

The Effectiveness of Dramatic Puppet and Therapeutic Play in Anxiety Reduction in Children Undergoing Surgery: A Randomized Clinical Trial

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Abstract

Background: Surgery as a stressful experience can affect the child and quality of care plan. Nurses can use non-pharmacological intervention to reduce anxiety and help children cope with this stress.

Objectives: This study was designed to compare the effects of dramatic puppet and therapeutic play on anxiety of children undergoing surgery.

Methods: In this randomized clinical trial, 75 children were divided into three groups (dramatic puppet, therapeutic play, and control) using a simple random allocation method. The study was conducted in Iran in 2013 - 2014. The revised children's manifest anxiety scale (RCMAS) was used to determine the anxiety of children. The data were analyzed using paired t-test, one-way analysis of variance (ANOVA), and Tukey test.

Results: The findings revealed that the changes of anxiety scores after the intervention were significantly different among the three groups ($P < 0.001$), so that the anxiety scores decreased in both the intervention groups (puppet and play) and increased in the control group.

Conclusions: Therapeutic play and dramatic puppet can be used by nurses as a care strategy and effective preoperative preparation intervention to reduce anxiety in children undergoing surgery.

Keywords: Anxiety, Surgery, Children, Nursing, Play Therapy

1. Background

Every year in USA, more than 5 million children undergo surgery. It is estimated that surgery is a threatening and stressful experience for 50% to 75% of children. Anxiety is an unpleasant emotion and state in which a person is under tense and apprehensive condition; it is a protective response of human to threatening situations or events (1-8).

Preoperative anxiety affects physical and psychological health and normal development of children, postoperative behavior, anxiety and pain, clinical recovery, cooperating with healthcare providers; it even increases analgesic requirements and results in emotional disturbances, delayed discharge, and a long-term negative impact on children's responses to later medical care. Anxiety associated with surgery may cause children to agitate, breathe deeply, cry, and even to stop playing or talking. Also,

this anxiety may cause them experience the nightmares, separation anxiety, eating disorders, and bedwetting and negatively affects children's behavior after discharge. Researches have shown that the risk of postoperative negative behavior in children with higher level of preoperative anxiety, is 3.5 times higher and these problems may continue until 6 to 12 months after discharge (1, 3, 6, 9-18). On the other hand, this anxiety affects parents of these children (17).

To reduce anxiety and help children cope with the stress of hospitalization and surgery, the American Academy of Pediatrics (Child Life Services for hospitalized children) recommended providing information, education, and formation of a trusting relationship between healthcare professionals and children and their parents by using various tools such as pictures, diagrams, orientation tours of surgical or treatment areas, therapeutic play, and

puppets (3).

It has been proved both pharmacological (e.g., sedative) and non-pharmacological (e.g., parental presence, behavioral preoperative preparation programs, music, acupuncture, teaching of coping skills, therapeutic play, play with familiar toys, and watching cartoons) approaches are useful for this purpose. However, due to adverse effects of pharmacological interventions, non-pharmacological methods are preferred (6, 9, 12, 15, 19).

Of course, design of these preparation techniques must be based on individual condition such as age, cognitive developmental level, temperament, social adaptability, personality and previous experiences of the child and his/her family that can facilitate children's emotional and physical well-being and reduce this stressful experience for them. Psychological preparation as a fundamental right for children undergoing surgery must not be forgotten and preparing children for hospitalization and surgery is an important task and responsibility for nurses (3, 6, 11, 20, 21).

Play as a normalizing activity and an essential component of child life and development helps children cope with stress and anxiety of conditions. It also provides opportunities for them to express their concerns. Research shows that play can have positive effects on physiological responses such as palm sweating, tachycardia, and hypertension and hence, it can be valuable in health care setting (3, 7, 11, 22).

Erickson also in his study demonstrated that the therapeutic play and puppets have benefits for the preparation of hospitalized children before medical procedure and enable them to express how they feel about the hospitalization experience (2, 23).

The results of studies demonstrated that therapeutic play is an effective intervention to prepare children for surgery by reducing preoperative anxiety in children and their parents, negative emotional manifestation, and post-operative pain of children (2, 4, 10, 17, 23, 24).

The use of child centered play therapy (CCPT) as a strategy to decrease levels of pre-surgical anxiety in children through the natural language of play can empower children to develop their emotions, which may lead to improved developmental outcomes and reduced residual trauma (18, 22).

Studies have shown that puppet as a therapeutic tool has positive effects in clinical practices. It provides the opportunity for children to express their concerns and fear of abandonment, punishment, and the feeling of helplessness; puppets also help children cope with illness, hospitalization and surgery, and encourage them to learn through playing and participating in teaching strategies

to promote their health. Moreover, puppet as an auxiliary tool can be used in research on children to demonstrate intended intervention; playing with puppets before surgery can be employed as an effective strategy to reduce anxiety in children undergoing surgery (25-28).

On the other hand, using puppets and toys provides this chance and opportunity for professionals to better understand the child's feelings and reactions to the events and makes a closer relationship between the child and professional team (28).

There are a few studies in nursing about the comparison of the effects of puppets and play as communication tools in reducing children's anxiety.

2. Objectives

Since child's psychological preparation before surgery by nurses is an important component of his/her care and also this preparation has an important positive effect on physical and psychological health and normal development of child, this clinical trial was conducted to compare the effectiveness of dramatic puppet and therapeutic play in anxiety of children undergoing surgery.

3. Methods

This was a three-group randomized clinical trial in which, a total of 75 children admitted to the surgery ward of Dr. Sheikh hospital in Mashhad in 2013 - 2014 took part. Dr. Sheikh hospital is a subspecialty medical center-governmental referral and teaching hospital for children in Mashhad, Iran, affiliated to the Mashhad University of Medical Sciences.

The study participants included children aged 6 - 12 years old who hospitalized with appendicitis diagnosis in presence of one of his/her parents, without visible growth or mental retardation and chronic diseases (diabetes, heart or kidney known disease), no history of previous surgery, no known phobia or separation anxiety, and not suffering from severe pain before intervention (that was measured using the Wong-Baker faces pain rating scale).

Exclusion criteria comprised opt out of the study and emergency need of child to surgery.

The children who met the eligibility criteria were assigned into one of three groups using a simple random allocation method. The groups were placed with simple draw in one of three daily blocks of "Saturday and Tuesday", "Sunday and Wednesday", and "Monday and Thursday".

3.1. Data Collection

After confirmation of appendicitis diagnosis and admitting the child to surgical ward, on the night before surgery in order to equalization groups, a brief explanation regarding the appendicitis surgery was given in accordance with the understanding of the child. Then, the child's anxiety was measured with Revised Children's Manifest Anxiety Scale (RCMAS).

Child entry in the research was according to non-probability (convenience) sampling method. Then, their allocation to the intervention (dramatic puppet and play) and control groups was performed using simple random allocation method.

This means that, based on a simple draw, children were placed in the dramatic puppet group in the daily block "Saturday and Tuesday", therapeutic play group in the daily block "Sunday and Wednesday", and the control group in the daily block "Monday and Thursday".

After a poll of 30 children hospitalized in the surgery ward to choose the favorite puppet among five popular puppets, Red Hat puppet was elected and clothes of this puppet were sewn (Red Hat is one of the children's popular puppet in Iran).

In the dramatic puppet group on the morning of surgery (Saturday and Tuesday), the researcher wore puppet clothes and accompanied the child before the surgery. This process consisted of three stages:

1) Early engagement: Red Hat introduced himself to child and explained for him space of ward and what is going to be done for the child.

2) Middle engagement: the relationship with the child continued, and all procedures were performed with assistance of Red Hat including changing clothes of child for surgery.

3) The final stage: Red Hat took the child to the operating room and remained bedside the child in the waiting room. Then, child's anxiety was measured as posttest and the Red Hat said goodbye to the child. Finally, the child was delivered to the anesthesiologist.

On the morning of surgery in the therapeutic play group (Sunday and Wednesday), based on the conditions of the child, he/she was engaged in his/her favorite game in the play room or on the bed one hour before the surgery in presence of the researcher.

The games included: ball and basket, bubble making, drawing on the canvas with the finger, and game machine. In the waiting room, child's anxiety was measured as posttest, the researcher said goodbye to the child, and the child was delivered to the anesthesiologist.

In the control group (Monday and Thursday) without any intervention, child's anxiety was measured as posttest

in the waiting room and the child was delivered to the anesthesiologist. Sampling was continued to complete the sample size in the procedure mentioned earlier.

The RCMAS is a 37-item standard self-report questionnaire to assess the level of anxiety in children and adolescents. The questionnaire measures symptoms of anxiety in 28 anxiety-related items and 9 lie items responded by children as yes or no. The score of each item is zero or one.

The range of scores for the anxiety items is 0 - 28, and a higher score indicates higher anxiety. The score range in the lie items varies from zero to nine, and a lower score indicates more honest answers to questions on subjects. A score of 18 or more has been found to indicate the presence of anxiety disorder. RCMAS consists of three sub-categories: physiological anxiety (10 items about somatic manifestations of anxiety such as sleep difficulties, nausea, and fatigue), worry/oversensitivity (11 items measuring obsessive concerns about a variety of things), and social concerns/concentration (7 items measuring distracting thoughts and fears that have a social or interpersonal nature).

RCMAS has been already confirmed in validity and reliability in Iran (29, 30). In the present study, Cronbach's alpha was 0.78 for the total RCMAS scores.

This study was approved by the ethics committee of Mashhad University of Medical Sciences and was registered in Iranian center of clinical trial registration with the ID number of IRCT2013122015875N1. A written informed consent letter was obtained from each parent before the study.

3.2. Sample Size

The sample size was calculated according to the data from a pilot study with 10 children using the following formula:

$$N = [(Z_{1-\alpha/2} + Z_{1-\beta})^2 (s_1^2 + s_2^2) / (m^1 - m^2)^2]$$

$Z_1 = 95\% = 1.96$; $Z_2 = 80\% = 0.84$ (test power); s and m represents estimated values of standard deviation and mean of anxiety in the groups, respectively.

3.3. Statistical Analysis

Collected data were analyzed using the statistical software SPSS, and $P < 0.05$ was considered significant. Mean and standard deviation were used to describe normal quantitative variables and median and inter-quartile range (IQR) for non normal variables; also, frequency and percentage were used to describe qualitative variables. The normality of the distribution of data was examined using the Kolmogorov-Smirnov test.

Repeated Measures ANOVA was done to determine the effect of the intervention on anxiety. In addition, paired t-test was used to compare the scores before and after the intervention; one way ANOVA was employed to compare the anxiety scores of the groups. The Tukey test was performed after ANOVA to determine which groups in the sample are different.

4. Results

During the study period, 75 children with appendicitis diagnosis were assigned to three groups (each group = 25). Kolmogorov-Smirnov test showed that the anxiety scores were normal ($P = 0.146$), while systolic and diastolic pressure data, before and after the intervention was non-normal.

The variables of age of child, age of parents, waiting time for surgery, systolic and diastolic pressure, gender of child, hospitalization history, employment status of the child's parent, and child attendant had not significant differences between the groups; therefore, the three groups were equal in terms of the above factors (Table 1).

To determine the effect of intervention on the anxiety, the repeated measures ANOVA was conducted and due to the interaction between time and group ($F = 31.401$, $P < 0.001$), the results were recognized invalid; thus, the comparisons in sub-group were performed separately.

One-way ANOVA test results showed that the three groups were not significantly different in terms of anxiety before the intervention ($P = 0.669$).

As shown in Table 2, the changes in anxiety scores after the intervention were significantly different among the three groups ($F = 16.97$, $P < 0.001$), so that anxiety decreased in both intervention groups and increased in the control group. Also, Tukey test showed anxiety changes were statistically significant between control and puppet groups ($P < 0.001$) as the same as control and play groups ($P < 0.001$); while it was not observed a statistically significant difference in anxiety changes between puppet and play groups ($P = 0.889$).

However, the mean of anxiety was lower in the puppet group than the other two groups (Figure 2, Table 2).

5. Discussion

According to the findings of this study, the use of puppet and play reduces anxiety in children undergoing surgery. The anxiety scores in both groups of puppet and play were lower than the scores in the control group. The findings revealed that there was no statistically significant difference in anxiety scores between the puppet and play

groups. Although lower anxiety scores in puppet than play group were not statistically significant, but clinically they are valuable.

According to the observations of Erikson (1963) and Piaget (1963), play, as a form of communication and self-expression and one of the fundamental components for the normal growth and development of child, provides an opportunity for children to express understanding of the around world, communicate with others, learning to develop control of self and the environment; also play can be used as a psychological intervention to help children cope with the stress of hospitalization and surgery (2, 25).

Therapeutic play is defined as a framework of activities in accordance with the psychosocial and cognitive development of children that can facilitate emotional and physical reactions of children to hospitalization and surgery. It can be used by nurses as a healthcare strategy in daily care, preparing hospitalized children for surgery, invasive and painful procedures (25).

In review of studies, therapeutic play has a special therapeutic value for hospitalized children and has positive effects on reduced anxiety and negative emotions in children undergoing surgery in pre- and post-operative periods; and it can improve and increase cooperation of child during procedures such as anesthetic induction (2, 10, 23-25, 31). Also, this intervention can reduce anxiety in parents of child undergoing surgery (10) and postoperative pain in children (23).

The play gives the opportunity to hospitalized and undergoing surgery child to return to his/her normal life and activities and reduces the anxiety. Play provides for them the chance to gain control in many situations and have positive experience of surgery (25).

The use of play therapy and puppet as a coping skill is considered as an effective preoperative preparation intervention for children. However, it is recommended to perform an initial evaluation of developmental/cognitive level of child as well as routine evaluation of child anxiety and effectiveness of the mentioned interventions (10, 20, 32).

Since child's psychological preparation for surgery is an important component of his/her care, many hospitals around the world, especially pediatric hospitals in Philadelphia, Seattle, and Miami, have implemented preparation and therapeutic play programs in order to relief and reduce anxiety in children (33).

Studies demonstrated puppet therapy as creative intervention and an appropriate strategy to communicate with hospitalized children that is in accordance with the motor, cognitive, and emotional development of child; it influences emotional response in the child undergoing surgery and gives him/her the opportunity to feel closer and more

Table 1. Demographic Characteristics of Children^a

	Puppet	Play	Control	P Value
Age of child	9.3 ± 1.9	9.0 ± 1.8	9.6 ± 2.1	0.57
Age of parent				
Father	38.2 ± 4.1	36.4 ± 4.6	38.2 ± 4.1	0.26
Mother	34.5 ± 4.7	33.4 ± 4.9	35.3 ± 4.7	0.32
Gender of child				
Male	15 (60.0)	13 (52.0)	17 (68.0)	0.56
Female	10 (40.0)	12 (48.0)	8 (32.0)	
Waiting time for surgery (hour)	9.8 ± 3.2	10.3 ± 3.5	11.9 ± 4.5	0.14
Systolic pressure				
Before intervention	102.2 ± 11.1	100.8 ± 9.5	104.2 ± 11.6	0.69
After intervention	101.4 ± 11.2	100.2 ± 10.0	104.4 ± 11.8	0.47
Diastolic pressure				
Before intervention	65.3 ± 7.0	63.5 ± 6.6	66.4 ± 7.8	0.62
After intervention	64.6 ± 6.8	64.4 ± 6.3	67.2 ± 8.0	0.41
Hospitalization history				
Yes	7 (28.0)	7 (28.0)	6 (24.0)	0.93
No	18 (72.0)	18 (72.0)	19 (76.0)	
Employment status of the child's father				
Self-employed	9 (36.0)	8 (32.0)	5 (20.0)	0.53
Employee	16 (64.0)	17 (68.0)	20 (68.0)	
Employment status of the child's mother				
Housekeeper	16 (64.0)	21 (84.0)	21 (84.0)	0.18
Employee	9 (36.0)	4 (16.0)	4 (16.0)	
Child attendant				
Father	3 (12.0)	0 (0.0)	4 (16.0)	0.35
Mother	17 (68.0)	17 (68.0)	16 (64.0)	
Both parents	5 (20.0)	7 (28.0)	5 (20.0)	
Grandfather and grandmother	0 (0.0)	1 (4.0)	0 (0.0)	

^aValues are expressed as mean ± SD or No. (%).

comfortable and minimize the hierarchical status in adult-child relationship; it also provides this opportunity to respect the autonomy of child. This kind of therapy helps children learn how to overcome and control negative emotions such as fear and anxiety and experience a manageable amount of fear; it also has a positive effect on child's responses and willingness about later medical care (14, 27, 28).

Another study has revealed the use of puppets as a strategy and tool for communication with children suffering from cancer can help enrich clinical practice, encourage ill children to report their experience, and assist health

team for evaluation and intervention in clinical practice (28).

Creating psychological preparation by using distraction technology such as view of animated cartoons, video glasses, clown doctors, therapeutic play, parental presence, music, acupuncture, and puppet as anxiety reduction strategies that are safe, noninvasive, non pharmacologic, and pleasant for children strongly is recommended (2, 9, 10, 12, 32, 34-37).

Considering the results of this study, nurses as professional healthcare givers can use therapeutic play and puppet as care strategy to reduce anxiety of hospitalized chil-

Table 2. Comparison of Anxiety in Three Groups^a

	Before	After	Difference	P (Paired T-Test)	
				t	P Value
Puppet group (n = 25)	13.72 ± 4.70	8.84 ± 3.48	- 4.88 ± 2.91 ^b	8.397	< 0.001
Play group (n = 25)	12.48 ± 5.74	9.52 ± 6.18	-2.96 ± 4.96 ^b	2.983	0.006
Control group (n = 25)	12.76 ± 4.85	16.56 ± 5.51	3.80 ± 4.07 ^c	-4.666	< 0.001
One way ANOVA					
F	0.40	16.97	31.40		
P Value	0.669	< 0.001	< 0.001		

^aValues are expressed as mean ± SD.

^{b,c}Significant differences together.

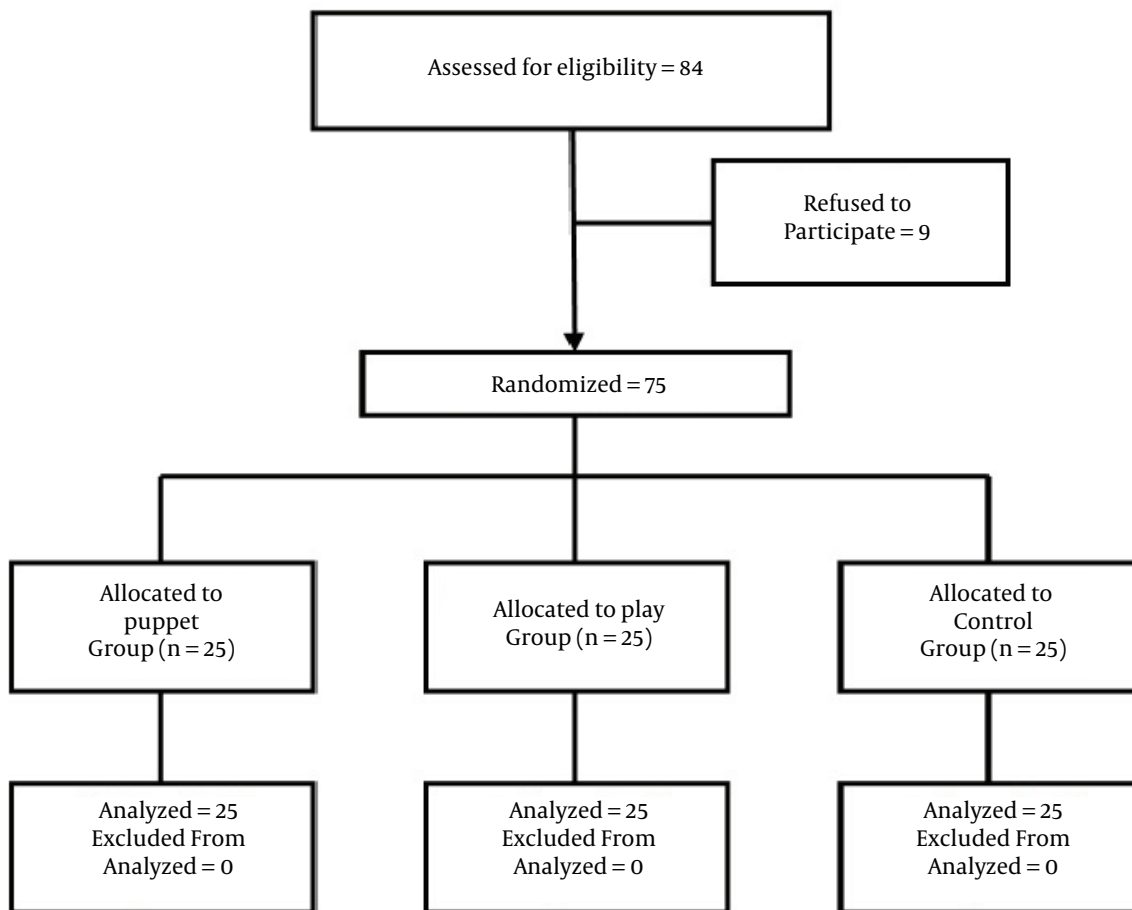


Figure 1. CONSORT Diagram of Participants in the Clinical Trial

dren.

5.1. Strengths and Limitations

The present research was performed for the first time in Iran with a suitable design (randomized clinical trial).

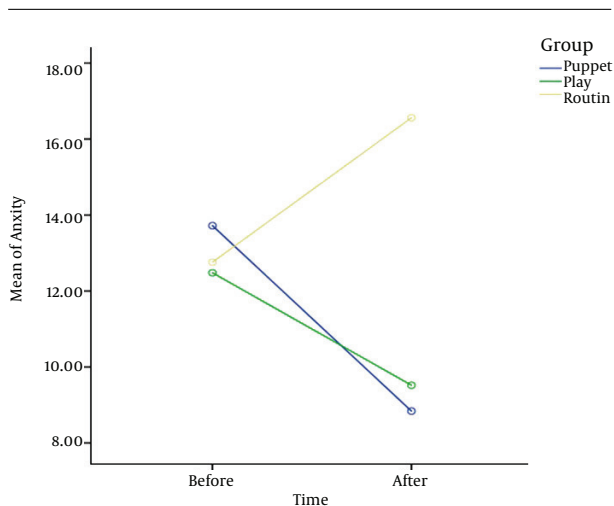


Figure 2. Anxiety Scores of Groups Based on Time



Figure 3. Red Hat Puppet

As a limitation of the current research, the individual differences of children (gender, age, etc.) could affect the anxiety score. It was tried to use randomization and control group to minimize these differences.

Also, in this study, only the child's anxiety was measured. It is suggested to investigate more variables such as parental anxiety, postoperative behavior, and pain of chil-

Table 3. Non Normal Variables Based on Median and Inter-Quartile Range (IQR)

	Puppet	Play	Control
Systolic pressure			
Before intervention	100.00 (15.00)	100.00 (16.50)	110.00 (25.00)
After intervention	100.00 (20.00)	95.00 (20.00)	105.00 (25.00)
Diastolic pressure			
Before intervention	60.00 (10.00)	60.00 (10.00)	65.00 (10.00)
After intervention	60.00 (10.00)	60.00 (10.00)	65.00 (10.00)

dren in future studies.

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Footnotes

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