International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effect of Percussion Toy on Level of Pain Perception Among Infants Receiving Vaccination at Selected Health and Wellness Centre, Puducherry

Mrs. Sivasakthi[1], Dr. Sujatha[2], Mrs. Anne Jennifer[3]

[1]M.Sc. Nursing, Child Health Nursing, College of Nursing - Pondicherry Institute of Medical Science
[2]Professor, Dept. of Child Health Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry.
[3]Assistant Professor, Department of Child Health Nursing, College of Nursing, Pondicherry Institute of Medical Sciences

ABSTRACT

Pain will affects the physiological and behavioural reactions in infants. It may cause permanent structural and functional changes in infants. Due to pain, infants experience acute measurable, physiologic, behavioural, metabolic and hormonal response to pain. This leads to long term negative effects on neurologic and behavioural evelopment of the child.

METHODS

True experimental post-test only control group design was adopted for the study. The study was conducted at Mettupalayam, Health and Wellness Centre, Puducherry. Study participants were infants aged between 6-20 weeks. 80 infants was selected by using consecutive sampling technique and computer generated randomization and divided into experimental and control group. Percussion toy – sound producing drum (a musical instruments that makes a sound) shown to the children of experimental group, 30 seconds before vaccination, during and 15 seconds after vaccination. Vaccination for control group with routine care (conventional intervention). The post-test data was collected by using the Neonatal Infant Pain Scale (NIPS) in experimental and control group.

RESULT

The study results revealed that 70% mild and 30% moderate pain in experimental group, 60% moderate and 40% severe pain in control group among infants receiving vaccination. The study showed that the difference in the level of pain perception was statistically significant at $p<0.05$ level. This states that there is a significant difference between post-test level of pain perception among infants receiving vaccination in experimental and control group.

CONCLUSION

The study was done to assess the effect of percussion toys on level of pain perception among infants receiving vaccination at selected Health and Wellness Centre, Puducherry. Consecutive sampling technique and computer generated randomization was used to select the sample. The data was collected among 80 infants undergoing vaccination. Collected data was analyzed by descriptive and inferential

statistics. The study findings revealed there was statistical significant difference in post-test level of pain perception among experimental and control group ($p<0.001$).
Hence it was concluded that the percussion toy reduces the level of pain perception among infants receiving vaccination.

Keywords: Percussion Toys, Pain Perception, NIPS, Vaccination

1. INTRODUCTION

Infant is a specific term used for 'child' or 'baby' and is derived from the Latin term 'infantrix' which means 'speechless' or 'unable to speak'. Infants grow into children and children grow into adolescents, all of which are interconnected. All aspects of physical, psychological, emotional, psychosexual, spiritual, intellectual, cognitive, moral, language and speech- interact in various ways that may affect the other in the normal advance towards maturity.[1]

Pain will affects the physiological and behavioural reactions in infants. It may cause permanent structural and functional changes in infants. Due to pain, infants experience acute measurable, physiologic, behavioural, metabolic and hormonal response to pain. This leads to long term negative effects on neurologic and behavioural development.[2]

According to international association for the study of pain, "**Pain is an unpleasant sensory and emotional experience, that resembling or associated with acutual or potential tissue damage."**[3]

The National Institute of Health (NIH) states that pain is a signal sent by the nervous system that indicates there may be an issue with the body's systems. Pain is an unpleasant feeling, such as a prick, sting, burn, or ache on any part of the body. It has a tendency to come and go frequently, but it can also be persistent. The two types of pain: acute pain and chronic pain may arise in an individual. Acute pain usually is sudden in nature; it may be because of diseases, injuries, or inflammation. It can usually be diagnosed and it can be treated. It usually goes away, but sometimes it can turn into chronic pain.[4]

Severe problems can result from chronic pain, which can last for a long time. Pain is not often curable, but there are many ways to manage it. Management depends on the cause and type of pain. There are pharmacological treatments, including pain relievers. There are also non-pharmacological treatments, like acupuncture, physical therapy, and sometimes surgery.[5]

Vaccination is an important tool for controlling and eliminating life threatening diseases. Vaccination is a process of protecting an individual from a disease through introduction of live or killed or attenuated organism in the individual system.[6]

Vaccination is key to child survival. Vaccination is one of the most effective way to protect infants lives and future. More than half of the world's most vulnerable children still does not take the essential vaccines which they need to survive and live healthy lives. Vaccinating children could prevent 1.5 million deaths globally.[7]

Vaccination is the strengthening of the defense mechanism against infections. Injections of any kind can hurt. Vaccinations are the most painful procedures during childhood. Infant remembers pain and may avoid future medical care because of painful experience in a hospital or clinic. The experience of pain is subjective; infants react to it with behavioral reactions that depend on their age and cognitive processes. The first step to manage pain is pain assessment. For younger and non-communicating infant behavioral scales are used.[8]

Atraumatic care is the provision of therapeutic care by health personnel and through the use of interventions that eliminate or minimize psychological and physical distress experienced by children by children and their families in health care system.[9]

1.1 STATEMENT OF THE PROBLEM

A study to assess the effect of percussion toy on level of pain perception among infants receiving vaccination in selected Health and Wellness Center, Puducherry.

1.2 OBJECTIVES

1. To determine the effect of percussion toy on level of pain perception among infants during vaccination.
2. To find out the association between the level of pain perception among infants with their selected demographic variables.

1.3 HYPOTHESES

$1H_1$: There is a significant difference in the level of pain perception among infants during vaccination of experimental and control group.

$2H_1$: There is a significant association between level of pain perception among infant receiving vaccination with their selected demographic variables.

2. MATERIALS AND METHODS

True experimental study was adopted in this study.the study was conducted at Health and wellness Centre, Mettupalayam, Puducherry. Study participants were infants between 6 to 20 weeks of age. Consecutive sampling technique was used to select the study participants. Sample size was 80. Using computer generated table, 40 participants were allotted to experimental and 40 to control group. The tool used for data collection was Neonatal infant pain scale (NIPS).

2.1. TOOLS AND TECHNIQUES:

TOOL 1: DEMOGRAPHIC VARIABLES

Demographic variables such as age, gender, previous history of hospitalization, any toy based distraction used previously and type of vaccine.

TOOL 2: NEONATAL INFANT PAIN SCALE (NIPS)

The NIPS (Lawrence et al.,1993) was developed at children hospital of eastern Ontario. The standardized scale to observe the level of pain perception among infants during vaccination. The assessment of six parameters includes facial expression, cry, breathing pattern, arm and leg movement and state of arousal. The parameters are categorized according to the behavioural response of the infant. The maximum pain score of tool was 7 and minimum was 0.

S.NO	PARAMETERS	0 POINT	1 POINT	2 POINT
1.	**Facial expression**	**Relaxed** - restful face, neutral expression	**Grimace** - tight facial muscles, furrowed brow, chin, jaw	-
2.	**Cry**	**No cry**- quiet, not crying	**Whimper**- mild moaning, intermittent.	**Vigorous crying**- loud scream
3.	**Breathing pattern**	**Relaxed**- usual pattern for this infant	**Change in breathing**- indrawing, irregular, faster than usual, breath holding, gagging.	-

4.	**Arms**	**Relaxed-** no muscular rigidity, occasional random movements of arms.	**Flexed/extended**- tense, straight arms, rigid or rapid extension, flexion.	-
5.	**Legs**	**Relaxed**- no muscular rigidity, occasional random movements of legs.	**Flexed/extended-** tense, straight legs, rigid or rapid extension, flexion.	-
6.	**State of arousal**	**Sleeping/ awake**- quiet, peaceful, random leg movements, sleeping or alert.	**Fussy-** alert, restless and thrashing.	-

SCORING PROCEDURE

TOOL 2: NEONATAL INFANT PAIN SCALE (NIPS)

It consist of 6 items related to pain perception. Minimum score is 0 and maximum score is 7.

SCORE	INTERPRETATION
0	No pain
1-2	Mild pain
3-4	Moderate pain
5-7	Severe pain

2.2 DESCRIPTION OF INTERVENTION

The nature and purpose of the study was explained to the parents. Informed consent was obtained from the parents of selected participants. Percussion toy – sound producing drum (a musical instruments that makes a sound) shown to the children of experimental group, 30 seconds before vaccination, during and 15 seconds after vaccination. Vaccination for control group with routine care (conventional intervention). The post-test data was collected by using the Neonatal Infant Pain Scale (NIPS) to assess the level of pain perception in experimental and control group.

3. RESULTS AND DISCUSSION

Table: 1 Frequency and percentage distribution of the demographic variables of infants by experimental and control group.

n= 80

S.No.	Demographic variables	Experimental group (40)		Control group (40)	
		f	%	f	%
1.	**Age of the child in weeks**				
	a) 6-9	16	40.0	14	35.0
	b) 10-13	11	27.5	15	37.5
	c) 14 and above	13	32.5	11	27.5
2.	**Gender**				
	a) Boy	16	40.0	18	45.0

	b) Girl	24	60.0	22	55.0
3.	**Previous history of hospitalization**				
	a) Yes	12	30.0	17	42.5
	b) No	28	70.0	23	57.5
4.	**Previous usage of toy based distractions during vaccination**				
	a) Yes	6	15.0	3	7.5
	b) No	34	85.0	37	92.5
5.	**Type of vaccine**				
	a) Pentavalent I	16	40.0	14	35.0
	b) Pentavalent II	11	27.5	15	37.5
	c) Pentavalent III	13	32.5	11	27.5

Table 1 shows the demographic variables of infants. Among 80 infants 16 (40.0%) from experimental and 14 (35.0%) from control group belongs to the age group of 6-9 weeks. Most of them 24 (60.0%) from experimental and 22 (55.0%) from control group were girls. Majority of them, 28 (70.0%) from experimental and 23 (57.5%) from control group were don't have the history of previous hospitalization. Majority of the infants 34 (85.0%) from experimental and 37 (92.5%) were does not used any toy based distractions previously during vaccination. Most of them 16 (40.0%) from experimental and 14 (35.0%) from control group received pentavalent I vaccine.

Table 2: Frequency distribution of post-test level of pain perception among infants during vaccination by experimental and control group.

n=80

POST-TEST LEVEL OF PAIN PERCEPTION	EXPERIMENTAL GROUP (40)	CONTROL GROUP (40)
	F	F
Mild pain	28	0
Moderate pain	12	24
Severe pain	0	16

Table 2 shows frequency wise distribution of post-test level of pain perception among infants. In experimental group, majority of infants 28 had Mild and 12 had Moderate level of pain perception. In control group, majority of infants 24 had Moderate and 16 had severe level of pain perception.

Figure 1: Percentage wise distribution of post-test of the level of pain perception among infants during vaccination.

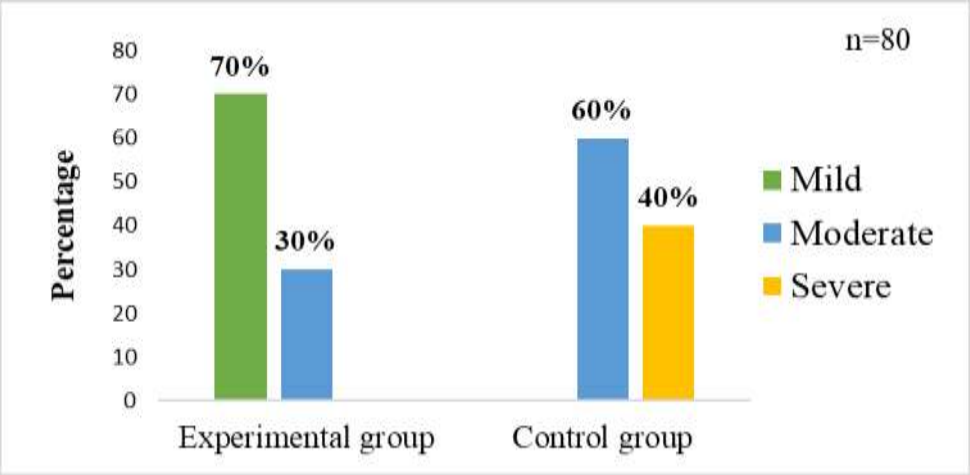

Figure 1: shows the percentage wise distribution of post-test level of pain perception among infants. In experimental group, 70% infants had Mild pain and 30% infants had Moderate level of pain perception. In control group, 60% infants had Moderate pain and 40% infants had Severe level of pain perception.

Table 3: Determination of effect of percussion toy on level of pain perception among infants during vaccination in experimental group and control group.

n=80

S. No.	Group	Mean	SD	Median	Inter-quartile range	Mann whitney U	P Value
1.	Experimental group	2.03	0.95	2.00	3.00- 1.00	114.00	< 0.001*
2.	Control group	4.30	1.20	4.00	5.00-3.00		

-p < 0.001 significant

Table 3 shows that at p<0.001 level there is a statistical significant difference in the post test level of pain perception between experimental and control group.

Table 4.1: Association between the post-test level of pain perception among infants with their demographical variables in experimental group.

n= 40

S. No.	Demographic variables	Experimental group (40) Post test level of pain perception				P Value
		Mild		Moderate		
		f	%	f	%	
1.	**Age of the child (Age in weeks)**					
	a) 6-9	7	25.0	9	75.0	
	b) 10-13	9	32.1	2	16.7	
	c) 14 and above	12	42.9	1	8.30	0.013*

2.	**Gender**					
	a) Boy	12	42.9	4	33.3	
	b) Girl	16	57.1	8	66.7	0.729**
3.	**Previous history of hospitalization**					
	a) Yes	9	32.1	3	25.0	
	b) No	19	67.9	9	75.0	0.725**
4.	**Previous usage of toy based distractions during injection**					
	a) Yes	6	21.4	0	-	
	b) No	22	78.6	12	100.0	0.153**

**- Not significant, *p < 0.05 statistically significant.

Table 4.1 shows that there is a association between the age of the child and level of pain perception in experimental group. Gender, previous history of hospitalization, previous usage of toy during injection has not shown statistically significant association with the post-test level of pain perception among infants.

Table 4.2: Association between the post-test level of pain perception among infants with their demographical variables in control group.

n= 40

SL. No.	DEMOGRAPHIC VARIABLES	CONTROL GROUP(40) POSTTEST LEVEL OF PAIN PERCEPTION				X^2 value	P value
		MODERATE		SEVERE			
		f	%	f	%		
1.	**Age of the child (Age in weeks)**					-	0.053**
	a) 6-9	7	29.2	7	43.8		
	b) 10-13	7	29.2	8	50.0		
	c) 14 and above	10	41.7	1	6.20		
2.	**Gender**					0.170	0.897**
	a) Boy	11	45.8	7	43.8		
	b) Girl	13	54.4	9	56.3		
3.	**Previous history of hospitalization**					0.273	0.601**
	a) Yes	11	45.8	6	37.5		
	b) No	13	54.2	10	62.5		
4.	**Previous usage of toy based distractions**					-	0.262**
	a) Yes	3	12.5	0	-		
	b) No	21	87.5	16	100		

**- Not significant

Table 4.2 shows that there was no significant association between level of pain perception among infants with selected demographic variables such as age, gender, previous history of hospitalization and toy based distractions used previously during vaccination in control group.

4. CONCLUSION

The study was done to assess the effect of percussion toys on level of pain perception among infants receiving vaccination at selected Health and Wellness Centre, Puducherry. Consecutive sampling technique and computer generated randomization was used to select the sample. The data was collected among 80 infants undergoing vaccination. Collected data was analyzed by descriptive and inferential statistics. The study findings revealed there was statistical significant difference in post-test level of pain perception among experimental and control group ($p<0.001$).

Hence it was concluded that the percussion toy reduces the level of pain perception among infants receiving vaccination

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