

Sympathetic stimulation increases directly the heart rate<sup>[19]</sup>. So recognizing and managing children/ patient's anxiety and behavior is very important aspect for doing a successful dental treatment. Frankl's behavior rating scale, is commonly used scale in dentistry due to its ease of learning and usage, allows quick classification of child patient in one of the four categories: definitely negative, positive, negative, and definitely positive.<sup>[20,21]</sup> In multiple visit child's response have been studied in relation to dental treatment<sup>[22,23,24]</sup>. Child's response is found to be improved with subsequent visit by many researchers but according to Venham et al response pattern was very complicated in multiple visits.<sup>[23,24]</sup> This study aims to assess the changes in anxiety pattern of children and their behavior during first dental visit i.e. while waiting, during procedure and after procedure. Another important aspect of this study is to assess the anxiety pattern in mothers during first dental visit. This might help to assess influence of maternal anxiety extend along the course of treatment of children.

## MATERIAL AND METHODS:

A cross-sectional descriptive study was conducted in

Department of Pedodontics and preventive dentistry with a sample size of 60 between the age group of 4 to 6 years reporting to the department for the first time accompanied by the mother's. Ethical clearance was obtained from the Institutional Ethical Committee. Parent's consent and child's assent were obtained. Children and mothers with any systemic condition, children requiring emergency line of treatment and not willing to participate were excluded. Physiological parameters like heart rate, blood pressure and oxygen saturation were recorded both for child and mother using wrist cuff and pulse oximeter while waiting, during procedure and after procedure. A simple procedure of oral prophylaxis was carried out. Child behavior was recorded while waiting, during procedure and after procedure. Behavior was recorded with Frankl's Behavior Rating Scale.

Statistical analysis was done by using descriptive and inferential statistics using chi-square test and student's paired t test and software used in the analysis were SPSS 22.0 version and Graph Pad Prism 7.0 version and  $p < 0.05$  is considered as level of significance.

**TableNo:1 Comparison Of Physiological Parameters In Children**

Comparison of Systolic Blood Pressure for children		Paired Differences							
					95% Confidence Interval of the Difference		t	df	p-value
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
	Waiting-During Procedure	11.00	6.68	0.86	9.27	12.72	12.73	59	0.0001,S
	Waiting-After Procedure	16.25	7.95	1.02	14.19	18.30	15.82	59	0.0001,S
	During Procedure-After Procedure	5.25	7.88	1.01	3.21	7.28	5.15	59	0.0001,S
Comparison of Diastolic Blood Pressure for children	Waiting-During Procedure	1.95	3.92	0.50	0.93	2.96	3.84	59	0.025,NS
	Waiting-After Procedure	5.20	6.92	0.89	3.41	6.98	5.81	59	0.021,NS
	During Procedure-After Procedure	3.25	6.28	0.81	1.62	4.87	4.00	59	0.011,NS
Comparison of Oxygen Saturation for children	Waiting-During Procedure	0.15	1.16	0.15	-0.15	0.45	1.00	59	0.321,NS
	Waiting-After Procedure	0.55	1.40	0.18	0.18	0.91	3.02	59	0.014,NS
	During Procedure-After Procedure	0.40	1.12	0.14	0.10	0.69	2.75	59	0.028,NS
Comparison of Heart Rate for children	Waiting-During Procedure	9.85	7.50	0.96	7.91	11.78	10.17	59	0.0001,S
	Waiting-After Procedure	24.60	8.72	1.12	22.34	26.85	21.84	59	0.0001,S
	During Procedure-After Procedure	14.75	8.87	1.14	12.45	17.04	12.87	59	0.0001,S

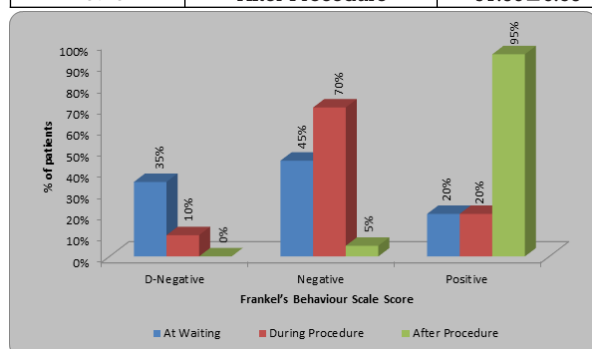
**TableNo:2 Comparison Of Physiologic Parameters In Mothers**

Comparison of Systolic Blood Pressure for mothers		Paired Differences							
					95% Confidence Interval of the Difference		t	df	p-value
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
	Waiting-During Procedure	9.25	8.77	1.13	6.98	11.51	8.16	59	0.0001,S
	Waiting-After Procedure	13.00	7.20	0.92	11.13	14.86	13.98	59	0.0001,S
	During Procedure-After Procedure	3.75	5.72	0.73	2.27	5.22	5.07	59	0.0001,S
Comparison of Diastolic Blood Pressure for mother	Waiting-During Procedure	3.85	4.82	0.62	2.60	5.09	6.17	59	0.031,NS
	Waiting-After Procedure	5.25	6.06	0.78	3.68	6.81	6.70	59	0.021,NS
	During Procedure-After Procedure	1.40	4.28	0.55	0.29	2.50	2.53	59	0.014,NS
Comparison of Oxygen Saturation for mothers	Waiting-During Procedure	0.30	0.78	0.10	0.09	0.50	2.95	59	0.025,NS
	Waiting-After Procedure	0.95	2.22	0.28	0.37	1.52	3.31	59	0.032,NS
	During Procedure-After Procedure	0.65	2.32	0.30	0.04	1.25	2.16	59	0.0345,NS

Comparison of HeartRate for mother	Waiting-DuringProcedure	9.95	5.32	0.68	8.57	11.32	14.48	59	0.0001,S
	Waiting-AfterProcedure	20.20	6.29	0.81	18.57	21.82	24.85	59	0.0001,S
	DuringProcedure-AfterProcedure	10.25	6.71	0.86	8.51	11.980	11.81	59	0.0001,S

**TableNo:3 Comparison Of Physiologic Parameters Among Children And Mothers**

		Child	Mother	CV(%)Child	CV(%)Mother	t-value
Comparison of SBP among child and mother	Waiting	122.50±9.50	131.50±7.98	7.75	6.06	5.61p=0.0001,S
	During Procedure	111.50±7.49	122.25±5.16	6.71	4.22	9.15p=0.0001,S
	AfterProcedure	106.25±8.85	118.50±4.80	8.32	4.05	9.41p=0.0001,S
Comparison of DBP among child and mother	Waiting	76.20±4.70	80.98±4.69	6.16	5.79	5.57p=0.0001,S
	During Procedure	75.90±5.20	80.91±4.71	6.85	5.82	5.53p=0.0001,S
	After Procedure	75.88±5.15	80.33±4.75	6.78	5.91	4.91p=0.0001,S
Comparison of oxygen saturation among child and mother	Waiting	95.93±3.24	97.35±2.23	3.37	2.29	2.78p=0.006,S
	During Procedure	96.25±2.39	97.26±2.26	2.48	2.32	2.39p=0.018,S
	After Procedure	96.21±2.39	97.25±2.24	2.48	2.30	2.49p=0.016,S
Comparison of heart rate among child and mother	Waiting	106.50±7.93	102.10±7.27	7.44	7.12	3.16p=0.002,S
	During Procedure	96.65±9.33	84.68±4.89	9.55	5.77	8.79p=0.0001,S
	After Procedure	81.90±6.89	84.68±4.83	8.41	5.70	2.56p=0.012,S

**Graph1: Comparison Of Frankel's Behavior Scale Score****DISCUSSION:**

Anxiety is a fear of unknown, which is a form of emotion, and is associated with changes in blood pressure and heart rate. Anxiety can be seen from two different aspect i.e psychological and physiological aspect. [25] It is been proved that stress produces anxiety, which activates a chain of physiological reactions which ultimately affects the heart rate and blood pressure [26] Any of the senses like sight, smell, sound, touch or taste may produces the physiological variation. Afferent fibers carry the sensations from sensory organs to CNS. Adrenal medulla is stimulated by preganglionic sympathetic fibers there by secreting stress hormones. This profoundly causes increase in blood pressure. [27] Emotional outburst associated with fear can produces changes in heart rate, blood pressure, even can cause frank fainting and death. [28]

Johnson and Baldwin was one of the first to identify a positive and significant correlation between maternal anxiety and the repertoire of behavior of children who were undergoing treatment. [29] Anxiety among children and their mothers during dental treatment is one of the challenges faced by the dentist. Hence it is important to assess the patient's anxious behavior, so that technique for achieving clinical security may be applied. [30]

The results of this study clearly showed a statistically significant change in the systolic blood pressure and heart rate of children (P=0.0001,P=0.0001,P=0.0001), (P=0.0001, P=0.0001, P=0.0001) respectively and mothers (P=0.0001,

P= 0.0001, P=0.0001), (P= 0.0001, P=0.0001, P=0.0001) respectively while waiting, during procedure and after procedure.[Table no 1, 2] According to Best and Taylor [31] emotional excitement tends to increase arterial blood pressure, particularly the systolic phase and heart rate also increased. Increase in systolic blood pressure and heart rate initially i.e while waiting may be due to the fear of unknown. Venham and Quatrolli [24] stated that fear of unknown is responsible for the initial reaction of a child to dental visit. And also Venham et al [23] concluded that during initial visit, child showed a higher negative behavior, and the initial dental experience sensitizes the child to the dental treatment.

It was observed in our study that there was gradual lowering of blood pressure and heart rate of children after procedure. Might be after initial commencing i.e after oral examination and a simple procedure of oral prophylaxis the children probably got sensitized to the environment and dental setting which might have resulted in their near to normal physiological paramaters and positive behavior after procedure. There was no significance found with diastolic blood pressure and oxygen saturation of children and mothers. [Table no: 1, 2]

Comparison of Frankle's behavior rating scale (graph: 1) score showed that children showed definitely negative behavior while waiting (i.e 35%) and gradually their behavior was positive after procedure. Initial definitely negative behavior may be due to new environment and a fear of procedure to be carried out on them.

Ripa (1979) concluded that in almost all children and especially in pre-school children some degree of apprehension or anxiety is experienced during their dental visit. [32] Taylor et al stated that negative behavior of pre-school children in initial phase of treatment was due to separation anxiety and fear of unknown. [33]

The physiological changes in mother and children showed the similar pattern [Table no: 1, 2]. Maternal anxiety imparts some form of fear to their children which are manifested as changes in systolic blood pressure and heart rate. Mother's higher physiological parameters, gradually came to the normal or near normal during procedure and after procedure. The initial anxiety may be due to the anticipation of the dental procedure and fear of unknown. And on seeing their children's improving attitude towards the treatment,

might have gradually reduced their anxiety.

However the results of the study cannot be generalized due to small sample size, study with larger sample size should be carried out.

## CONCLUSION:

Supported with the knowledge of child's anxiety, application of appropriate behavior management technique becomes easier. This facilitates to provide best treatment to the child patient and helps to instill a positive attitude towards the dental treatment.

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