

Non-Pharmacological Pain Management and its Effect on Pain of Children Postoperatively

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ABSTRACT

Background: Pediatric surgeries are common and painful for children. About 44 – 93% of pediatric patients have been reported to experience postoperative pain. There is a growing trend toward the use of non-pharmacological techniques to supplement analgesia in children. The use of non-pharmacological methods can help reduce opioid intake and potentially harmful physiological and psychological responses to pain.

Methods: A quasi-experimental study design was conducted on non-probability (purposive) convenience sample, consist of (90) child at age (3-12 years), selected from both gender at hospitals that provide surgical management for children in Al Amara city. The sample divided into (3) main groups include (30) child in each one, which also divided into (6) sub groups include (5) child in each one.

Result: statistic shows that highest percentages of children experience (severe – very severe pain level) when assessed by OPS objective pain scale before applied any strategies to decrease their pain 13(43.4%) and 10(33.3%) respectively with arithmetic mean and standard division for group A (4.93 ± 1.552) which classified as severe pain. However, after applied the non-pharmacological pain strategies, most of children's pain level was clearly decreased and high percentage of their pain was disappeared 13(43.4%) with arithmetic mean and standard division for group A (2.33 ± 2.682) which classified as mild pain.

Conclusion: This study confirms the effectiveness of non-pharmacological pain management for children to decrease their pain after surgery and not depend on medication only.

Keywords: non-pharmacological management, postoperative pain, children

INTRODUCTION

Pain is a feeling, which motivates person to avoid damaging situations and protect impaired tissues during healing process¹. The International Association for the Study of Pain² define pain as an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage. Postoperative acute pain is defined as pain that is present in a surgical patient after the procedure³. Almost 80% of patients undergoing surgery experience postoperative pain, and 80% of them reported moderate to severe pain intensity. Management of postoperative pain has become a major concern in pediatrics⁴.

Management of children's acute pain in the postoperative period is challenging. Previous studies have shown that postoperatively, children experience a high intensity of pain even when receiving pain medication. all 100 children who underwent either minor or major surgery expressed mild or severe pain during the first three postoperative days⁵.

Pediatric pain is more than simply a sensory experience, it's a complex, multidimensional phenomenon and the emotional component of pain is particularly strong in children, because they are not young adults, so the management of pain should involve various interventions, both pharmacological and non-pharmacological⁵.

Non-pharmacological methods are widely accepted as strategies that may be used independently with mild pain or as a complement to pain medication for moderate or severe pain to ensure adequate relief. The use of non-pharmacological methods can help reduce opioid intake and potentially harmful physiological and psychological responses to pain. Non-pharmacological

methods, which do not include the use of medications involve such strategies as cognitive-behavioral, physical methods, emotional support, help in daily activities and creating a comfortable environment can change children's pain perception and alter pain behavior as well as pain more tolerable⁶.

Nonpharmacologic pain management strategies aim to assist children in coping with pain and to give them a sense of mastery or control over the situation. These strategies may be categorized as behavioral-cognitive, in which the child focuses on a specific area or aspect rather than the pain (e.g., relaxation, distraction, imagery, biofeedback, thought stopping, and positive self-talk), or biophysical, in which the focus is on interfering with the transmission of pain impulses reaching the brain e.g., heat and cold applications, massage and pressure⁷. In this study, the researcher chooses some strategies to apply and compare their effect on children's pain after surgery. The researcher selects video and video games, blowing bubbles, deep breathing, music listening, and foot massage as a non-pharmacological method to apply in this study.

METHODOLOGY

A quasi-experimental study design was conducted on non-probability (purposive) convenience sample, consist of (90) child at age (3-12 years), selected from both gender at hospitals that provide surgical management for children in Al Amara city. The sample divided into (3) main groups include (30) child in each one, which also divided into (6) sub groups include (5) child in each one. For each groups one or more strategies of pain management were applied as shown in table (1).

Table 1: sample distribution according to pain strategies (N=90)

Study group	Type of pain strategies	Description
A (30) child	Non pharmacological intervention	This group divided into 6 sub-groups, each sub group include 5 children (6 different non pharmacological pain management were applied to them).
B (30) child	Pharmacological intervention	All children in this group receive pain medication only as prescribed (not sub divided)
C (30) child	Pharmacological and non-pharmacological intervention	This group divided to 6 sub-groups, each sub group include 5 children (A combination of non-pharmacological and pharmacological pain management were applied to them). The same intervention in group A and B

All study sample admitted electively in surgical ward, as documented in the medical records at the setting of the study for three continues months (133) operation has been done for children for different medical diagnosis.

The study instrument is composed of three parts and these parts are: part I: the socio-demographic characteristics of children and their parents, part II: non-pharmacological pain management

methods the children received post-surgery, part III: assessment of postoperative pain by use objective pain scale.

To decrease pain level among children postoperatively, a 3 methods were selected; non-pharmacological, pharmacological, and combination between them. Before and after implemented any method, each child assessed for his/her pain level by OPS.

Non-pharmacological pain management method, it implemented for study group A (n=30), this group divided to 6 sub group with 5 children. The following strategies were chosen to decrease the level of pain due to their accessibility, safety, and acceptance by the community of the study.

- Video and video game method: the tablet device used in this method with video games, the child choose his/her favorite game to play for about 30 minutes under supervision of guardians.
- Deep breathing method: this method implemented for children (6-12 years), children were training before surgery about using deep breathing technique. Postoperatively children encouraged to use deep breathing technique during sitting or lying position of children as following: empty the lungs from air by expiration, take breath in quietly through the nose for 2-4 seconds, hold the breath for 3-7 seconds, exhale forcefully through the mouth like blowing a candle for 4-8 seconds, then repeat the cycle up to 4 times.
- Blowing Bubbles method: In this method, children used commercial bubble blower [a toy containing soapy liquid, this toy allows soap bubbles to be produced when a specific part of the apparatus is blown into) to blow it as much he able to do for 10-20 minute.
- Music method: In this method, a short children's songs such (al sisan Shu Helween and collection of Masha and the Bear songs) recorded upon the tablet device. Postoperatively children listened to the songs by the headphones for about 20 minute.
- Quran listening method: in this method, Yasin Sura from the Holy Quran recorded upon the tablet device. Postoperatively played for children by the headphone for about 20 minute.
- Foot massage method: children's feet gently massaged with baby oil while during child's laying position as follow: the entire soles, bridge, heels, and toes were gently massaged, and then the children's foot were held with one hand, pressed, and the toes of each foot gently pulled with the other hand. Rotational movements

from the heels by using the thumb of one hand. These movements were performed on both feet for 10 minutes for each foot.

Pharmacological pain management method, it was implemented for study group B (n=30), all those children receive only analgesia (Acetaminophen) by nurses through intravenous method as physician order. After 30 minute of medication administration, children pain level was assessed.

Combination of both pharmacological and non-pharmacological pain method, it was implemented for the study group C (n=30), the analgesic medication (Acetaminophen) and one of the previous non-pharmacological methods were used to assess pain level. This group divided to 6 sub group with 5 children.

RESULT OF THE STUDY

The statistics revealed that the highest percentages of children (25.6%, 22.2%) was at age groups (3-4 years and 5-6 years) respectively, with arithmetic mean of age and standard deviation (7.22 ± 3.070). More than half of children 52(57.8%) was male, and two-third of them were living in urban area 62(68.9%). More than half of children was middle born 55(61.1%), most of children did not reported previous hospitalization and surgery 69(76.7%), 75(83.3%) respectively.

Table 1: Distribution of Children's Socio-Demographic Characteristics

Variables	Categories (n=90)	Frequency	Percent
Age	3 - 4 years	23	25.6
	5 - 6 years	20	22.2
	7 - 8 years	12	13.3
	9 - 10 years	18	20.0
	11 - 12 years	17	18.9
	$\bar{x} \pm$ Std. Dev.	7.22 ± 3.070	
Gender	Male	52	57.8
	Female	38	42.2
Residence	Urban areas	62	68.9
	Rural areas	28	31.1
Birth order	First born	18	20.0
	Middle born	55	61.1
	Last born	17	18.9
Previous surgery	Yes	15	16.7
	No	75	83.3

Table 2: Assessment of Objective Pain Scale Levels for Children Before and After Application of Pain Management Strategies (n=90)

Pain Management	Pain Scale Levels Assessment	Before Application		After Application	
		F	%	F	%
Group A Non-pharmacological pain management : (n=30)	No Pain (0) : 1	-	--	13	43.3
	Mild Pain (1- 2): 2	-	--	4	13.3
	Moderate Pain (3 - 4): 3	6	20.0	7	23.3
	Sever Pain (5 - 6): 4	13	43.3	4	13.3
	Very Severe Pain (7 - 8): 5	10	33.3	1	3.3
	Worst Pain Possible; (9 - 10):6	1	3.3	1	3.3
	Total	30	100.0	30	100.0
	$\bar{x} \pm$ Std. Dev.	4.93 ± 1.552		2.33 ± 2.682	
Group B pharmacological pain management: (n=30)	No Pain (0) : 1	-	--	4	13.3
	Mild Pain (1- 2): 2	-	--	1	3.3
	Moderate Pain (3 - 4): 3	-	--	3	10.0
	Sever Pain (5 - 6): 4	1	3.3	13	43.3
	Very Severe Pain (7 - 8): 5	22	73.3	8	26.7
	Worst Pain Possible; (9 - 10):6	7	23.3	1	3.3
	Total	30	100.0	30	100.0
$\bar{x} \pm$ Std. Dev.	7.77 ± 0.858		5.07 ± 2.434		
Group C Combination: (pharmacological and non- pharmacological pain management) (n=30)	No Pain (0) : 1	-	--	19	63.3
	Mild Pain (1- 2): 2	-	--	5	16.7
	Moderate Pain (3 - 4): 3	5	16.7	2	6.7
	Sever Pain (5 - 6): 4	16	53.3	3	10.0
	Very Severe Pain (7 - 8): 5	8	26.7	1	3.3
	Worst Pain Possible; (9 - 10):6	1	3.3	-	--
	Total	30	100.0	30	100.0
$\bar{x} \pm$ Std. Dev.	5.67 ± 1.446		1.30 ± 2.184		

The results in table (3) showed that, high significant differences before and after intervention of pain management strategies except before and after intervention between non-pharmacological and combination methods

Table 3: Multiple Comparisons among non-pharmacological, pharmacological, and combination methods by Scheffe test

Pain assessment period	Pain Management method	(J) Pain Management	Mean Difference (I-J)	Comparisons	
				P- value	Sig.
Before intervention	non-pharmacological	Pharmacological	-1.833 ⁻	0.000	HS
		Combination	0.267	0.738	NS
	Pharmacological	non-pharmacological	1.833 ⁺	0.000	HS
		Combination	2.100 ⁺	0.000	HS
	Combination	non-pharmacological	-0.267 ⁻	0.738	NS
		Pharmacological	-2.100 ⁻	0.000	HS
After intervention	non-pharmacological	Pharmacological	-2.733 ⁻	0.000	HS
		Combination	1.033	0.266	NS
	Pharmacological	non-pharmacological	2.733 ⁺	0.000	HS
		Combination	3.767 ⁺	0.000	HS
	Combination	non-pharmacological	-1.033 ⁻	0.266	NS
		Pharmacological	-3.767 ⁻	0.000	HS

The mean difference is significant at the 0.05 level. Sig.= Significant; P=Probability; NS: Non-Significant at (P > 0.05); S: Significant at (P < 0.05); HS: High Significant at (P < 0.01).

DISCUSSION

Postoperatively pediatric often experience different level of pain, the management of pediatric pain consider a major concern in health care setting⁸. Inadequate management of postoperative pain may lead to development of complications and prolonged recovery time with increased morbidity and mortality rates ⁴. For that, some of non-pharmacological pain strategies were used to decrease pain level among children postoperatively as expounded in table (2). In this table highest percentages of children experience (severe – very severe pain level) when assessed by OPS objective pain scale before applied any strategies to decrease their pain 13(43.4%) and 10(33.3%) respectively with arithmetic mean and standard division for group A (4.93 ± 1.552) which classified as severe pain. However, after applied the non-pharmacological pain strategies, most of children`s pain level was clearly decreased and high percentage of their pain was disappeared 13(43.4%) with arithmetic mean and standard division for group A (2.33 ± 2.682) which classified as mild pain.

This result confirms the effectiveness of non-pharmacological pain management for children to decrease their pain after surgery and not depend on medication only. The non-pharmacological pain management mainly depend on human relationships, distraction from pain thought, and relaxation that children can feel to decrease pain severity.

CONCLUSION

Based on the result of the study, discussion and critical interpretation of the findings, the researcher concluded that the highest percentages of study samples were in age group (3 –4 years), male, from urban area, middle born, and did not have previous pain experience. Pain assessment before intervention for the three groups was at sever pain level. Application of non-pharmacological pain reduction practice (video game, deep

breathing, blowing bubble, music, the Quran listening and foot massage) are effective on pharmacological and combination group. There is non-significant association between socio-demographic characteristics and pain management of children postoperatively at (p value > 0.05), except (the children`s age) shows that there is significant association with score pain levels

REFERENCES

- 1- Dmytriiev, D. (2019). Assessment and treatment of postoperative pain in children. *Anaesthesia, Pain & Intensive Care*, 392-400
- 2- International Association for the Study of Pain. (2020). A Revised Definition of Pain: IASP Revises Its Definition for the First Time Since 1979. <https://www.prnewswire.com/news/international-association-for-the-study-of-pain/>
- 3- American Society of Anesthesiologists. (2012). Practice guidelines for acute pain management in the perioperative setting. <https://pubs.asahq.org/anesthesiology/article/116/2/248/12956/Practice-Guidelines-for-Acute-Pain-Management-in>
- 4- Boric, K., Dosenovic, S., Jelcic Kadic, A., Batinic, M., Cavar, M., Urlic, M., ... & Puljak, L. (2017). Interventions for postoperative pain in children: An overview of systematic reviews. *Pediatric Anesthesia*, 27(9), 893-904
- 5- Goštautaitė, S., Piščalkienė, V., Laanterä, S., & Uosukainen, L. (2017). Non pharmacological pain management in postoperative care of school-age children. *Higher education*, 16, 4
- 6- He, H. G., Jahja, R., Lee, T. L., Ang, E. N. K., Sinnappan, R., Vehviläinen-Julkunen, K., & Chan, M. F. (2010). Nurses' use of non-pharmacological methods in children's postoperative pain management: educational intervention study. *Journal of Advanced Nursing*, 66(11), 2398-2409.
- 7- Kyle ,T., & Carman,S.(2013). *Essentials of pediatric nursing*. Wolters Kluwer Health
- 8- Olsen, S. W., Rosenkilde, C., Lauridsen, J., & Hasfeldt, D. (2020). Effects of nonpharmacologic distraction methods on children's postoperative pain—a nonmatched case-control study. *Journal of PeriAnesthesia Nursing*, 35(2), 147-154.