



# Effectiveness of Helfer skin tap technique on pain reduction during intramuscular injection among infants

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## ABSTRACT

*Pain is a major source of distress for children and their families as well as health care providers. Skin tapping (Helfer skin tap technique) is one of the methods which keeps the muscles relaxed and thus reduce pain while administering IM injection. The objectives of the study are to assess the pain level among infants during intramuscular injection both control and experimental group. To find out the effectiveness of Helfer skin tap technique in the experimental group and to associate the pain score with demographic variables. Methods Quasi-experimental design used in this study Comprised of 60 infants selected by purposive sampling technique, 30 in experimental & 30 in the control group came in Immunization clinic in IGMC & hospital, Shimla. HSTT used in experimental group & routine technique in the control group. The pain was assessed by the FLACC pain scale. Results: The result revealed that 66.7 % of the infants in the experimental group had mild pain, only 23.3% perceived moderate and no anyone perceive severe pain during IM injection by using Helfer skin tap technique. 40 % of the infants in the control group had severe pain, 46.7% perceived moderate pain, only 13.3% perceived mild pain during IM injection by using a routine technique. The present study findings supported that there is a significant difference in pain score in the IM administration with Helfer skin tap technique. The conclusion of the study proved that Helfer Skin Tap Technique was effective than the Routine Technique in administering IM Injections. It was concluded that the perception of pain intensity is less when intra muscular injection is administered by using Helfer Skin Tap Technique. It works on a theoretical basis such as gate control theory.*

**Keywords**— Helfer skin tap technique, Immunization room, Infants age (1-6) months

## 1. INTRODUCTION

Every human being is born with the responsibility to protect one's own health and that of others. This responsibility cannot be carried out if one is ignorant. Injections can be administered through a variety of routes such as intramuscular, intravenous, subcutaneous and intradermal. [1] Procedural pain is an important source of discomfort for patients in nursing care settings. The nurse uses a variety of interventions to bring relief. Pain management during an invasive procedure is a challenge to direct care providers. [1] Providing pain relief is considered a most basic human right and it is the responsibility of the nurse to use the most effective approach to pain control. Effective pain management not only reduces physical discomfort but also improves quality of life. Nurses care for patients in many settings and situations in which interventions are provided to promote comfort. Comfort is a concept central to the art of nursing.

In India, a survey conducted found that 96% of all injections given by private doctors were of antibiotics, vitamins and analgesics. A conservative estimate of the average number of injection ranged from 0.9 to 8.5 per person per year, with a median of 1.5 injections per person per year. According to the World Health Organization, intramuscular injection is an administration of medications parent rally through a skin puncture by a syringe and a needle deep into a large muscle of the body for prophylactic or curative purposes.

Routine immunizations are the most frequent painful medical procedure during childhood. The World Health Organization estimates that 12 billion injections are given annually and that approximately 5% is childhood vaccinations. Vaccine injections are the most common reason for procedural pain in childhood. Immunization is a stressful experience for children as well as parents. During the clinical experience, the investigator found that vaccine administration causes iatrogenic pain in children. The investigator felt that there is a paucity of studies in this area in Indian setup so the investigator interested in conducting a study to assess the pain level of an infant while immunization by applying Helfer Skin tap technique

## 2. OBJECTIVES

- To assess the level of pain among infants in both the control and experimental group.
- To find the effectiveness of Helfer skin tap technique on the reduction of pain in the experimental group.
- To associate the pain score with selected demographic variables

### 3. ASSUMPTIONS

- Every child is unique and responds in a unique way to painful procedure.
- Helfer skin tap technique may have an effect on reducing pain during IM injection.

### 4. METHODOLOGY

#### 4.1 Research approach

In this study, Quantitative research approach has applied.

#### 4.2 Research setting

Immunization Clinic of IGMC & Hospital, Shimla H.P.

#### 4.3 Population

Children (1to 6 months) who were undergoing intramuscular injection in the immunization clinic at IGMC Shimla HP.

#### 4.4 Sample

Infants (1to6months) who were undergoing IM injection attending immunization clinic at IGMC & H, Shimla, H.P

#### 4.5 Sampling Technique

Non-probability purposive sampling technique.

#### 4.6 Sample Size

In this study, sampling size has been 60 children who have been receiving DPT, Pentavalent vaccinations

#### 4.7 Tool

The tool consisted of two parts:

**Part I:** It consists of demographic data such as age, sex, birth order, a dose of vaccine, type of vaccine, informant.

**Part II:** The instrument used to assess the effectiveness of Helfer skin tap technique on pain reduction among children age 1to 6 months by FLACC which consists of 5 points total score is 10. The minimum score is 0 and the maximum score is 10. FLACC pain scale. It consists of Facial expression, Leg movement, Activity, Cry & Consol-ability

#### 4.8 Scoring Key

The scoring is done for the demographical variable as per the dividend category. For the FLACC score, standardized scoring is used.

Category	Score -0	Score – 1	Score – 2
Face	No particular expression or smile	Occasional grimace or frown withdrew, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense.	Kicking or legs were drawn up
Activity	Lying quietly normal position, moves easily	Squirming shifting back and forth, tense	Arched, rigid or jerking.
Cry	No cry (awake or sleep)	Moans or whimpers;	Crying steadily screams or sobs.
Consolability	Constant relaxed	Reassured by occasional touching, hugging or being talked to distractible	Difficult to console or comfort

For the FLACC score category is divided

0: Relaxed and comfortable

1–3: Mild discomfort

4–6: Moderate pain

7–10: Severe discomfort or pain or both

#### 4.9 Reliability of Tool

The Karl Pearson's correlation coefficient formula used to assess the effectiveness of standardized tool i.e. FLACC Pain scale. Reliability score is  $r=0.76$

#### 4.10 Ethical Consideration

Permission has been obtained from the research and ethical committee of the Eternal University. Permission has been obtained from Merkel, Sandra for using the FLACC scale. Permission has been obtained from the concerned authority in the IGMC, Shimla & a written consent has been obtained from the participants.

#### 4.11 Procedure for data collection

A formal permission has been obtained from the Principal Akal College of Nursing and from the hospital administration, Head of pediatric medicine department of IGMC. Children have been identified as per inclusion criteria. Collected the baseline information data from parents. For experimental group procedure is:

After identifying the injection site tap the skin 16 times approximately 5 seconds with the palmer aspect of the dominant hand to relax the muscle. After preparing the skin with alcohol uncap the syringe in the dominant hand make a "V" with the thump and

tap the skin again for 3 times. Insert the needle into the anterolateral aspect of the thigh. After aspirating to prevent injection into the vessel as per normal routine inject the medication slowly while continuing to tap muscle gently to keep it relaxed. Remove the needle while simultaneously tapping the skin again using “V” tap (spreading the thumb and index finger) with non-dominant hand. The procedure was observed or video recorded and pain assessment had been done by using the FLACC scale by the researcher. For the control group, routine procedure was carried out & procedure was observed or video recorded and pain assessment had been done by using FLACC scale by the researcher.

**5. RESULT AND ANALYSIS**

In current study data analysis is described under the following sections:

**Section 1:** Profile of the child / demographic variables of the child.

**Section 2:** Assess the pain score by using the FLACC pain scale among the experimental & control group.

**Section 3:** Find the effectiveness of Helfer skin tap technique.

**Section 4:** Associate the pain score with demographic variables in both the experimental and control group.

**5.1 Section 1:** Profile of the child / demographic variables of the child.

**Table 1: Frequency and percentage of demographic variables of the child of the experimental group. N=30**

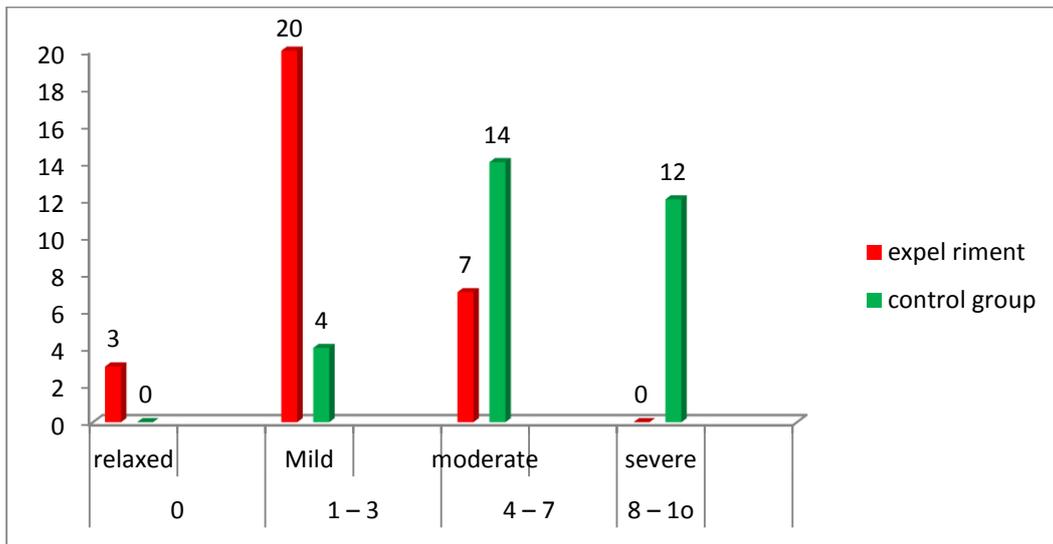
S. no	Variable	Category	F	%
1	Age in months	1.5 month	8	26.7
		2 months	3	10
		2.5 months	1	3.3
		3 months	9	30
		3.5 months	3	10
		4 months	5	16.7
		4.5 months	1	3.3
2	Gender	Male	18	60
		Female	12	40
3	Birth order	First	9	30
		Second	17	56.7
		Third	4	13.3
4	Dose of vaccine	First	12	40
		Second	13	43.3
		Third	5	16.7
5	Type of vaccine	Pentavalent	30	100
		DPT	0	0
6	Informants	Mother	20	66.7
		Father	7	23.3
		Other	3	10

**5.2 Section 2:** Assess the pain score by using the FLACC pain scale among the experimental & control group.

**Table 2: Frequency and percentage of demographic variables of the child of the experimental group. N=30**

S. no	Variable	Categories	F	%
1	Age in months:	1.5 month	5	16.1
		2 months	6	19.4
		2.5 months	4	12.9
		3 months	6	19.4
		3.5 months	5	16.1
		4 months	2	6.5
		4.5 months	2	6.5
2	Gender	Male	15	50
		Female	15	50
3	Birth order	First	12	18.7
		Second	14	45.2
		Third	4	12.9
4	Dose of vaccine	First	12	38.7
		Second	13	41.9
		Third	5	16.1
5	Type of vaccine	Pentavelant	30	10
		DPT	0	0
6	Informants	Mother	18	58.1
		Father	9	29
		Other	3	9.7

**Section 2:** Assess the pain score by using the FLACC pain scale among the experimental and control group.



**5.3 Section 3:** Find the effectiveness of Helfer skin tap technique.

**Table 3: Effectiveness of Helfer skin tap technique among the experimental group with a control group**

Group	Mean FLACC score	Std. Deviation	T	Df	Sig.
Experimental group: Helfer skin tap technique	2.55	1.434	-9.895	58	p<0.001*
Control Group: Routine technique	6.59	1.722			

In the experimental group, the mean FLACC Mean ± SD score was 2.55± 1.434 and the Mean± SD score was 6.59 ±1.722 among the control group. t score was found -9.895 and df are 58, which shows the data is highly significant at the level of p<0.001\*. The above statistical data supports that there is a difference in pain perception during IM injection among the experimental group

**5.4 Section 4:** Associate the pain score with demographic variables in both the experimental and control group.

**Table 4: Associate the pain score with selected demographic variables by using the FLACC pain Scale in the control group**

Variables		Sum of Squares	Df	Mean Square	F	Sig.
Age (in months)	Between Groups	10.31	7	1.473	2.39	0.056
	Within Groups	13.557	22	0.616		
Gender	Between Groups	1.652	7	0.236	0.887	0.533
	Within Groups	5.848	22	0.266		
Birth order	Between Groups	4.283	7	0.612	1.405	0.253
	Within Groups	9.583	22	0.436		
Dose of vaccine	Between Groups	4.814	7	0.688	1.434	0.242
	Within Groups	10.553	22	0.48		
Type of vaccine	Between Groups	0	7	0	.	.
	Within Groups	0	22	0		
Informant	Between Groups	2.985	7	0.426	0.892	0.529

This Table Depicts that in the control group the association between age and pain score is significant (p 0.056), other variables are not significantly associated with pain.

**Table 5: Associate the pain score with selected demographic variables and pain score using the FLACC Scale in the experimental group**

Variables	Groups	Sum of Squares	Df	Mean Square	F	Sig.
Age (in months)	Between Groups	5.728	5	1.146	1.27	0.309
	Within Groups	21.647	24	0.902		
Gender	Between Groups	0.611	5	0.122	0.445	0.812
	Within Groups	6.589	24	0.275		
Birth order	Between Groups	1.356	5	0.271	0.602	0.699
	Within Groups	10.811	24	0.45		
Dose of vaccine	Between Groups	3.122	5	0.624	1.224	0.328
	Within Groups	12.244	24	0.51		
	Within Groups	0	24	0		
Informant	Between Groups	0.278	5	0.056	0.102	0.991
	Within Groups	13.089	24	0.545		

It shows that in the experimental group no association between selected demographic variables and pain score.

## **6. DISCUSSIONS**

### **6.1 Findings of the study**

In the present study, it was revealed that 66.7% of infants in the experimental group had mild pain, 10% infants had relaxed and 23% infants had moderate pain during IM injection by using Helfer skin tap technique. In the control group, 40% of infants had severe pain, 47% of infants had moderate pain and only 13% of infants had mild pain during IM injection by using the routine technique. The study also showed that t score was -9.895 and df is 58, which shows the data is highly significant at the level of  $p < 0.001^*$ . The statistical data supports that there is a difference in pain perception during IM injection among the experimental group.

### **6.2 Limitations**

The present study had the following limitations:

1. The study was conducted on a limited number of infants (60) only for a period of four weeks.
2. The study is limited to infants without any other complications
3. Broad generalization cannot be made due to the limited area of setting and limited sample size.

## **7. NURSING IMPLICATIONS**

### **7.1 Nursing practice**

Helfer Skin Tap Technique can be adapted to the procedure of intramuscular injection. Nurses can be taught about the Helfer Skin Tap Technique and it can be practiced in the clinical setting. As there is not much empirical evidence for the procedure of intramuscular injection findings can be merged into evidence-based nursing practice.

### **7.2 Nursing Education**

- Helfer skin tap technique can be included in the literature on intramuscular injection.
- The procedure of using Helfer Skin Tap Technique for intra-muscular injection can be included in the nursing curriculum.
- Nursing students can be taught about Helfer Skin Tap Technique for intra-muscular injection

### **7.3 Nursing Administration**

- Nurse Managers can update about the procedure of intramuscular injection using Helfer Skin Tap Technique and educate nurses about it through in-service education programs.
- The findings of the study could be used as a basis of in-service education for nurses so as to make them more competent in self-evaluating the effectiveness of administering IM injection with indigenous techniques on the patients.

### **7.4 Nursing Research**

Nurse researcher can conduct a study to verify the scientific rationale physiology behind the effect of Helfer Skin Tap Technique. Randomized clinical trials could be undertaken so that the validity of the results can be increased and it can be incorporated into the evidence-based nursing practice.

## **8. RECOMMENDATIONS**

- The study could have been more accurate if the two techniques “with and without skin tapping technique” was done on the same patient.
- An experimental comparative study could be done with four groups design where rhythmic skin tapping could be done with varying frequencies in each group, to evaluate the effective range of frequency in minimizing pain.
- A multi-group study can be done comparing other indigenous techniques like the application of cold, massage therapy, music therapy etc. to evaluate the effectiveness of these techniques on pain perception by the patients while receiving IM injection.

**Discussion:** Pain is a major source of distress for children and their families as well as health care providers. It is an accepted fact that there is reduced pain in giving an injection into a relaxed muscle. The present study findings supported that there is a significant difference in the pain score in the IM administration with Helfer skin tap technique. This reduction in pain results in the better adaptation of infants. In conclusion, the findings of this study strongly emphasise the importance of making helper skin technique is a compulsory step in IM injection/ vaccination and thus we can reduce the agony of our clients. The study proved that Helfer Skin Tap Technique was effective than the Routine Technique in administering IntraMuscular Injection with mild pain or no pain and there is an association between Helfer Skin Tap Technique

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