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Effect of Art Therapy versus Bubble Breaths on Anxiety among Children Undergoing Surgery in Selected Hospitals

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ABSTRACT

Introduction: Anxiety among children undergoing surgery has an impact on postoperative outcomes; and is an extremely unpleasant experience for children and their family. To reduce preoperative anxiety art therapy and bubble breaths were tested in this study.

Aim: To compare and evaluate the effect of art therapy and bubble breaths on anxiety among children undergoing surgery in selected hospitals.

Methods and Material: Quasi-experimental pre-test post-test control group design was adapted. The study was conducted among children undergoing surgery. 90 samples were selected using non-probability purposive sampling and data collection was done using demographic variables and Modified Short State Trait Anxiety Inventory. Art Therapy & Bubble Breaths were administered to Experimental Group1 & Experimental Group 2 respectively. Both groups received interventions 2 times.

Results: Bubble breaths were significantly more effective in reducing the anxiety among children undergoing surgery as compared to art therapy.

Conclusion: This study concludes that bubble breaths are more effective in reducing pre-operative anxiety and are enjoyable for children of all ages. This is cost-effective and can be included as a preoperative routine for reducing anxiety among children in preoperative period.

Key Words: Art Therapy, Anxiety, Bubble Breaths, Children, Effect, Surgery

INTRODUCTION

Anxiety among children undergoing surgery is usually characterized by subjective feelings of tension, nervousness, apprehension and worry that may be expressed in various forms such as crying. Postoperative maladaptive behaviours include, feeding difficulties, apathy and withdrawal, new onset enuresis and sleep disturbances, these may also result from anxiety before surgery.[1]

Children are human being in the stage of birth and puberty. They are innovative, active, bubbling and happy when their parents are in their house. A hospital stay can be a painful experience for a child as children miss home and normal everyday life. They may experience unfamiliarity with events, fear and confusion.[2]

Apart from the impact on postoperative outcomes, preoperative anxiety is an extremely unpleasant experience for children and their family. Some children prefer to vocalize their fears while others manifest it in behaviours such as agitation, crying and cessation of conversation or play and also attempting to escape from care providers. This is also accompanied by significant physiological changes such as secretion of stress hormones and increase in heart rate.[3]

Anxiety is defined as "apprehension without apparent cause". It is a normal emotional state that we all experience at different times in our life. It is usually associated with anticipated fear of something that might happen in future. Anxiety is a psychological and physiological state characterized by cognitive, somatic, emotional and behavioral components.[4]

Total number of children in India is 164.5 millions. Child-

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hood is often associated with illness and hospitalization. The National Center for Health Statistics has estimated that around 3.5 million children below 15 years of age are getting hospitalized every year.[5]

Reports of preoperative anxiety in children are varied, but are estimated to be 60.0% among children who are admitted for surgeries.[6]

A scheduled surgical procedure in children is a stressful procedure for child &family. Operative procedures in paediatrics is an unpleasant & potentially threatening experience which leads to preoperative anxiety due to child's illness, hospitalization, fear of surgical intervention etc. Moreover it is well known that preoperative anxiety in children lead to negative postoperative responses, including long term behavioural problems, longer period of hospitalization and more pain.[7]

Preoperative anxiety can be seen commonly during the surgical experience in all age groups, higher levels of anxiety alter a patient's surgical course and cause increased postoperative pain.[8]

Preoperative anxiety among pediatric patients is very common,it has been associated with the display of maladaptive behaviors post-surgery, including high postoperative pain, parent-child conflict and increased anxiety and sleeping disturbances.[9]

Children who exhibit more anxiety preoperatively are 3 times more likely to exhibit post-operative negative behaviors. As many as sixty-seven percentages of children may develop postoperative negative behavioral changes including general anxiety, apathy and withdrawal, separation anxiety, sleep disturbances, aggression towards authority, and eating disturbances.[10]

Kaine and co-workers stated that negative behavioural response in 54.0% children (2 to 10 years) after 2 weeks, 20.0% after six months and 7.3% after one year of surgery.[11]

MATERIAL AND METHODS

Research Design

In this study Quasi-experimental, pre-test post-test control group design was used to assess the effect of art therapy versus bubble breaths on anxiety among children undergoing surgery in selected hospitals.

Setting

The setting of the study was Dr. D. Y. Patil Hospital.

Sample

The sample selected for present study comprised of the children undergoing surgery from 6 to 12 years of age admitted in Dr. D. Y. Patil Hospital.

Instrument

In this study, the tool consisted of following:-

- **Demographic Variables:** This includes 12 questions which obtain information regarding demographic data such as age, gender, religion, education of the child, father's education, father's occupation, mother's education, mother's occupation, family income, presence of caregiver with child, duration of hospitalization, and play activities of the child during hospitalization.
- **Modified Short State-Trait Anxiety Inventory:** The Modified Short State-Trait Anxiety Inventory has 10 elements related to anxiety, with score 0, 1, 2, 3. In that Not at all is rated as score 0, somewhat is rated as score 1, moderately is rated as score 2 and very much is rated as score 3.

Scoring Key:

0 -10: Severe anxiety

11 – 20: Moderate anxiety

21 – 30: Mild anxiety

- Art Therapy Profile
- Bubble Breaths Profile

Intervention

The samples were selected considering inclusion & exclusion criteria. The researcher introduced herself to the subjects and their parents, assurance of confidentiality was given to the subjects and their parents and consent/assent was obtained from subjects. Socio-demographic data was collected from each subject. Pre-test was conducted for all three the groups using Modified Short State Trait Anxiety Inventory. On the same day 2 times art therapy was given for 30 – 40 minutes to children in experimental group 1 once in morning & then in evening. Bubble breaths were given 2 times to children in experimental group 2 for 15 – 20 minutes once in morning & then in evening. Post-Test data was collected following each intervention. Data collection from control group was also done.

Ethical consideration

The research study was carried out after obtaining permission of Sub Ethical Committee (DYPV / CON/ 523/ 2020), Research& Recognition Committee (DPU / 656 / - 15 / 2020) of Dr. D. Y. Patil Vidyapeeth Pune.

Data Collection

After obtaining administrative permissions from hospital authorities the actual data was collected from 14.12.2020 to 23.01.2021.

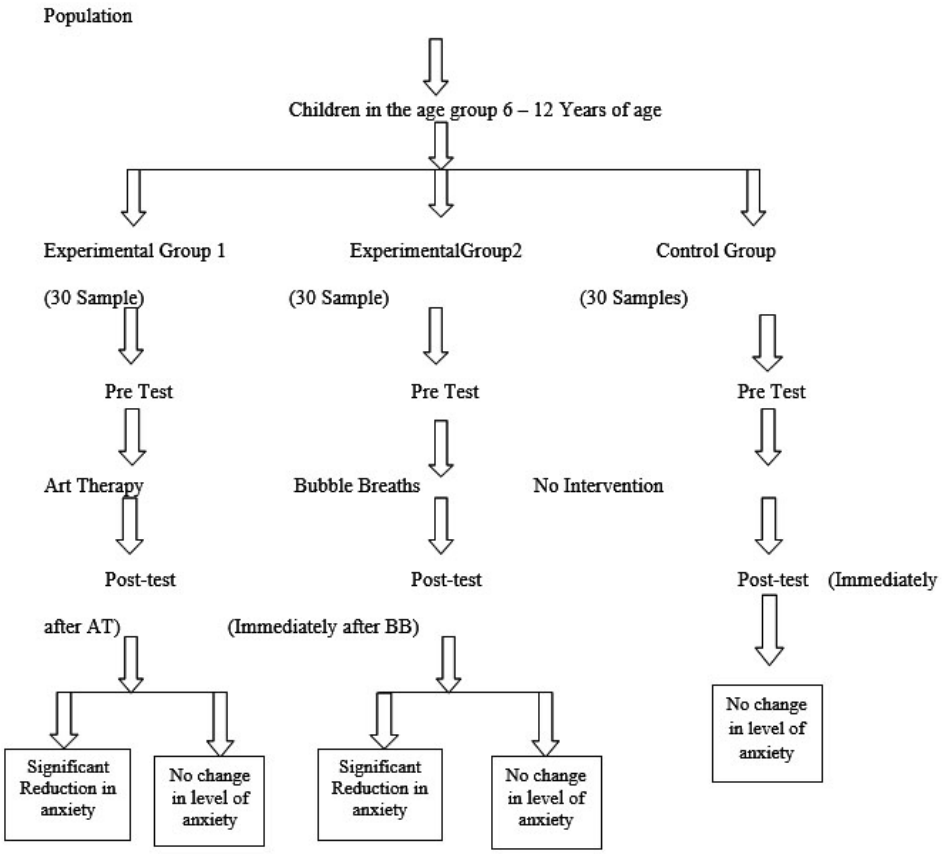

Figure 1: Schematic diagram showing procedure for data collection.

Figure 1 depicts the step by step procedure followed during the study for collection of data.

Data Analysis

Descriptive and analytical statistics were done. The data is represented in mean and standard deviation. The association of the level of anxiety with selected socio-demographic variables was analysed by Fisher's exact test. The independent sample t-test and paired sample t-test were used to check to mean differences. The level of significance was kept at $p<0.05$. The software used was R Software.

RESULTS

Table 1: Sample's descriptionin terms of frequency and percentages based on their personal characteristics.

N=30, 30, 30

S.N.	Demographic variable	CG		AT		BB	
		Freq	%	Freq	%	Freq	%
1.	Age of the child						
	6 to 9 years	17	56.7%	12	40.0%	11	36.7%
	9 to 12 years	13	43.3%	18	60.0%	19	63.3%
2.	Gender						
	Male	19	63.3%	19	63.3%	19	63.3%
	Female	11	36.7%	11	36.7%	11	36.7%
3.	Education of the child						
	Std 1 to 2	10	33.3%	8	26.7%	7	23.3%
	Std 3 to 4	10	33.3%	8	26.7%	10	33.3%
	Std 5 to 6	10	33.3%	14	46.7%	13	43.3%

Table 1: ***(Continued)***

S.N.	Demographic variable	CG		AT		BB	
		Freq	%	Freq	%	Freq	%
4.	Father's Education						
	No formal education	3	10.0%	4	13.3%	2	6.7%
	Primary	1	3.3%	0	0.0%	4	13.3%
	Secondary	1	3.3%	1	3.3%	2	6.7%
	Higher Secondary	9	30.0%	8	26.7%	3	10.0%
	Graduation & above	16	53.3%	17	56.7%	19	63.3%
5.	Father's Occupation						
	Daily wager	4	13.3%	3	10.0%	5	16.7%
	Private employee	6	20.0%	10	33.3%	9	30.0%
	Government employee	4	13.3%	6	20.0%	8	26.7%
	Business	16	53.3%	11	36.7%	8	26.7%
6.	Mother's Education						
	No formal education	4	13.3%	5	16.7%	6	20.0%
	Primary	3	10.0%	0	0.0%	2	6.7%
	Secondary	2	6.7%	2	6.7%	2	6.7%
	Higher Secondary	8	26.7%	10	33.3%	9	30.0%
	Graduation & above	13	43.3%	13	43.3%	11	36.7%
7.	Mother's Occupation						
	Homemaker	21	70.0%	17	56.7%	11	36.7%
	Daily wager	3	10.0%	2	6.7%	5	16.7%
	Private employee	6	20.0%	10	33.3%	11	36.7%
	Government employee	0	0.0%	1	3.3%	3	10.0%
8.	Monthly Family Income						
	Upto Rs.10000	5	16.7%	3	10.0%	4	13.3%
	Rs.11000 to Rs.20000	3	10.0%	2	6.7%	4	13.3%
	Rs.21000 to Rs.30000	5	16.7%	6	20.0%	4	13.3%
	Rs.31000 to Rs.40000	6	20.0%	7	23.3%	8	26.7%
	Rs.40000 & above	11	36.7%	12	40.0%	10	33.3%
9.	Presence of caregiver						
	Yes	30	100.0%	30	100.0%	30	100.0%
	No	0	0.0%	0	0.0%	0	0.0%
10.	Duration of hospitalization						
	Up to 3 days	12	40.0%	7	23.3%	8	26.7%
	4 to 6 days	11	36.7%	14	46.7%	9	30.0%
	7 to 9 days	7	23.3%	9	30.0%	13	43.3%
11.	Preferred play activities						
	Toys	7	23.3%	6	20.0%	5	16.7%
	Playing alone	11	36.7%	5	16.7%	5	16.7%
	Group play	11	36.7%	16	53.3%	15	50.0%
	Other	1	3.3%	3	10.0%	5	16.7%

Table 1, describes the demographic details of the samples involved in the study in terms of frequencies & percentages.

Table 2: Distribution of level of anxiety among children undergoing surgery before art therapy & bubble breaths

N=30, 30, 30

S. N.	Anxiety		O_1	
			Freq	%
1.	Control Group	Mild (Score 21-30)	7	23.3%
		Moderate (Score 11-20)	21	70.0%
		Severe (Score 1-10)	2	6.7%
2.	Art Therapy	Mild (Score 21-30)	0	0.0%
		Moderate (Score 11-20)	27	90.0%
		Severe (Score 1-10)	3	10.0%
3.	Bubble Breaths	Mild (Score 21-30)	1	3.3%
		Moderate (Score 11-20)	28	93.3%
		Severe (Score 1-10)	1	3.3%

Table 2 shows that, in the control group, 23.3% of the children undergoing surgery had mild anxiety (score 21-30), 70% of them had moderate anxiety (Score 11-20) and 6.7% of them had severe anxiety (Score 1-10). In Art therapy group, 90% of them had moderate anxiety (Score 11-20) and 10% of them had severe anxiety (Score 1-10). In Bubble breaths group, 3.3% of them had mild anxiety (score 21-30), 93.3% of them had moderate anxiety (Score 11-20) and 3.3% of them had severe anxiety (Score 1-10).

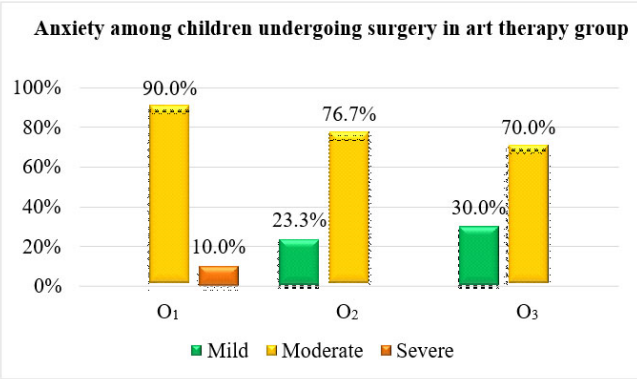

Figure 2: Distribution of effect of art therapy on anxiety among children undergoing surgery. N=30

Figure 2 shows that, in art therapy, 90.0% of the children undergoing surgery had moderate anxiety (Score 11-20) and 10.0% of them had severe anxiety (Score 1-10) in first observation. In second observation, 23.3% of them had mild anxiety (Score 21-30) and 76.7% had moderate anxiety (Score 11-20). In third observation, 30.0% of them had mild anxiety(Score 21-30) and 70.0% had moderate anxiety (Score 11-20). This indicates that the anxiety among children undergoing surgery reduced remarkably after art therapy.

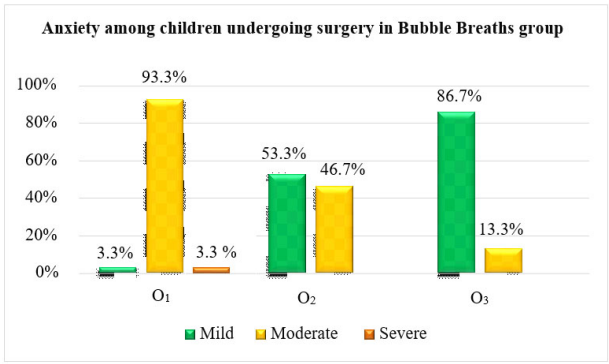

Figure 3: Distribution of effect of bubble breaths on anxiety among children undergoing surgery. N=30

Figure 3 shows that, in bubble breaths group 3.3% the children undergoing surgery had mild anxiety (Score 21-30), 93.3% had moderate anxiety (Score 11-20) and 3.3% had severe anxiety (score 1-10) in first observation. In second observation, 53.3% of them had mild anxiety (Score 21-30) and 46.7% had moderate anxiety (Score 11-20). In third observation, 86.7% had mild anxiety (Score 21-30) and 13.3% had moderate anxiety (Score 11-20). This indicates that the anxiety among children undergoing surgery reduced remarkably after bubble breaths therapy.

Table 3: Paired t-test for the effect of art therapy and bubble breaths on anxiety among children undergoing surgery. N=30

S. N.	Group	Observation	Mean	"S.D."	T	df	"p-value"
1.	Art Therapy	O_1	17.1	2.8			
		O_2	19.1	1.7	4.7	29	0.000
		O_3	20.1	1.6	5.6	29	0.000
2.	Bubble Breaths	O_1	17.6	2.1			
		O_2	20.7	1.6	9.7	29	0.000
		O_3	22.1	2.0	12.7	29	0.000

Table 3 shows that in art therapy group Average anxiety score in first observation was 17.1 which increased to 19.1 and 20.1 in second and third observation with 29 degrees of freedom. T-values for this test were 4.7 and 5.6 on second and third observations respectively. In bubble breaths group, average anxiety score in first observation was 17.6 which increased to 20.7 and 22.1 in second and third observations respectively. T-values for this test were 9.7 and 12.7 on second and third observations with 29 degrees of freedom. Corresponding p-values were small (less than 0.05), therefore the null hypothesis was rejected. It was evident that the anxiety among the children undergoing surgery reduced significantly in both the experimental groups.

Table 4: Two sample t-test for the comparison of experimental group 1 &experimental group 2 with control group. N=30, 30

S. N.	Time Point	Group	Mean	"S.D."	T	df	"p-value"
1.	O_2	Control Group	0.9	2.0	2.1	58	0.022
		Art Therapy	2.0	2.4			
	O_3	Control Group	1.4	2.0	2.5	58	0.007
		Art Therapy	3.0	3.0			
2.	O_2	Control Group	0.9	2.0	4.6	58	0.000
		Bubble Breaths	3.1	1.7			
	O_3	Control Group	1.4	2.0	6.2	58	0.000
		Bubble Breaths	4.5	1.9			
3.	O_2	Art Therapy	2.0	2.4	2.0	58	0.026
		Bubble Breaths	3.1	1.7			
	O_3	Art Therapy	3.0	3.0	2.3	58	0.013
		Bubble Breaths	4.5	1.9			

Table 4, shows the results of two sample t–test at different time points. The comparison of experimental groups shows that bubble breaths are significantly more effective in reducing the anxiety among children undergoing surgery as compared to Art therapy.

Table 5: Fisher's exact test for the association of the level of anxiety among children undergoing surgery with selected socio-demographic variables. N=90

S. N.	Demographic variable		Anxiety			"p-value"
			Mild	Moderate	Severe	
1.	Age of the child	6 to 9 years	4	35	1	0.382
		9 to 12 years	4	41	5	
2.	Gender	Male	4	48	5	0.439
		Female	4	28	1	
3.	Education of the child	Std 1 to 2	4	20	1	0.259
		Std 3 to 4	0	26	2	
		Std 5 to 6	4	30	3	

Table 5: ***(Continued)***

S. N.	Demographic variable		Anxiety			"p-value"
			Mild	Moderate	Severe	
4.	Father's Education	No formal education	0	8	1	0.897
		Primary	1	4	0	
		Secondary	0	4	0	
		Higher Secondary	2	16	2	
		Graduation & above	5	44	3	
5.	Father's Occupation	Daily wager	0	11	1	0.234
		Private employee	2	23	0	
		Government employee	3	12	3	
		Business	3	30	2	
6.	Mother's Education	No formal education	0	14	1	0.530
		Primary	1	4	0	
		Secondary	0	6	0	
		Higher Secondary	5	20	2	
		Graduation & above	2	32	3	
7.	Mother's Occupation	Homemaker	6	41	2	0.209
		Daily wager	0	9	1	
		Private employee	1	24	2	
		Government employee	1	2	1	
8.	Monthly Family Income(In Rs.)	Upto Rs.10000	1	10	1	0.946
		Rs.11000 to Rs.20000	1	8	0	
		Rs.21000 to Rs.30000	1	12	2	
		Rs.31000 to Rs.40000	3	17	1	
		Rs.40000 & above	2	29	2	
9.	Duration of hospitalization	Up to 3 days	3	22	2	0.924
		4 to 6 days	3	28	3	
		7 to 9 days	2	26	1	
10.	Preferred play activities	Toys	3	15	0	0.549
		Playing alone	1	17	3	
		Group play	3	36	3	
		Other	1	8	0	

Table 5 shows data analysis related to association of level of anxiety among children undergoing surgery with selected socio-demographic variables, since all the "p-values"were large (greater than 0.05), therefore none of the demographic variables were found to have significant association with anxiety among children undergoing surgery.

STATISTICAL ANALYSIS

Descriptive and analytical statistics were done. The data is represented in mean and standard deviation. The association of the level of anxiety with selected socio-demographic variables was analysed by Fisher's exact test. The independent sample t-test and paired sample t-test were used to check to mean differences. The level of significance was kept at $p<0.05$. The software used was R Software.

DISCUSSION

A hospital-based comparative study was conducted in Capital Hospital. The study was carried out in pre-school children aged 3 to 6 years who were admitted in paediatric ward of Capital Hospital. Questionnaire was used for demographic details and measurement of severity of anxiety. Two different experimental groups were instructed to undergo art therapy and play therapy consecutively for 3 days, 30 minutes each

day. Post-test was performed on 4thday; the questionnaire measured level of anxiety. Self-structured hospitalization anxiety scale was developed to measure the severity of anxiety symptoms. Assessment of anxiety level was done before and after the test. T-test, ANOVA and Chi-square test were performed to find an association between the variables. Play therapy was significantly more effective ("p-value" 0.025) than art therapy.[12]

Similarly in present study, the samples were 90 children who were undergoing surgery. 30 children were allotted to art therapy group. Self-structured interview on demographic variables & Modified Short State-Trait Anxiety Inventory were used. The T values were 4.7 and 5.6 after first and second intervention with 29 degrees of freedom. Corresponding "p-value" was small (less than 0.05). So, it was evident that art therapy was effective in reducing anxiety.

A study was conducted to assess the effect of soap bubbles as a distraction technique for anxiety management, fear, and pain in children waiting for a medical examination at the paediatric emergency room. 74 children (M = 9.30; "S.D." = 1.10; 50.0% female) were randomly assigned to either a control group or experimental group. The children in the experimental group were provided soap bubble protocol while waiting for a medical examination at the paediatric emergency room. Anxiety, fear, and pain were assessed by self-report administered to the children. ANCOVA analyses were run using CAM.[13]

In present study the 30 children were allotted to bubble breaths group. The T values were 9.7 and 12.7 after first and second intervention with 29 degrees of freedom. Corresponding "p-value" was small (less than 0.05) Therefore it was evident that bubble breaths were effective in reducing anxiety. Children who had severe anxiety, it was reduced to mild or moderate levels. Therefore it shows bubble breaths were effective in reducing anxiety.

To compare levels of anxiety in children from bubble breaths with art therapy two sample t-test was used. Average change in anxiety score in art therapy group is 2 and 3 on second and third observations respectively which were 3.1 and 4.5 for bubble breaths group. T-values for this comparison were 2 and 2.3 on second and third observations with 58 degrees of freedom. Corresponding p-values were small (less than 0.05). Average reduction in anxiety among children in bubble breaths group was significantly higher than art therapy group therefore bubble breaths were significantly more effective in reducing the anxiety among children undergoing surgery than art therapy.

A study was conducted to assess prevalence and factors having association with preoperative anxiety in children between 5-12 years of age. Study involved 210 selected children undergoing inguinal and umbilical hernia repair. Socio-demographic and clinical variables were taken into consideration for analysis.Study results indicated that the male children were more prevalent, 7-12 years of age and were from lower socioeconomic status. In bivariate analysis, the factors associated with preoperative anxiety included 5-6 years age group and lower socioeconomic status was constantly associated with preoperative anxiety. Existence of these characteristics increased chances of developing preoperative anxiety. [14]

However in this study, the analysis related to level of anxiety among children undergoing surgery with selected sociodemographic variables revealed that all "p-values" were large(> 0.05), therefore none of the demographic variables were found to have significant association with anxiety among children undergoing surgery.

CONCLUSION

The results of the study revealed that art therapy & bubble breaths, both are effective in reducing preoperative anxiety. However bubble breaths were more enjoyable & convenient for children of all ages. Bubble breaths are cost effective and can be included as preoperative routine for reducing anxiety among children.

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