

# Effect of Expressive Arts Therapy Interventions on Comfort of Children Undergoing Surgery

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Received August 1, 2019, accepted September 1, 2019.  
doi: 10.47104/ebnrojs3.v1i4.113

## ABSTRACT

**Context:** Children undergoing surgery may experience pain and discomfort. Unfortunately, it is not always possible to completely prevent postoperative pain and discomfort with analgesics. Therefore, there is an increasing interest in non-pharmacological interventions through expressive arts therapy.

**Aim:** This study aimed to evaluate the effect of expressive arts therapy interventions on the comfort of children undergoing surgery.

**Methods:** A quasi-experimental design utilized in this study. This study conducted at the Pediatric Surgical Department in Children's Hospital affiliated to Ain Shams University, Cairo, Egypt, on a purposive sample of 84 children undergoing surgery. Children randomly assigned to two equal groups (control group 42 and study group 42). A child's assessment record was used to gather data related to characteristics of the studied children and surgery data. Pain assessment record to assess the child's physiological and physical parameters of pain. A Numeric Pain Rating Scale to assess a child's pain intensity. State-Trait-Anxiety Inventory for Children to measure anxiety levels. Besides, A Comfort Assessment Scale to assess children's numerical pain intensity and discomfort.

**Results:** There are statistically significant differences in mean pain intensity scores were observed between the control and study groups on the second day after surgery and before discharge ( $p > 0.05$ ). The mean anxiety scores were significantly lower in the study group compared to the control group in the day after surgery and before discharge ( $p < 0.05$ ). Also, there were observed improvements in mean comfort scores between the study and the control group on the day after surgery scores and on the day of discharge with a statistically significant difference ( $p < 0.05$ ). There were statistically significant differences at ( $p$ -value=0.000) between children in the control and study group regarding children's postoperative pain intensity, anxiety levels, and comfort scores.

**Conclusion:** The application of expressive arts therapy interventions was positively improving comfort and reducing pain intensity and anxiety levels among children undergoing surgery in the study group compared to the controls, emphasizing the importance of using expressive arts therapy interventions for improving children's postoperative comfort.

**Keywords:** Expressive arts therapy, postoperative comfort, children

## 1. Introduction

Surgery is a tense experience for children. It associated with moderate to severe pain and discomfort. Exposure to postoperative pain is associated with high levels of distress and anxiety, which results in adverse long-term emotional outcomes and lower pain thresholds. Children may blame themselves for their pain experience. However, unrelieved pain and discomfort can interfere with the wound-healing process (Koller & Goldman, 2012).

The intense postoperative pain and discomfort have demonstrated long term adverse effects for children, including; eating and sleeping disturbances, decreased cooperative behavior, increased fears, and posttraumatic stress. However, minimization of postoperative pain, anxiety, and discomfort may influence future fear of health care and reduce harmful and long-term adverse effects of procedural pain (Nilsson, Enskär, Hallqvist, & Kokinsky 2003; De Young, Hendrikz, Kenardy, Cobham, & Kimble 2014).

The surgical operation can be a significant event in children's attitudes towards hospitals; more than 5 million children undergo surgery every year. Up to 80% of children experience moderate to severe pain, even when receiving analgesics. Managing children's pain is a growing priority in hospital settings, with increasing attention given to minimizing the pain (Kain, Mayes, O'Connor, & Cicchetti, 1996).

The time of arts always is the best time for children. It is the time of fun, relaxation, and pleasant feeling from creating something they made. Children were usually enjoying coloring, drawing, painting, cutting, and pasting. Arts therapy is a powerful therapeutic tool for reducing postoperative pain and discomfort in children. Also, it may help to modify the child's response to emotional and physical problems related to pain (Solan, 2018).

Expressive arts therapy is improving and enhancing the physical, mental, and emotional well-being of children through the creative process of art production. It considered one of the most extended-standing forms of communication. It helps children coping in stressful and traumatic situations, increasing self-esteem, reducing stress and anxiety include fear of mutilation, disfigurement, separation, helplessness, loss of control, pain, needles, and

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death (American Art Therapy Association AATA, 2018; Aguilar, 2017).

Expressive arts therapy accelerates psychological and physical healing. It alerts the parasympathetic system causes specific areas of the brain to release endorphins and other neurotransmitters that affect pain perception. Moreover, it reduces the physiological hyper-arousal and fight-or-flight response associated with stress (Málek et al., 2017; Phelps, 2019).

Postoperative pain management is considered a child's right. The top priorities for nursing care of children undergoing surgical procedures are assessing, monitoring, intervening, preventing, and minimizing the pain and discomfort regardless of their diagnosis or type of pain. Therefore, nurses have a unique role in controlling and relieving acute postoperative pain and discomfort by using both pharmacological and non-pharmacological approaches (Madenski, 2014; Loeser & Treede, 2008).

Nurses have an essential role in providing safe pain-relieving measures, decreasing related physiologic risks, and promote optimal wound healing. Many practical approaches enable nurses to monitor and to reduce the child's postoperative pain and discomfort. Expressive arts therapy techniques used in conjunction with consideration of the child's needs. The techniques of expressive art therapy may include; crafting activities, forming clay activities, drawing, and coloring (Siegel, Haruka, Rachlin, & Yount, 2015).

## 2. Significance of the study

Pain and discomfort area of frequent occurrence in children undergoing surgical procedures, but it is frequently managed inadequately, approximately 80% of children undergoing surgery, with 86% of cases characterized by moderate to extreme pain and discomfort (Yount, Rachlin, & Siegel, 2013).

Pain and discomfort are tense experiences for children undergoing surgery. Nurses are usually neglecting pain-relieving measures. Advancements of expressive arts therapy had been producing significant benefits in the pediatric population (Bitonte & De Santo, 2014). Therefore, applying expressive arts therapy techniques for children undergoing surgery that consequently decrease a child's pain, anxiety, and discomfort.

## 3. Aim of the study

This study aimed to evaluate the effect of expressive arts therapy interventions on the comfort of children undergoing surgery.

### 3.1. Research hypotheses

The researchers hypothesized that the application of expressive arts therapy would positively affect the comfort of children undergoing surgery.

- Children who are cared for by expressive art therapy will exhibit reduced pain intensity compared to the controls.
- Children who are cared for by expressive art therapy will exhibit fewer anxiety levels compared to the controls.

- Children who are cared for by expressive art therapy will exhibit more comfort compared to the controls.

### 3.2. Operational definition

*Expressive arts therapy* is an approach that integrates psychotherapy with multi-arts, intermodal approach using imagination, arts ritual, and the creative process such as drawing, coloring, and crafting activities.

*Acute pain* is an unpleasant sensory, emotional, and mental sensation (experience) associated with vegetative signs, the psychological response, and changes in behavior.

*Anxiety* refers to the anxious response and unusual preoccupation about deleterious consequences that can result from visiting hospitals or from undergoing surgical procedures in a hospital.

*Comfort* is a multidimensional concept, experienced by child patient as a sense of positivity and strength characterized not only by the relief of physical discomfort but integration of positive emotions that include feeling confident, competent, having a sense of personal control, feeling cared for, valued, safe (able to trust) and at ease. Children described comfort in terms of feeling better, safe, and not sad.

## 4. Subjects & Methods

### 4.1. Research design

A quasi-experimental research design was utilized in this study to establish the causality, the effect of an independent variable on the dependent variable (Dutra & Dos Reis 2016). The independent variable, which is expressive arts therapy interventions on the dependent variables, including pain, anxiety, and level of pain intensity of children undergoing surgery. In which the children were assigned to the control group and study group to measure the effect of expressive arts therapy on the comfort of children undergoing surgery.

### 4.2. Research setting

The study was carried out in the Pediatric Surgical Department at Children's Hospital Affiliated to Ain Shams University that includes one surgical ward consisted of eight beds for pre and postoperative care. Throughout the implementation of the study, the daily schedule of surgeries included three to seven pediatric patients.

### 4.3. Subjects

A purposive sample that composed of 84 children who were undergoing surgery and were recruited in this study according to their inclusion criteria, using a simple random method to select the children from the booking schedules of the surgical unit. Children who met the selection criteria were recruited and assigned randomly to either the control group (n=42) or the study group (n=42) using the Research Randomizer, to ensure that every subject has the same probability of being chosen.

The sample size calculated according to the total number of children undergoing abdominal and urological surgeries in the past three months was 285, and based on

the following assumption of Power Analysis to define sample size.

$$n = \frac{t^2 \times P(P-1)}{m^2}$$

n = the required sample size.

t = the confidence level at 95% (standard value of 1.96).

p = estimated prevalence of pain and discomfort among children undergoing surgery.

m = the margin of error at 5% (standard value of 0.05).

#### *Inclusion criteria*

Children ages ranged between 6-12 years, from both genders and undergoing abdominal and urological surgeries for the first time in their lives.

#### *Exclusion criteria*

- Children who are suffering from chronic illness.
- Children with mental disabilities.
- Children who are suffering from postoperative complications such as wound infection and septicemia.
- Children had connective devices such as chest tube, endotracheal tube, urinary catheter, and gastric tube.

### **4.4. Tools of the study**

The data collected through the following tools:

#### **4.4.1. Child's Assessment Record**

The researchers designed that after reviewing the related literature, *Wong, Hockenberry, and Wilson (2015)* to gather data regarding the following:

First part: it was concerned with characteristics of the studied sample (including; child's name, age, gender, and level of education).

Second part: it was concerned with the child's diagnosis and type of surgery.

#### **4.4.2. Pain Assessment Record**

It was adopted from *Wong et al. (2015)* to gather data for the control and study group. It was composed of two parts concerned with pain physical and physiological manifestations.

First part: It included four queries concerned with physiological indicators (including; heart rate, respiratory rate, blood pressure, and oxygen saturation).

Second part: Physical manifestations included seven queries regarding (gastrointestinal upset, cramps, stomach pain, shivering, sweating, flushing, and difficult breathing).

#### **4.4.3. Numeric Pain Rating Scale (NPRS)**

It adopted from *Gabrielle et al. (2012)*. It is a self-report pain scale used to measure pain intensity for children ages of at least six years old who understand how to rank numbers. Children's pain intensity ranged from 0 (meaning 'no pain at all') to 10 (meaning 'the worst possible pain') based on the NPRS. In the current study, the NPR Scale used for scoring pain intensity in the day before surgery and day after the surgery.

#### **4.4.4. The State Anxiety Scale for Children (SAS-C)**

It was a short form of the State-Trait-Anxiety Inventory for Children (STAI-C) adopted from *Spielberger*

(1983). It used to measure children's level of state anxiety. The ten items of SAS-C scales divided into five items assessing negative emotions and five items assessing positive emotions.

The researchers asked the child to choose one response from the three given rating scale (1= never, 2= sometimes and 3= always) for each item and instruct the child to answer how it currently describes his/her feelings. The child should give an immediate response and dissuade from thinking too long about his/ her answers. The total scores range from 10-30, with higher scores indicating higher levels of anxiety.

### **4.4.5. The Comfort Assessment Scale**

It adopted from *Ambuel, Hamlett, Marx, and Blumer (1990)*. It was a behavioral scale measurement used to assess children's comfort under the age of 18 years. The comfort measures, both behavioral and physiological responses to pain. It consisted of eight indicators, including alertness, calmness-agitation, crying, physical movement, muscle tone, blood pressure, heart rate, and facial tension. Each indicator scored from 1 to 5. The scale scored between ranges of 0 to 40, with 0 representing no pain or discomfort. A high score indicates a high level of pain intensity and discomfort.

### **4.5. Procedures**

The content of expressive arts therapy intervention protocol based on reviewing related literature (*Siegel, Haruka, et al., 2015; LeBlanc et al., 2016; Wajcman, 2018*). Also, a group of three experts in pediatric nursing were reviewed the study intervention protocol and evaluated the tool content validity.

Ethics approval granted from the Scientific Research Ethical Committee of Faculty of Nursing, Ain Shams University. Oral consent obtained from each subject (children and their accompanying mothers). The researchers have explained the purpose and procedures of the study to children included in the study. Besides, the rights of withdrawal from research at any time have explained to each child and mother using a participant information sheet. Participating children and their mothers were assured that their identities and the data collected would be kept confidential.

Official permission to carry out the study obtained through an issued letter from the Dean of the Faculty of Nursing / Ain Shams University to the director of Children's hospital to get the agreement to conduct the study.

A pilot study was applied on 10% (n=8) of the studied subjects (84) to test applicability, clarity of the study tool, to estimate the time needed to fill each tool, as well as to test the feasibility of the research process. The studied children included in the pilot study were included in the study sample while there was no modification required in the study tools.

The actual fieldwork carried out during the period that started from April to the end of Jun 2019. Where, the

researchers were available two days per week from 9 am to 4 pm to gather the necessary data and implement the expressive arts therapy session using the previously mentioned study tools.

The researchers selected the child according to their eligibility criteria identified and recruited. The researchers greeted, introduced themselves to the child and his/her accompanying mother, explained the technique and purpose of the research before surgery. Once consent had been obtained from the child and his/her accompanying mother, the child, was asked what kind of arts he/she would like to do and select one from the art cart (forming clay activities, craft activities, drawing and coloring activities) according to the child's preference.

The baseline data were collected, which included characteristics of the studied children, diagnosis, and type of surgery. The researchers assessed the studied children's physical manifestations and physiological indicators before starting the intervention (including; heart rate, respiratory rate, blood pressure, and oxygen saturation). Also, the researchers assessed pain scores by using NPRS and anxiety scores using SAS-C and measure the child's degree of comfort using the comfort scale before starting the intervention.

Implementation of the Study Interventions: For the study group children, they received four sessions of the previously selected expressive arts therapy interventions for 30 minutes, started in the day before surgery (first session) and continued two sessions in the day after surgery and the last session (fourth session) before discharge in the third day after surgery.

The researchers provided the arts cart that included art materials including; age-appropriate and nontoxic colors (e.g., cake watercolor), coloring materials (e.g., coloring book, colored markers, brushes); for crafting activities (e.g., stickers, craft sticks, glitter, glue, colored keys, paper, and cotton) and air-dry clay, crayons, markers, and colored pencils.

Crafting activities: The researcher presented the craft materials and asked each child to explore it before starting their activities, followed by a short tutorial that explained the key elements of the craft activities (including forming paper flower, clown, paper boat, fish, sheep and congratulation cards). The researcher did not encourage the children to interact with each other. Then, children were starting to create craft activities with the help of their mothers when used scissors. Also, children were allowed to create their characters to support their autonomy.

Forming clay activities: Clay activity is one of the most popular loveable activities for the children. The researcher represented clay materials with different colors and shapes and encouraged children to create their favourite character.

Drawing and coloring activities: The researcher presented the coloring materials, including a coloring book, cake watercolor, colored markers, pencils, and brushes. The children asked to select a picture from the coloring book and color preferences. The researchers represented ten colors available to each child (red, orange, yellow, green, blue, purple, pink, white, brown, and black), were placed in

front of the child in a randomized order. The children started to color the selected picture using their color preferences.

Invitations were extended to children's mothers to participate in expressive arts therapy interventions with their children. However, most parents chose to sit behind and watch their children. The researchers given the importance of sanitation and infection prevention standards of the *Joint Commission (2018)*, a majority of the materials were single-patient use. Also, items such as crayons, markers, pencils, that are opened and used by a child patient are sent home with that child to enjoy after discharge. Any hard, nonporous surface that can be disinfected with hospital-grade wipes is sanitized and used repeatedly, such as permanent markers and scissors. Also, the researchers instruct children to wash their hands after the art session.

The researchers applied the first session of the selected expressive arts therapy in the day before surgery, and then the child entered to operation room according to his/her schedule in the operation list. The researchers met the child in next day after surgery and applied the second and third sessions of expressive arts therapy in the morning and afternoon shift. On the morning of the third day after surgery and before discharge, the researchers met the child and applied the fourth session of expressive arts therapy.

Also, the researchers were assess studied children's NPRS scores, SAS-C scores, and degree comfort by using the previously mentioned tools after completing the first session of expressive arts therapy in the day before surgery, after the third session in the day after surgery and after the fourth session before discharge.

Children in the control group were received only routine pre and postoperative hospital care; The researchers met the child in the day before surgery to assess the level of pain using NPRS and anxiety scores using SAS-C and measure the child's degree of comfort using comfort scale. The researchers gave some of the art therapy materials include colored pencils, coloring booklets, and clay for children of the control group after the completion of the study to achieve the equity and justice between the children in the control and study group and avoid discrimination of nursing care.

Evaluation phase: According to the monitored pain manifestations, the total NPRS scores divided into four categories: (1) "no pain" when the total scores obtained was zero, (2) "mild pain" for scores 1 to less than 3, (3) "moderate pain" for scores 3 to less than seven and (4) "severe pain" when scores more than seven. The higher values indicated a worse case of pain.

Means of SAS-C and comfort scores were measured to compare the level of anxiety and comfort between the control and study groups throughout the study intervention. Means of HR, RR, Bp, and oxygen saturation were measured to compare the physiological patterns between the two groups after expressive arts therapy intervention.

#### 4.6. Data analysis

All the data were checked carefully, immediately after collection to avoid any missing or wrongly entered answers. Data were revised, coded, tabulated, analyzed, and presented using Statistical Package for Social Sciences (IBM SPSS V21), and the confounding factors have also been considered. Frequencies, percentages, arithmetic mean, and standard deviations were used for quantitative variables. Chi-square used for testing the difference between qualitative variables. The student t-test used for comparisons of quantitative variables between the control and study group. Data were analyzed applying appropriate statistical methods to determine the statistically significant differences as follows:

- $P\text{-value} \leq 0.05$  was considered significant statistical differences.
- $P\text{-value} > 0.05$  was considered non-significant statistical differences.

#### 5. Results

Table 1 reveals that the mean age and standard deviation of the studied children in the study and control group. They were  $8.43 \pm 1.99$  &  $7.71 \pm 1.78$  respectively, more than three quarters (76.2%) of children in the control group and (78.6%) of children in the art therapy group were in primary school.

Figure 1 illustrated that more than two thirds 64.3% of the studied group and more than half 59.5% of the control group were males while more than one third 35.7% of the studied group and less than half 40.5% of the control group were females.

Figure 2 clarified that less than half 47.7% of children in the study group had emergency appendicitis, followed by 14.3% of them had urological problems. 11.9% of children in the study group had gall bladder stones, keep track of 9.5% of them complained of acute abdominal pain and congenital spherocytosis, and fewer of them 7.1% had a hernia. For children in the control group, the same figure illustrated that an equal percentage of 40.5% of them had appendicitis, less than one quarter (23.8%) had urological problems. 11.9% of children had gall bladder stones, and acute abdominal pain followed by 7.1% of them had congenital spherocytosis, and the minority 4.8% had a hernia.

Figure 3 illustrates that the majority of the studied children, 85.7% in the art therapy group, and more than two quarters 76.2% of children in the control group had an abdominal surgical operation, respectively. While, less than one quarter 23.8% of the control group and the rest, 14.3% of the art therapy group had urological surgical operations, respectively.

Figure 4 illustrates that more than half 57.1% of the studied children in art therapy group selected clay activities; more than a quarter, 26.2% of them were selected drawing and coloring, while only 16.7% of them selected crafting activities.

Figure 5 represents the physical manifestations in both control and art therapy groups after using expressive arts

therapy. This figure shows that less than half 47.6% of children in the art therapy group compared to the majority, 80.9% of the controls had stomach pain. As regards GIT upset, cramps, flushing, and difficult breathing were mentioned by 7.1%, 9.5%, 4.8%, and 4.8% in art therapy group compared to 38.1%, 31%, 21.4%, and 31% of children in the control group respectively. Also, it was observed that children in the art therapy group did not complain from shivering or sweating after using expressive art therapy.

Table 2 highlighted a marked improvement in physiological indicators in children of the study group compared to the controls before and after the intervention. There was a statistically significant difference between the study and the control groups after intervention regarding children's heart rate, respiratory rate, systolic blood pressure and oxygen saturation with  $P < 0.05$ , and statistically insignificant in diastolic blood pressure before and after the intervention with  $P > 0.05$ . Moreover, there was an insignificant difference between the study and control groups before the intervention.

Table 3 shows that there was a statistically insignificant difference in children's pain intensity score between control and study groups in the day before surgery with  $P\text{-value} \geq 0.05$ . While there was a statistically significant difference in children's pain intensity score between control and study groups on day after surgery and before discharge from hospital with  $P < 0.001$ .

Figure 6 highlights a marked improvement in children's mean pain scores between the day before surgery, day after surgery, and before discharge in the study and control groups after using expressive art therapy. The mean pain scores were 0.83 in the control group and 0.67 in the study group on the day before surgery and decreased from 5.98 in the control group to 3.36 in the study group on the day after surgery. As well the mean pain scores were more decreased from 5.11 in the control group to 3.0 at the study group on the day before discharge.

Table 5 shows that there was a statistically insignificant difference in children's anxiety according to the state-trait anxiety scale after intervention between control and study groups the day before surgery with  $P \geq 0.05$ . Also, there was a highly statistically significant difference in children's anxiety after intervention between control and study groups in the day after surgery and before discharge from the hospital with  $P < 0.001$ .

Figure 7 highlights a marked improvement in children's mean anxiety scores after using expressive art therapy intervention. The mean anxiety scores were 12.69 in the control group compared to 11.55 in the study group on the day before surgery, and the mean anxiety scores also decreased from 21.67 in the control group to 18.65 in the study group in the day after surgery. Besides, before discharge, the mean anxiety score decreased from 14.95 in the control group compared to 10.47 in the study group.

Table 6 demonstrates a statistically insignificant difference in children's comfort after intervention between control and study groups in the day before surgery with  $p > 0.05$ . Meanwhile, there was a statistically significant

difference in children's comfort after intervention between control and study groups on the day after surgery and before discharge from the hospital with  $p < 0.001$ .

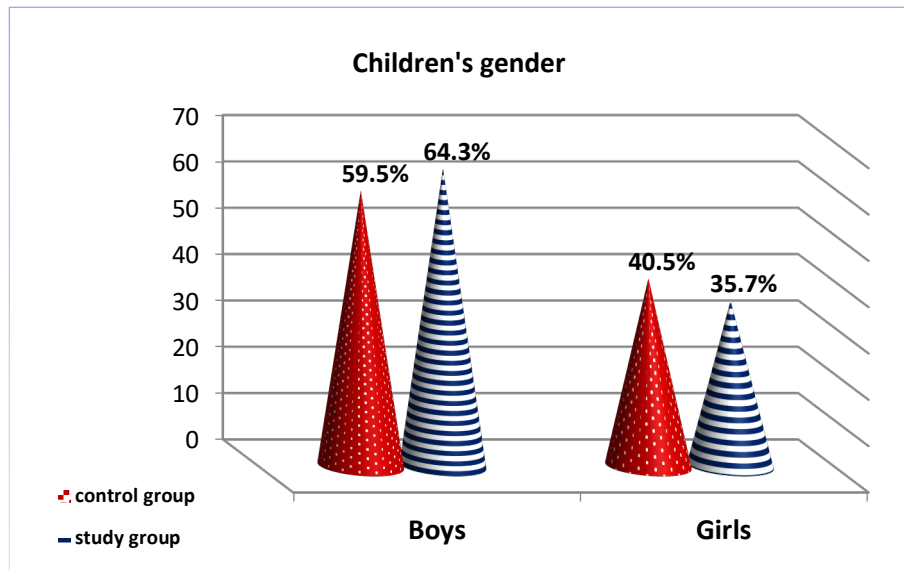
Figure 8 illustrates the children's mean comfort scores were lower in the study group at 7.21 scores on the day before surgery compared to 8.19 scores among the control

group. While on the day after surgery, the children's comfort score in the study group was 16.38 scores compared to the 31.26 scores in the control group. As well, before discharge, the mean comfort score in the control group was 20.73 and 13 scores in the study group.

**Table (1) Frequency and percentage distribution of children in both groups according to their characteristics (n=84).**

Characteristics	Control group (n=42)		Study group (n=42)		Tests used	p-value
	No.	%	No.	%		
<b>Age (year):</b>						
6-<8	24	57.1	17	40.5	t-test 0.056	>0.05
8- < 10	11	26.2	12	28.6		
10-≤12	7	16.7	13	30.9		
$\bar{X} \pm SD$	7.71±1.78		8.43±1.99			
<b>Level of education</b>						
Primary	32	76.2	33	78.6	$\chi^2$ 6.56	>0.05
Preparatory	10	23.8	9	21.4		

*Insignificant statistical differences  $P \geq 0.05$*



**Figure (1): Percentage distribution of the children in both groups according to their gender (n=84).**

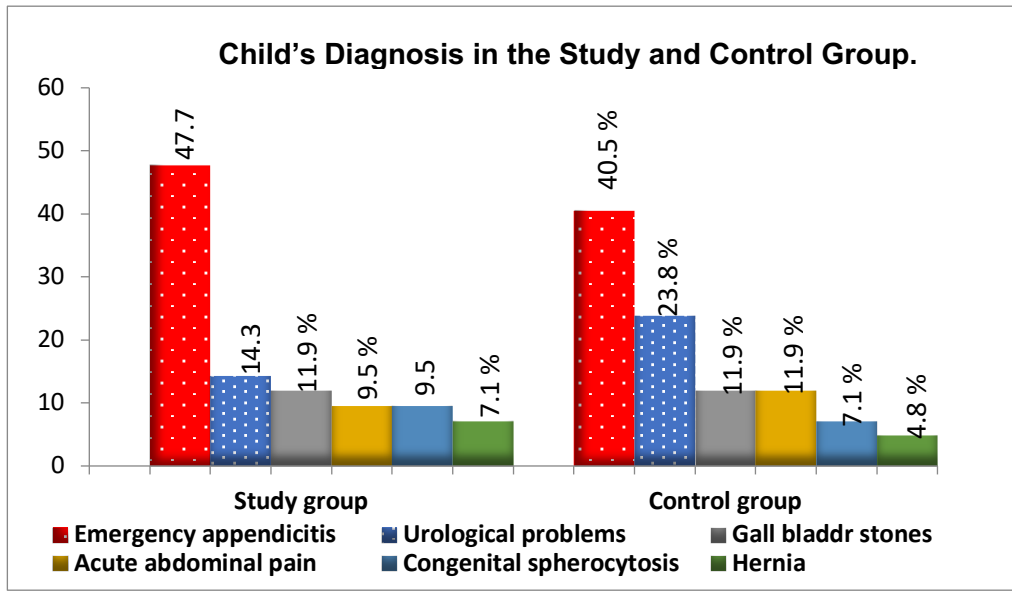


Figure (2): Percentage distribution of child's diagnosis in the study and control group (n=84).

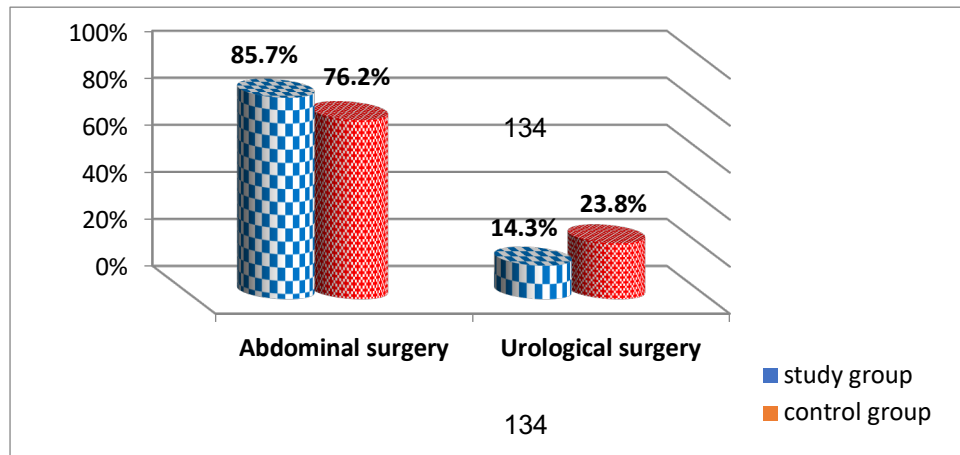


Figure (3): Percentage distribution of the children in both control and study groups regarding their types of surgery (n=84).

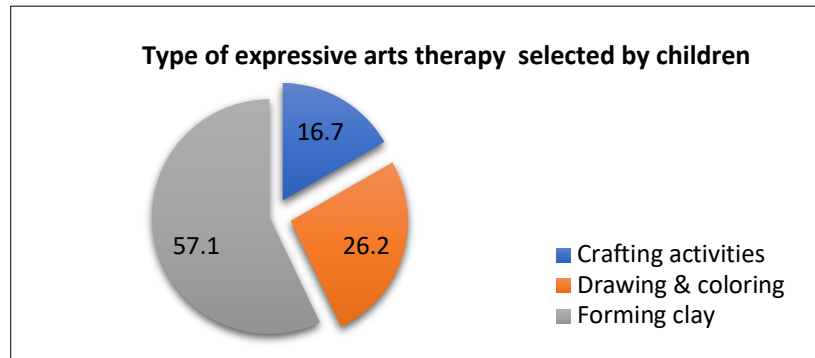


Figure (4): Percentage distribution of children in the art therapy group according to their selected expressive arts therapy (n=42).

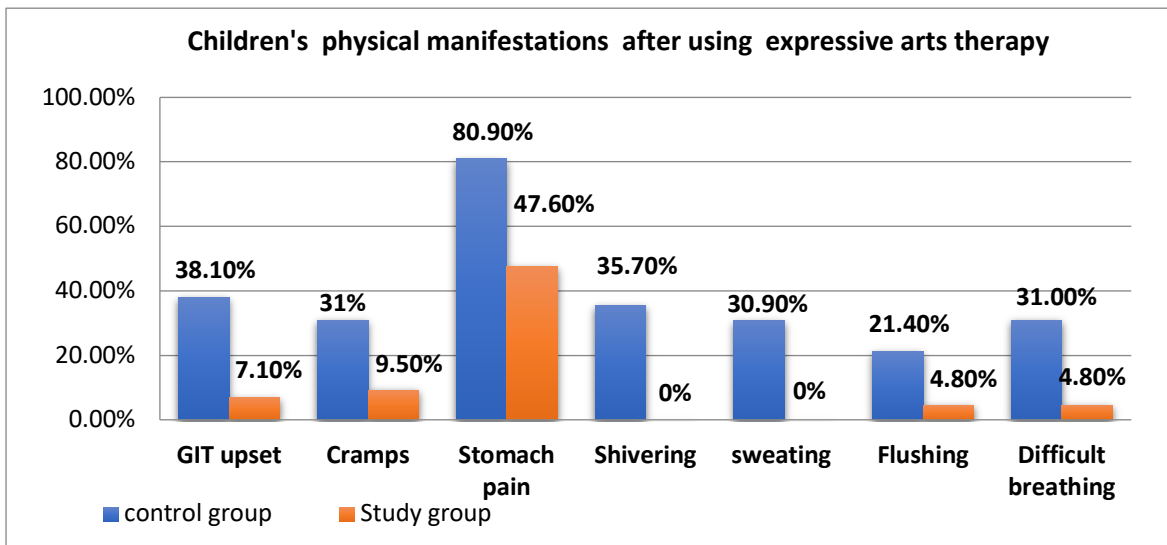


Figure (5): Percentage distribution of the children's physical manifestations in both control and study groups post-surgery (n=84).

Table (2): Comparison of physiological indicators between children of the control and study group (n=84).

Physiological measures	Before Intervention		After Intervention		t-test (1)	P-value (1)	t-test (2)	P-value (2)
	Control group (n=42)	Study group (n=42)	Control group (n=42)	Study group (n=42)				
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$				
Heart rates (b/min)	74.43±2.30	72.79± 7.29	86.83±3.52	75.31±2.61	1.720	0.093	16.043	0.00
Respiratory rates (c/min)	19.24±3.09	19.43±2.79	24.21±1.93	20.31±2.49	0.677	0.502	7.264	0.00
Blood pressure (mmHg)								
Systolic blood pressure	101.57±2.39	101.48±2.07	110.38±4.88	105.31±3.99	0.454	0.652	6.401	0.00
Diastolic blood pressure	67.95±5.69	67.71±4.78	72.19±3.79	72.19±3.79	0.337	0.738	0.14	0.14
Oxygen saturation	97.12±1.23	97.02±1.44	94.71±1.68	97.05±1.63	0.474	0.638	5.634	0.00

t- test (1) = relation between control group and study group day before surgery.

t- test (2)= relation between control group and study group day after surgery.

Table (3): Comparison of pain intensity scores between children of the control and study group (n=84).

Categories of pain intensity scoring	Control group (n=42)								Study group (n=42)								t-test	P-value
	No pain		Mild pain		Moderate pain		Severe pain		No pain		Mild pain		Moderate pain		Severe pain			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Day before surgery	11	26.2	31	73.8	0	0.0	0	0.0	19	45.2	23	54.8	0	0.0	0	0.0		
Mean ±SD				0.83±0.581								0.67±0.687					0.227	>0.05
Day after surgery	0	0.0	0	0.0	16	38.1	26	61.9	0	0.0	22	52.4	20	47.6	0	0.0		
Mean ±SD				5.98±1.423								3.36±1.032					10.27	<0.001
Before discharge	0	0.0	4	9.5	33	78.6	5	11.9	0	0.0	27	64.3	15	35.7	0	0.0		
Mean ±SD				5.11±1.53								3.0±1.68					7.760	<0.001



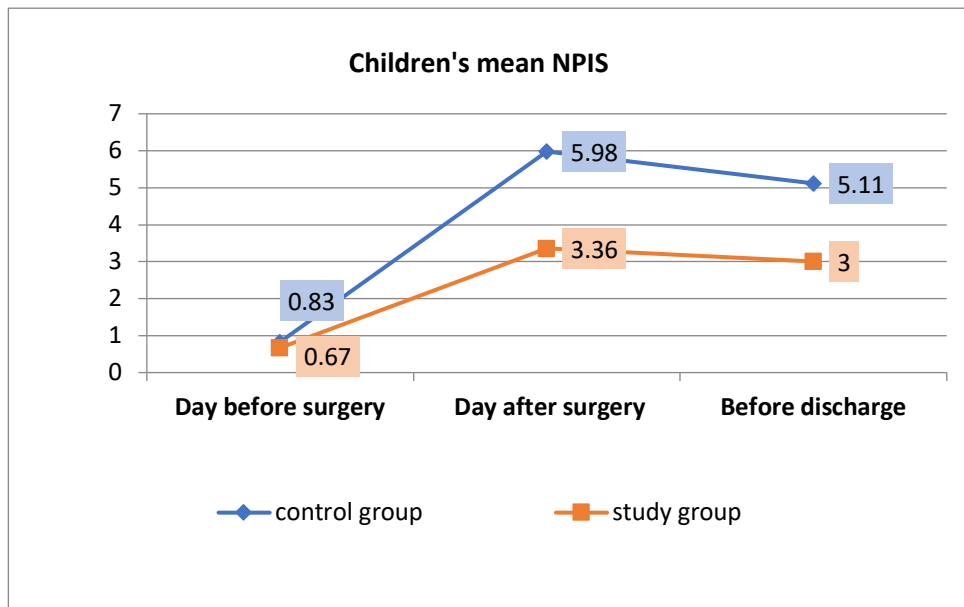


Figure (6): Mean numerical pain intensity scores between children of the control and study group (n=84).

Table (5): Comparison of Anxiety total scores between children of the control and study group.

Anxiety total scores	Control group (n=42)	Study group (n=42)	t-test
	Mean ±SD	Mean ±SD	
Day before surgery	12.69±1.80	11.55±1.36	3.204
Day after surgery	21.67±2.534	18.65±1.46	17.026
Before discharge	14.95±2.33	10.47±1.48	9.797

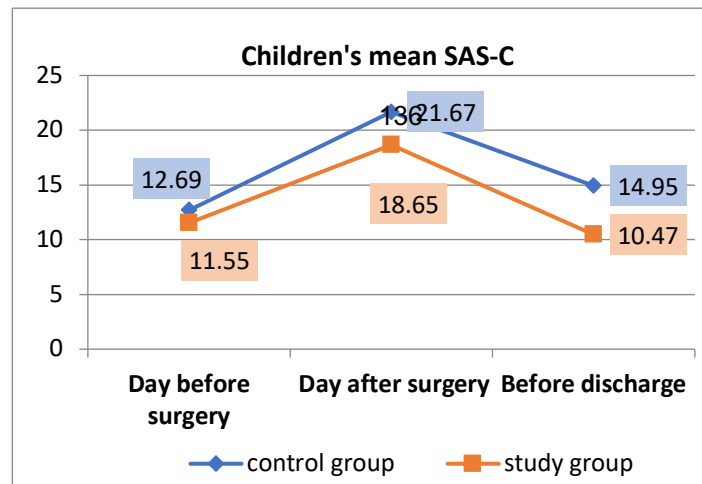


Figure (7): Mean scores of State anxiety scale for children (SAS-C) between children of the control and study group.

Table (6): Comparison of comfort total scores between children of the control and study group

Total comfort scores	Control group (n=42)	Study group (n=42)	t-test
	Mean ±SD	Mean ±SD	
Day before surgery	8.19±1.58	7.21±2.31	2.92
Day after surgery	31.26±2.35	16.38±3.19	23.16
Before discharge	20.73±3.41	13±1.16	10.31

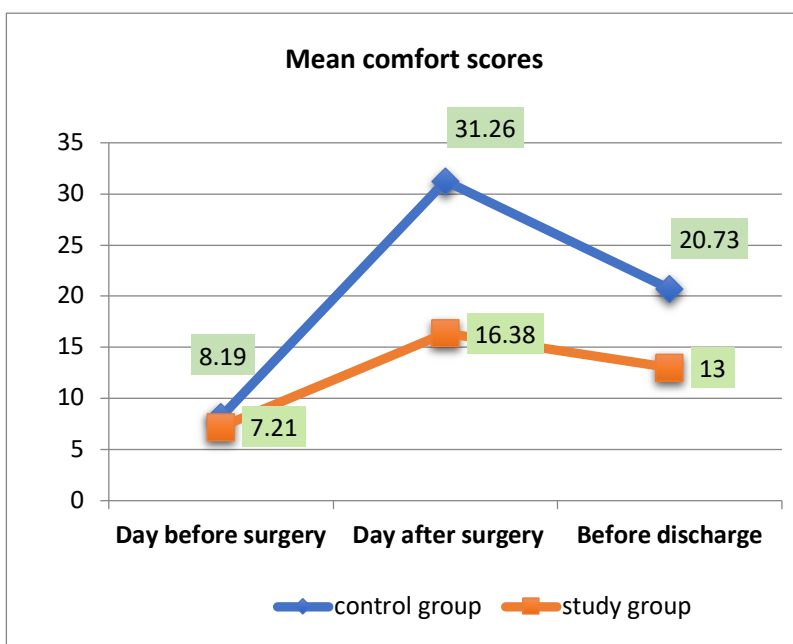


Figure (8): Mean comfort scores between children of the control and the study group.

## 6. Discussion

Children may suffer adverse outcomes following admission to the hospital; pain and discomfort are remaining the most common outcomes among children undergoing surgical procedures. In the developed country, many health agencies implemented an innovative, expressive arts therapy program for children to reduce stress during their time in the hospital (Devine et al., 2018).

Expressive art therapy is a helpful tool in coping with stress and anxiety, increasing sense of hope, autonomy, competence, and self-esteem in the children. Participation in arts also facilitated the safe and contained expression of feelings in the child. Therapeutic play can be combined with expressive arts to elicit emotional expression and decrease anxiety and fear in the hospitalized child (Ball, Hole, & Hirsch, 2018). The study aimed to evaluate the effect of expressive arts therapy interventions on the comfort of children undergoing surgery.

As regards the characteristics of children in both groups, the present study revealed that less than half of the children in the study group and more than half of children in the control group their age was ranged between six to less than eight years old, respectively. Also, more than three-quarters of children in both control and study groups were at the primary level of education.

The study finding was in agreement with a research study about "Effect of designed wound care guidelines for pediatric nurses on the occurrence of surgical site complications." Khalafallha, Mohammed, and Bahnsawy, (2018), who found that nearly three-quarters of the children in the study group and two-thirds of children in the control group their age ranged between six and less than eight years. As regards the level of education, the study finding was in agreement with Bratton, (2017), who studied "The depth and breadth of pediatric surgical nursing," and found

that more than three-quarters of studied children were in primary school.

According to the gender of both study and control groups, the results of the current study show more than two thirds in the art therapy group, and more than half of the control group were males. This result was similar to the results of a study by Sabur, Elgamil, and Elhadi (2017), entitled "Assessment of nurses' knowledge and practices regarding wound vacuum-assisted closure therapy." They found that two-thirds of the children were males.

Regarding the diagnosis of children among study and control groups, the results obtained that, less than half of children in both control and study groups had appendicitis, a fifth of them had urological problems, about a tenth of children in the study group, had gall bladder stones, beside the rest of the study group diagnosed with a hernia.

These results were incongruent with Khalafallha et al. (2018), who found that the highest percentage of diagnosis in both study and control groups had Hirsch-sprung disease followed by less than half had appendicitis, and fewer of the children had congenital hypertrophic pyloric stenosis. Additionally, Mohammed, Mohammed, and Abdul Fatah (2015), contrasted with study finding, they found that the highest percentage of children had appendicitis, and fewer children had urological problems. This finding also congruent with the study by Ademuyiwa, Bode, Adesanya, and Elebute (2016), who studied "Non-trauma related pediatric abdominal surgical emergencies in Nigeria" and concluded that, more than half of children in the pediatric surgery diagnosed with appendicitis.

Concerning the types of surgery, it is evident that the majority of children in the study group and more than two-quarters of the control group had an abdominal surgical operation, less than one-quarter of the control group, and the rest of the study group had urological surgical operation respectively. This finding was an agreement with Power

and Franck (2016), who study "Postoperative behavior changes and pain in children, following inpatient and day-case surgery." Power and Frank found that children scheduled for planned abdominal, and urology surgery were identified from the relevant surgery lists at each site.

As regards the selection of children the art therapy there were classified into; more than half of studied children selected clay during play; more than a quarter of the selected drawing and coloring, while the rest of them selected crafting activities. From the researcher's point of view, most children are more interested in playing with clay. Girls more interesting in crafting activities while boys are more interested in drawing and coloring during play. Besides, art therapy is one of the few therapies where the children become actively involved in treatment through the process of artmaking and creation.

The study showed that the physical manifestation of children in both control and study groups, as observed, less than half of children in the study group having stomach pain after using expressive art therapy compared to the majority of children in the control group was still having stomach pain. As regards GIT upset, cramps, flushing, and difficult breathing were mentioned by the rest of the children in the study group; complaints were fewer than children in the control group. Also, shivering and sweating in the study group were disappeared after using expressive art therapy.

These findings were in agreement with the findings of the study conducted by Huirne, Bouwsma, Dongen, Terwee, and Ven (2016) entitled "Substitution of usual perioperative care to enhance postoperative recovery in children undergoing surgery." They found that there is improve in clinical manifestation outcomes, quality of life, earlier discharge from hospital, and reduction in healthcare costs in children undergoing surgery after using health play instruments.

Concerning the physiological indicators in children of the study group compared to the control group, the results of the study observed marked improvement after using the expressive art therapy for the control group. There was a statistically significant difference between study and control groups after intervention regarding children's heart rate, respiratory rate, systolic blood pressure, and oxygen saturation. From the researcher's point of view, this could be explained by the fact that expressive arts therapy interventions promoted parasympathetic activation, which causes a reduction in heart rates, respiratory difficulties, and GIT upset.

These findings were congruent with those of Archibald, Scott, and Hartling, (2014), who found that art therapy, reduces physiological features associated with adverse medical diagnoses, thus facilitating reconnections of neural pathways. Jaber, Bahloul, and Guétin, (2007), recognized that music and art therapy provides a significant reduction in heart rate ( $88 \pm 15$  versus  $82 \pm 15$  b/m, with  $p < 0.05$ ) and systolic arterial blood pressure ( $137 \pm 17$  versus  $128 \pm 14$  mm Hg,  $p < 0.05$ ).

Regarding children's pain intensity scores in both control and study groups, there was a statistically

insignificant difference in children's pain intensity scores after intervention between control and study groups in the day before surgery with  $P$ -value  $\geq 0.05$ . While there was a statistically significant difference in children's pain intensity score between control and study groups at day after surgery and before discharge from hospital with  $P < 0.001$ .

This result was an agreement with Viscardi, (2016), who mentioned in a similar study "Art therapy as a support group for pediatric patients with surgery," found that the preoperative anxiety and postoperative pain are clinically decreased, and shortage the duration of hospital stay with interventions by art therapy before and after surgery. Also, Mohamed et al. (2016) supported these findings in a study entitled "Effects of music and art therapy in children undergoing abdominal surgery." They mentioned in surgical intervention, the music and art therapy are a non-pharmacological, inexpensive, and non-invasive technique that can significantly enhance children satisfaction and decrease the perioperative stress and pain.

Regarding the children's mean pain scores between the day before surgery, the day after surgery, and before discharge in the study and the control groups after using expressive art therapy, the study shows, the mean pain children scores were higher in the control group compared to the study group at the day before surgery and higher in the control group compared to the study group at the day after surgery. As well, the mean pain scores were more in the control group compared to the study group on the day before discharge. This could be due to using the art therapy, which leads to decrease pain intensity in the study group.

This finding came in agreement with Abdulrasheed, Nasir, and Ameh, (2016), who studied "Meta-analysis evaluating art therapy interventions for anxiety and pain in surgery in India," and indicated that the different outcome measures of pain resulted in a statistically significant MD of  $-0.50$  ( $-0.66$  to  $-0.34$ ) at  $p < 0.001$ , indicating the high effect of art therapy interventions in reducing pain. This finding is supporting the first research hypothesis.

In the light of the study findings, it was observed that there was a statistically insignificant difference in children's anxiety according to the state-trait- anxiety score between control and study groups in the day before surgery with  $P \geq 0.05$ . Also, there was a highly statistically significant difference in children's anxiety between control and study groups in the day after surgery and before discharge from the hospital with  $P < 0.001$ . From the researchers' point of view, the art therapy designed for hospitalized pediatric patients can reduce anxiety in patients hospitalized for surgery or medical treatment.

Devine et al. (2018), supported this finding that the art therapy can provide coping methods and reduce the anxiety that helps pediatric patients not only focus their attention away from their painful or frightening medical procedures but also create an avenue to master traumatic events ultimately.

Concerning the children's mean anxiety in the study group after using expressive art therapy intervention, marked improvement was found. The mean anxiety scores

were higher in the control group compared to the study group on the day before surgery, and the mean anxiety scores also higher in the control group compared to the study group in the day after surgery. Besides, before discharge, the mean anxiety score was higher in the control group compared to the study group. The improvement in the study group anxiety might be related to the art therapy.

These findings were consistent with the findings of the study conducted by *Vaajoki, Pietila, and Kankkunen, (2017)*, entitled " Effects of art therapy on anxiety intensity and pain distress after surgery," and reported the data on mean change in anxiety scores between postoperative outcomes and preoperative baseline measurements revealed a significant effect of art therapy interventions in reducing anxiety, with an MD of  $-1.41$  ( $-1.89$  to  $-0.94$ ) with  $P < 0.001$ . Also, *Siegel et al. (2015)*, evaluated the emotional responses of the children confirmed that the art therapy sessions improved the mood and alleviated the anxiety level of the children compared to the children in the wait-list control group. There was a trend of improvement in mood reported by the children immediately following the therapy interval. This finding is supporting the second research hypothesis.

In the light of the study findings, a statistically insignificant difference in children's comfort was observed between control and study groups at the day before surgery with  $p > 0.05$ . Meanwhile, there was a statistically significant difference in children's comfort between control and study groups in the day after surgery and before discharge from the hospital with  $p < 0.001$ .

The study showed that the children's mean comfort score was lower in the study group on the day before surgery compared to the control group. While, on the day after surgery, the children's comfort score in the study group was lower compared to the control group. As well, before discharge, the mean comfort score in the control group was higher compared to the study group. The researchers believe that the positive effect of the expressive arts therapy intervention as a new nonpharmacological modality to improving comfort among children.

These findings were consistent with the findings of the study conducted by *Yount et al. (2013)*, who studied art therapy for hospitalized children and found that it was a source of stress-relief and comfort for the children, not only during the therapy session but throughout the remainder of their hospital stays. The hospital staff also gained the impression that pain improved as the healing of wounds helped to externalize and mirror the child's experience.

Art therapy helps the children to express the complex emotions without the need for words, eases anxiety, and reduces stress, improves self-acceptance and self-esteem. It also enhances self-awareness, especially forming clay activities, crafting activities, and drawing and coloring activities, which may be stimulated the parasympathetic activities and lead to alleviating the pain and raises the sensation of comfort among children. This finding is supporting the third research hypothesis.

## 7. Conclusion

In the light of the research aim and hypothesis, the application of expressive arts therapy was positively improving comfort and reducing pain intensity and anxiety levels among children undergoing surgery in the study group compared with their controls.

## 8. Recommendations

The current study is emphasizing on the importance of utilizing expressive arts therapy interventions for improving children's postoperative comfort. The study also set the comfort and pain intensity measuring scales as a part of nursing care for children undergoing surgery.

The study also recommends the engagement of pediatric nurses in continuous professional training by studying the modern comfort and pain management for children undergoing surgery. Besides, the conduction of further studies on a broader sample size that focuses on the effect of expressive arts therapy interventions on the comfort of children undergoing surgery is also recommended.

Implications for future pediatric nursing practice is recommended to discuss the different options and benefits of art therapy with hospitalized children and their families. Children may be more encouraged to participate if provided with arts activities to enable them to draw freely on their own. Hospitalized children or other children who have communication barriers may benefit more than others. Also, expressive arts therapy would help nurses by allowing them to gain insight into children's needs and unexpressed emotions. This recommendation can be made possible with specialized training for the nurses on how to interpret children's' expressive arts activities.

Implications for future pediatric nursing research include using other forms of expressive arts therapy and utilize the more, quantifiable tool to measure efficacy should be taken into consideration as a part of the holistic care for pediatric patients.

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