

A comparative study to assess the effectiveness of helpers skin tap technique versus routine technique on pain reduction among patients receiving intramuscular injections in selected hospitals in Greater Noida

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Abstract

Statement of the problem: A research titled "A Comparative Study to Assess the Effectiveness of Helper's Skin Tap Technique Versus Routine Technique on Pain Reduction among Patients Receiving Intramuscular Injections in Selected Hospitals in Greater Noida."

Aim: The aim of study is to assess the effectiveness of Helper's Skin Tap Technique Versus Routine Technique on Pain Reduction among Patients Receiving Intramuscular Injections in Selected Hospitals in Greater Noida.

Objectives of the study

- To assess the level of pain experienced by the patients receiving intra muscular injection using Helper's skin tap technique.
- To assess the level of pain experienced by the patients receiving intra muscular injection using routine technique.
- To compare the level of pain experienced by the patients receiving intra muscular injection using the Helper's skin taps technique and routine techniques.
- To find out an association between levels of pain experienced with selected demographic variables.

Methodology: A qualitative research approach was used and the research design adopted for the present study was Experimental research design. The target population for the study was patients who all are receiving IM injection in selected hospitals, greater Noida. Convenient sampling Technique was used during study. Simple size 60 data analysis was done based on objectives and hypothesis of study

Results: In this research the findings show that maximum number of patients under experimental group selected for the study who satisfied the inclusion criteria were N=12 (40%) where in control group N=13(43.4) were among 40-49 years, followed by N=8(26.7%) in both experimental and control group, were from 30-39 years further N=8(26.7%) in experimental and in control N=7(23.3) were of 20-29 years and N=2(6.7%) in both experimental and control group were of 50-60 years.

In this research the researcher has selected N=60 (100%) as adult males both in experimental and control group.

The majority of the patient N=22 (73.3%) experimental group N=28(93.3) control group were married, whereas N=8(26.7%) experimental group N= 2(6.2) control group were unmarried. Widower and divorced were N=0 in both experimental and group. The most of the patients lived in rural areas where as N=26 (86.7) experimental group and N=25(83.3) control group, followed by patient lived in urban areas where as N=4(13.3) experimental group N=5 (16.7) control group.

Majority were N=11 (36.7%) in experimental group & N=16(53.3%) in the control groups subjects were can read and write & the experimental group N=10 (33.3%) and N=8 (26.7%) of subjects in the control group have no formal education. Whereas N=7 (23.3%) of the subjects in the experimental group and N=5 (16.6%) of the subjects in the control group have middle education. And N=2 (6.7%) experimental group N=1 (3.3%) in control group.

Most of the patient were working in experimental group N=16(53.3) same in control group N=19(63.3) whereas N=14(46.7) experimental group N=11(36.6) control were not working.

The level of pain perception during IM injection in Experimental group. Majority of the samples (100%) perceived minor pain with Helper's skin tap. whereas majority (53.3%) moderate and (46.7%) had minor pain with routine technique.

Conclusion: The present study revealed that there was a significant reduction in pain among patients after administration of Helper's skin tap technique. Thus it proved to be an effective treatment for pain.

Keywords: Greater Noida, helpers skin tap, technique, pain reduction, patients receiving, injections, intramuscular

Introduction

"I don't believe in playing hurt, in taking injections to cover the pain"
-Monica Seles

Pain is an affliction feeling often caused by exaggerated or injurious stimuli because it is a complex and subjective phenomenon. Pain is a horrible sensory and emotional

experience associated with actual or potential tissue damage, or described in terms of such damage." Pain motivates the individual to withdraw from injuriously situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future. Most of the time pain resolves once the noxious stimulus is removed and the body has healed, but it may persist despite removal of the

stimulus and apparent healing of the body. Sometimes pain arises in the absence of any detectable stimulus, damage or disease.

Pain is the most habitual for physician consultation in most developed countries. It is a major symptom in many medical conditions, and can interfere with a person's quality of life and general functioning. Simple pain medications are useful in 20% to 70% of cases.

Helfer's skin tap technique offers a painless/ less painful injection experience. In this technique, rhythmic tapping before and during injection over the skin at the site of injection keeps the muscle relaxed and stimulates large diameter fibers. It provides a mechanical stimulation and distraction during intramuscular injection and thus helps to reduce pain as described in gate control theory by Roger Metzack and Past Wall in 1965.

Need for the study

According to World Health Organization, there are 16 billion injections administered every year. Around 5% of these injections are for immunizing children and adults, and 5% are for other procedures like blood transfusions and injectable contraceptives. The remaining 90% of injections are given into muscle (intramuscular route) or skin (subcutaneous or intra dermal route) to administer medicines.

The use of Helfer skin taps technique to reduce pain during IM injections have been proved effective in different studies (Manju, (2014) [16], reported that Helfer skin tap tapping is a simple and in-expensive procedure to reduce pain during IM injection. No adverse effect of using Helfer skin tap technique will be noted in the previous studies (George). Providing pain relief is considered a most basic human right, so it is the responsibility of the nurse to use most effective approach to pain control. Nurses are ethically and legally responsible for managing pain and relieving suffering. Effective pain management is not only reduces physical discomfort, but also improves quality of life.

Objectives of the study

- To assess the level of pain experienced by the patients receiving intra muscular injection using Helfer's skin tap technique.
- To assess the level of pain experienced by the patients receiving intra muscular injection using routine technique.
- To compare the level of pain experienced by the patients receiving intra muscular injection using the Helfer's skin taps technique and routine techniques.
- To find out an association between levels of pain experienced and selected demographic variables.

Methodology

- **Research approach:** A qualitative approach was adopted for this study.
- **Research Design:** Randomized controlled trial

Variables

- **Dependent Variables:** Dependent variable in this study is pain reduction associated with intramuscular injection.
- **Independent Variables:** The independent variable in

this study is Helfer's skin tap technique and routine technique.

- **Demographic variables:** Age, gender, marital status, residence, education and occupation.
- **Setting:** Sharda Hospital Greater Noida Uttar Pradesh, 1000 bedded hospital.
- **Target population:** Patients receiving intramuscular injection.
- **Sample:** Patients receiving intramuscular injection at Sharda Hospital.

Sample Size

- 30 samples was in experimental group
- 30 samples was in control group

Sampling Technique: Convenient sampling method was used to allot patients to experimental group and control group.

Sampling Criteria: Sampling criteria is the list of characteristics of the elements that we have determined beforehand that are essential for eligibility to form part of the sample.

Inclusion criteria

1. Adult patients aged 20 to 60 years' old.
2. Willing to participate in the study and who can speak Hindi or English.

Exclusion criteria

1. Patients with chronic pain associated with other disease condition.
2. Sedated, critically ill and unconscious patients.

Data collection methods:

- The Investigator introduces himself to the patients receiving intramuscular injection and notifies about his aims objectives and steps of the study.
- Demographic data was obtained using a structured interview technique.
- The experimental group was subjected to Helfer's skin tap technique before and after the procedure of intramuscular injection.
- **Helfer's skin tap technique:** It's a method in which the researcher taps the muscle which is intended to use with the palmar side of fingers sixteen times before insertion and while removing the needle continuously tap during intra muscular injection which reduces the pain.
- **Routine technique:** It is the method in which the researcher makes V shape with thumb and forefinger and cleans the site of injection with alcohol swabs before administering intramuscular injection.
- The level of pain of the control and experimental group was assessed after the procedure of intramuscular injection administration using comparative pain scale to determine the effectiveness of Helfer's skin tap.
- Data analysis was done by using the descriptive and inferential statistic.

Plan for data analysis

The data obtained was analyzed in terms of the objective of

the study, using descriptive and inferential statistics. Experts in the field of nursing and statistics directed the development of data analysis plan, which was as follows:

- Organizing data on a master sheet.
- Tabulation of the base line data in terms of frequencies, percentage, mean and standard deviation to describe the data.
- Inferential statistics were used to draw the following conclusions.
- Independent t-test for comparison of pain between the experimental and the control group.

Validity

The content validity of tools was done by a panel of five experts from medical and nursing field, who had expertise in developing such instruments and the necessary modification was done accordingly.

Analysis of sample characteristics

Table 1: Frequency and percentage distribution of subjects according to socio demographic variables in experimental group and control group

N=60				
Socio demographic variables	Experimental group		Control group	
	F	%	F	%
Age				
a) 20-29	8	26.7	7	23.3
b) 30-39	8	26.7	8	26.7
c) 40-49	12	40	13	43.3
d) 50-60	2	6.7	2	6.7
Gender				
a) Male	30	100	30	100
Marital status				
a) Single	8	26.7	2	6.7
b) Married	22	73.3	28	93.3
c) Widower	0	0	0	0
d) Divorced	0	0	0	0
Residence				
a) Rural	26	86.7	25	83.3
b) Urban	4	13.3	5	16.7
Education				
a) Illiterate	10	33.3	5	16.7
b) Read and write	11	36.7	16	53.3
c) Middle education	7	23.3	8	26.7
d) Higher education	2	6.7	1	3.3
Occupation				
a) Working	16	53.3	19	63.3
b) Not working	14	46.7	11	36.7

Age

In this research the findings show that maximum number of patients under experimental group selected for the study who satisfied the inclusion criteria were N=12(40%) where in control group N=13(43.4) were among 40-49 years, followed by N=8(26.7%) in both experimental and control group, were from 30-39 years further N=8(26.7%) in experimental and in control N=7(23.3) were of 20-29 years and N=2(6.7%) in both experimental and control group were of 50-60 years.

Section II: Finding on distribution of level of pain based

on comparative pain scale in control and experimental group

Table 2: Distribution of level of pain based on comparative pain scale in control and experimental group

N=60				
Level of pain perception	Routine technique		Helfer's skin tap	
	F	%	F	%
No pain (0)	-	-	-	-
Minor pain (1-3)	14	46.7	30	100
Moderate pain (4-6)	16	53.3	-	-
Sever pain (7-10)	-	-	-	-

Table 2 reveals that the level of pain perception during IM injection in Experimental group. Majority of the samples (100%) perceived minor pain with Helfer's skin tap. whereas majority (53.3%) moderate and (46.7%) had minor pain with routine technique.

Section III: Finding on comparison of level of pain score between experimental and control group.

Testing of hypotheses

H₁: Patients who receive Intra muscular injection by using Helfer's skin tap technique experience less pain in comparison to the pain experienced during the routine techniques.

H₂: There will be significant association between the level of pain and selected demographic variables of patients receiving IM injection.

Table 3: Comparison of level of pain scores between the experimental and control by using independent 't' test

N=60					
Independent "T" Test					
	Mean	SD	t' value	D.F	'p' value
Helfer's skin tap	1.7	0.6	11.031	D.F value 1=58	<0.001**
Routine care	3.7	0.7		D.F value 2=56.887	

** Denotes significant at 1%level

Table 3, revealed that comparison of the scores of pain between experimental and control groups obtained were $p < 0.001$. This suggests that there was highly significant difference observed, i.e. reduction in pain among patient who all are receiving IM injection in the experimental group observed, is not by chance and is because of the intervention (Helfer's skin tap) provided to the experimental group.

H₁: Patients who receive Intra muscular injection by using Helfer's skin tap technique experience less pain in comparison to the pain experienced during the routine techniques.

The hypothesis was tested using independent 't' test method. Table 3 shows that the mean pain scores using Helfer skin tap technique (1.7) was lesser than the mean pain score of routine technique (3.7). The 'p' value is less than 1% level. So the researcher accepts the research hypothesis and rejected the null hypothesis.

Section IV: Association between levels of pain experienced and selected demographic variables

Table 4: Association between levels of pain experienced by control group (Routine care) and selected demographic variables

N=30						
Socio demographic variables	Minor		Moderate		X ²	P-Value
	F	%	F	%		
Age						
• 20-29	4	28.6	3	18.8	2.443	0.486
• 30-39	5	35.5	3	18.8		
• 40-49	4	28.6	9	56.2		
• 50-60	1	7.1	1	6.2		
Marital status						
• Single	2	14.3	-	-	2.367	0.118
• Married	12	85.7	16	100		
• Widower	-	-	-	-		
• Divorced	-	-	-	-		
Residence						
• Rural	12	85.7	13	81.2	0.107	0.743
• Urban	2	14.3	3	18.8		
Education						
• No formal education	1	7.1	4	25	2.679	0.444
• Read and write	8	57.1	8	50		
• Middle education	4	28.6	4	25		
• Higher education	1	7.1	-	-		
Occupation						
• Working	9	64.3	10	62.5	0.010	0.919
• Not working	5	35.7	6	37.5		

Table 5: Association between levels of pain experienced by experimental group (Helfer’s skin tap) and selected demographic variables

N=30								
Socio demographic variables	Minor						X ²	P-value
	Very mild		Discomforting		Tolerable			
	F	%	F	%	F	%		
Age								
• 20-29	2	16.7	5	33.3	1	33.3	8.021	0.237
• 30-39	1	8.3	6	40	1	33.3		
• 40-49	7	58.3	4	26.7	1	33.3		
• 50-60	2	16.7	0	0	0	0		
Marital status								
• Single	6	50	2	13.3	0	0	5.795	0.055
• Married	6	50	13	86.7	3	100		
• Widower	-	-	-	-	-	-		
• Divorced	-	-	-	-	-	-		
Residence								
• Rural	12	100	12	80	2	66.7	3.462	0.177
• Urban	0	0	3	20	1	33.3		
Education								
• No formal education	3	25	6	40	1	33.3	5.872	0.438
• Read and write	5	41.7	5	33.3	1	33.3		
• Middle education	4	33.3	3	20	0	0		
• Higher education	0	0	1	6.7	1	33.3		
Occupation								
• Working	6	50	9	60	1	33.3	0.804	0.669
• Not working	6	50	6	40	2	66.7		

H₂: There will be significant association between the level of pain and selected demographic variables of patients receiving IM injection.

Table 4 & 5 shows there was no significant association between the Helfer’s skin tap technique and the selected demographic variables at (0.05%) level of significance. So, researcher accepts the null hypothesis and rejected the research hypothesis.

Summary, Conclusion, Implications and Recommendations

Summary

A comparative study on helper’s skin tap versus routine care patient receiving IM injection was conducted in sharda hospital Greater Noida with the objectives to assess the level of pain among patients receiving IM injection by using standardized comparative pain scale and demographic data Performa. The study was conducted through signing consent

form and filling demographic variables, then IM injection given to control and experimental group respectively. Randomized controlled trial design and convenient sampling technique.

The finding was discussed under following sub heading:

1. Socio demographic variables of subject in experimental and control group
2. Distribution of pain score based on comparative pain scale in experimental and control group.
3. Comparison of level of pain scores between experimental and control group.
4. Levels of pain experienced and selected demographic variables.

Demographic Variables

Age

In this research the findings show that maximum number of patients under experimental group selected for the study who satisfied the inclusion criteria were N=12(40%) where in control group N=13(43.4) were among 40-49 years, followed by N=8(26.7%) in both experimental and control group, were from 30-39 years further N=8(26.7%) in experimental and in control N=7(23.3) were of 20-29 years and N=2 (6.7%) in both experimental and control group were of 50-60 years.

Gender

In this research the researcher has selected N=60 (100%) as adult males both in experimental and control group.

Marital Status

The majority of the patient N=22(73.3%) experimental group N=28(93.3) control group were married, whereas N=8(26.7%) experimental group N=2(6.2) control group were unmarried. Widower and divorced were N=0 in both experimental and group.

Residence

The most of the patients lived in rural areas where as N=26(86.7) experimental group and N=25(83.3) control group, followed by patient lived in urban areas where as N=4(13.3) experimental group N=5(16.7) control group.

Education

Majority were N=11(36.7%) in experimental group & N=16(53.3%) in the control groups subjects were can read and write & the experimental group N=10(33.3%) and N=8(26.7%) of subjects in the control group have no formal education. Whereas N=7(23.3%) of the subjects in the experimental group and N=5(16.6%) of the subjects in the control group have middle education. And N=2(6.7%) experimental group N=1(3.3%) in control group.

Occupation

Most of the patient were working in experimental group N=16(53.3) same in control group N=19(63.3) where as N=14(46.7) experimental group N=11(36.6) control were not working.

Distribution of pain score based on comparative pain scale in experimental and control group

Table 2 reveals that the level of pain perception during IM

injection in Experimental group. Majority of the samples (100%) perceived minor pain with Helfer's skin tap, whereas majority (53.3%) moderate and (46.7%) had minor pain with routine technique.

Comparison of level of pain scores between experimental and control group

Table 3 revealed that comparison of the scores of pain between experimental and control groups obtained were $p < 0.001$. This suggests that there was highly significant difference observed, i.e. reduction in pain among patient who all are receiving IM injection in the experimental group observed, is not by chance and is because of the intervention (Helfer's skin tap) provided to the experimental group.

The hypothesis was tested using independent 't' test method. Table 3 shows that the mean pain scores using Helfer skin tap technique (1.7) was lesser than the mean pain score of routine technique (3.7). The obtained' value- 11.031 was statistically no significant at 0.001 level. So the researcher accepts the null hypothesis and rejected the research hypothesis.

Levels of pain experienced and selected demographic variables

Table 4 & 5 shows there was no significant association between the Helfer skin tap technique and the selected demographic variables at 0.05% level of significance. Accept (residence and occupation) in control group. In this case researcher accepts the research hypothesis and reject null hypothesis. Rest the researcher rejects the research hypothesis and accepts the null hypothesis.

Conclusion

Based on the analysis of the findings of the study, the following inferences were drawn. There was a significant reduction in pain among patients after administration of Helfer's skin tap technique. Thus it proved to be an effective treatment for pain. Therefore, this intervention should be promoted as an institutional policy and implemented as a routine care for all patients following IM injection for effective management of pain.

Implications

Nursing implications

The findings of the study have implication for Nursing service, Nursing education, Nursing administration and Nursing research.

Nursing Service

This study highlights the importance of clients who all are receiving IM injection. The study gives the insight for the nurses to plan and to organize care during IM injection. It will also improve the skills of pain assessment using CPS. Administration of Helfer's skin tap reduces patients pain during IM injection.

Nursing Education

The findings of the study can be of importance to the nurse educators. Pain is a major symptom which makes the man to consult the medical practitioner. This shows that patients with immediate medical assistance. The study will help the

nurse educator to know the pain during IM injection and which will guide her to impart the knowledge regarding pain it's assessment and the treatment. This study can be used as an informative illustration for students and staff who can effectively use this planned nursing intervention in the patients who all are receiving IM injection. The Helfer's skin tap technique when the patient is in pain.

Nursing Administration

The findings of the study can be used by the nurse administrator to improve nursing care. Policies and protocols can be made by the nurse administrators regarding the pain assessment during IM injection and its care nurse administrator can provide inservice education to the staff. This help to provide better pain management during IM injection. Patients will recover fast due to pain relief.

Nursing Research

It provides new avenues for further studies in this area. The study will motivate the researcher to research in various health sectors and provide quality care to the patients. The evidence based nursing will gain higher scope in nursing setting.

Limitations

1. The present study was limited to surgical and orthopaedic ward of Sharda hospital Greater Noida
2. The study was limited to those who all are receiving IM injection.
3. The present study was limited to only 60 patients.
4. The extraneous variables could not be controlled by the investigator.

Recommendation

- A similar study on a large and wider sample, for a long period of time would be more pertinent in making broad generalizations.
- A similar study can be undertaken in different settings.
- A comparative study can be conducted with Helfer skin tap technique and Rhythmic skin tapping technique.
- A similar study can be done in patients those who all are receiving IM injection.
- A study may be conducted to assess knowledge and practice of staff nurses regarding pain management.

Summary

This chapter deal with on the basis of descriptive and inferential statistics. It includes summary, conclusion, implication of the study, nursing practice, nursing education, Nursing administration, Nursing research, limitations of the study and recommendations.

Conflict of Interest

Not available

Financial Support

Not available

References

1. International Association for the Study of Pain. Pain definitions [Internet]. Wikipedia, 2015 Jan. Available from: <https://en.wikipedia.org/wiki/Pain>

2. The neurobiology of pain: Symposium of the Northern Neurobiology Group, Manchester. Manchester: Manchester University Press, ISBN 0-7190-0996-0. Cutaneous nociceptors, 1984, p. 106. Available from: <https://en.wikipedia.org/wiki/Pain>
3. The Handbook of Chronic Pain. Nova Biomedical Books, 2007. ISBN 1-60021-044-9. Available from: <https://en.wikipedia.org/wiki/Pain>
4. Debono DJ, Hoeksema LJ, Hobbs RD. Caring for patients with chronic pain: Pearls and pitfalls. J Am Osteopath Assoc. 2013;113(8):620-627.
5. Arthritis Research & Therapy. 2004;6(4):151-4. Available from: <https://en.wikipedia.org/wiki/Pain>
6. Assessment of pain. Br J Anaesth. 2008;101(1):17-24. PMID: 18487245. Available from: <https://en.wikipedia.org/wiki/Pain>
7. Sivapriya S, Kumari LA. Study to assess the effectiveness of Helfer's skin tap technique on pain during intramuscular injection among neonates born in labour room of a selected tertiary level hospital. Int J Sci Res. 2013;4(4):51.
8. Nivedha, Nidhisha. Effectiveness of Heifer skin tap technique vs usual standard technique in reducing pain during intramuscular injection among adult patients. Int J Sci Res. 2016;5(7):528.
9. World Health Organisation. [Internet], 2017 Available from: <http://www.who.int>
10. Shehata OMH. Effects of Helfer's skin tapping and Z-track techniques on pain intensity among hospitalized adult patients receiving intramuscular injection. Int J Nurs Res Health Sci. 2016;3(3):77-94. Available from: www.noveltyjournals.com
11. Hassnein AA, Soliman MMH. Efficacy of Helfer's skin tapping technique on pain intensity as perceived by patients receiving intramuscular injection. Int J Nurs Didact. 2016;2(1). Available from: <http://innovativejournal.in/ijnd/index.php/ijnd>
12. Miaskowski C. The impact of age on a patient's perception of pain and ways it can be managed. Pain Manag Nurs. 2000;1(3):2-7.
13. Therese AM, Devi S. Effectiveness of Helfer's skin tap technique and routine technique on pain reduction among patients receiving intramuscular injection at Government General Hospital, Puducherry. Int J Sci Res. 2014;3(10):1446-1449.
14. Hassnein AA, Soliman MMH. Efficacy of Helfer's skin tapping technique on pain intensity as perceived by patients receiving intramuscular injection. Int J Nurs Didact. 2016;6(2):12-22.
15. Shah S, Narayana A. Effect of Helfer's rhythmic skin tap technique on procedural pain among patients receiving intramuscular injection. MJNHS. 2016;2(1):8-9.
16. Manju R. Helfer's skin tap technique on pain during immunization among infants. TNNMC. 2014;2(2):19-22.
17. Shah S, Narayana A. Effect of Helfer's rhythmic skin tap technique on procedural pain among patients receiving intramuscular injection. MJNHS. 2016;2(1):8-9.
18. Hassnein AA, Soliman MMH. Efficacy of Helfer's skin tapping technique on pain intensity as perceived by

- patients receiving intramuscular injection. *Int J Nurs Didact*. 2016;6(2):12-22.
19. Krusezeuskp AZ, Lany SH, Johnson JE. Effect of positioning on discomfort from intramuscular injections in the dorsogluteal site. *Nurs Res*. 1979;28(2):103-5.
 20. Austine I. Effectiveness of Heifer skin tapping technique upon pain during administration of intramuscular injection [Internet]. Available from: <https://www.researchgate.net/publication/271205884>
 21. The effect of the application of manual pressure before the administration of intramuscular injections on students' perceptions of post-injection pain: a semi-experimental study. *J Clin Nurs*. 2017 Jun;26(11-12):1632-8.
 22. George J, Tryambake RG. The effectiveness of digital pressure on pain among patients receiving intramuscular injection. *Int J Pract*. 2016;4(2):57-60.
 23. Shehata OMH. Effects of Helfer's skin tapping and Z-track techniques on pain intensity among hospitalized adult patients receiving intramuscular injection. *Int J Nurs Res Health Sci*. 2016;3(3):77-94. Available from: www.noveltyjournals.com.

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