Original Research Paper

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Pediatrics

"EVALUATE THE EFFECTIVENESS OF COLD APPLICATION ON LEVEL OF PAIN ASSOCIATED WITH INTRAMUSCULAR IMMUNIZATION AMONG INFANTS IN SELECTED HOSPITALS AT UDAIPUR, RAJASTHAN"

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ABSTRACT

Introduction: Pain is highly unpleasant and very personal sensation that cannot be shared with others. International Association for the study of pain defines pain as an unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of such damage. Infants, including new born babies, experience pain similarly and probably more intensely than older children and adults.

Aims and methods: It included the quantitative experimental research approach, quasi experimental post-test only design with control group design, variables under study were cold application as independent variable, reducing pain during intramuscular immunization as dependent variable. Research used modified conceptual framework based On Ernestine wiedenbach's helping art of clinical nursing model (1964). Selected Hospital of Udaipur city as research setting, total 120 samples, and non-probability convenient sampling techniques was used. The cold application used for this study and tool used for data collection were socio-demographic data and neonatal infant pain (NIP) scale. The data obtained were analyzed by descriptive and inferential statistical in terms of frequency, percentage and chi-square.

Result: Projected the Comparison Of Neonatal Infant Pain (NIP) Scale Score With Experimental And Control Group it revealed The mean post test score for pain among experimental group Mean=4.19 was lower than the mean post-test pain score for the control group Mean=7.21 and the obtained 'z' value was z =18.57 greater than the table value. The finding shows that cold application was effective in reducing pain among undergone IM immunization. Hence, Research hypothesis H_1 is accepted. Findings related to association of cold application during IM immunization. In experimental group significant association between pain score with their selected socio-demographic variables such as age in months ($\chi 2$=9.50), gender ($\chi 2$=4.41), weight of infant ($\chi 2$=10.47) were found to be significant at 0.05 level whereas In control group significant association between pain score with their selected socio-demographic variables such as age in months ($\chi 2$=1.64), gender ($\chi 2$=1.55), weight of infant ($\chi 2$=4.31) were not found to be significant at 0.05 level. Hypothesis was tested at 0.05 levels. This indicates there is significant association in experimental group and not significant association in control group. Hence research hypothesis H_2 was accepted.

Conclusion: The main focus of the study was to assess the effectiveness of cold application in reducing pain during IM immunization among infants. In the present study 120 infants were selected through nonprobability convenient sampling technique. Researcher used quasi experimental post-test only design to assess pain during IM immunization Data were collected through NIP scale and data were analysed through suitable statistical method.

KEYWORDS : Cold Application, Intramuscular Immunization, Effectiveness, Pain, Infant.

INTRODUCTION:

An infant word is derived from the Latin word infant, meaning "unable to speak" or "speechless". It refers to the very young offspring of a human or animal. When applied to humans, the term is usually considered synonymous with baby or brain (in Scottish English), but the latter is commonly applied to the young of any animal. The term infant is typically applied to young children between the ages of 1 month and 12 months.[1]

Children of today are the citizen of tomorrow. World population continues to grow, but the number of children in the world has now reached its peak. According to the United Nation's population division estimate for the mid 2010, there were 642 million children aged 0- 4 years.[2]

Immunization is the most aversive medical procedures for healthy infants and children and is the most common source of childhood iatrogenic pain. The unpleasant sensory and emotional responses that result from the pain of immunization may induce the fear of needle sticks for these children. Painful procedures are likely to be confounded with anticipatory and concurrent anxiety, usually considered together as procedure related distress.[3]

Cold application is also known as cryotherapy. It works by reducing blood flow to a particular area, which can significantly reduce inflammation and swelling that causes pain, especially around a joint or a tendon. It can temporarily reduce nerve activity, which can also relieve pain.[4]

Nikita Das (2020) conduct a quasi-experimental (post-test only control) design with non-probability purposive sampling with sample size 160 was conducted in Immunization Center in Rajbiraj, Nepal. Ice cube wrapped with gauze was applied on the injection site for 30 seconds before the administration of injection followed by administration of vaccines. FLACC scale was used to assess the pain. The study shows that local cold application is effective on reducing the pain ($p<0.005$).[5]

After an extensive review, the investigator found the pain was one of the most intense and under treated problem in infants receiving immunization. The investigator during her personal experience found that there was not standard routine to assess the pain and no intervention to manage to this problem among infants receiving immunization. So, researcher decided to conduct study on cold application to reduce pain.

Problem Statement

"Evaluate the effectiveness of cold application on level of pain associated with intramuscular immunization among infants in selected hospitals at Udaipur, Rajasthan"

Objectives

- To assess the level of pain associated with intramuscular immunization among infants.
- To evaluate the effectiveness of cold application on level of pain associated with intramuscular immunization among infants.
- To find out the association between the level of pain associated with intramuscular immunization among infants with their selected socio demographic variables.

Research Hypothesis

- **H_1:** There is a significant difference between the mean score on level of pain associated with intra muscular immunization among experimental and control group.
- **H_2:** There is a significant association between the levels of pain associated with intramuscular immunization among infants with their selected demographic variables in experimental and control group.

Methodology

It included the quantitative experimental research approach, quasi experimental post-test only design with control group design, variables under study were cold application as independent variable, reducing pain during intramuscular immunization as dependent variable. Research used modified conceptual framework based On

Ernestine wiedenbach's helping art of clinical nursing model (1964). Selected Hospital of Udaipur city as research setting, total 120 samples, and non-probability convenient sampling techniques was

Inclusion Criteria
The study includes:
- Healthy infants receiving their routine intramuscular immunization.
- Whose parents, caregivers are willing to participate.
- Those infants receiving DPT and Hepatitis-B vaccine.

Exclusion Criteria
The study excludes:
- History of seizure
- Fever or illness that would prevent administration of vaccine.
- Parents and caregivers who are not willing to participate.
- Severe allergic reaction or encephalopathy to a previous DPT and Hepatitis-B vaccine.

Development and description of tool
The tool was developed based on review of literature, opinion from experts in the field of Medical and Nursing. The following steps were undertaken to prepare the final

Tool: The tool consists of two sections:
Section A: Demographic variable:
It consists of 7 items seeking information about Age of the infant, gender, weight of infants, type of vaccine, Parents who are accompanying with the child during IM immunization and History of allergic reaction due to intramuscular injection previously**.**

Section II: Neonatal Infant Pain Scale (NIPS):
Neonatal infant pain scale is a behavioural assessment tool for measurement of pain in preterm and full-term neonates, birth to 1 year. This can be used to monitor a Neonate before during and after a painful procedure such as IM immunization. It was developed at the Children's Hospital of Eastern Ontario and adapted from CHEOPS scale. This tool includes six categories of pain behaviours including facial expression, cry, breathing pattern, arms, legs, state of arousal.

Score–interpretation: Regarding pain score, the maximum score is 10 and minimum score is 0. The score was divided into the following categories.
- 0 - No pain
- 1-3 - Mild pain
- 4-6 - Moderate pain
- 7-10 - Severe pain

Reliability of the tool
In this study, Neonatal Infant Pain Scale (NIPS) was used to assess level of pain associated with intramuscular immunization, is a reliable tool**.**

Ethical consideration
The researcher has done cold application on level of pain associated with intramuscular immunization among infants in selected hospitals at Udaipur, Rajasthan.. The proposed study was conducted after the approval from Geetanjali College of nursing Ethical Committee. Permission were obtained from the concerned authorities. Informed consent were obtained from the parents of children participating in study. Respondents had given the right to withdraw from the study at any time they want and assurance was given to the study subjects and parents that, the privacy and anonymity of the individual will be maintained confidentially.

Method of data collection:-
Informed consent was taken from the mother or caregiver. After explaining the study, cold application was applied for 30 seconds prior to intramuscular immunization. At the end of this period intramuscular immunization was given during which pain assessment was done among infants in experimental group for one minute using Neonatal Infant Pain Scale (NIPS). The pain assessment among control group was done without the intervention.

Plan for data analysis
The Researcher used Descriptive statistics which include frequency, percentage and mean, medium and standard deviation to assess the demographic variables of infants receiving intramuscular immunization. Inferential statistics such as 'z' test was used to compare the effectiveness of post-test assessment. Chi-square test was done to find out the association between the physiological parameters and demographic variables.

Projected outcome
After the study, the researcher will know whether cold application has much effect on level of pain associated with intramuscular immunization among infants in experimental group.

Study result

Section A: socio-demographic data:
Among 30 infants with IM Immunization in experimental group: were 34 (57 %) belongs to the age group 1-4 months, were 39 (65 %) belongs to male, were 35 (58 %) belongs to the weight <5 kg, were 33 (55 %) belongs to the hepatitis B, were 60 (100%) belongs to yes and were 60 (100%) belongs to no.

Among 30 children with IM Immunization in control group: were 30 (50 %) respondents belongs to the age group 1-4 months, were 33 (55 %) respondents belongs to male, were 34 (57 %) belongs to the weight <5 kg, were 33 (55 %) belongs to the hepatitis B, were 60 (100%) belongs to yes and were 60 (100%) belongs to no.

Section B: Comparison of NIP Scale Score With Experimental and Control Group:
Table 1: Comparison of NIP Scale Score With Experimental and Control Group

Group	Mean	SD	Mean differance	Z - Value	Inference
Post-Experimental Group	4.19	0.69	3.02	18.57	S*
Post- control Group	7.21	0.66			

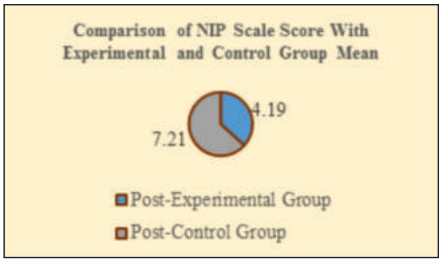

Figure 1: Comparison of NIP Scale Score With Experimental and Control Group

Figure 1 & Table 1: Experimental group & control group:- Projected the Comparison Of Neonatal Infant Pain (NIP) Scale Score With Experimental And Control Group it revealed The mean post test score for pain among experimental group Mean=4.19 was lower than the mean post-test pain score for the control group Mean=7.21 and the obtained 'z' value was z =18.57 greater than the table value. The finding shows that cold application was effective in reducing pain among undergone IM immunization. Hence, Research hypothesis H_1 is accepted.

Section C: findings related to association between selected demographic Variables in experimental and control group:-
Findings related to association of cold application on level of pain associated with intramuscular immunization. In experimental group significant association between pre-test level of pain associated with intramuscular immunization with their selected socio-demographic variables such as age in months ($\chi 2$=9.50), gender ($\chi 2$=4.41), weight of infants ($\chi 2$=10.47), were found to be significant at 0.05 level whereas In control group significant association between pre-test level of pain associated with intramuscular immunization with their selected socio-demographic variables such as age in months ($\chi 2$=1.64), gender ($\chi 2$=1.55), weight of infants ($\chi 2$=4.31), were not found to be significant at 0.05 level.\

DISCUSSION
The present study has been undertaken to "Evaluate the effectiveness of cold application on level of pain associated with intramuscular immunization among infants in selected hospitals at Udaipur, Rajasthan**".** The first objective was to assess the level of pain

associated with intramuscular immunization among infants. The present study revealed that the post test mean score for pain among experimental group Mean=4.19 was lower than the mean post-test pain score for the control group Mean=7.21 and the obtained 'z' value was z =18.57 greater than the table value.

A similar quasi experimental (Post-test only control) study was conducted by Nikita Das in year 2020 at, Nepal shows the mean pain score of study group is 5.587 whereas for control group is 7.625. The obtained z test value is 1.959, which is statistically significant at $p<0.005$.Local cold application is effective on reducing the pain. The study findings revealed that the effectiveness of local cold application in reducing injection pain among infants. In the present study, local cold application was given as a cutaneous stimulation during immunization among infants It was suggested that cutaneous stimulation at the injection site would reduce the pain associated with immunization. This activity is based on the Gate - control theory of pain, which explains that physical interventions such as massage, stroking, rubbing, stimulation of the tissue are theorized to travel through the faster A beta fibers and interfere with the other ascending pain signal, which is transmitted on the slower A-delta fibers, which reduces the intensity of a painful stimulus in the same area.

The similar study conducted in Maharashtra, India revealed that the mean pain score of experimental group was 0.66 after local cold application and control group was 8.93. The unpaired t test value was 24.817 ($p<0.01$), showing significant difference between mean pain score level among children in control and experimental group as p value < 0.05.13 The present study revealed that there was no statistically significant association between age and pain level but the mean scores of age of 5-7 months infants (6.23) was less as compared to age of 2-4 months (6.73), this concluded as age level increases, pain level decreases. It was clinically found that children with greater age experience less pain as diversational therapies can be used for them like distractors, music therapy, massage, breastfeeding etc.

CONCLUSION

The main focus of the study was to assess the effectiveness of cold application in reducing pain during IM immunization among infants. In the present study 120 infants were selected through nonprobability convenient sampling technique. Researcher used quasi experimental post-test only design to assess pain during IM immunization Data were collected through NIP scale and data were analysed through suitable statistical method.

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