

Effect of Play Intervention on Anxiety and Vital Signs in Children during Preoperative Period

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Abstract: *Background:* The preoperative period is stressful for many children undergoing surgery. So, play intervention can be used for preparation of child for surgery and it is considered pleasurable and enjoyable aspect of child's life. **Aim:** This study aimed to assess the effect of play intervention on anxiety and vital signs in children during preoperative period. **Settings:** This study was conducted at surgical units and the operating rooms affiliated to Benha Specialized Pediatric Hospital and Benha University Hospital at Benha city to collect the study data. **Sample:** A purposive random sample of (66) children during the preoperative period from the previously mentioned settings at Benha City. **Tools of data collection:** It was included three tools; an interviewing questionnaire sheet to collect data, it included children's characteristics at surgical units (tool I), vital signs record sheet (tool II) and The modified Yale Preoperative Anxiety Scale (mYPAS) to assess the level of anxiety in the studied children during the preoperative period (tool III). **The results:** The study results revealed that anxiety score was lower significantly in the study group during preoperative period than in the control group. **The study concluded that** play intervention had significantly effective way in reducing anxiety in children during preoperative period. **The study recommended:** The importance of using play intervention at preoperative period and emphasize the using of play materials used to reduce anxiety in children.

Key words: Play intervention, anxiety, vital signs, children, preoperative period.

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I. Introduction

Preoperative period is considered a threatening and stressful experience for children because of unfamiliar with the environment and medical procedures; it can result in children's anger, uncertainty, anxiety, and feelings of helplessness. Moreover, preoperative period is considered the stage in which the child becomes more vulnerable for his needs, particularly the psychological needs, becoming more prone to an emotional imbalance, anguish and fear (Gomes et al., 2019). Surgical operations are situations performed for multiple reasons, causing anxiety for both children and their families. This anxiety is generally reflected as fear, or anger. Moreover, parental separation, pain, loss of control, a strange environment, and unknown environmental conditions are among the important causes for anxiety in children during the preoperative period (Aytekin et al., 2016).

Anxiety is the most commonly reported of negative responses. Also, high levels of anxiety can be harmful to children's physiologically, psychologically and behaviorally. Physiologically anxiety can cause reaction such as increased heart rate, muscle tension, nausea and mouth dryness. Psychological effects such as apprehension and uneasiness. Behavioral effects include inability to cope with medical treatment, and increases their uncooperative behavior and negative emotions towards healthcare professionals (Ertuget al., 2017). The anxiety caused by the hospital environment and surgical procedure may be harmful during the preoperative period because it might affect cognitive, social, and affective development. Furthermore, anxiety causes negative consequences, such as nausea, insomnia, nightmares, and emotional and behavioral distress (e.g. enuresis, aggressive behavior, eating and sleeping disorders) (Vagnoli, 2019).

Children between the ages of 3-12 years are at greatest risk for developing anxiety, a history of previous stressful medical encounters such as previous hospitalization affects how a child reacts to a new medical encounters (Cote et al., 2018). Major stressors of hospitalization include separation, loss of control, bodily injury and pain. Children's reactions to these stressors are influenced by their developmental age, their previous experience with illness, separation, or hospitalization, their innate and acquired coping skills, the seriousness of the diagnosis and the support system available (Hockenberry and Wilson, 2019).

Preoperative anxiety in children is characterized by feeling of tension, apprehension and nervousness. These responses are attributed to separating from parent, loss of control, fear of injury, unfamiliar environment with strange personnel and uncertainty about the surgery and its outcomes (Dwajrej et al., 2018). It is estimated that 40% to 60% of children develop significant anxiety before their surgery. Furthermore, some children verbalize their fears explicitly, whereas

others express their anxiety only by behavioral changes. Children may appear scared or agitated, breathe deeply, tremble, stop talking and start to cry, some may wet or soil themselves (Cote et al., 2018).

In addition, preoperative anxiety is associated with neuroendocrine changes such as increased serum cortisol, epinephrine and adrenocorticotrophic hormone level which can contribute to delayed wound healing and increased postoperative pain (Chieng et al., 2014). Also, preoperative anxiety can cause long term behavioral changes such as feeding difficulty, new onset of enuresis, withdrawal apathy, loss of temper and negative behavior associated with health care (Dai & Livesley, 2018).

Vital signs are considered to be the baseline indicators of a child's health status and affected by a variety of internal and external factors, including many disease conditions and pain. (Royal College of Pediatrics and Child Health, 2016). All vital signs can be affected by surgery and anesthesia and reflect the child's level of instability. Monitoring and measuring vital signs are core essential skills for nurses working with children preoperatively. Also, when assessing and monitoring child's vital signs, their psychological needs should be recognized and appropriate action taken (Rees et al., 2017).

One of the most commonly used intervention to reduce or prevent preoperative anxiety is play that is considered a framework of activities taking the psychosocial and cognitive development of children into account, in order to facilitate the emotional and physical well-being of these children (Kourkouta et al., 2014). Play is the main job of children; through it, they express emotions and release unacceptable impulses in a socially acceptable way. Moreover, play is essential for children's mental, emotional, and social well-being. Also, children need to act out their fears and anxieties as a means of coping with the stress of illness and hospitalization. Throughout their play activities, children need the acceptance of adults and their presence to help them control aggression and to channel their destructive tendencies (Hockenberry & Wilson, 2019).

Providing play for children and giving sufficient information about the treatment and surgery process to children and the parents help them to complete the treatment with more comfort, and thus affects the level of their satisfaction with the treatment process. Furthermore, it is important to provide opportunities for implementing play intervention appropriate to the child age (Beevi, 2019).

Significance of the study

A child's surgery is often a very significant and memorable event in the life of the child and his family. The fear of the unknown can be overwhelming. It is not surprising therefore that up to 65 % of children experience significant anxiety associated with the preoperative period. Preoperative anxiety is associated with multiple complications that might develop immediately after surgery or thereafter (Dwajraj et al., 2018).

Various techniques have been considered to reduce preoperative childhood anxiety. Play is one of the most commonly used interventional techniques for prevention and treatment of childhood preoperative anxiety. Play has long been regarded as a vital element and through it children are given the opportunity to develop mastery of self and the environment and to enhance their understanding of the world (Sola et al., 2017).

Aim of the study

This study aimed to assess the effect of play intervention on anxiety and vital signs in children during preoperative period.

Research hypothesis

Children who received preoperative play interventions (study group) would experience lower levels of anxiety and normal vital signs when compared with children who received usual care (control group).

Operational Definitions

Effect: in this study means reduction in anxiety score as determined by significant difference in anxiety score before and after intervention.

Play intervention: play intervention is a process where the concept of play is used as diversion. In this study it refers to the use of inflatable balloon, toys, drawing, coloring and puzzles to divert the mood of children.

Anxiety: anxiety refers to the normal response experienced by the children towards stress on the period before surgery and will be assessed by using modified Yale pre-operative anxiety scale.

Vital signs: vital signs include heart rate, respiration and blood pressure which considered most important signs that indicate the status of the body's vital (life-sustaining) functions. Measuring it help to notice problems early and give important clues about the child's health.

Children: in this study children who are between 3-12 years of age group and undergoing surgery

II. Subjects and method

Research Design

A quasi experimental design was used in the current study.

Settings

The study was conducted at surgical units affiliated to Benha Specialized Pediatric Hospital affiliated to Egyptian Ministry of Health and population and Benha University Hospital at Benha city to collect the study data. The surgical unit at Benha Specialized Pediatric Hospital in the first upper floor composed of 4 rooms and each room contain 3 to 4 beds where the children admitted before and after surgery and the operating room found in the second floor. While the surgical unit at Benha University Hospital found in the fourth floor in which the child admitted before and after surgery and the operation room found in the first upper floor composed of two operating rooms; first called general surgery; and the second called Ear Nose Throat (ENT) surgery.

Sample

A purposive sample of 66 children from the above mentioned settings after fulfilled the following inclusion criteria and divided randomly to two equal groups included (33 child in control group and 33 child in the study group). Sample size was calculated as following: the total number of children age from 3-12 years in the previous year 2017 with minor operations were 660 child, so the researchers take 10% of the total number (66) child.

Inclusion criteria:

- Age: 3-12 years.
- Free from neurological syndromes or congenital malformation
- Children who are willing to participate in study.

Exclusion criteria:

- Children who take anxiolytic or psychoactive drugs
- Children with neuro-psychomotor deficit
- Children with cognitive deficit or physical disabilities
- Children who refused to participate

Tools of data collection

Three tools were used for data collection:

1- Tool I: An interviewing questionnaire sheet

This tool was designed by the researcher after reviewing a related literature, it was written in a simple Arabic language and it included personal characteristics of the studied children as age, diagnosis, gender, educational level, residence and child arrangement among siblings.

2- Tool II: Vital signs recording sheet

This tool developed by the researchers to record the child's vital signs at different times.

3- Tool III: The modified Yale Preoperative Anxiety Scale (mYPAS)

The modified Yale Preoperative Anxiety Scale (mYPAS) was developed by **Kain et al., 1997** and adopted by the researchers to assess the level of anxiety in the studied children during the preoperative period. It contain 22 items divided into five categories (1) Activity, (2) Vocalization, (3) Emotional expressivity, (4) State of apparent arousal, (5) Use of parents, each representing a different domain of child anxiety and is used at 4 items in time during the preoperative phase, except vocalization category is used at 6 items.

Scoring system are based on four-point Likert scale varying between (0) for severe anxiety, (1) for moderate anxiety, (2) for little anxiety and (3) for no anxiety. Then the scores were converted into percentile scores where means and standard deviations were calculated. However, $0 < 4$ was considered severe anxiety, moderate anxiety $4 < 8$, little anxiety $8 < 12$ and no anxiety scored $12 \leq 15$, with a higher score indicated less anxiety.

Validity and reliability of tools:

The tools were reviewed for content validity by a jury panel of three experts in the field of pediatric and psychiatric nursing. Modifications of the study tools were done according to the experts' judgment on clarity of sentences, the appropriateness of content and sequence of items. The reliability was done by Cronbach's Alpha coefficient test, which indicated a high internal consistency of tools, internal consistency of Modified Yale Preoperative Anxiety Scale equal 0.79.

Ethical Considerations

An informed oral consent was obtained from every mother after explanation of the nature and the aim of the study. The mothers were assured that all data are used only for research purpose. Each mother was informed that participation is voluntary and has the right to refuse or withdraw at any time with no consequences. Also, they were confidentiality secured.

Administrative design

An official approval to conduct this study was obtained from the Dean of Faculty of Nursing to Director of Benha Specialized Pediatric Hospital and Benha University Hospital. A clear explanation was given about the nature, importance and expected outcomes of the study.

Pilot study:

The pilot study was carried out on 10.0% of the overall sample (6 children, "3 from control group and 3 from study group"), to ascertain the relevance, clarity, and applicability of the tools, estimate the time required to fill the study tools. As well as, detect any problems peculiar to implement play intervention and the process of collecting data. According to the results of the pilot study, no modifications were done. Children within the pilot study were included from the study sample.

Field work :

The study was carried out from beginning of February 2018 to the end of May 2018, covering a period of four months. The researchers visited the previously mentioned settings twice/week (Monday and Tuesday) from 9.00 a.m. to 1.00 p.m. to collect data by using the previous tools. The study was executed according to the following phases:

Preparatory phase:

Before beginning the study, the researchers equipped themselves with extensive reviewing the background, components and essential elements of play that considered suitable for the studied children to build and upgrade knowledge and skills that researchers would carry out. The researchers reviewed the required materials that were used during the preoperative period, this phase took one month (February 2018).

Implementation phase:

The researchers interviewed and introduced themselves to each mother, and explained all information about the study aim, duration, and activities then oral consent was obtained. All children satisfying inclusion criteria of the study. A systematic random sample was done to assign them equally into study and control groups drawn with a systematic random technique of (66) children during the preoperative period from the previously mentioned settings, were included (33 child in control group and 33 child in the study group). It was used to select each 3rd one child (1, 3, 6 and 9) from the surgical list.

Tools were completed by the researchers in both groups. The data collection was mainly divided into three times: (a) One hour before transferring to the operating room (baseline) (b) On the time of transferring. (c) In the operating room. The average time for completion tools was around 40-50 minutes, divided as (10 minutes) for tool I, (15 minutes) for tool II and (20-25 minutes) in tool III, in which tool II and tool III completed at three times of assessment. After completion of data collection, children in the control group were received routine care, while children in the study group, were allocated individually with their parents. The researchers take 3-4 child in each day. Also, children in the study group were received play intervention such as toys, books, drawing materials (sheets of paper, color pencils, crayons, ruler, pencils and eraser) and mobile games. Children actively engaged and participated in playing.

The play intervention was implemented one hour before transferring to the operating room in the surgical unit for each child individually and also implemented during the time of transferring to the operating room. The play intervention not implemented in the operating room because the researcher was found some inhibitors to implement play intervention to the child such as hospital policy. The play time for each child took 35-40 minutes before the time of assessment.

Evaluation phase

After the completion of the play intervention; children's' anxiety immediately were evaluated (one hour before transferring to the operating room, time of transferring and in the operating room). Anxiety level of children was measured by using the modified Yale Preoperative Anxiety Scale (mYPAS), at three times (one hour before transferring to the operating room (base line), at the time of transferring and in the operating room).

Vital signs were taken also at three times (one hour before transferring to the operating room, at the time of transferring and in the operating room) to assess child's responses especially to stressful procedures, the vital signs parameters are considered to be objective and concrete indicators. (Implementation phase and evaluation phase took three months, from the beginning of March 2018 to the end of May 2018).

Statistical analysis

Data were verified prior to computer entry. Statistical Package for Social Sciences (SPSS version 20.0) was used, followed by data analysis and tabulation. Descriptive statistics applied (mean, standard deviation, frequency and percentages). Tests of significance (Chi-square, and independent t test) were used for comparison between the groups and to test the study hypotheses. A statistically significant difference was considered at p-value <0.05, a highly statistical significant difference was considered at p-value ≤ 0.001 and no statistical significant difference was considered at p-value > 0.05.

III. Results

Table (1) illustrated children’s characteristics, it was observed that, the mean age of the studied children in both study and control group was (5.18±1.13 & 6.45±1.82) respectively. Concerning residence of children, more than half (57.6%&54.5%) of them from rural. Moreover, there was no statistical significant difference between study and control group regarding their characteristics.

Table (2) showed that there was no statistical significant difference (P>0.05) between the study and control group regarding vital signs one hour before transferring, while there was highly statistical significant difference (P<0.001) between study and control group regarding vital signs in the operating room regarding heart rate and respiration.

Table (3) indicated that there were highly statistical significant differences (P<0.001) between the study and control group regarding total mean score of scale at base line, time of transferring and in the operating room.

Table (4) showed highly statistical significant differences (P<0.001) between the study and control group regarding total mean score of scale one hour before transferring, time of transferring and in the operating room.

Table (5) showed that the majority (87.9%) of the study group had no anxiety one hour before transferring, while the minority of control group had no anxiety. Also this table clarified that there were highly statistical significant differences (P<0.001) between the study and control group regarding total anxiety score one hour before transferring, time of transferring and in the operating room.

Figure (1): Illustrates that, less than two thirds (63.6%) of the study group were female, and less than half (48.5%) of the control group were female. (X² = 1.53, p >0.05).

Figure (2): Illustrates that, the majority (84.8%) of the control group had no previous surgery, while less than two thirds (63.6%) of the study group had no previous surgery. (X²=3.88, p >0.05).

Table (1): Distribution of the studied children in the study and control group according to their characteristics (n=66).

Children’s characteristics	Study group		Control group		X ²	P value
	No	%	No	%		
Age in years					0.776	>0.05
3 >6	13	39.4	11	33.3		
6 > 9	11	33.3	12	36.4		
9 ≥12	9	27.3	10	30.3		
Mean ±SD	5.18±1.13		6.45±1.82			
Child arrangement among siblings					8.00	>0.05
First	18	54.5	20	48.4		
Second	6	18.2	12	36.4		
Third	4	12.1	2	6.1		
Others	5	15.2	3	9.1		
Residence					0.062	>0.05
Rural	19	57.6	18	54.5		
Urban	14	42.4	15	45.5		
Previous hospitalization					2.35	>0.05
Yes	18	54.5	24	72.7		
No	15	45.5	9	27.3		
Siblings’ previous surgery					6.72	>0.05
Yes	17	51.6	12	36.4		
No	16	48.4	21	63.6		
Type of surgery					15.675	>0.05
Tonsillectomy	9	27.3	11	33.3		
Hernia repairs	3	9.1	9	27.3		
Correction of bone fractures	4	12.1	2	6.1		
Adenoidectomy	5	15.2	6	18.2		
Unilateral nephrectomy	1	3.0	0	0.0		
Appendectomy	7	21.2	3	9.1		
Congenital defects repair	4	12.1	2	6.1		
Thyroidectomy	0	0.0%	1	3%		

No statistical significant at P value >0.05

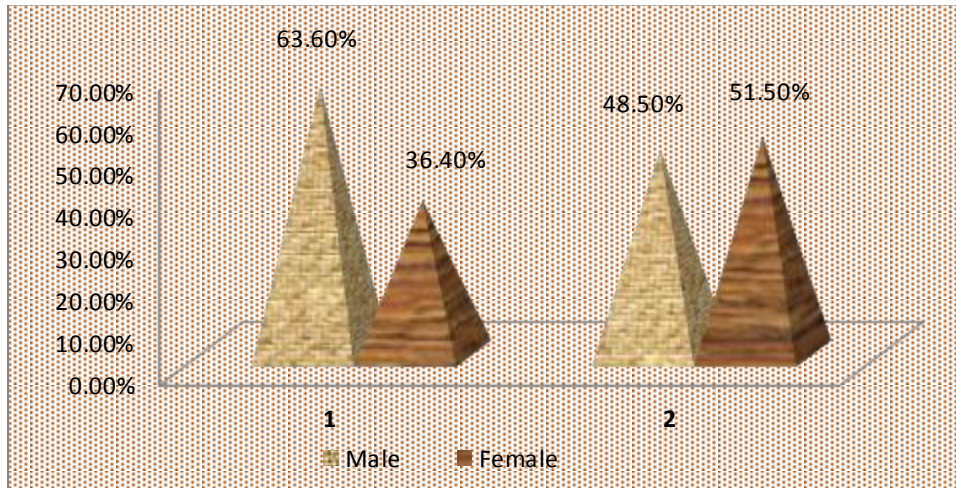


Figure (1): Distribution of the studied children according to their gender (n=66). (1 study group/ 2 control group)

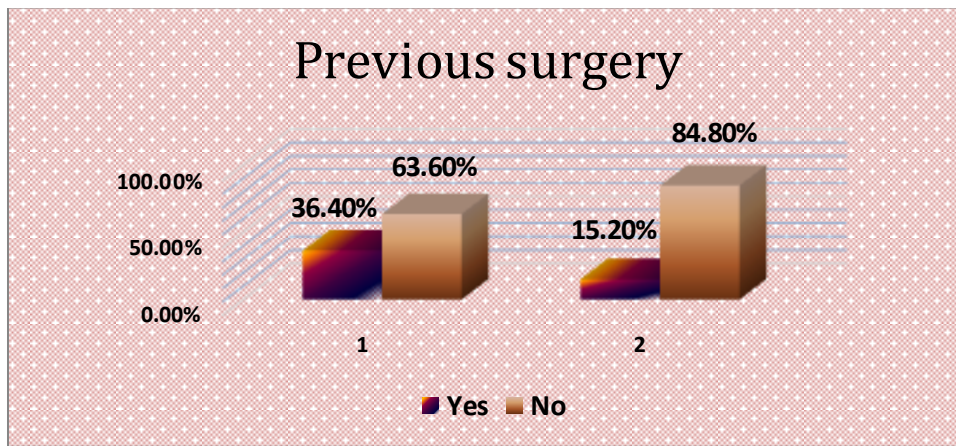


Figure (2): Distribution of the studied children according to their previous surgery (n=66). (1 study group/ 2 control group)

Table (2): Distribution of the studied children in the study and control group according to their vital signs one hour before transferring, time of transferring and in the operating room (n=66).

Vital signs	Time of assessment	Study group				Control group				X ²	P value
		Normal		Abnormal		Normal		Abnormal			
		No	%	No	%	No	%	No	%		
Heart rate	one hour before transferring to the operating room	27	81.8	6	18.2	25	75.8	8	24.2	0.363	>0.05
	At the time of transferring	21	63.6	12	36.4	15	45.5	18	54.5	9.42	<0.05*
	In the operating room	24	72.7	9	27.3	10	30.3	23	69.7	19.80	<0.001**
Blood pressure	one hour before transferring to the operating room	30	90.9	3	9.1	27	81.8	6	18.2	0.00	>0.05
	At the time of transferring	22	66.7	11	33.3	18	54.5	15	45.5	5.65	<0.05*
	In the operating room	21	63.6	12	36.4	9	27.3	24	72.7	8.80	<0.05*
Respiration	one hour before transferring to the operating room	30	90.9	3	9.1	24	72.7	9	27.3	3.66	>0.05
	At the time of transferring	20	60.6	13	39.4	18	54.5	15	45.5	2.75	>0.05
	In the operating room	23	69.7	10	30.3	12	36.4	21	63.6	30.80	<0.001**

Highly statistical significant at P value <0.001**; Statistical significant at P value <0.05*; No statistical significant at P value >0.05

Table (3): Total mean score of anxiety regarding the scale items between the study and control group one hour before transferring, time of transferring and in the operating room (n=66).

Scale items	Times of assessment	Study group	Control group	Independent t test	P value
		Mean ±SD	Mean ±SD		
Activity	One hour before transferring to the operating room	2.72±.67	1.96±.72	4.38	<0.0001**
	At the time of transferring	2.54±.79	1.27±.45	6.01	<0.0001**
	In the operating room	1.96±.84	1.06±.24	5.92	<0.0001**
Vocalization	One hour before transferring to the operating room	2.36±0.82	1.51±.97	3.82	<0.0001**
	At the time of transferring	1.93±1.08	0.81±.8	5.21	<0.0001**
	In the operating room	1.60±1.19	0.69±.58	3.91	<0.0001**
Emotional expressivity	One hour before transferring to the operating room	2.66±0.65	1.54±.66	6.94	<0.0001**
	At the time of transferring	2.06±0.89	1.090±.29	5.89	<0.0001**
	In the operating room	1.78±0.89	1.06±.24	4.51	<0.0001**
State of apparent arousal	One hour before transferring to the operating room	2.96±0.63	1.51±.75	6.87	<0.0001**
	At the time of transferring	2.21±.81	1.24±0.43	6.01	<0.0001**
	In the operating room	1.90±1.80	1.06±0.24	5.79	<0.0001**
Use of parents	One hour before transferring to the operating room	2.75±0.66	1.69±.72	6.18	<0.0001**
	At the time of transferring	2.09±0.91	1.18±0.39	5.25	<0.0001**
	In the operating room	1.81±0.72	1.06±0.24	5.68	<0.0001**

Highly statistical significant at P value <0.001**

Table (4): Total mean score of anxiety between the study and control group one hour before transferring, time of transferring and in the operating room (n=66).

Times of assessment	Study group	Control group	Independent t t test	P value
	Mean ±SD	Mean ±SD		
One hour before transferring to the operating room	13.21±2.65	8.30±3.37	7.08	<0.0001**
At the time of transferring	10.84±3.75	5.60±1.73	7.40	<0.0001**
In the operating room	9.09±3.96	4.93±1.39	5.85	<0.0001**

Highly statistical significant at P value <0.001**

Table (5): Total anxiety score between the study and control group one hour before transferring to the operating room, time of transferring and in the operating room (n=66).

Times of assessment	Total anxiety score	Total anxiety score				X ²	P value
		Study group		Control group			
		No	%	No	%		
One hour before transferring to the operating room	No	29	87.9	5	15.2	19.41	<0.0001**
	Little	1	3.0	10	30.3		
	Moderate	3	9.1	18	54.5		
	Severe	0	0.0	0	0.0		
At the time of transferring	No	15	45.5	0	0.0	28.83	<0.0001**
	Little	10	30.3	3	9.1		
	Moderate	8	24.2	30	90.9		
	Severe	0	0.0	0	0.0		
In the operating room	No	10	30.3	0	0.0	31.33	<0.0001**
	Little	11	33.3	2	6.1		
	Moderate	12	36.4	31	93.9		
	Severe	0	0.0	0	0.0		

Highly statistical significant at P value <0.001**

IV. Discussion

Preoperative anxiety is a state of worry or nervousness that occurs prior to surgical intervention. Moreover, anxiety is one of the most prevalent preoperative problems in children that can be caused by such factors as maternal situational anxiety, child’s mood, child’s age, quality of prior medical interventions, operating rooms, separation from parents, and unfamiliar environment of operating rooms **Shoja et al., (2018)**. Therefore, the present study aimed to assess the effect of play intervention on anxiety and vital signs in children during preoperative period.

Regarding children characteristics, the present study revealed that there was no statistical significant difference between study and control group regarding their personal characteristics. This may be due to the homogeneity of the sample. This result was consistent with **Mahmoudi-gharaei et al., (2008)** on the study done about “Effect of Preoperative Play Interventions on Post-Surgery Anxiety” which reported no statistically significant difference was observed between the two groups in demographic variables.

The findings of the current study showed that the mean age of study and control group was 5.18±1.13 and 6.45±1.82. This finding supported with **Memarzadeh et al., (2006)** in a study about “The effect of parental presence on anxiety during anesthesia induction in children 2 to 11 years of age undergoing surgery” who reported that the mean age in the case and control group was 5.11±2.30 years and 5.81±2.32years.

Regarding gender of the studied children, the present study revealed that less than two thirds of the study group were females and less than half of control group were females. This finding was disagreement with **Li et al., (2014)**, on the study done about “Effect of therapeutic play on pre- and postoperative anxiety and emotional responses in Hong Kong Chinese children” who found that more than two thirds (64.7%) of study group and (70.2%) of the control group were males.

In relation to vital signs of the studied children, the present study showed that there was no statistical significant difference between the study and control group regarding vital signs one hour before transferring to operating room, while there was highly statistical significant difference between study and control group regarding vital signs in the operating room regarding heart rate and respiration. This finding may be due to play and games are very interesting to children. Because of their young age and cognitive development level, children do not understand the purpose or significance of a surgical operation and are prone to regard it as a threat. This fear can increase the secretion of

cortisol and norepinephrine, which in turn affect the vital signs. This result was supported by a study done by **Aranha, et al., (2017)** about impact of multimodal preoperative preparation program on children undergoing surgery who found that multimodal preoperative preparation program is effective in stabilizing pulse, respiration, and BP of children.

The results of the current study indicated that providing toys for children before an operation decreases their anxiety. This result was in accordance with the previous studies of **Ghabeli et al., (2014)** on the study done about “effect of toys and preoperative visit on reducing children's anxiety and their parents before surgery and satisfaction with the treatment Process” who indicated that providing toys for children before an operation decreases their anxiety. **Weber, (2010)** also noted in his study about “The influence of play activity on the child's anxiety during the preoperative period in the outpatient surgical center” that children who participated in play activities in the recreation room decreased their anxiety and those in the control group remained anxious. **Memarzadeh et al., (2006)** also reported that play reduce preoperative anxiety and added that children are more vulnerable to the anxiety associated with surgery due to their limited ability, higher dependence on others, self-control inability, little experience of life, and little understanding of healthcare systems.

On the same context **Messina et al., (2014)** in a study that indicate play, learning and entertainment during the preparation for surgery can prevent preoperative anxiety for children. These findings highlighted the role of play-therapy on reducing stress in children before a surgery. It also emphasized on the importance of game room and toys in reducing children's preoperative anxiety. Since anxiety before surgery causes behavioral improvement in the postoperative period, severe preoperative anxiety causes psychological and physiological outcomes after the operation. Therefore, the management of anxiety in children leads to the best psychological and physiological response to surgery and better managing of their health. Moreover, using games play an important role in reducing extreme anxiety, adjustment of children with hospital environment, and the post-operative problems after surgery.

The result of the current study clarified that there were highly statistical significant differences between the study and control group regarding total mean score of Modified Yale Preoperative Anxiety Scale (mYPAS) one hour before transferring, time of transferring and in the operating room. This may be because play intervention enhanced the children's sense of control and cope with anxiety and potential threats. This result was similar to **Silva et al., (2017)** on the study done about ‘toy and story for therapeutic play sessions’ who reported that children who are allowed to play may feel safer in the perioperative period, even in a strange environment and recommended that health professionals be trained to use a playful approach and in the context of child healthcare, aiming to support the coping with potentially threatening situations.

Concerning the total anxiety score between the study and control group, the current study reported that the majority of the study group had no anxiety one hour before transferring while the minority of control group had no anxiety. Also this table clarified that there was highly statistical significant differences between the study and control group regarding total anxiety score one hour before transferring, time of transferring and in the operating room. This demonstrates the effect of play on reducing anxiety among the studied children. This result was similar to **Li et al., (2014)**, who indicated that children in the experimental group reported lower state anxiety scores than children in the control group.

V. Conclusion

Based on the findings, children in the preoperative period are particularly vulnerable to anxiety that resulting in physiological, emotional, cognitive, behavioral, and interpersonal changes. So, engagement in an interesting play can reduce children's preoperative anxiety and improve their vital signs. Also, play intervention is effective in the preoperative period, as its content is already very familiar to nurses and took a short time to implement by a staff nurse's to a group of children and their parents.

VI. Recommendations

Based on the results of the current study, the following recommendations were suggested:

1. Establishing preoperative play activities for children undergoing abdominal surgeries is essential for preparation of the child for surgery.
2. Offering a well-designed play activity room in the hospitals for the children with different age groups to relieve their anxiety and fear.
3. Conducting a comprehensive preoperative preparation program for children and their parents starting from admission, including play activities.

4. Updating knowledge and practice of nurses through implementation of continuing educational programs about the importance of preoperative play activities.
5. Awareness about the importance of play for children even when they are ill should be promoted in nurses, parents, and health care professionals

Recommendations for further researches:

1. Focus research studies on children during preoperative period to study their coping strategies toward the surgical experience after play interventions.
2. Replication of this study is warranted, and this would enhance opportunities to generalize the findings to other pediatric-age groups, and other surgical clinical settings.
3. Studying the effect of play intervention on a wide variety of surgical disorders preoperatively with longer duration of play session is mandatory.

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