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Effect of Utilization of Intra –Oral Camera on Oral Health Promotion in Children of Mosul City
Utilization of Intra –Oral Camera for Oral Health Promotion in Children of Mosul City

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ABSTRACT
Aim of the study To determine the effect of intra oral camera on pediatric patient during dental appointment on oral health promotion, education and motivate children to establish better oral hygiene measure. **Materials and Methods.** The sample of current study consisted of (40) children**.** Demographic information was obtained for all the children's parent before examination regarding name, age, gender. The inclusion criteria include children had good general health, ages between 7-10 years for both gender, not received any dental treatment before, they were randomly divided into two groups; a control group without the use of intra oral camera (CTR-group) (60)and an intraoral camera group (IOC-group)(60).**Results** The values of mean, maximum and minimum are different between the control and study group and the comparison of mean values of heath promotion for the children in each group by one way analysis of variance (ANOVA) test, and the results showed that there were a statistically significant differences within and in between each group ($p \leq 0.05$) as there were in systole(0.037) and diastole(0.003) blood pressure and heart rate(0.025).**conclusion** The results of the present study showed that use of IOC as education and distraction was effective in decreasing pain perception and state anxiety level in children without anxiety disorders during routine dental treatment .

Key word Promotion, Children Dental Education , Intra Oral Camera.

I. INTRODUCTION

Oral disease is still a prime public health problem in high income nations and encumbrance of oral disease is growing in many low- and middle-income nations . Oral diseases can lead to irreversible destruction and unnecessary pain, and further result in general health problems, dental anxiety, depression, lost school time and poor quality of life, low self-esteem [1 2 3] .

Special disclosing agents containing dyes or other coloring agents, namely basic fuchsine , iodine, erythrosine, fast green, gentian violet, fluorescein, food dyes, and two-tone disclosing agents in the form of solutions, tablets, mouth rinses or wafers can be used in health promotion[4].

Disclosing agents are used in various aspects: to personalize the patient instruction and motivation, to evaluate the effectiveness of oral hygiene maintenance; for the preparation of plaque indices, for self-evaluation by the patient, for plaque control in special in children, in research studies with regard to the effectiveness of plaque control devices like toothbrushes, dentifrices; to evaluate the amount of removal of biofilm during and after respective periodontal surgeries([5 6 7 8 9], using disclosing agents may improve oral health status in schoolchildren, by increasing the awareness of their personal oral hygiene condition[10].

Health promotion consists of two main parts: a change in environment or some regional policies, and health education[11]. Health education is still considered as a basic component of health promotion and is widely recognized as a tool for changing health behaviors[12] .

The first dental visit is an important step in the child's life and the time of it should be an fundamental part of the child's general health care. The age of child at first dental visit helps in defining the quality of the promotion and preventive dental care that the child will receive and, mark the future oral health of the child. Many studies have recommended early dental visits for children, will be ideally if it happened before completion of 12 months of age [13 14 15 16].

Dental fear and anxiety mainly appear in patients who supposed their visit to the dentist will be a traumatic experience[17], or in patients who

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had previously traumatic experiences in the dental clinic[18].

Distraction is a non-aversive approach used to alleviate a child's discomfort by disrupting his/her attention away from the main assignment to achieve successful treatment with peak quality[(19)].

The advantage of distraction technique is displacing the focus and attention away from the dental equipment and instruments, as well as sensation of relaxation and easiness in the chair[(20)].

Due to chain of physiological reactions resulting in a change of blood pressure and heart rate [(21).] later, a number of authors deduce that both blood pressure and heart rate are increased simultaneously, so it can be used as reliable indicators of anxiety[(22 23)]. IOC is a small handheld device which is ergonomic, lightweight and it is comfortable to use, relatively cheap and can capture high-quality videos , images and that are readily available for the patient and the clinician which can be magnified and viewed[(24)].

The Aim of The Current Study is to

To determine the effect of intra oral camera on pediatric patient during dental appointment on oral health promotion, education and motivation children to establish better oral hygiene measure in term of physiological responses to fear manifested in pulse rate, oxygen saturation and blood pressure in the children with and without the use of the intraoral camera.

II. MATERIALS AND METHODS

Sample collection and preparation :

The study was approved by Research Ethics Committee board University of Mosul College of Dentistry, and from the directorate of Health / Nineveh, and also an approval from the Directorate of the Al-Noor Specialized Dental Heath Center/Nineveh was obtained.

The sample of current study consisted of (40) children**.** Demographic information was obtained for all the children's parent before examination regarding name, age, gender. The children ages were between 7 and 10 years and they were randomly divided into two groups; a control group without the use of intra oral camera (CTR-group) (20)and an intraoral camera group (IOC-group)(20) as seen in the figure(1). Parents of children who were willing to participate in the study filled an informed consent after explanation of the procedure, and their information was recorded in a specially designed case sheet, chair side DHE with the use of disclosing agent was performed to both groups with IOC and without IOC.

Inclusion and exclusion criteria for the pediatric children included modification of the criteria described by Al-Khotaniet al (2016)[(25)]as the following :

Inclusion Criteria:(1) General good health
(2) Age between 7-10 years for both gender
(3) Patient not received any dental treatment before
Exclusion Criteria : (1) Previous dental experience in medical setting or known dental phobia as reported by their parents.
(2)The need for pharmacological management to obtain cooperation.
(3)Medical disability such as the history of seizures or convulsion disorders, nystagmus, vertigo or equilibrium disorders, eye problems and autism.

One dental visit was performed for each pediatric patient, all information was recorded in a specially designed case sheet prepared for this study. Anxiety and cooperative behavior was assessed.

Type of The Dental Work

Chair side dental health education with using of disclosing tablets

Materials

Material used in the study
1-Intra Oral Camera (SZCNT. China) 2-Sphygmomanometer(Gig Ben. China) 3-Pulse Oximeter(Finger Pulse Qxime. China)

Methods

Dental / Clinical examination:

Clinical examination was carried out for each child under standardized condition following the recommendation of WHO. Children was examined using plane mirrors and probes with the child sitting in a chair in front of the examiner. General information were recorded prior to examination in a special form for recording data.

Methods Technique

The children eligible to the treatment according to the inclusion criteria and the following was recorded

1- Physiological assessment including measurement of blood pressure (systole and diastole), digital blood pressure and heart rate monitor with wrist cuff was used . The cumbersome procedure of blood pressure recording with conventional sphygmomanometer and stethoscope was avoided which may unnecessarily lead to production of anxiety in children, to check the reliability of the instrument,

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it was checked alongside conventional sphygmomanometer before the initiation of the study. The range of error was found to be around ±2 mmHg. The figure matches with the range of error mentioned in the manual booklet of the instrument. To minimize this range of error, blood pressure and pulse rate were recorded 3times at a row for each case. Then, the average was calculated which was taken as the accepted value for consideration. Pulse rate and oxygen saturation before and after any Health Promotion for both control and study groups .as seen in figure (2)

2- Behavioral Assessment

Also patient will received assessment for anxiety and behavior by using global scale and modified dental anxiety scale MCDA.

For Global rating scale (GRS) was filled by the researcher the behavior was classified in to 1: Poor, 2: Fair, 3: Good, 4:Very good, 5: Excellent according to for both groups[26]

The MCDASf consists of questions regarding several dental procedures and the child pointed to the appropriate 'cartoon faces' that represents their emotions or anxiety level at that time. The scale consists of eight questions about 'going to the dentist generally, having teeth looked at, teeth being scraped and polished, injection in gum, filling, having tooth taken out being put to sleep to have treatment (Dental General Anesthesia or DGA) and 'having a mixture of gas and air which will help you feel comfortable for treatment but cannot put you to sleep (Relative Analgesia or RA). Each question has five scores ranging from relaxed or not worried to very worried in an ascending order from one to five. The minimum score is 8 and the maximum score is 40, this was modified in to 6 questions and translated in to Arabic to obtain an Arabic version of the version of the six modified questions was used, each question was scored from 1-5 and the total score for the scale is between 5-30[27 28].

In this study we excluded the point 7and 8 because both questions are about general anesthesia and laughing gas which are not popular in Iraq in public government facility. For our study the score was obtained by proportion with the MCDAS(8)question so the result less than 14 indicating absence of state anxiety and more than 14 presence of state anxiety and scores higher than 2, indicating severe phobic disorder [29]

For the MCDA scale the child were asked to identify an expressive picture of his feelings for each of the dental treatments and all these measure were done before performing any dental operation as shown in table(2).

In the case of a control group, displaying educational paper images that included correct tooth brushing methods and the importance of using dental floss, as well as displaying educational and awareness pictures about healthy food that is beneficial to the body and teeth, and pictures of unhealthy food harmful to the health of the body and teeth and this was a modification of the method described by [30].

Santa et al (2014) the disclosing agent was used by the child by asking him/her to chew a tablet and let it mix with the saliva in his mouth, then swish the saliva around for about 30 seconds and spit it out, then the child can see the area of plaque and calculus accumulation by use ordinary mirror for the control group[31].

In case of study group the same thing was done except an intra oral camera screen was used to showing pictures about healthy food that is beneficial to the body and teeth, and pictures of unhealthy food harmful to the health of the body and teeth, areas were disclosing agent was present on the teeth, correct tooth brushing method and the importance of using dental floss picture taken from the patient mouth divided into four sections showing the sides of the upper and lower jaws and the front teeth as show in figure (3).

III. STATISTICAL ANALYSIS

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 19). Which included the following:

1-Descriptive statistic including means, frequency, standard deviation. maximum, minimum values.

2- One way analysis of variances (ANOVA) and Duncan's multiple range test were used. The results were considered significant when $p \leq 0.05$.

IV. RESULTS

Mean and Standard Deviation, frequency, percent for the Study and Control Group are listed in table (1). The mean value between the control and study group in blood pressure (systolic and diastolic), heart rate shown that the highest value in control group in comparison with low value in study group after application of IOC, as seen in table (2). The mean value of are compared by one-way analysis of variance (ANOVA)test, and the result that were statistically significant difference within and between group at $P \leq 0.05$ as shown in table (3).

V. DISCUSSION

The current study evaluated the utilization of intra oral camera as a tool of education and distraction of the children during oral health promotion

The study focuses on the significance of monitoring the stress levels in the pediatric patients during oral health promotion by using physiological parameters with dental anxiety. Estimation of blood pressure, oxygen saturation, pulse rate and other physiological parameters has been proved to be effective and valid in the assessment of the dental anxiety in children.

Thus, a rapid valuation of these physiological biomarkers could help to monitor stress levels in the pediatric patients by minimizing or reducing the fear and anxiety levels during the different dental treatment .

Our hypotheses for this study were patients would view the camera use favorably, and the completion rate would be higher in the group in which patients viewed tooth images on IOC screen during dental health promotion than the group in which patients did not view such images.

Thus, the child can clearly see the places where the calculus and dental plaque collect and focus on these places when brushing later on, the changes in the oral hygiene behaviors associated with visual technologies (pictures and video clip) reinforces the impact on learning because what we see and hear has great impact on our behavior[32].

Araujo et al (2019)[33] found that patients who used an intraoral camera had a highly increase in the tooth brushing and the flossing habits than those who did not, and also corresponding decrease in bleeding level on probing.

VI. CONCLUSION

The results of the present study showed that use of IOC as education and distraction was effective in decreasing pain perception and state anxiety level in children without anxiety disorders during routine dental treatment.

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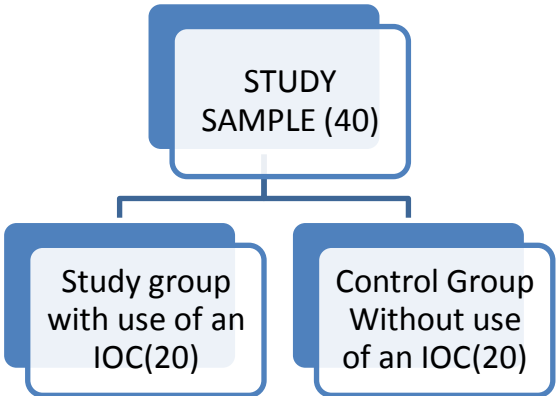

Figure (1): Experimental Design of the Study

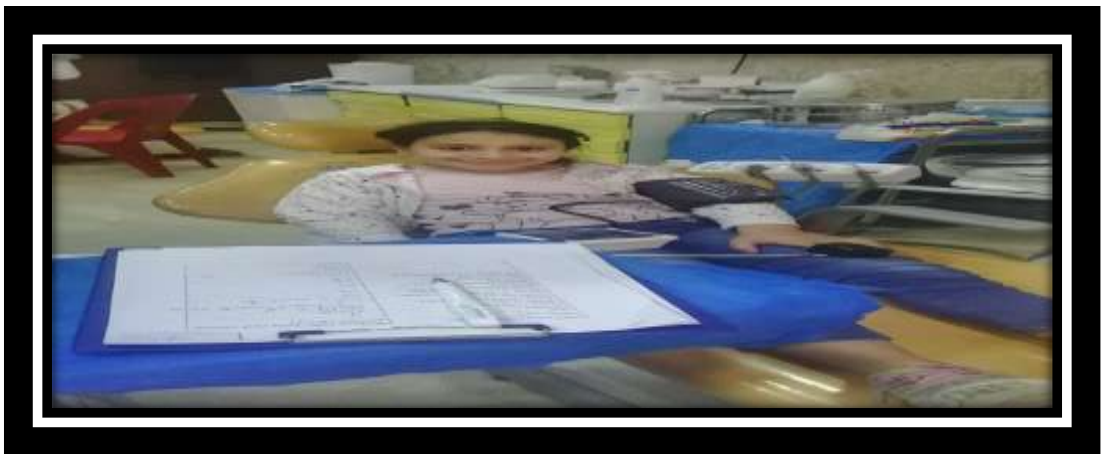

Figure (2):Physiological Assessment (Blood Pressure, Pulse Rate, SPO2)

Figure (3) : Disclosing Tablet in Patient Mouth

Table (1):Distribution of the Participants According to Age groups for Health Promotion

	Age			
Age groups	**Control**		**Study**	
	Frequency	**Percent**	**Frequency**	**Percent**
7.00	6	30.0	6	30.0

8.00	7	35.0	7	35.0
9.00	2	10.0	2	10.0
10.00	5	25.0	5	25.0
Total	**20**	**100.0**	**20**	**100.0**
Mean		**8.30**		**8.30**
Standard Deviation		**1.17**		**1.17**

Table(2): Descriptive Data Maximum Minimum and Mean of Systolic, Diastolic and Heart rate for Control and Study Group in Health Promotion

Health Promotion	N	Minimum	Maximum	Mean
(control) Systolic blood Pressure (before)	20	90.00	139.00	108.65
Systolic blood Pressure (after)	20	85.00	128.00	108.25
(study) Systolic blood Pressure (before)	20	93.00	131.00	111.05
Systolic blood Pressure (after)	20	88.00	117.00	100.50
(control) Diastolic blood pressure (before)	20	60.00	89.00	74.90
Diastolic blood pressure (after)	20	56.00	86.00	73.10
(study) Diastolic blood pressure (before)	20	63.00	90.00	80.45
Diastolic blood pressure (after)	20	55.00	84.00	69.00
(control) Heart Rate(before)	20	88.00	115.00	102.50
Heart Rate (AFTER)	20	85.00	118.00	106.30
(study) HeartRate(before)	20	77.00	119.00	105.80
Heart Rate(after)	20	69.00	117.00	94.35
(control)MCDAS	20	7.00	20.00	14.75

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Gs	20	4.00	5.00	4.35
(study)MCDAS	20	6.00	24.00	15.40
GS	20	3.00	5.00	4.55

Table (3):ANOVA for Health Promotion Mean Value Between the Variable in Each Groups

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SP	Between Groups	1067.80	3	355.93	2.96	.037*
	Within Groups	9115.00	76	119.93		
	Total	10182.80	79			
DP	Between Groups	1280.70	3	426.90	4.93	** .003
	Within Groups	6575.10	76	86.51		
	Total	7855.80	79			
PR	Between Groups	1829.53	3	609.84	3.27	.025*
	Within Groups	14138.95	76	186.03		
	Total	15968.48	79			
SPO2	Between Groups	.45	3	.15	.048	.98
	Within Groups	239.50	76	3.15		
	Total	239.95	79			

**p≤0.01 highly significant and *P≤0.05; statistical significant difference