



A Quasi Experimental Study To Assess The Effectiveness Of Ice Cube Application Prior To Intramuscular Injection In Reducing Pain Among Children Between 8 And 12 Years Of Age In Selected Hospitals At Kanyakumari District Tamilnadu India.

Dr. Anilet Anandhy.K, Professor, Department of child health nursing, Joy University, Tirunelveli.

Dr. Achsha Shiny.A, Professor, Department of child health nursing, Joy University, Tirunelveli.

Mrs. Chinnu Mary.J, Asst. Professor, Department of child health nursing, Joy University, Tirunelveli.

ABSTRACT

Ice cube application has an analgesic numbing effect on soft tissues, due to a combination of decreased production of pain mediators and slower spread of nerve pain signals. **Statement of the problem:** A Quasi experimental study to assess the effectiveness of ice cube application prior to intramuscular injection in reducing pain among children between 8 and 12 years of age in selected hospitals at Kanyakumari district. **Objectives:** To assess the level of pain with ice cube application after IM injection in experimental group. To assess the level of pain without ice cube application after IM injection in control group. To assess the effectiveness by comparing the level of pain after IM injection between the experimental and the control group. To determine the association between the post test level of pain with the selected demographic variables in experimental group. **Methodology:** A Quasi experimental study with post test only control design was used to achieve the objectives of the study. Non probability convenient sampling technique was used to select the samples. The sample size of the study was 60 (30 in experimental and 30 in control group) respectively. The study was conducted in two phases, phase I and phase II respectively. **Results:** It reveals that in the Experimental group the mean post test score is 4.76 with standard deviation of 1.76. Whereas in the control group the mean post test was 8.3 with standard deviation 1.24. The mean difference is 3.54. The obtained unpaired t' test value was 2.16 which is greater than the table value ($p=2.00$) with the degree of freedom 58 at 0.05 level of significance. Hence the research hypothesis (H_1) was accepted. There was a significant difference between post

test level of pain among children between the age group of 8 and 12 years taken IM injection in experimental and control group $t=2.16(p<0.05)$. **Conclusion:** From the results of the study, it is concluded that Ice cube application is not only cost effective but also easy to apply and shows a better effect. The nurses can include the Ice cube application in their routine activities to reduce the pain during IM injection.

Keywords: Ice cube application, Intramuscular injection, Pain

INTRODUCTION

Pain is universal, complex and subjective experience. Assessing and managing a child with pain is a daily problem for nurses. Nurses are not only the agents, who carry out doctors orders, but also the ones who implement the orders and who work closely with patients to facilitate healing processes. So nurses can use simple interventions to relieve procedural pain in children and promote comfort for them.

Injections are the most common reason for iatrogenic pain in childhood. With the steadily increasing number of recommended injections, there has been a concomitant increase in concern regarding the adequacy of pain management. Physical interventions and injection techniques that minimize pain during injection offer an advantage over other techniques because they can be easily incorporated into clinical practice without added cost or time. Their effectiveness, however, has not previously been studied using injections are the most common source of iatrogenic pain in childhood, being administered repeatedly throughout infancy, childhood and adolescence.

Pain from injections is a source of distress for children, their parents and nurses, and if not addressed, can lead to pre-procedural anxiety at future procedures, medical fears, and healthcare avoidance behaviors including non-adherence with injections. It is estimated that up to 25% of adults have needle fears. The majority of people with needle fears develop them in childhood. Efforts aimed at minimizing pain in childhood have the potential to prevent the development of needle fears and promote consumer satisfaction and trust in the health care system because of more positive experiences for children and their families being a systematic approach.

NEED FOR STUDY

Pediatric nursing is traditionally involved in professional and competent care of children. One of the most dramatic advances in pediatric nursing is the traumatic care of children. To the child of any age, a visit to the hospital can be, at best, a frightening event and at worst, a traumatizing experience. The children imagine hospital as a place where they get injection. Injections of any kind can hurt when they happen to see a nurse or a doctor with an injection syringe. The emotional disturbance and fear knows no boundary in children who feel threatened by painful procedures.

In India 77.2% of rural and 80% of urban children are given injections annually. However the children undergoing injection will experience severe to moderate pain. Hence many non-pharmacological measures to reduce the level of pain. The pain associated with such injections is a source of distress for children, their parents and those administering the injections. If not addressed, this pain can lead to preprocedural anxiety in

the future, needle fears and health care avoidance behaviors, including no adherence with injections. About 10% of the population avoids injection and other needle procedures because of needle fears.

Health care providers and researchers often use the term “distress” to refer to the combination of pain and anxiety. The treatment of painful procedures in children requires special consideration and planning because pain preventive measures reduce both short-term and long-term morbidity. Current evidence indicates that pain and distress in children is poorly managed and children continue to suffer unnecessarily. This can lead to anticipatory anxiety, needle phobia and the avoidance of health care. Obviously, it is impossible to make many basic procedures such as immunization and other injections painless, but there are strategies to minimize the pain.

STATEMENT OF THE PROBLEM

A Quasi experimental study to assess the effectiveness of ice cube application prior to intramuscular injection in reducing pain among children between 8 and 12 years of age in selected hospitals at kanyakumari district.

OBJECTIVES

- To assess the level of pain with ice application after IM injection in experimental group.
- To assess the level of pain without ice application after IM injection in control group.
- To compare the level of pain after IM injection between the experimental and the control group.
- To determine the association between the level of pain and selected demographic variables in experimental group.

HYPOTHESES

H1: There will be a significant difference in the level of pain after IM injection between the experimental and the control group.

H2: There will be a significant association between the selected demographic variables and posttest level of pain in experimental group.

METHODOLOGY:

Evaluative research approach was used as an appropriate research approach for the present study to assess the effectiveness of ice cube application prior to intramuscular injection in reducing pain among children between 8 and 12 yrs of age in selected hospitals at Kanyakumari district. The research design adopted for this study is Post test only control group design in this study the independent variable is Ice cube application and the dependent variable is pain score among children between 8 and 12 years of age. The samples were selected by

adopting Non probability convenient sampling. In this study the sample size was 60 children between 8 and 12 years of age who satisfied the inclusion criteria. 30 children were in experimental group and 30 children in control group. The tool used in this study has two parts. Demographic data are the first part of the tool consists of 6 items for obtaining information about the age, sex, education, present complaints, previous pain experience for intramuscular injection, amount of injection in ml etc and Numerical pain rating scale was used individually to collect the data

RESULTS:

SECTION - I

Table 1: Data on demographic variables of children between 8-12yrs

N=60

s.no	Demographic variables	Experimental group		Control group	
		F	%	f	%
1.	Age				
	a. 8	7	23.3	5	16.7
	b. 9	4	13.3	6	20
	c. 10	6	20	6	20
	d. 11	8	26.7	8	26.6
	e. 12	5	16.7	5	16.7
2.	Gender				
	a. Male	11	36.7	18	60
	b. Female	19	66.3	12	40
3.	Education				
	a. 3	7	23.3	4	13.3
	b. 4	2	6.7	3	10
	c. 5	8	26.7	8	26.7
	d. 6	6	20	7	23.3
	e. 7	7	23.3	8	26.7
4.	Present complaints				
	a. Fever	23	76.7	18	60
	b. Body ache	1	3.3	4	13.3
	c. Infection	2	6.7	6	20

	d. Other complaints	4	13.3	2	6.7
5.	Previous pain experience				
	a. Once	0	0	3	10
	b. Twice	2	6.7	4	13.3
	c. Thrice	6	20	7	23.3
	d. More than thrice	22	73.3	16	53.4
6.	Amount of IM injection				
	a. 1 ml	4	13.3	6	20
	b. 2 ml	16	53.3	11	36.7
	c. 3ml	10	33.4	13	43.3

Table 1

It represents the frequency and percentage distribution of children age group between 8-12 yrs with selected demographic variables such as age, gender, education, present complaints, previous pain experience, and amount of IM injection. With regard to age majority of 8(26.7%) of 8 yrs in both experimental group and control group. With regard to gender, majority of 19(66.3%) of females in experimental group and 18(60%) of males in control group. With regard to education, maximum of 8(26.7%) of 5th standard in both experimental group and control group. With regard to present complaints majority of 23(76.7%) had fever in experimental group, and 18(60%) had fever in control group. With regard to previous pain experience majority of 22(73.3%) had pain more than thrice, in experimental group and 16(53.4%) in control group. With regard to amount of IM injection majority of 16(53.3%) received 2ml in experimental group and 13(43.3%) received 3ml in control group.

SECTION II

Table 2: DATA ON CHILDREN AGE GROUP BETWEEN 8-12YRS BASED ON THEIR LEVEL OF PAIN AFTER IM INJECTION

S.No	Level of pain	Children between 8-12 yrs			
		Experimental group		Control group	
		F	%	f	%
1	No Pain	2	6.7	0	0
2	Mild	4	13.3	0	0
3	Moderate	20	66.7	1	3.3
4	Severe	4	13.3	29	96.9

The above table shows that the post test level of pain in Experimental group And Control group. In Experimental group it reveals that, majority of the children 20 (66.7%) were had moderate pain and 4(133.33%) were had mild pain and 4(13.3%) had severe pain and 2(6.7%)were had no pain. Whereas in Control group, majority of the children 1 (3.3%) were had moderate pain and 29 (96.9%) were had severe Pain and none of them had mild or no pain.

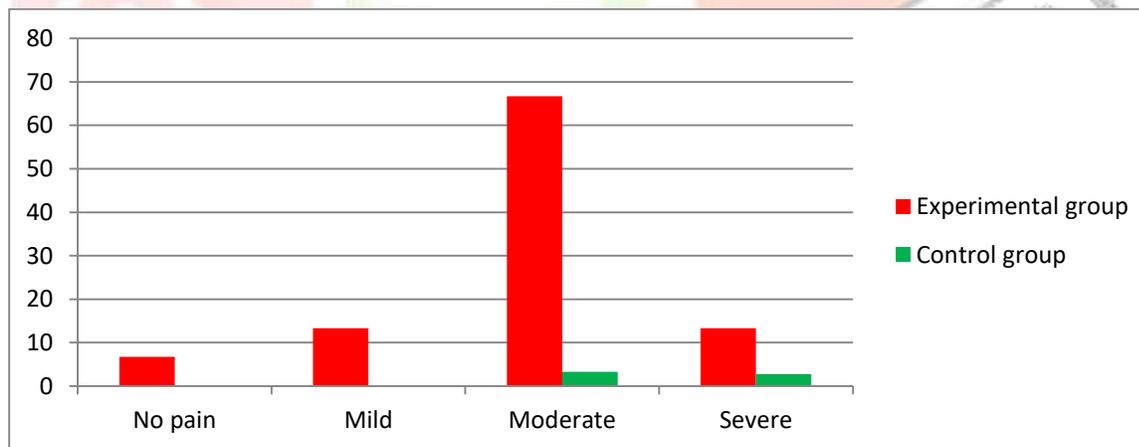


Fig 1.1: DATA ON CHILDREN AGE GROUP BETWEEN 8-12YRS BASED ON THEIR LEVEL OF PAIN AFTER IM INJECTION

SECTION III

**DATA ON EFFECTIVENESS OF ICE APPLICATION ON LEVEL OF PAIN AMONG CHILDREN
AGE GROUP BETWEEN 8-12yrs WITH IM INJECTION RELATED PAIN**

Table 3: Mean standard deviation, mean difference and 't' value of post test level of pain in experimental group and control group **N=60**

S.no	Post intervention	Mean	SD	MD	Degrees of freedom	't' value
1.	Experimental group	4.76	1.76	3.54	58	2.16
2.	Control group	8.3	1.24		P value (2.00)	S

The above table reveals the comparison of post test level of pain between experimental group and control group.

It shows that the calculated 't' value (2.16) is greater than the table value ($p=2.00$) at 0.05% level of significance. So it inferred that there is a significance difference between the post test level of pain among the children between 8-12 yrs of age group in experimental group and control group. Hence the research hypothesis (H_1) was accepted, and it was inferred that ice application is effective in reducing pain in children age group between 8-12yrs with IM injection related pain.

SECTION-IV

Table 4: DATA ON ASSOCIATION OF POST TEST LEVEL OF PAIN AMONG CHILDREN AGE GROUP BETWEEN 8-12YRS AND SELECTED DEMOGRAPHIC VARIABLES IN EXPERIMENTAL GROUP.
n=30

Sl.No	Demographic variables	Level of pain								P value	χ^2
		None		Mild		moderate		severe			
		F	%	f	%	f	%	f	%		
1	Age										
	a) 8	0	0	2	6.7	5	16.7	0	0	21.03	32.24 df=12 S
	b) 9	0	0	0	0	4	13.3	0	0		
	c) 10	0	0	0	0	3	10	3	10		
	d) 11	0	0	2	6.7	6	20	0	0		
	e) 12	0	0	0	0	2	6.7	1	3.3		
2.	Gender										
	a. Male	1	3.3	0	0	8	26.7	2	6.7	7.82	2.88 df=3 NS
	b. Female	1	3.3	4	13.3	12	40	2	6.7		
3.	Education										
	a. 3	0	0	2	6.7	5	16.7	0	0	16.92	19.8 df=9 S
	b. 4	0	0	0	0	2	6.7	0	0		
	c. 5	0	0	0	0	5	16.7	3	10		
	d. 6	0	0	2	6.7	4	13.3	0	0		
	e. 7	2	6.7	0	0	4	13.3	1	3.3		
4.	Present complaints										
	a. Fever	1	3.3	3	10	15	50	4	13.3	16.92	9.5 df=9 NS
	b. Body ache	0	0	0	0	1	3.3	0	0		
	c. Infection	0	0	1	3.3	1	3.3	0	0		
	d. Other complaints	1	3.3	0	0	3	10	0	0		
5.	Previous pain experience										

	a. Once	0	0	0	0	0	0	0	0		
	b. Twice	0	0	0	0	2	6.7	0	0	16.92	10.28
	c. Thrice	0	0	0	0	3	10	3	10		df=9
	d. More than thrice	2	6.7	4	13.3	15	50	1	6.7		NS
6.	Amount of IM injection										
	a. 1ml	0	0	0	0	4	13.3	0	0	12.59	3.4
	b. 2ml	1	3.3	2	6.7	10	33.3	3	10		df=6
	c. 3ml	1	3.3	2	6.7	6	20	1	3.3		NS

S –significant

NS- not significant

Table 4 indicates the sustentative summary of chi-square analysis, which was used to bring out the association between the level of pain and their selected demographic variables in experimental group.

The table 4 shows that there is a significant association between the level of pain and selected demographic variables such as age (32.24) and education (19.8), and there is no significance association between level of pain and selected demographic variable such as gender, present complaints, previous pain experience and amount of IM injection. Total number of children age group between 8-12yrs attended at 0.05% level of significance in experimental group.

MAJOR FINDINGS:

- **To assess the level of pain with ice application after IM injection in experimental group.**In experimental group children age group between 8-12yrs with IM injection 2(6.7%) had no pain, 4(13.3%) had mild pain, majority of children 20(66.7%) had moderate pain and only 4(13.3%) had severe pain.
- **To assess the level of pain without ice application after IM injection in control group.**In control group majority of children 29(96.9%) had severe pain, only 1(3.3%) of child had moderate pain and none of the children had mild and no pain.
- **To compare the level of pain after IM injection between the experimental and the control group.**It reveals that in Experimental group the mean post test score was 4.76 with Standard deviation of 1.76. Whereas in Control group the mean post test was 8.3 with standard deviation of 1.24.The mean difference is 3.54.The obtained Unpaired t- test value is 2.16 which is more than the table value (p=2.000) with the degree of freedom 58 at 0.05 level of significance. Hence the Research Hypotheses (H1) was accepted.It is revealed that the post test level of pain in Experimental group is lower than that of the Control group. Hence the research hypothesis H1 stated earlier that

denotes there will be a significant difference between post test level of pain among children age group between 8-12yrs with IM injection pain in experimental group and control group is retained at $p < 0.05$ level.

- **To determine the association between the level of pain with the selected demographic variables.** The results shows that there is a significant association between the level of pain and selected demographic variables such as age (32.24), gender (2.88), education (19.8), present complaints (9.5), previous pain experience (10.28) and there is no significance association between level of pain and selected demographic variable such as amount of IM injection. Total number of children age group between 8-12yrs attended at 0.05% level of significance in experimental group.

CONCLUSION

The main conclusion of the present study is Ice application is effective in reducing pain among children age group between 8-12yrs taken IM injection which is denoted by significant reduction in level of pain. The selected children are comfortable and not cried during injection. From the results of the study, it is concluded that Ice application is not only cost effective but also easy to apply. The nurses can include the Ice application in their routine activities to reduce the pain during IM injection related pain.

References

- Moghaddam k, Moghaddam M, Sadeghmoghaddam L, Ahmadi F. The Concept of Hospitalization of Children from the View Point of Parents and Children. *Iran J Pediatr.* 2011; 21(2):201-208.
- Rostami S Salsali M, Movahedi A, Keikhaee B. Moradi A. Effect of local refrigeration prior to venipuncture on pain related responses in school age children. *Australian Journal of Advanced Nursing, The Volume 24 Issue 2 (2006 Dec-2007 Feb)*
- Fradet C, McGrath PJ, Kay J, Adams S, Luke B. A prospective survey of reactions to blood tests by children and adolescents. *Pain [online] 1990 [cited on Jan]; Available from. 2012; 40(1):53-60.* www.ncbi.nlm.nih.gov/pubmed/2339016
- Merskey H. Pain terms: A list with definitions and notes on usage. *Pain [online] 1979 [cited on Dec]; Available from. 2012; 6:249-52.* www.ncbi.nlm.nih.gov/pubmed/233901.
- Lehmann JF. Therapeutic heat and cold. 4th edition. Williams and milkins. baltimore.619-28 6. Stinson J, Yamada J, Dickson A, Lamba J, Stevens B. *Pain Res Manag:* 2008; 13(1):51-57. 7. Textbook of pediatric nursing. Marlow D, Barbara A. Redding. Edition, Saunders, 1988,
- Available from: <https://quizlet.com/166499357/painmanagement-flash-cards/>
- Jacobson AF. Intradermal normal saline solution, selfselected music and insertion difficulty effect in IV insertion pain. *Journal of acute and critical care.* 2000; 28(2):114-122.
- Bugaj R. the cooling analgesics and rewarming effects of ice massage on localized skin. *physical therapy.* 1975; 55(1):11-18.

- Rostami S, Salsali M, Movahedi A, Keikhaee B, Moradi A. Effect of local refrigeration prior to venipuncture on pain related responses in school age children. Australian Journal of Advanced Nursing, The Volume 24 Issue 2 (2006 Dec-2007 Feb)
- Abbott K, Fowler-Kerry S. The use of a topical refrigerant anesthetic to reduce injection pain in children. Journal of Pain and Symptom Management. 1995; 10(8):584-590.
- Hasanpour M, Tootoonchi M, Aein F, Yadegarfar G. The effects of two non-pharmacologic pain management methods for intramuscular injection pain in children. Acute Pain. 2006; 8(1):7-12.
- Stinso J, Yamad J, Dickson A, Lamba J, Steven B. Pain Res Manag. 2008; 13(1):51-57.
- Sarifakioglu, Nedim, Sarifakioglu, Evren. Evaluating the Effects of Ice Application on the Pain Felt during Botulinum Toxin Type-A Injections: A Prospective, Randomized, Single. Blind Controlled Trial. Annals of Plastic Surgery. 2004; 53(6):543-546.

