

### **Effectiveness of Dental Game Apps In Managing Anxiety In Pediatric Dental Procedures**

<sup>1</sup>Dr.Harshitha.K, Post-Graduate, Department of Pedodontics and Preventive dentistry, Yenepoya Dental College and hospital, Yenepoya university, Mangalore (575018), Karnataka

<sup>2</sup>Dr.Ajay.Rao.H.T, Professor, Department of Pedodontics and Preventive dentistry, Yenepoya Dental College and hospital, Yenepoya university, Mangalore (575018), Karnataka

<sup>3</sup>Dr.Sham.S.Bhat, Vice Principal, Professor, Department Of Pedodontics and Preventive dentistry, Yenepoya Dental college and hospital, Yenepoya university, Mangalore (575018), Karnataka

<sup>4</sup>Dr .Afreen Shabbir, Reader, Department of Pedodontics and Preventive dentistry, Yenepoya Dental College and hospital , Yenepoya university ,Mangalore(575018),Karnataka

**Corresponding Author:** Dr. Harshitha.K, Post-Graduate, Department of Pedodontics and Preventive dentistry, Yenepoya Dental College and hospital, Yenepoya university, Mangalore (575018), Karnataka

**Citation of this Article:** Dr.Harshitha.K, Dr.Ajay.Rao.H.T, Dr.Sham.S.Bhat, Dr .Afreen Shabbir, “Effectiveness of Dental Game Apps In Managing Anxiety In Pediatric Dental Procedures”, IJDSIR- September - 2020, Vol. – 3, Issue - 5, P. No. 423 – 427.

**Copyright:** © 2020, Dr. Harshitha.K, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

#### **Abstract**

**Aim and objectives:** The aim of the study was to compare the child’s anxiety before and after the use of dental game app.

**Materials and Methodology:** 68 children of age 7 -12 years were made to use ‘dentist game’, which is a mobile dental game app developed by Mazarredo, available in google play store on android smart phones. The anxiety levels were recorded before and after playing the game using the modified dental anxiety scale.

**Results:** The results were found to be highly significant; 36.8% for high anxiety & low anxiety was 63.2%, were as after the treatment high anxiety reduced to 0% and low anxiety was 100% .

**Conclusion:** The use of mobile game dental app was found to reduce the anxiety and fear of the paediatric patients in dental setup.

**Keywords:** Mobile Phone, Dental Game App, Modified Dental Anxiety, Pediatric, Airtor.

#### **Introduction**

The greatest challenge that dentist is facing today is managing paediatric patients in a dental clinic .Children found to be so anxious these days as they consider the dental clinic to be a very scary place to visit. False information from the peer, media and even the parents have created an objective fear and anxiety within many children. Dental anxiety is a state of apprehension that something dreadful is going to happen in relation to the

dental treatment and it is coupled with a sense of losing control [1]. In order to reduce dental anxiety among children behavioural management techniques are implemented. The basic techniques of behaviour management used to reduce child's anxiety are telling show do (TSD), positive reinforcement, nonverbal communication voice control and distraction [2].

Distraction is a method of behaviour management in which the patients are distracted from the sound or sight of the dental treatment thereby reducing the anxiety. With the advancement in technology, a standard mobile device has gone from being no more than a simple two-way to being a mobile phone, GPS navigation device, an embedded web browser, instant messaging, and a hand held game [3]. Generally seen that children from all the age groups, be it a toddler to a teenager are stuck up to the mobile phone playing games or browsing internet.

Hence mobile phones can be used in favour of pediatric dentistry for educating the patients about the treatment procedures which can help in reducing their fear or anxiety. Therefore, the aim of the study was to compare the child's anxiety before and after the use of dental game app.

## Materials and Methods

A total of 68 patients, between 7 to 12 years selected from the Department of Paedodontics, Yenepoya dental college, Mangalore. The candidates with good general health and with no history of systemic illness or hospitalization. Children undergone class 1 restoration in any of these visits was included in this study. Children with systemic diseases, Visual and hearing impairment and mental retardation were excluded from this study. Materials required were Modified Dental Anxiety Scale, Dentist game, Smart mobile phone, Gloves, Mouth mirror, Probe, Airtor, burs, Excavators, Restorative cement, Cotton and gauge

This experimental study was conducted after obtaining the institutional ethical committee clearance and informed written consent from the patients or parents of the selected subjects. After obtaining the consent, parents were given a brief introduction about the procedure and purpose of the study. There was a set of data assessment. The first assessment was done before the treatment using modified dental anxiety scale. During the using modified dental anxiety scale. During the procedure dentist game app was given. Then second assessment was carried out after the treatment using modified dental anxiety scale Fig(1). Finally anxiety level of children were compared.

The image shows a questionnaire titled "Modified Dental Anxiety Scale". The instructions are: "CAN YOU TELL US HOW ANXIOUS YOU GET, IF AT ALL, WITH YOUR DENTAL VISIT? PLEASE INDICATE BY INSERTING 'X' IN THE APPROPRIATE BOX". There are five questions, each with five response options: "Not Anxious", "Slightly Anxious", "Fairly Anxious", "Very Anxious", and "Extremely Anxious".

Question	Not Anxious	Slightly Anxious	Fairly Anxious	Very Anxious	Extremely Anxious
1. If you went to your Dentist for TREATMENT TOMORROW, how would you feel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. If you were sitting in the WAITING ROOM (waiting for treatment), how would you feel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. If you were about to have a TOOTH DRILLED, how would you feel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 1: shows Modified dental anxiety scale Dentist game-Dental game app

This is a smart phone game which demonstrates and educates various dental procedures to the children such as use of airtor, forceps, Local anesthesia, scaling. Developed from Mazarredo, 69 3<sup>a</sup> Bilbao CP 48009 Bizkaia Fig(2), Fig(3).



Fig. 2: Shows dentist games



Fig. 3: Shows dental instruments in dentist game

**Result**

The obtained data were entered into standardized form and were statistically analysed using SPSS version 21.0. T – test was applied for comparison of before and after the use of modified dental anxiety scale with and without using dental game apps where P value was 0.0001 which was statistically significant.

**Table 1 T-test**

	N	Mean	SD	Median	Change (%)	T test P value	
Before treatment - Total score	68	14.38	4.66	13.50	55.21	0.0001	HS
After treatment -Total score	68	6.44	2.03	5.00			

High significant difference was seen,(p-value=0.0001)

Before the treatment; anxiety score was 14.38±4.66 & after the treatment it was 6.44±2.03. This showed 55.21% reduction after the treatment compared to before treatment and was highly significant with P=0.0001.

**Table 2: shows Comparison of anxiety level before and after the use of dental game app**

		Count	Column N %
Before - Total score	High anxiety	25	36.8%
	Low anxiety	43	63.2%
	Total	68	100.0%
After -Total score	High anxiety	0	.0%
	Low anxiety	68	100.0%
	Total	68	100.0%

Before the treatment 36.8% for high anxiety & low anxiety 63.2%, whereas after the treatment high anxiety reduced to 0% and low anxiety increased to 100%.

**Discussion**

The integral component in pediatric dental practice is managing of a child’s behaviour. The fundamental method to achieve success in treating a child is based on knowledge of dental materials ,hand piece skills and most important is behavioural management [4]. The aim of behavioural management technique is to enhance child’s acceptance and cooperative towards dental treatment [5]. This ultimately helps in reducing child’s fear and anxiety towards dental treatment such as use of hand piece. To establish communication, build a trusting relationship between child, dentist and parent and to reduce anxiety and fear behavioural management techniques are induced by pediatric dental practitioners. This encourages the child to build positive attitude towards oral and dental health care, by coping up and willing to understand ,undertake dental procedures for treatment [6-8]. In present condition,there are wide variety of behavioural management technique for pediatric dental practitioners such as densensitization, tel-show-do, positive

reinforcement, modeling, distraction, voice control, nonverbal communication and general anesthesia. Parallel to the mentioned above techniques smart mobile offers opportunity to track emotional changes and regular behaviour.

Dental tools as mobile game app educate children about restoration, scaling and extractions. The present study explains regarding restoration, scaling and extractions. The evolution of computers and electronic based application gave rise to smart phones .Smart phones has dental as well as mental health apps which benefits in cost effectiveness, can collect date through online [9]. According to the India’s latest survey ,the internet users are 34.8% [10]. So this can challenge to spread the technology based knowledge effectively and equally. Another benefit of mobile application is that,it is available in all languages including English. In the present study 7-14years children included in study where they can understand English .This study supports various authors that smart phone dental game app technique are effective tool to reduce dental anxiety in children The most concern in children is preoperative anxiety .Preoperative anxiety is expressed in form of fear of separate from caretaker or mother and fear towards unknown where as fear of mutilation and death is observed in children. Around 40-60% of children undergoing dental procedures experiences preoperative anxiety [11,12].

Preoperative anxiety have negative impact on children such as emergence delirium, postoperative pain, uncooperative behaviour or pre-operative analgesia. Signs in preoperative anxiety includes sleep disturbance, increased muscle tone ,escape behaviour and agitation [11]. In this study post treatment anxiety was reduced when compared to pretreatment anxiety after the use of mobile dental game app. This is because dental game apps might have influenced and educated the children regarding

treatment and have contributed significantly for behaviour management during procedure .Playing mobile games can allow a child to experience an interactive reward-dependent and might act as an attractive option for pretreatment exposure.

### Conclusion

The use of mobile game dental app was found to reduce the anxiety and fear of the paediatric patients in dental setup. Henceforth we can conclude that mobile dental game application could be used as an adjunct behaviour management technique.

### References

1. Graziano AM, DeGiovanni IS, Garcia KA. Behavioral treatment of children's fears: A review. *Psychol Bull* 1979;86:804-30.
2. Locker D, Thomson WM, Poulton R. Onset of and patterns of change in dental anxiety in adolescence and early adulthood: A birth cohort study. *Community Dent Health* 2001;18:99-104.
3. Wright GZ, Stigers JI. Non-pharmacologic management of children's behaviors. In: Dean JA, Avery DR, McDonald RE, editors. *Dentistry for the Child and Adolescence*. 9th ed.. St. Louis: CV Mosby Co.; 2011. p. 30.
4. Roberts JF, Curzon ME, Koch G, Martens LC. Review: Behaviour management techniques in paediatric dentistry. *Eur Arch Paediatr Dent* 2010;11:166-74.
5. Viechtbauer W, Smits L, Kotz D, Budé L, Spigt M, Serroyen J, et al. A simple formula for the calculation of sample size in pilot studies. *J Clin Epidemiol* 2015;68:1375-9.
6. Pinkham JR. Behavioral themes in dentistry for children: 1968-1990. *ASDC J Dent Child* 1990;57:38-45.
7. Oliver K, Manton DJ. Contemporary behavior management techniques in clinical pediatric dentistry: Out with the old and in with the new? *J Dent Child (Chic)* 2015;82:22-8.
8. Crossley ML, Joshi G. An investigation of paediatric dentists' attitudes towards parental accompaniment and behavioural management techniques in the UK. *Br Dent J* 2002;192:517-21.
9. Musselman RJ, Dummett Co Jr. Hospitalization and general anesthesia for behavior control. In: Ripa LW, Barenie JT (eds). *Management of Dental Behavior in children*. Littleton: PSG Publishing, 1979. p. 205-8.
10. American Academy on Pediatric Dentistry Clinical Affairs Committee-Behavior Management Subcommittee; American Academy on Pediatric Dentistry Council on Clinical Affairs. Guideline on behavior guidance for the pediatric dental patient. *Pediatr Dent* 2015;30 7 Suppl:125-33.
11. Wollin SR, Plummer JL, Owen H, Hawkins RM, Materazzo F. Predictors of preoperative anxiety in children. *Anaesth Intensive Care* 2003;31:69-74.
12. Kain ZN, Mayes LC, Caldwell-Andrews AA, Karas DE, McClain BC. Preoperative anxiety, postoperative pain, and behavioral recovery in young children undergoing surgery. *Pediatrics* 2006;118:651-8