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The Effect of a Planned Play Program as a Nursing Intervention in Reducing Post-operative Pain among Children Undergoing Abdominal Surgeries

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Abstract
Background: *Pain may be a universal experience and a major source of distress for children and their families similar as health care providers. Pain affects children of all ages, even a fetus. Nursing interventions to manage pain after surgery are vital to stop undesirable physiological and psychological consequences. Numerous non-pharmacological approaches to alleviate hospitalized children's pain suggest play as a central part.*
Aim of the study:*This study was done to evaluate the effect of a planned play program as a nursing intervention on reducing post-operative pain among children undergoing abdominal surgeries.*
Method:*A quasi experimental research design was used.*
Subjects*: The study included 70 children of both gender and their caregivers.*
Tools: *Four tools were used to collect data; an interview questionnaire sheet for mothers to collect socio-demographic data and clinical data about the child's health problem, physiological pain assessment tool to obtain baseline data and determine child's physiological response to pain, faces pain scalewas used as a pain assessment tool for younger group (4-7 years), and FLACC behavioral scale for assessing the behavioral responses of children toward postoperative pain.*
Results:*The finding of this study showed that, children with abdominal surgeries who participate in a planned play program were expressed less postoperative pain intensity than those children who receive routine care.*
Conclusion*:It was concluded that the planned play program had a positive effect on reducing post-operative pain of children undergoing abdominal surgeries.*
Recommendation*:The study recommended planning systematic play sessions to help the child coping with the emotional and physical pain resulting from hospitalization or surgical procedures.*

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I. Introduction

Pain is defined as a universal expertise and asignificant source of distress for children and their families, in addition as health care providers. It affects children of all ages, even a fetus. Pain may end up from varied causes including; illness processes, injuries, procedures, and surgical interventions **(Kyle & Carman, 2013)**. Post-operative pain in the immediate period after surgery is one in all the most considerations of health teams and additionally its inevitable outcomes of operative procedures. Despite the progress of pediatric post-operative pain management and use of analgesic drugs, post-operative pain remains a public drawback, due to problem in pain assessment and considerations concerning side effects of analgesics in pediatrics **(Kulshrestha & Bajwa, 2014)**.

Nursing interventions to manage post-operative pain are important to prevent short term effects of unalleviated painlike, exaggerated levels of stress and anxiety for the children and their families, delayed healing of wounds, longer hospital stays, higher admittance rates, additional frequent visits similarly as long run consequences as well as, will increase emotional and behavioral responses throughout future painful events **(Lundeberg, 2015; and Hossain, Wiroonpanich, & Orapiriyakul, 2014)**.Nurses have a moral obligation to alleviate a child's pain, not merely because of the effects of unalleviated pain, but also because proper pain management may have benefits like, earlier mobilization, shortened hospital stays, and reduced budgets. To offer effective nursing management of children in pain, anticipate the presence of pain and acknowledge the

child's right to pain management. Pediatric nurses ought to be ready to assess and use of pain assessment tools for various ages and deliver nursing intervention to alleviate pain either by pharmacological or non-pharmacological methods so as to decrease children's pain **(The American Society for Pain Management Nursing, 2014; Panjganj& Bevan, 2016)**.Non-pharmacological approaches are an "integral part of the nursing care of all children suffering pain", and embrace cognitive-behavioral and physical approaches. The physical interventions embrace application of warmth and cold, massage and pressure, and transcutaneous electrical nerve stimulation. Whereas the cognitive-behavioral intervention is one reasonably of psychological intervention that's effective in pain management. The aims of this intervention are to maneuver a child from a helpless and anxious, and painful stateof affairs, to empower the child to cope well. The psychological intervention approaches include: the psycho instructional approach; deep respiration, distraction, relaxation, play therapy, guided imagery, and hypnosis **(Wente, 2013)**. Numerous non-pharmacological approaches to alleviate hospitalized children's pain suggest play as a central part. Play may be a strong tool to decrease tension, anger, frustration, anxiety, conflict that exaggerates pain of hospitalized children **(Ullan, Belver, Fernandez, Lorente, Badia, & Fernandez, 2014)**.

II. Subject And Methods

Research Design:-

A quasi-experimental research design was utilized in this study.

Setting:-

The study was carried out at the inpatient pediatric surgery department in Mansoura University Children's Hospital (MUCH).

Subjects:-

The study included a convenient sample of 70 children of both gender and their caregivers were recruited over a period of six months for this study.

Inclusion criteria:-

- Children aged from 4 to 11years.
- Children undergoing abdominal surgeries and were approached within the first, second and third post-operative day.

Exclusion criteria:-

- Presence of serious post-operative abdominal surgeries complications as bleeding (internal and external) shock and surgical wound infection.
- Children with neurological disorders like cerebral palsy and seizure.

Tools of data collection:-

Four tools were used for data collection.

Tool (1): An interview questionnaire sheet for mothers. It was designed by the researcher in simple Arabic language after reviewing of current related literature. The data were collected through an interview with child caregivers and child's medical record. It comprised of two parts as follows:

Part I:concerned withsocial characteristics of the studied children and their parents that include age, gender, child's rank, school grade of children and also age of parents, level of education, occupation, number rooms and number of family members.

Part II:concerned withclinical data about the child's health problem. It composed of six questions about diagnosis, type of abdominal surgery, date of surgery performing, previous experience of pain, methods that used to reduce previous pain of child and role of play in reduce previous pain.

Tool (2): Physiologic pain assessment tool:

It was designed by the researcher in English language to determine child'sphysiologic response to post-operative pain. It was used by the researcher to record heart rate, respiratory rate and oxygen saturation of children pre and post implementation of a planned play program.

Tool (3):Faces pain scale:

It was adopted by **Wong and Baker, (1988),** to assess pain of children as young as 3 - 4 years of age. It consists of six cartoon faces, and these faces ranged from "a smiling face "no pain" to "a tearful face" "worst

pain". The researcher asked a child to choose face that indicating own pain, then the researcher recorded degree of pain intensity under chosen face on pain scale.This tool was used pre and post implementation of a planned play program. The rating scale graded as follows: very happy (0), showed a little pain/hurt (1), clarified little more pain/hurt (2), represented more pain/hurt (3), showed a whole lot pain/hurt (4), clarified more pain/hurt (5).

Tool (4):FLACC behavioral pain scale:

This scale was developed by **(Merkel et al., 1997),** adapted by **Abd El-Wahab(2003)** and adopted by the researcher. It was used for assessing the behavioral responses of children toward post-operative pain. It has been demonstrated to be a reliable scale for children from age 2 months to 7 years of age. It contained 5 items that are related to facial expression, cry / vocalization, position in bed, activity and consolability. Each observation was given a score of 0 or 1 or 2, with the total score of the scale is ranged from 0-10.

Method

1- Official approval for conducting the study was obtained from faculty of nursing Mansoura University as well as the ethical committee of faculty of nursing of Mansoura University.
2- An official permission was obtained by submission of an official letter to the director of the hospital and the head of pediatric surgery department to conduct the study after explaining the aim of the study.
3- The first and second tool was developed by the researcher after reviewing of the related literature but the third tool was adopted by **Wong and Baker, (1988),**and the fourth tool was developed **(Merkle et al., 1997)**, adapted by **Abd El-wahab (2003)**and adopted by the researcher.
4- A pilot study was conducted on a total of 10% of the total subjects size (7 children) according to the criteria of selection before starting the data collection to test the tool clarity, effectiveness, applicability to estimate the time needed to apply the study tool and to detect the required modification. Since the study tools didn't require any modification. Therefore, the study subjects of the pilot study were included in the study sample.
5- Data collection of this study was extended over a period of 7 months starting from February to the end of August 2015.
6- The researcher was available four days / week from Saturday to Tuesday; at morning, afternoon, and night shifts, the studied mothers and their children were divided into subgroups, with varying numbers (1-2 mothers accompanying their children). Morning shifts' sessions started from 8.30 to 9.00 am, Afternoon shifts started from 3.30 to 4.15 pm, and night shifts started from 8.30 to 9.15 pm.
7- The researcher started when met every child's caregiver on individual base and explained the aim and nature of the study to obtain their oral consent to participate in the study and collect the socio-demographic characteristic of the child and their parents.
8- The planned play program consist of five session. Both the first and the second sessions were theoretical sessions conducted at the class room placed at the surgical department at the same admission day for each child, at afternoon and night shifts as the admission was routinely done about 11.00 to 12.00 pm.
9- The guiding flayer about importance of distracting the children through play to relive their post-operative pain was given to every mother during the first session for attracting the attention, motivated her, and helping her for reviewing its content when needed.
10- The practical play sessions were conducted at morning shifts; where the first practical session conducted in the first post-operative day at the in-patient department beside the child' bed, and the second and the third practical sessions were provided in second and third post-operative day. Each practical session was provided after the initial assessment (pre-test).
11- The playing material (toys) used in the play sessions were differ to suit the child's age, interests, likes and dislikes. The play material toys used in the play sessions for young age group (4-7years) were in the form as: Bear: It is a cuddly and soft toy that is approximately 30 x 10 cm in size with different colors and song, Simple puzzle: It was consisted of four pieces simple block for construction of different animals and birds pictures such as fish, bear, and butterfly, Doll: It is a model of girl made of plastic, and book story for coloring and paints.
12- The researcher measure children physiological measurements (heart rate, respiratory rate and oxygen saturation) and pain intensity pre and post implementation of the intervention program using tool (I, II,III, IV), and The researcher and the mother were present during the playing session to interact with the child at play.

Ethical Considerations:

1. Oral approval was obtained from each child's care giver before the beginning of the study after explanation of the purpose of the study.
2. Anonymity and confidentiality of the study subjects were assured
3. The researcher emphasized that, there is no physical or psychological harm was caused for the study subjects.
4. Participants allowed withdraw from the study at any stage freely without any responsibility.

Limitation of the Study:

- Overcrowding at the inpatient surgery department made the collection of data difficult, and distract mothers attention during sessions.

Statistical Analysis:

The collected data were coded, processed and analyzed using Statistical Package of Social Science (SPSS) program for windows (version 16). Quantitative continuous data were presented in mean and standard deviation (SD) while categorical data were presented as number and percent. The independent t-test was used for testing significance of parametric quantitative data of each two groups after testing normality using Kolmogrov-Smirnov test. For comparing categorical variables, significance was tested using Chi Square test (substituted by Fischer Exact test and Monte Carlo test if the expected cell count <5). If the p-value ≤ 0.05, we reject null hypothesis (H0) and conclude that there is a significant difference between the tested two groups.

III. Results

Data collected in this study will be presented in the following main sections:-

Section I: Represent characteristics of the studied children and their mothers.

1. Characteristics of the studied children (table 1).
2. Distribution of the studied children according to type of abdominal surgeries(figure 1).
3. Characteristics of the children's mothers(table 2).

Section II: Representphysiological measurements and pain intensity Scale pre and post implementation of a planned play program(table 3- 11).

1. Distribution of younger studied children according to mean scores of physiological measurements pre implementation of the study intervention (table 3).
2. Distribution of younger studied children according to mean scores of physiological measurements post intervention(table 4).
3. Distribution of younger children in experimental group according to mean scores of physiological measurements (pre/post)intervention(table 5).
4. Distribution of younger studied children according to post-operative pain intensity using faces scale pre intervention(table 6).
5. Distribution of younger studied children according to post-operative pain intensity using faces scale post intervention(table 7).
6. Distribution of younger children in the experimental group according to post-operative pain intensity using faces scale (pre/post) implementation of the study intervention(table 8).
7. Distribution of younger studied children according to total score grading of post-operative pain intensity using behavioral scale pre intervention(table 9).
8. Distribution of younger studied children according to total score grading of post-operative pain intensity using behavioral scale post intervention (table 10).
9. distribution of younger children in the experimental group according to post-operative pain intensity using behavioral scale (pre/post) intervention(table 11).

Section I: Represent characteristics of the studied children and their mothers:-

Table(1)showed the distribution of the studied children according to their characteristics. It was found that, 65.7 %, and 54.3% of children in the control and experimental groups respectively were aged 7-11 years old and 51.4% of them in control group were girls, while 51.4% in experimental group were boys. As regard to school grade of children, it was observed that, 77.1%, and 54.3% of them in the control and experimental groups respectively were in primary school grade. Moreover, the same equal percentages (31.4%) of children in the control group were ordered as first and second siblings in their family, while 40% of them in the experimental group were the first siblings. There were no statistical significance differences between children in the control and experimental groups in relation to children's age, gender, school grade level and birth order at (p=0.329, 0.434, 0.027and 0.922) respectively.

Figure (1): It was clearfrom the figure that60 %, 57.1%, of children in the control and experimental groups respectively had appendectomy.

Table(2) It was clear from the table that, 45.7%, and 37.1% of mothers in the control and experimental groups were aged from 30 to less than 35 years old. Concerning the educational level of mothers, it was observed that, 42.8% of them in the control group hadn't educated, while 51.4% of mothers in the experimental group received technical education. The same table also cleared that, the majority (91.4%, 97.1%) of children's mothers in the control and experimental groups respectively were housewives. There were no statistical significance differences between control and experimental groups in relation to mothers' age, educational level and occupation at (p= 0.35, 0.173 and 0.614) respectively.

Section II: Represent physiological measurements and pain intensity Scale pre and post implementation of a planned play program.

Table (3) It was evidenced from the table that, there were no statistical significance differences between children in the control and experimental groups pre implementation of play sessions in relation to mean scores of heart rates and oxygen saturation levels in the first, second and third days post-operative at (p=0.259, 0.604, 0.457,0.056, 0.866 and 0.083) respectively. Regarding mean scores of respiratory rates, there was a highly statistical significance difference between children in the control and experimental groups pre play sessionsin the second day post-operative at p<0.001, while there was no significance difference in the first and third day post-operative at p=0.387.

Table (4)illustrated the distribution of younger studied children according to mean scores of physiological measurements post intervention. It was observed that, there was statistical significance difference between children in the control and experimental groups post implementation of play sessions in relation to mean scores of heart rates in the first 24 hours post-operative (p= 0.05), while there were no significant differences in the second and third day post-operative at p=0.35, and 0.30.The same table also clarified that, there were no significant differences between children in the control and experimental groups post play sessions in the first, second and third day post-operative in relation to mean scores of respiratory rates and oxygen saturation levels at (p=0.27, 0.67, 0.92, 0.26, 0.32 and 0.92) respectively.

Table (5)showed the distribution of younger children in experimental group according to mean scores of physiological measurements (pre / post)intervention. There were highly statistical significance differences between pre and post play program in day1, 2 and 3 post-operative (p < 0.001, 0.001 and 0.02) respectively. As regards mean scores of respiratory rates, it was observed that there was highly statistical significance difference between pre and post play program in the day 2 post-operative (p<0.001), while there were no statistical significance differences between pre and post play program in the day 1and day 3 post-operative at p=0.959, and 0.136. Concerning mean scores of oxygen saturation levels, it was proved that there were statistical significance differences between pre and post play program of children in the experimental group in day1 and day 2 post-operative (p= 0.01, and 0.009) but there was no statistical significance difference in the third day at p=0.333.

Table (6)revealed that, the same equal percentage (33.3%) of children in the control group pointed to hurts a little bit and hurts a little more, while 50% of them in the experimental group pointed to hurts a little bit pre implementation of play sessions. There was no statistical significance difference in pain intensity between children in the control and experimental groups pre implementation of play sessions in the first 24 hours post-operative at p=0.738. The same table also cleared that, 58.3%, and 93.8% of children in the control and experimental groups complain hurts a little bit in the second day post-operative, while 100%, 56.2% of children in both two groups had no pain in the third day post-operative. There were statistical significance differences in pain intensity expressed by faces scale between children in the control and experimental groups pre play sessions in the second and third day post-operative (p= 0.024, and 0.008) respectively.

Table (7)clarified the distribution of younger studied children according to post-operative pain intensity using faces scale post intervention. It was revealed that, 41.7% of children pointed to hurts a little more in the control group, while the majority (87.5%) of them had no pain in experimental group post play session in the first 24 hours post-operative. The same table also clarified that, 66.7%, and 100% of children had no pain in the control and experimental groups respectively post implementation of playsession in the second day post-operative, while all children (100%) had no pain in both two groups post play session in the third day post-operative. There were highly statistical significance differences in pain intensity by faces scale between children in the control and experimental groups post playsessions in the first and second day post-operative (p< 0.001, 0.02 respectively).

Table (8) illustrates that, 50%, 93.8% of children in experimental group pointed to hurts a little bit pre implementation of play program in the day 1 and 2 post-operative, while 56.2% of them had no pain in the day 3 compared to all (100%) of them post play program had no pain in the day 2 and 3 post-operative and also majority (87.5%) of them had no pain post play program in the first 24 hours post-operative. There were highly statistical significance differences of post-operative pain intensity using faces scale between pre and post play

program in first, second and third day post-operative (p <0,001, 0.001and 0.003 respectively).

Table (9) It was clear from table that, the same equal percentages (33.3%) of children in the control group complain mild discomfort and moderate pain, while 62.5% of children in experimental group felt mild discomfort pre implementation of play sessions in the first 24 hours post-operative. There was no statistical significance difference in pain intensity between children in the control and experimental groups pre play sessions in the first 24 hours post-operative at p=0.253. The same table also clarified that,50%, and 93.8% of children in the control and experimental group complain mild discomfort in the second day post-operative, while 100%, 56.2% of children in both two groups felt relaxed and comfortable in the third day post-operative. There were statistical significance differences in pain intensity by behavioral scale between children in the control and experimental groups pre play sessions in the second and third day post-operative at p= 0.029, and 0.008, while there was no significance in the first 24 hours post-operative at p=0.253.

Table (10) showed the distribution of younger studied children according to total score grading of post-operative pain intensity using behavioral scale post intervention. It was found that, 41.7% of children in the control group complain mild discomfort, while 87.5% of them in experimental group expressed that they are relax and comfort post implementation of play sessions in the first 24 hours post-operative. Moreover, 58.4%, and100% of children in the control and experimental groups felt relaxed and comfortable in the second day, while all children (100%) in both two groups expressed that they are relax and comfort in the third day post-operative. There were statistical significance differences in pain intensity by behavioral scale between children in the control and experimental groups post play sessions in the first and second day post-operative at (p= 0.002, and 0.007) respectively.

Table (11) proved the distribution of younger children in the experimental group according to post-operative pain intensity using behavioral scale (pre ⁄ post) intervention. It was evident from this table that, 62.5% of children in the experimental group complain mild discomfort pre implementation of play program compared to 87.5% of them post play program felt relaxed and comfortable in the first 24 hours post-operative, while the majority (93.8%) of them pointed to mild discomfort pre play program compared to all (100%) of them post play program felt relaxed in the second day post-operative and also 56.2% of children in the experimental group expressed that they are relax and comfort compared to all (100%) of them post play program felt relaxed and comfortable in the third day post-operative. There were highly statistical significance differences in pain intensity by behavioral scale between pre and post play program among children in the experimental group in the first, second and third day post-operative at (p<0.001, 0.001 and 0.003) respectively.

Table (1): Number and Percentage Distribution of the Studied Children according to their Characteristics

Items	Control n= 35) (		Experimental n= 35) (		Significance
	N	%	N	%	
Age/yrs					
4- >7	12	34.3	16	45.7	χ^2 = 0.925
7-11	23	65.7	19	54.3	P = 0.329
Gender					
Boy	17	48.6	18	51.4	χ^2 = 0.612
Girl	18	51.4	17	48.6	P = 0.434
School grade					
Nursery	8	22.9	16	45.7	χ^2 = 4.900
Primary	27	77.1	19	54.3	P = 0.027
Birth order					
1st	11	31.4	14	40	Monte Carlo test
2nd	11	31.4	9	25.7	P = 0.922
3rd	9	25.7	8	22.9	
> third	4	11.4	4	11.4	

Figure (1): Distribution of the Studied Children according to Type of Abdominal Surgeries

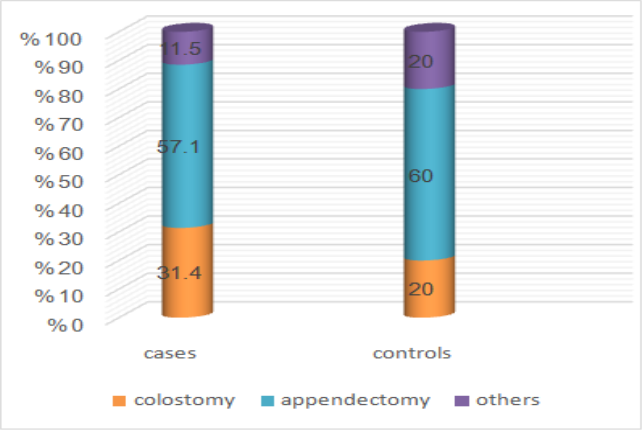

Table (2): Percentage Distribution of Children's Mothers according to their Characteristics

Items	Control (n= 35)		Experimental (n= 35)		Significance
	N	(%)	N	(%)	
Age					
20-	5	14.3	10	28.6	$\chi^2 = 3.121$
25-	14	40	12	34.3	P = 0.35
30-	16	45.7	13	37.1	
Educational level					
Not educated	15	42.9	14	40	$\chi^2 = 3.507$
Non- university education	12	34.3	18	51.4	P = 0.173
Higher education	8	22.9	3	8.6	
Occupation					
Housewife	32	91.4	34	97.1	Fischer Exact test
Employee	3	8.6	1	2.9	P = 0.614

Table (3): Distribution of Younger Studied Children according to Mean Scores of Physiological Measurements post Intervention

Items	Control (n=12) age (4-7 years)	Experimental (n=16) age (4-7 years)	Significance
	Mean ± SD	Mean ± SD	
Heart rate			
1st 24 hours post-operative	108.4 ± 5.5	99.81±13.65	t = 2.053
2nd day post-operative	104.2±5.08	100.25±13.59	P = 0.05*
3rd day post-operative	104.1±5.7	99.75±13.32	t = 0.962
			P = 0.35
			t = 1.054
			P =0.30
Respiratory rate			
1st 24 hours post-operative	20.2±1.4	19.44±1.89	t = 1.120
2nd day post-operative	19.6±1.08	19.31±1.96	P =0.27
3rd day post-operative	19.3±1.2	19.19±1.72	t = 0.431
			P =0.67
			t = 0.107
			P =0.92
Oxygen saturation			
1st 24 hours post-operative	97.75±0.62	97.5±0.52	t = 1.162
2nd day post-operative	97.75±0.45	97.56±0.51	P =0.26
3rd day post-operative	97.92±0.29	97.69±0.48	t = 1.006
			P =0.32
			t = 1.466
			P =0.155

Table (4): Distribution of Younger Children in the Experimental Group according to Mean Scores of Physiological Measurements (pre/post) Intervention

Items	Experimental Age Group (4-7 Years) N=16		Significance
	Pre intervention Mean ± SD	post intervention Mean ± SD	
Heart rate			
- 1st 24 hours post-operative	106.13±12.72	99.81±13.65	t=4.798
- 2nd day post-operative	105.06±13.09	100.25±13.59	p<0.001*
- 3rd day post-operative	102.63±12.79	99.75±13.32	t=4.99
			p<0.001*
			t=2.608
			p=0.02*
Respiratory rate			
- 1st 24 hours post-operative	19.38±5.02	19.44±1.89	t=0.052
- 2nd day post-operative	20.06±1.84	19.31±1.96	p=0.959
- 3rd day post-operative	19.5±1.75	19.19±1.72	t=3.503
			p<0.001*
			t=1.576
			p=0.136
Oxygen saturation			
- 1st 24 hours post-operative	96.31±1.82	97.5±0.52	t=2.893
- 2nd day post-operative	97.19±0.4	97.56±0.51	p=0.01*
- 3rd day post-operative	97.63±0.5	97.69±0.48	t=3
			p=0.009*
			t=1
			p=0.333

Table (5) Distribution of Younger Studied Children according to Post-operative Pain Intensity Using Faces Scale post Intervention

Items	Control n=12 Age (4-7y)		Experimental n=16 Age (4-7y)		Significance
	N	(%)	N	(%)	
1st 24 hours post-operative					
No hurts	2	16.7	14	(87.5)	Monte Carlo test.
Hurts a little bit	3	25	2	(12.5)	P < 0.001*
Hurts a little more	5	41.7	0	0	
Hurts even more	2	16.7	0	0	
2nd day post-operative					
No hurts	8	66.7	16	(100)	Fischer Exact test.
Hurts a little bit	4	33.3	0	0	P = 0.02*
3rd day post-operative					
No hurts	12	100	16	(100)	……..
Hurts a little bit	0	0	0	0	

Table (6) Distribution of Younger Children in the Experimental Group according to Post-operative Pain Intensity Using Faces Scale (pre/post) intervention

Items	Experimental Age Group (4-7 Years) N=16				Significance
	Pre intervention		Post intervention		
	N	(%)	N	(%)	
1st 24 hours post-operative					
No hurts	2	12.5	14	87.5	χ^2 =18.6
Hurts a little bit	8	50	2	12.5	p<0.001*
Hurts a little more	3	18.8	0	0	
Hurts even more	3	18.8	0	0	
2nd day post-operative					
No hurts	1	6.2	16	100	χ^2 =28.24
Hurts a little bit	15	93.8	0	0	p<0.001*
3rd day post-operative					
No hurts	9	56.2	16	100	χ^2 =8.96
Hurts a little bit	7	43.8	0	0	p=0.003*

Table (7): Distribution of Younger Studied Children according to Total Score of Post-operative Pain Intensity Using Behavioral Scale Post Intervention

Items	Control n=12 Age (4-7y)		Experimental n=16 Age (4-7y)		Significance
	N	(%)	N	(%)	
1st24 hours post-operative					
Relaxed and comfortable	3	25	14	87.5	
Mild discomfort	5	41.7	2	12.5	Monte Carlo test.
Moderate pain	3	25	0	0	P = 0.002*
Severe pain	1	8.3	0	0	
2nd day post-operative					
Relaxed and comfortable	7	58.4	16	(100)	
Mild discomfort	4	33.3	0	0	Monte Carlo test.
Moderate pain	1	8.3	0	0	P = 0.007*
3rd day post-operative					
Relaxed and comfortable	12	100	16	(100)	……

Table (8): Distribution of Younger Children in the Experimental Group according to Post-operative Pain Intensity Using Behavioral Scale (pre/post) intervention

Items	Experimental N(16) Age (4-7y)				Significance
	Pre intervention		Post intervention		
	N	(%)	N	(%)	
1st24 hours post-operative					
Relaxed and comfortable	2	12.5	14	87.5	χ^2=18.33
Mild discomfort	10	62.5	2	12.5)	p<0.001*
Moderate pain	4	25	0	0	
2nd day post-operative					
Relaxed and comfortable	1	6.2	16	100	χ^2=28.235
Mild discomfort	15	93.8	0	0	p<0.001*
3rd day post-operative					
Relaxed and comfortable	9	56.2	16	100	χ^2=8.96
Mild discomfort	7	43.8	0	0	p=0.003*

Table (9): Distribution of Younger Studied Children according to Total Score of Post-operative Pain Intensity Using Behavioral Scale Pre Implementation of The Study Intervention

Items	Control n=12 Age (4-7y)		Experimental n=16 Age (4-7y)		Significance
	N	(%)	N	(%)	
1st24 hours post-operative					
Relaxed and comfortable	2	16.7	2	12.5	Monte Carlo test.
Mild discomfort	4	33.3	10	62.5	χ^2=4.083
Moderate pain	4	33.3	4	25	p=0.253
Severe pain	2	16.7	0	0	
2nd day post-operative					
Relaxed and comfortable	5	41.7	1	6.2	Monte Carlo test.
Mild discomfort	6	50	15	93.8	χ2=7.1
Moderate pain	1	8.3	0	0	p=0.029*
3rd day post-operative					
Relaxed and comfortable	12	100	9	56.2	χ^2=7
Mild discomfort	0	0	7	43.8	p=0.008*

Table (10): Distribution of Younger Studied Children according to Total Score of Post-operative Pain Intensity Using Behavioral Scale Post Implementation of The Study Intervention

Items	Control n=12 Age (4-7y)		Experimental n=16 Age (4-7y)		Significance
	N	(%)	N	(%)	
1st24 hours post-operative					
Relaxed and comfortable	3	25	14	87.5	Monte Carlo test.
Mild discomfort	5	41.7	2	12.5	P = 0.002*
Moderate pain	3	25	0	0	
Severe pain	1	8.3	0	0	
2nd day post-operative					
Relaxed and comfortable	7	58.4	16	(100)	Monte Carlo test.
Mild discomfort	4	33.3	0	0	P = 0.007*
Moderate pain	1	8.3	0	0	
3rd day post-operative					
Relaxed and comfortable	12	100	16	(100)	……

Table (11): Distribution of Younger Children in the Experimental Group according to Post-operative Pain Intensity Using Behavioral Scale (Pre/Post) Implementation of The Study Intervention

Items	Experimental N=16 Age (4-7y)				Significance
	Pre intervention		Post intervention		
	N	(%)	N	(%)	
1st24 hours post-operative					
Relaxed and comfortable	2	12.5	14	87.5	χ^2=18.33
Mild discomfort	10	62.5	2	12.5)	p<0.001*
Moderate pain	4	25	0	0	
2nd day post-operative					
Relaxed and comfortable	1	6.2	16	100	χ^2=28.235
Mild discomfort	15	93.8	0	0	p<0.001*
3rd day post-operative					
Relaxed and comfortable	9	56.2	16	100	χ^2=8.96
Mild discomfort	7	43.8	0	0	p=0.003*

IV-Discussion

According to**Global Surg Collaborative et al., (2016)**, abdominal surgery tends to be the foremost painful among all surgery sorts withinthe pediatric specialty hospital settings; associated post-operative pain is an expected outcome for children who endure surgery because of tissue and nerve injury caused by the surgery. Despite the growing evidence regarding the effectiveness of pediatric post-operative pain management through pharmacological and non-pharmacological methods, post-operative pain remains as a standard drawback in several countries; because of increasing considerations regarding side effects of analgesics in pediatricspecialty patients **(Miladinia et al., 2016)**.

A recent study urged that the safest approach to manage immediate post-operative pain is that the use of non-pharmacological interventions. The interventions vary according to child developmental stage; like pain management in infants includes swaddling and sucking. Whereas distraction techniques were used for toddlers, preschoolers and older children, embrace reading stories, enjoying games, observance cartoons, or pay attention to music **(Thrane, Wanless, Cohen, & Danford, 2016)**. Additionally, the employment and integration of play therapy as simply enforced mean of distraction approaches to dealwith post-operative pain for children has verified to be useful and helps to enhance pain management furthermore as stop negative expertise of hospitalization **(Chieng, Chan, Klainin-Yobas& He., 2014; and He et al., 2015)**.

Effective post-operative pain management has various benefits; this not only solely reduces the child's pain however additionally ends up in quicker post-operative recovery, improved sleep, accrued parental satisfaction, and result in shorter hospital stays. There are fewer readmissions to the hospital, and there's an attenuated want for post-discharge support**(Schug, et al., 2015; and Valizadeh Ahmadi, & Zarea, 2016)**. Nurses are the main providers of skilled care at intervals the post-operative care setting. So, the nurses play a key role in pain assessment and management of post-operative recovery on surgical wards **(Chatchumni, Namvongprom, Eriksson, & Mazaheri, 2016)**.

Regarding characteristics of the studied children, the current study reflected that, less than two thirds and more than one half of children in the control and experimental groups respectively were aged between 7 to 11 years old and also more than half of them in the control group were girls, while more than one half in experimental group were boys**.**These findings were in consistent with a study conducted by **Kozlowski,Kost-Byerly**, **Colantuoni**, **Thompson**, **Vasquenza**, **Rothman**, & **Monitto, (2014)** about "Pain prevalence, intensity, assessment and management in a hospitalized pediatric population" they reported that, the mean scores age of the studied children was 9 ± 6.2 years, the boys represented 58% of the studied sample. The researcher owing such similarity to the same international peak incidence age for such surgical problems of pediatric patients.

As regards, the type of abdominal surgeries that performed for the studied children, the present study, found that more than half and less than two thirds of them in the control and experimental groups had appendectomy.These findings were consistent with the Egyptian study done in Tanta University, by **Khirallah, Eldesouki, Elzanaty, Ismail, &Arafa, (2017**), about "Laparoscopic versus open appendectomy in children with complicated appendicitis",they reported that, acute appendicitis is one in every of the foremost common surgical emergencies in childhood period.

Concerning characteristics of the studied children' mothers, the current studyshowed that, more than two fifths and more than one third of mothers in the control and experimental groups respectively were aged between 30 to less than 35 years old.Moreover,near half of them in the control group were illiterate, while more than half in the experimental group received technical education.These findings were in disagreement with that of **EL-Wasefy, Ouda, Waly, &Hashem, (2015)** who conducted a study in the same setting about "Effect of an educational program for mothers regarding care of their children having gastrointestinal tract stomas " and found that, more than half of the studied children' mothers aged between twenty to less than thirty years old, and less

than half of them had technical education. Theresearcher suggested that, a lower level of education would be reflected on the mothers' knowledge either about the importance of play for their sick children or about the selection of age- appropriate play activities for their children.

Regarding physiological indicators of post-operative pain especially heart rate, respiratory rate, and oxygen saturation level among the studied young children pre and post implementation of the study intervention, the current study cleared that, no significant differences were found between control and experimental groups in relation to heart rate, respiratory rate, and oxygen saturation level pre intervention in the first day. While post intervention there was a significant difference in relation to heart rate only.The study results were supported by the findings of the study done by **Vedamurthy, (2009),** who studied "the effectiveness of therapeutic play in reducing pre-operative anxiety among children undergoing surgery in selected hospital at Bangalore"and found that, the children who exposed to therapeutic play sessions had significantly lower mean scores of heart rates than the control group.

The current study clarified that, there were no statistical significance differences between control and experimental groups in relation to heart rate and oxygen saturation level pre intervention in the second day post-operative, while significant difference was found in relation to respiratory rate.On the other hand, there were no statistical significance differences between control and experimental groups in relation to heart rate, respiratory rate and oxygen saturation level post intervention.These findings were supported by both studies conducted by **Lee, & Jo, (2014)** about "Attention to postoperative pain control in children" and by **Weiner, Penrose, Manias, Cranswick, Rosenfeld, Newall, & Kinney, (2016)** about" Difficulties with assessment and management of an infant's distress in the postoperative period ", as the studies conclude that physiological indicators is useful to determine a children's experience of pain and else that, physiological indicators in isolation can't be used as a measurement for pain because it can be influenced by associated clinical conditions.From the researcher point of view that such contradictions may be due to other factors such as child previous experience in dealing with pain, and individual response to distraction efforts.

Additionally, the present study indicated that, no statistical significance differences were found between control and experimental groups in relation to heart rate, respiratory rate and oxygen saturation level pre and post intervention in the third day post-operative,the researcher can interpret this result in the context of fact that, studied children in the third postoperative day become more calm, relaxed and less frightened because pain intensity decreased in third day than first and second day after surgery. Also, these findings were supported by **Olowe, & Purity**, **(2014)** whomentioned that,children who have undergone surgery typically feel a lot of pain after the surgery once anesthesia is wearing off. Pain is current on the first and second postoperative days, that later decrease.

In relation to effect of a planned play program on physiological indicators to post-operative pain among the studied young children in the experimental group. Findings of the current study indicated that, children in experimental group who exposed to three sessions of a planned play program experienced lower mean scores of heart rates post intervention than pre intervention.Therefore, highly statistical significance differences were found between pre and post intervention in relation to heart rate in the first, second and third day post-operative. The study results were supported by the findings of the study done by **Vijaya, (2014),** who studied "theeffectiveness of play therapy in reducing postoperative pain among children (2–5 yrs) in selected pediatric hospitals Madurai" who found that, the children who received the therapeutic play had considerably lower mean scores of heart rates post implementation of play therapy than pre implementation.The researcher can interpret this result in the context of fact that, when given the child opportunity to play that lead to facilitate his / her coping ability with pain and so the physiological response toward pain was decreased.

Additionally, the current study also revealed that, there was a highly statistical significance difference between pre and post intervention in relation to respiratory rate in the second day post-operative only. This finding was not consistent with the study conducted by **Thrane et al., (2016)** who studied "The assessment and non-pharmacologic treatment of procedural pain from infancy to school age through a developmental lens: a synthesis of evidence with recommendations" who reported that; respiratory rate was considerably reduced once playing with toy all over the three successive days.

In regards to pain intensity by self-report and behavioral scales among younger and older children pre intervention. The results of the present study revealed that children in the experimental group rated more pain intensity as a psychological response to post-operative pain than children in the control group. The study results were supported by the findings of the study done by **Zavras, Tsamoudaki, Ntomi, Yiannopoulos, Christianakis, & Pikoulis, (2015)** who studied "predictive factors of postoperative pain and postoperative anxiety in children undergoing elective circumcision" who reported that, post-operative pain measurement influenced by the sort of surgical technique, the absence of siblings, theextent of education of mothers, the presence of preoperative anxiety and a history of previous surgery.

Regarding pain intensity assessment using faces scale post play intervention among the studied young children, the present study, confirmed that, the studied children who participate in a planned play program were

expressed less postoperative pain intensity upon the used scale than those at control group who received a routine postoperative care. As well as positive effect of the play program among experimental group when comparing between pre and post play intervention at the three days post operation.Thisfinding is in the same line with an Indian study conducted by **Vijaya, (2014)** who studied "theeffectiveness of play therapy in reducing postoperative pain among children (2–5 yrs) in selected pediatric hospitals Madurai" , and a Spanish study conducted by **Ullan et al.,(2014),** about "the effect of a program to promote play to reduce children's post-surgical pain",as the researchers reported that, majority of children in experimental groups manifest less pain once distracted through play throughout the postsurgical period, and have lower score on the pain scale.

Alongside, **Koller**&**Goldman**, **(2012)** who reported in their study about"distraction techniques for children undergoing procedures" that, watching T. V and films are skimpy in reducing pain or distress throughout procedures when put next with different strategies like, short stories and interactive toys as more effective than watching television during painful procedures. Two appropriate mechanisms could explain which results. Theprimary involves the impact of distraction on the perception of pain. The second is related to the impact of mood on the perception of pain and to the transmission of emotions between the parents and the children in health settings **(Eldridge** & **Kennedy, 2010)**.Probably, the foremost often times studied psychological variable that changes the experience of pain is thatthe attention state. Particularly just in case of acute pediatric pain created by immunizations or by medical and surgical procedures, there's evidence that distraction will relieve the children's pain and enhance the effectiveness of analgesics (**Miller et al., 2010)**.

As regards assessment of pain intensity using behavioral scale post play intervention among studied younger children, the current study proved that, there was a positive effect of planned play intervention on pain intensity among experimental group over the control group. Moreover, the study results showed statistical significance differences of post-operative pain intensity using behavioral scale between pre and post play sessions among experimental children.These findings were agreed with the findings of **Kaheni, Rezai, Nesami,& Goudarzian, (2016)** who measured intensity of pain by the same behavioral pain scale while assessing the effect of distraction by playing a video computer game for children during the dressing change for the interventional group, and found that, (70%) of children in the control group experienced severe pain due to dressing change compared with (77.5%) of children in the intervention group had a little pain. with significant changes in pain intensity mean in the interventional group (2.575 ± 1.807), and (8.025 ± 1.187) in the control group.

V-Conclusion

From the results of the present study, it can be conducted that:

There was a positive effect of the planned play program as a nursing intervention in reducing post-operative pain among children undergoing abdominal surgeries.

VI-Recommendation

Based On The Findings Of The Present Study, The Following Recommendations Were Suggested:

A. For the nurses:

- Preparation and implementation of training programs on a regular basis for nurses on how to assess pain, and reduce it by pharmacological and non-pharmacological approaches.
- Application of pharmacological and non-pharmacological approaches combined to facilitate the alleviation of pediatric pain in the hospital.
- Promote continuous training for nurses in pediatric surgery units, both practically and theoretically, on the multiple benefits of using therapeutic play.

B. For children:

- Plan regular pre constructed play sessions to help children tolerate with the emotional and physical pain resulting from hospitalization or surgery.

C. For the hospital administrator:

- Provide toys and specify play zones for children to play when they are in hospital and most importantly set specialist in playing in the hospital to facilitate the integration of play in the routine care of children.

Further studies are needed:

- Further study is needed on a larger sample of children of one age group to determine if different results will be reached.
- Replication of this study with a larger sample size at different pediatric surgical department and with longitudinal follow-up so that the results could be generalized and compared for differences between Egypt and other countries.

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