

**EFFECTIVENESS OF SUPINE VERSUS SITTING UP POSITION  
ON REDUCTION OF PAIN PERCEPTION DURING  
INTRAMUSCULAR IMMUNIZATION AMONG INFANTS AT  
SELECTED HOSPITALS, MARTHANDAM.**



**DISSERTATION SUBMITTED TO  
THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY  
CHENNAI  
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF  
MASTER OF SCIENCE IN NURSING  
APRIL 2012**

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**BY**

**Mrs. R. FLORINE DAYANA**



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VERSUS SITTING UP POSITION ON REDUCTION OF PAIN  
PERCEPTION DURING INTRAMUSCULAR IMMUNIZATION  
AMONG INFANTS AT SELECTED HOSPITALS,  
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## **ABSTRACT**

A study to assess the effectiveness of supine versus sitting up position on reduction of pain perception during intramuscular immunization among infants at selected hospitals, Marthandam was conducted by R.Florine Dayana in partial fulfillment of the requirement for the degree of Master of Science in nursing at Sri.K.R.N.College of nursing, under the Tamilnadu Dr. M.G.R.Medical University.

### **The objectives of the study were:**

1. To assess the post test level of pain perception during intramuscular immunization among infants of group I with supine position.
2. To assess the post test level of pain perception during intramuscular immunization among infants of group II with sitting up position.
3. To compare the level of pain perception between group I and group II infants.
4. To associate the level of pain perception among infants of group I with their demographic variables.
5. To associate the level of pain perception among infants of group II with their demographic variables.

### **The following hypotheses were set for the study:**

- H<sub>1</sub>** There was a significant difference on the level of pain perception during intramuscular immunization between group I and group II.
- H<sub>2</sub>** There was a significant association between the post test level of pain perception of group I with their demographic variables during intramuscular immunization.
- H<sub>3</sub>** There was a significant association between the post test level of pain perception of group II with their demographic variables during intramuscular immunization.

Quantitative research approach was adapted for this study. Research design used in this study was Two group design comes under Multiple group experimental design. The study was conducted in two hospitals like William hospital and Annammal hospital at Marthandam. The study population composed of infants receiving DPT immunization from one month to four months. The data collection tool used for this study was Modified FLACC Scale. The content validity of the tool was established by five nursing experts and one medical expert. Pilot study was conducted to find out the feasibility of the study and plan for analysis.

Data collection was done and the data obtained were analyzed in terms of both descriptive and inferential statistics.

**The significant findings of the study were:**

1. Majority of infants 18 (60%) were between the age group of one to two months in group I.
2. Majority of infants 15 (50%) were between the age group of 3.1 to 4 months in group II.
3. Majority of infants 17 (56.66%) were females in group I.
4. Majority of infants 18(60%) were males in group II.
5. Majority of infants 15(50%) had worst pain in group I.
6. Majority of infants 21(70%) had moderate pain in group II.
7. The calculated 't' value was 10.95, which shows that there was significance difference between group I and group II during intramuscular immunization at  $P < 0.05$  level.

**Based on the findings of the present study the following recommendations are made:**

1. Similar study can be replicated on a large sample.
2. A study can be conducted to evaluate the effectiveness of audiovisual distraction compared with a blank TV screen in the reduction of pain associated with intramuscular immunization.
3. A comparative study can be conducted by the efficacy ,effect of dose ,and safety of sucrose for relieving procedural pain as assessed by physiologic and behavioural indicators.
4. A study can be conducted to assess the effectiveness and tolerability of various pharmacologic and combined interventions for reducing the pain experienced by children during immunization.
5. A comparative study can be conducted by using expressed breast milk and other non-pharmacological intervention in reduction of pain in neonates.
6. A study can be conducted to assess the effectiveness of play therapy on reduction of pain perception during intramuscular immunization.

## **KEY CONCLUSION**

The study concluded that there was a significant difference on level of pain perception among infants placed in sitting up position than the infants placed in supine position during intramuscular immunization. Sitting up position seems to be accompanied by a sense of control and feeling of less pain. Thus the study concluded that sitting up position was effective in reducing the level of pain perception during intramuscular immunization.

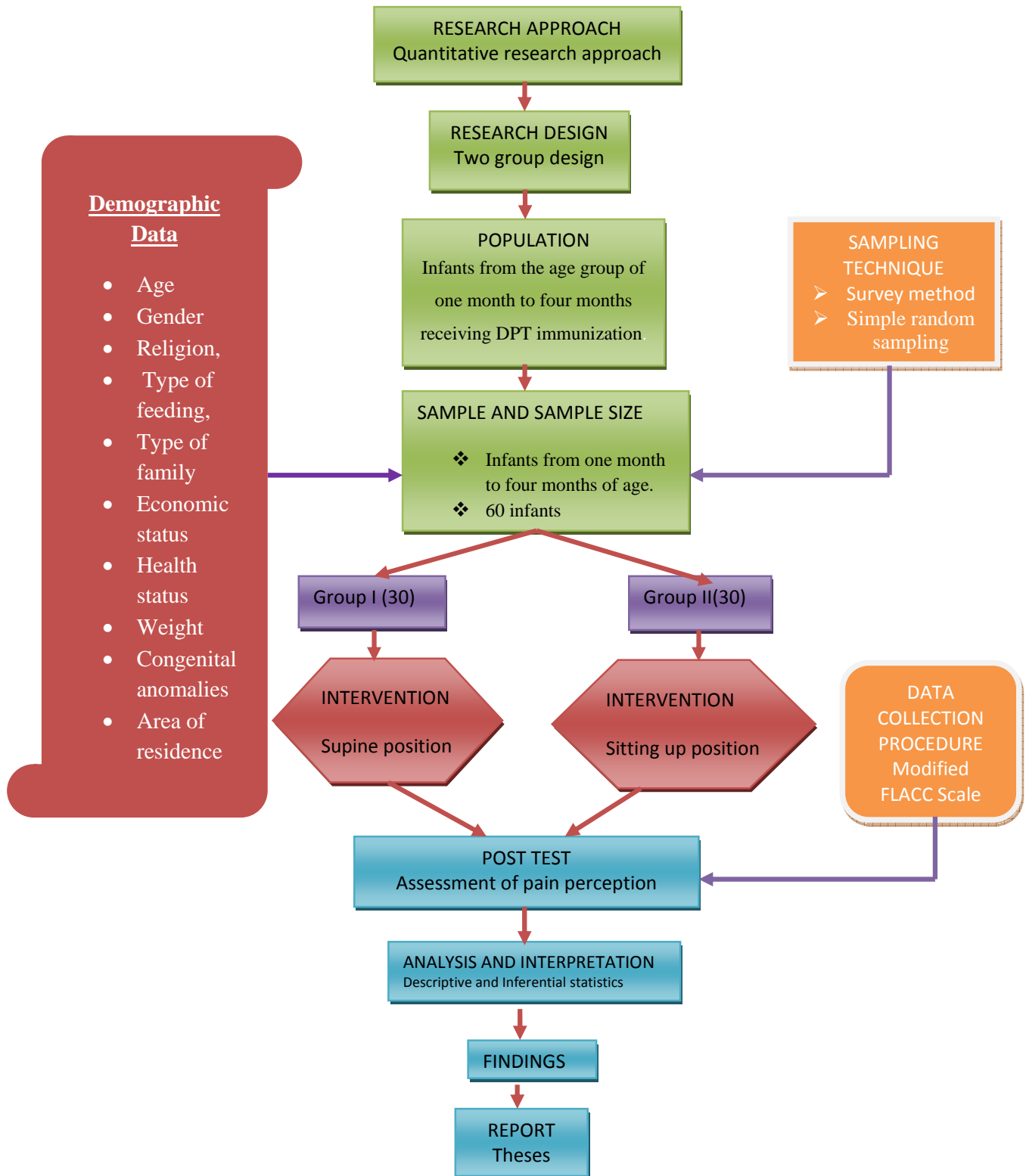


Fig 3: Schematic representation of research methodology



# CHAPTER-I

## INTRODUCTION

*We worry about what a child will become tomorrow,  
Yet we forget that he is someone today.*

*- Stacia Tauscher*

### BACKGROUND OF THE STUDY

The term 'pedia' is derived from the Greek word, which means child. Children are major consumers of health care. In India, about 35 percent of total populations are children below 15 years old. The developmental stage of child is newborn, infant, toddler, preschool, school age, and adolescence. Infants are very young children or babies from birth to twelve months. The term infant is derived from the Latin word infants, meaning "unable to speak" or "speechless".

The infants are not only large in number but vulnerable to various health problems and considered as special risk group. Majority of the childhood sickness and death are preventable by simple low-cost measures.

One of the most dramatic advances in pediatrics has been the decline of infectious diseases during the twentieth century because of the widespread use of immunization for preventable diseases (**Wongs**).

Nursing personnel are mostly responsible for the administration of immunization and its related activities. (**Parul Datta**).

Most of the vaccines are available as injections. Injected medications are rapidly absorbed by diffusing into either plasma or the lymphatic system. Although

injection results in faster and more reliable absorption than the oral route, injections are stressful and threatening to children and are not preferred. **(Susan)**.

To reduce the risk of injury, it is sometimes necessary to restrain the child before administering an injected medication. The parent, however, must feel confident in the ability to keep the child still enough to prevent injury.

Children perceive injections to be very painful. Even with the best preparation, it is hard for a child to understand that the pain of an injection lasts only seconds.

Prior to the late nineteenth century it was generally considered that babies hurt more easily than adults. It was only in the last quarter of the 20<sup>th</sup> century that scientific techniques finally established babies definitely do experience pain – probably more than adults – and has developed reliable means of assessing and of treating it.

The present understanding of pain in babies is largely due to the recognition that the fetal and newborn unmyelinated nerve fibres are capable of relaying information. At birth a baby has developed the neural pathways for nociception and for experiencing pain, but the pain responses are not a mature version of that of an adult. There are a number of differences in both nerve structure and in the quality and extent of nerve response which are considered to be pertinent to understanding neonatal pain.

Some of the signs of pain in babies are obvious, requiring no special equipment or training. The baby is crying and irritable when awake, develops a disturbed sleep pattern, feeds poorly, and shows a fearful, distrustful reaction towards care-givers.

**The Classical International Association for the Study of Pain** defines, pain as a subjective, emotional experience that is described in terms of tissue damage, depends on the sufferer being able to self-report pain, which is little use in diagnosing and treating pain in babies.

The cry response is increasingly important, as researchers are now able to differentiate between different kinds of cry: classed as “hungry”, “angry”, and “fearful or in pain”. Interpretation is difficult, however, depending on the sensitivity of the listener, and varies significantly between observers.

Studies have sought additional, visible and easily definable indicators of pain. Combinations of crying with facial expressions, posture and movements, aided by physiological measurements, have been tested and found to be reliable indicators. A number of such observational scales have been published and verified

Where the baby is to undergo some form of planned procedure, health professionals will take steps to reduce pain to a minimum, though in some circumstances it may not be possible to remove all pain. Some measures like local anesthetics, analgesics, providing oral stimulation, administering oral sugar are used to reduce the pain in children during intramuscular immunization.

### **Measures Reducing the Pain Perception**

Local anesthetics, Analgesics, Comforting, Oral Stimulation, Oral Sugar, and Other "old fashioned" techniques are being tested with some success. “Facilitated tucking”, swaddling and “kangaroo care” have been shown to reduce the response of babies to painful or distressful circumstances, while a comprehensive technique of

nursing, called “developmental care”, has been developed for managing pre-term infants.

### **Positioning**

Positions are used to comfort the patients. There are many positions used for reducing pain. For jugular venipuncture, the infant is placed in a mummy restraint. For lumbar puncture the infant is placed in a side lying position. Supine, sitting, standing, and side lying positions are used during intramuscular injection. Infants are unable to cooperate for many procedures: therefore the nurse is responsible for minimizing their movement and discomfort with proper positioning.

Sitting requires the buttocks resting on a more or less horizontal structure, like a chair or the ground. Special ways of sitting are with the legs horizontal, and in an inclined seat. The way of sitting on the floor involves bending the knees. One can also sit with the legs unbent, using something solid as support for the back or leaning on one’s arms. Sitting with bent legs can be done along two major lines; one with the legs mostly parallel and one where they cross each other. The parallel position is reminiscent, sometimes used for kneeling. The latter is a common pose for meditating.

Supine position is a position of the body: lying down with the face up, as opposed to the prone position. Anatomically described as position, the dorsal side is down, and the ventral side is up.

In infancy, sitting up seems to be accompanied by a sense of control, and in situation where an infant or child is forced to lie down, it is common for the infant to cry and struggle to get up. If this child is placed in a supine position during such a

procedure the result may be a feeling of loss of control, this infant invokes more pain.

**Stephens et al.,(1997).**

A study was conducted to assess the effectiveness of pain during injection. They suggested that a child is placed in a sitting up when receiving an injection would feel more in control and less pain for them. While lying down when a child is in a upright position it is less likely that the thigh muscles will be tensed. **Dowen and Dammyer (1999).**

A systematic review included four randomized control trails, that examined the influence of the child's position on the pain response during vaccination. Altogether, 281 infants from newborn to six months of age and children from four to six years were included. In three of the studies, lying supine resulted in more pain than sitting upright or being held by a parent. **Anna Taddio et al., ( 2002 ).**

## **NEED FOR THE STUDY**

India is a country with the largest number of children out of school, nearly 21 million. The reported data is inflated; it is likely that about 70 percent of children are fully immunized by 1990 in contrast to about 10 percent in 1985. The percentage of children who are fully vaccinated ranges from 13 percent in Nagaland to 91 percent in Tamilnadu.

The distribution of districts coverage of full immunization among children is below 20 percent in 115 districts, 20 to 39.9 percent in 153 districts, 40 to 59.9 percent in 128 districts, 60 to 79.9 percent in 109 districts and above 80 percent in 88 districts. The highest vaccination coverage was recorded in Ratnagiri and Kolhapur

districts of Maharashtra and Toothukudi district of Tamilnadu, where 99 percent. Children received the complete schedule of vaccination.

Children are the wealth of tomorrow. So prevention of disease is one of the most important goals in child care. During infancy and childhood, there are some of the preventive measures are available against certain infectious diseases. Some professional groups make recommendations concerning the prevention and treatment of infectious diseases by immunization. Immunizations are effective in decreasing and, in some cases, eliminating infectious childhood diseases.

Ideally, over 80 percent of infants and children should be immunized to decrease the likelihood that a susceptible person will come in contact with an infected person. In recent years, however, relatively low immunization levels in these age groups have occasioned scattered outbreaks of diseases. For this reason a national effort is being made toward improving the immunization levels of all children **(Marlow)**.

Immunization recommendations change because of advances in the field of immunology. For example, routine smallpox vaccination has been discontinued because modern science has eradicated smallpox throughout the world. The antigens used for immunization are both viral and bacterial. They have been changed to eliminate or modify the pathogenesis of the microbiologic agent. Vaccines made from viruses include live attenuated strains such as poliomyelitis, or killed vaccine such as influenza. Bacterial antigens include killed, whole organisms as in pertussis vaccine, toxoids such as tetanus or diphtheria, or attenuated live organisms as in BCG.

During the first year of life, the infant receives immunization against diphtheria, pertussis, and polio. Most of the vaccines are injections which cause pain during administration. The young infant responds to pain with total body movement associated with distraction. By the end of the first month of life, diffuse body response has decreased. During infancy, reflexive behavior is dominant. Between third and tenth months of age, infants are able to localize pain as they are moving their limbs, passing stool, hiccough, and cry. After six months, an infant responses to pain is influenced by the recall of prior pain experience and the emotional reactions of parents during a procedure. The older infants react intensively with physical resistance and uncooperativeness as they refuse to lie still, attempt to push the nurse away.

The development of scientifically based practice guidelines for selected problems was created. In that Pain was a targeted area. The development of guidelines for the care of children with pain was based on retrieval and review of articles related to pain. The research studies tested pain assessment tools and pharmacologic and non pharmacologic pain relief measures. They concluded that position is the one way in reducing pain perception of infants. **Agency for Health Care Policy and Research (1989)**

One major area of specific concern is pain management for premature infants, neonates and very young infants particularly with regard to painful procedure **(Halimaa, 2003;Lyon, 2005)**

A study was conducted to determine the effectiveness of physical interventions and injection techniques for reducing pain during vaccine administration in children. In this study pain during immunization can be decreased by injecting the

least painful formulation of a vaccine, having the child sit up (or holding an infant), stroking the skin or applying pressure close to the injection site before and during injection and performing a rapid intramuscular injection without aspiration. In conclusion, the infants perceive less pain in sitting up position. **Shah V et al.,( 2000 )**.

The optimal position during vaccination is unknown. The infants and children should be held by a parent in a position that is most comfortable for both of them (eg.) hold a baby in a bear hug, hold a child on the parents lap. One or more limbs must remain exposed for the vaccination provider. Among infants undergoing vaccination, holding the infant before and during the procedure result in less pain at the time of injection. While holding the infants on the mother's lap, there will be a skin contact between mother and baby. This touching or tactile stimulation is a cost effective intervention that may reduce the sensation of pain. The proposed mechanism of action involves the gate control theory of pain and the notion that the sensation of touch competes with the sensation of pain for transmission to the brain, there by resulting in less pain.

Infants and older children may sit on the examination table. The risk of accidental falls is minimized by having a parent stand against the examination table to provide support. The child can lie down after the injection.

Lying supine results in more pain than sitting upright or being held by a parent. Although the exact mechanism underlying the reduction in pain associated with non supine positioning is unknown, it may involve a reduction in anxiety, which in turn reduces the perception of pain. The recommendation of the study was, for reducing pain at the time of injection do not place children in a supine position during vaccination.



So reduction of pain is important during intra muscular immunization among infants. During my experience as a student nurse I got a chance of giving immunization to the infants in the OPD. When the infants are brought to the injection room, they started crying and express their fear and pain by holding the mothers neck tightly and they will not allow to give injection.

I am interested in doing study regarding the sitting versus supine position in reducing pain and to relieve discomfort. It is easier and cost effective intervention which helps in reducing pain.

## **STATEMENT OF THE PROBLEM**

A study to assess the effectiveness of supine versus sitting up position on reduction of pain perception during intramuscular immunization among infants at selected Hospitals, Marthandam.

## **OBJECTIVES**

1. To assess the post test level of pain perception during intramuscular immunization among infants of group I with supine position.
2. To assess the post test level of pain perception during intramuscular immunization among infants of group II with sitting up position.
3. To compare the level of pain perception between group I and group II infants.
4. To associate the level of pain perception among infants of group I with their demographic variables.
5. To associate the level of pain perception among infants of group II with their demographic variables.

## **HYPOTHESES**

- H<sub>1</sub>** There will be a significant difference on the level of pain perception during intramuscular immunization between group I and group II.
- H<sub>2</sub>** There will be a significant association between the post test level of pain perception of group I with their demographic variables during intramuscular immunization.
- H<sub>3</sub>** There will be a significant association between the post test level of pain perception of group II with their demographic variables during intramuscular immunization.

## **OPERATIONAL DEFINITIONS**

### **Assess**

Systematically and continuously analyzing and valuating supine versus sitting up position on reduction of level of pain perception during intramuscular immunization by using Modified FLACC Scale for infants.

### **Effectiveness**

It refers to outcome of the efficacy of supine versus sitting up position on reduction of level of pain perception during intramuscular immunization by Modified FLACC Scale for infants.

### **Supine Position**

It refers to baby lies flat with the back resting on the mattress and facing upwards during intramuscular immunization

**Sittingup Position**

It refers to the rest position, in which the baby is supported by buttocks over the mother's lap during intramuscular immunization.

**Pain**

It refers to an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage during intramuscular immunization among infants. The level of pain will be assessed by using Modified FLACC Scale.

**Immunization**

It refers to a process of administering DPT vaccines through intramuscular route for infants at vastuslateralis site.

**Infant**

It refers to children between the age group of one month to four months.

**ASSUMPTIONS**

1. Immunization is necessary for all children to fight against killer diseases.
2. Children experience pain when they are immunized.
3. Sitting up position is better in reducing the level of pain perception than supine position during intramuscular immunization.

**DELIMITATIONS**

1. The study was delimited to infants from one month to four months of age who were attending pediatric OP of William Hospital and Annammal Hospital, Marthandam.

2. The study was delimited to four weeks only.
3. The study was delimited to sample of 60 children.

### **PROJECTED OUTCOME**

1. The findings of the study will help the nurses to plan and use various positioning during intramuscular immunization to reduce pain perception.
2. Providing sitting up position during intramuscular immunization will reduce the pain perception better than supine position during intramuscular immunization.

## CONCEPTUAL FRAMEWORK

The conceptual framework for research study presents the measure on which the purpose of the proposed study is based. The framework provides the perspective from which the investigator views the problem.

The study is based on the concept of determining the effectiveness of supine versus sitting up position during intramuscular immunization among infants. The investigator adopted the Roy's Adaptation model.

Roy's Adaptation model focuses on three areas:

- Input
- Throughput
- Output

### **1. Input**

According to Roy's Adaptation model input refers to a infant's adaptation level. Here the input is adapting the painful situation by providing supine or sitting up position during intramuscular immunization.

### **2. Throughput**

In this model throughput refers to the infant's processes and effectors. In the present study it includes providing supine versus sitting up position in which, the child's thigh muscles will be more tensed in supine position and the child's thigh muscles will be less tensed in sitting position. And also mother holds the baby while giving immunization. So sensation of touch competes with sensation of pain for transmission to the brain. So the child perceives less pain in sitting than supine position during intramuscular immunization.

### **3. Output**

Output refers to outcome of the person's behavior. In the present study it refers to the outcome of the infant's pain perception level in supine versus sitting up position during intramuscular immunization using Modified FLAAC Scale.



## **CHAPTER – II**

### **REVIEW OF LITERATURE**

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put a research problem in contest (**Polit& Beck, 2006**).

The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for use in practices or to provide a basis for conducting a study (**Burns, 1997**).

This study assessed the effects of positioning in the reduction of pain perception during intramuscular immunization. From the collected review of various associated literature and research studies, topics can be divided as follows;

**Section A:** Studies related to pain and immunizations

**Section B:** Studies related to positioning on pain reduction during immunization.

#### **SECTION - A**

##### **Studies Related to Pain and immunization**

**Kikuta A (2010)** conducted a study on “Effectiveness of different pain relieving interventions to reduce pain from immunization in adults”. The pain was assessed by visual analogue or other numeric rating scale. Six studies representing 853 participants were identified. One study evaluating pharmacological interventions (lidocaine) found them to be effective in reducing pain from immunization. Similarly,



two studies evaluating physical pain relieving techniques, either skin cooling interventions (Fluori-Methane) or tactile stimulation found them to reduce pain. The study results showed that, one study of jet injectors found them to be more painful than conventional needle and syringe. Neither freezing needles nor warming vaccines was found to be effective in reducing pain.

**Landman Z et al., (2009)** conducted a study on, “Multifaceted distraction method designed to reduce injection-associated pain in school aged children”. A clinical trial evaluated 41 children, four to six years of age, who were given three standard Pre-kindergarten immunizations. Twenty one were assigned randomly to an office routine control group, whereas 20 received a multifaceted, discomfort – reducing intervention. According to patient and parent Faces pain scale –Revised scores and non-blinded, video taped observations scored according to the face-legs-activity–consolability method, the intervention group showed highly significant reductions in pain and discomfort, compared with the control group (patient self-report,  $p < 0.0013$ ; parent report,  $p < 0.0002$ ; observation score,  $p < 0.0001$ ). The study results showed that, this multifaceted distraction intervention reduced significantly the pain.

**Theodorsson E et al., (2009)** conducted a study on, “Assessing the parents and infants salivary cortisol response in relation to the use of pacifier and oral glucose”. Ninety eight infants were included into one of four intervention groups: ‘glucose and pacifier’, ‘water and pacifier’, ‘glucose’ or ‘water’. Saliva was collected before and 30 min after the immunization. Infant’s crying time and parent’s self reported stress were measured before and after immunization. Infant’s in the ‘pacifier and glucose group’ had a significantly smaller change in salivary cortisol than infants

in the other groups. The study results showed that, the combination of oral glucose and pacifier dampen infant's salivary cortisol in response to the three-month immunization.

**Landman Z et al., (2009)** conducted a randomized clinical trial “to reduce immunization discomfort in four to six years old children”. They evaluated 41 children, four to six years old, who were given three standard Pre-kindergarten immunizations; 21 were assigned randomly to an office routine control group, whereas 20 received a multifaceted, discomfort reducing intervention. In conclusion, this multifaceted distraction intervention reduced significantly the pain and discomfort of childhood immunizations in children from four to six years of old.

**Taddio A et al., (2009)** conducted a study “to determine if acute pain response after administration of the diphtheria, polio, and tetanus toxoids and acellular pertussis and hemophilus influenza type b vaccine and the pneumococcal conjugate vaccine is affected by the order in which they are given”. The study was conducted in outpatient pediatric clinic in Canada under the design of single-center, double-blind, randomized clinical trial. One twenty healthy infants of two to six months of age undergoing routine immunization were participated. The modified behavioral pain scale was used and the score was 7.6 Vs 8.2. The study results showed that, pain was reduced when the DPTaP-Hib vaccine was administered before the PCV in infants undergoing routine vaccination. They recommended that the order of vaccine injection DPTaP-Hib to be followed by the PCV.

**Rieder MJ et al., (2009)** conducted a study “to assess the effectiveness and tolerability of pharmacologic and combined interventions for reducing injection pain during routine childhood immunizations under quasi experimental design”. Thirty-

two studies, involving 3856 infants and children of two weeks to 15 years old. In a meta-analysis of two trials, including 276 children, child self-reported pain ratings were lower in children who received topical local anesthetics than in those who received placebo. The standardized mean difference was 0.25. The use of topical local anesthetics was associated with less pain than was placebo in four trials (529 infants) based on the difference between modified behavioral pain scale scores before and after vaccination; the weighed mean difference was -0.79 and the SMD was -0.43. The study results showed that, topical local anesthetics sweet tasting solutions, and combined analgesic intervention, including breast feeding, were associated with reduced pain during childhood immunizations and should be recommended for use in clinical practice.

**Uman LS et al., (2009)** conducted a study on, “A systemic review to determine the efficacy of various psychological strategies for reducing pain and distress in children during routine immunization”. 0 to 18 years old children were participated, using validated child self-reported pain or observer-reported assessments of child distress or pain under the design of randomized control trails and quasi. They examined the efficacy of psychological interventions like breathing exercises, suggestion, child directed distraction, parent-lead distraction, nurse-lead distraction, parent coaching and combined cognitive behavioral interventions. The study results showed that, evidence suggest that these interventions are effective in reducing the pain and distress associated with routine child hood immunizations. Although additional well-designed trials examining psychological interventions are needed, parents and health care professionals should be advised to incorporate psychological interventions to reduce the pain and distress experienced by children during immunization.

**Cohen LL et al., (2009)** conducted a study on “A randomized trial examines the effectiveness of the shot blocker, a physical intervention designed to decrease children’s injection pain”. Participants included eighty nine 4 to 12 year old children receiving immunizations at a pediatric practice. Participants were randomized to Shot Blocker, placebo control, or typical care control groups. Measures of child distress included self-report, parent report, health care provider report, change in heart rate, and observational behavioral coding. The study results showed that, the data do not support the effectiveness of the Shot Blocker for acute pediatric pain relief.

**Bartell JC et al., (2008)** conducted a study “to determine whether administering intramuscular injections using cold needles would decrease patient’s perceived pain and have an effect on the immune response elicited by the vaccine”. Eighty participants received an injection of influenza vaccine in one arm and a saline injection in the other using a cold or room temperature needle in a double-blind fashion assigned at random. Participants rated their pain after each injection using a standard visual pain scale bounded by no pain and most painful injection ever. Vaccine antibody response was measured using hemagglutination inhibition assays. The study results showed that, pain after influenza vaccine administration is mild. Use of cold needles may not be worth pursuing for injections associated with mild pain. However, it may be worthwhile to explore using cold needles as an analgesic with more painful injections.

**Teeland L et al.,(2007)** conducted a study on, “Evaluating oral glucose as an analgesic to reduce infant distress after immunization during the first year of life and to investigate if these effects change during this period”. A prospective control trial of the effectiveness of glucose on crying response to immunizations at 3,5, and 12

months of age. A total of 110 infants were randomized to receive 2ml of 30 percent glucose or water. The same solution was given at 3,5 and 12 months. Crying was registered from onset of the injection up to 120 seconds. Infanrix polio hib was administered intramuscular in the thigh. Observation nurse and parents were blind to the nature of the solution. The study results showed that, sweet solution can be used as a simple and safe method to reduce the distress following immunization in infants up to 12 months.

**Sam J et al., (2007)** conducted a study “to compare acute pain response during immunization in infants using a slow standard of care injection technique versus a rapid pragmatic technique under Randomized control trail”. The setting of the study is urban pediatric primary care practice. Healthy infants four to six months of old receiving their routine DPTap-Hib immunization were participated. The interventions are in the standard of care group slow aspiration prior to injection, slow injection and slow withdrawal and in the pragmatic group no aspiration, rapid injection, and rapid withdrawal. The study results showed that, immunization using a pragmatic rapid injection technique is less painful than a slow standard of care technique and should be recommended for routine intramuscular immunizations.

**Schechter NL et al., (2007)** conducted a study “to reduce pain during pediatric immunizations under evidence based review and recommendations”. Preparation of the child before the procedure seems to reduce anxiety and subsequent pain. The limited available data suggest that intramuscular administration of immunizations should occur in the vastuslateralis for children <18 months of age and in the deltoid for those >36 months of age. Controversy exists in site selection for 18 to 36 month old children. A number of studies suggest that the ventrogluteal area is the most

appropriate for all age groups. Longer needles are usually associated with less pain and less local reaction. During the injection parental demeanor clearly affects the child's pain behavior. The study results showed that, in the era of multiple injections, it seems that parents prefer that multiple injections be given simultaneously, rather than sequentially, if there are enough personnel available. Immunizations are stressful for many children; until new approaches are developed, systematic use of available techniques can significantly reduce the burden of distress associated with these procedures.

**Lemyre B et al., (2007)** conducted a study on, "Efficacy and safety of topical tetracaine on the pain response of neonates during a venepuncture". The effectiveness in tetracaine 4 percent gel, before a venepuncture, in reducing procedural pain in infants under a randomized double-blind placebo control trial. One hundred and forty two infants were included 1.1gm of tetracaine and placebo was applied to the skin for 30 minutes. Participants received oral sucrose if they met eligibility criteria. The venepuncture was performed according to a standard protocol. A medium effect size in the pain score was considered clinically significant. Local skin reactions and immediate adverse cardio respiratory events were noted. The study results showed that, Tetracaine did not significantly decrease procedural pain in infants undergoing a venepuncture, when used in combination with routine sucrose administration.

**Savaffer S et al., (2007)** conducted a study on, "Compare the analgesic effects of breast feeding and sucrose solutions in reducing pain due to venipuncture in term neonates". The study was conducted in Akdeniz University, Turkey. The participants were allocated into one of the sucrose, breast feeding and control groups.

In order to assess the pain response of the neonates before, during and after venepuncture, Neonatal Infant pain scale was used. This study has confirmed some well known information that breast feeding and oral sucrose solution have pain reducing effects in infants undergoing venepuncture.

**Uman LS et al., (2006)** conducted a study on, “Efficacy of cognitive-behavioral psychological interventions for needle related procedural pain and distress in children and adolescents”. Participants included children and adolescents 2 to 19 years old undergoing needle related procedure. Only randomized control trails with atleastfive participants in each study arm comparing a psychological intervention group with a control or comparison group were eligible for inclusion. Twenty eight trails with 1951 participants were included. Together, these studies included 1039 participants in treatment conditions and 951 in control conditions. The most commonly studied needle procedures were immunizations and injections. Overall, there is preliminary evidence that a variety of cognitive behavioural interventions can be used with children and adolescents to successfully manage or reduce pain.

**ShahPS et al., (2006)** conducted a study “to evaluate the effectiveness of breast feeding or supplemental breast milk in reducing procedural pain in neonates”. Randomized or quasi randomized controlled trails of breast feeding or supplemental breast milk in neonates were eligible for inclusion in this review. Eleven eligible studies were identified. No study was identified that has evaluated effectiveness of repeated administration of breastfeeding or supplemental breast milk for pain relief. The study results showed that, If available, breast feeding or breast milk should be used to alleviate procedural pain in neonates undergoing a single painful procedure

compared to placebo, positioning or no intervention. Administration of glucose or sucrose similar effectiveness as breast feeding for reducing pain.

**Posfay-Barbe KM et al., (2005)** conducted a study “to assess how physicians interested in vaccination issues immunized, or would immunize, their own children by University of Geneva”. They performed a comparison of past and projected immunizations rates in the children of pediatricians and non pediatricians. One thousand seventeen valid questionnaires were received (response rate:49.1%;pediatricians:53.3%).Nine hundred fifteen physicians (90%)had > or =1 child. All physicians reported immunizing children in their practice. In conclusion, ninety three percent of the surveyed physicians agree with the current official vaccination recommendations and would apply them to their own children. However, the observation that 5% of non pediatricians would not use haemophilus influenza type b vaccine if they had a child born in 2004 is unexpected and concerning.

**Macarthur C et al., (2004)** conducted a study “to compare acute pain response to two measles-mumps-rubella vaccines under double-blind clinical trial design”. The study was conducted in Hospital for sick children, Toronto. Forty nine, twelve months old infants received their first measles-mumps-rubella vaccination. Random allocation to receive priorix or MMR-II given as intervention. Modified behavioral pain scale was used. The study results showed that, priorix vaccine causes significantly less pain than MMR-II at the time of injection for twelve month old infants receiving their first measles-mumps-rubella vaccination.

**Rudin M et al., (2004)** conducted “a systematic review of the adverse events after immunization with aluminium containing DTP vaccines”. The adverse events after exposure to aluminium –containing vaccines against Diphtheria, Tetanus and



Pertussis (DTP), alone or in combination, compared with identical vaccines, either without aluminium or containing aluminium in different concentrations. The study is a systematic review with meta-analysis. Two reviewers extracted data in a standard way in all included studies and assessed the methodological quality of the studies. They identified 35 reports of studies and included three randomized trials, four randomized trials, and one cohort study. They did a meta-analysis of data from five studies around two main comparisons (vaccines containing aluminium hydroxide vs no adjuvant in children aged up to 18 and vaccines containing adjuvant type of aluminium vs no adjuvant in children aged 10-16 years). In young children, vaccines with aluminium hydroxide caused significantly more erythema. In older children, there was no association between exposure to aluminium containing vaccines, but there was an association with local pain lasting up to 14 days. In conclusion aluminium salts in vaccines cause no serious or long lasting adverse events.

**Holubkov R et al., (2003)** conducted a study “to assess the effectiveness, feasibility, and parental acceptance of a simple combination pain reduction intervention for infants receiving multiple immunization injection under the design of Randomized, controlled, clinical trial”. Subjects were randomly assigned to the intervention or control group for administration of four injections. The intervention group received sucrose and oral tactile stimulation and were held by their parents during immunization. The control group did not receive these interventions. One hundred sixteen infants were participated and the age group of two months. The main outcome measures are, Blinded assessment of audio taped crying, heart rate, parent preference for future use of the injection technique, and nurse-rated ease of vaccine administration. The study results showed that, combining sucrose, oral tactile stimulation, and parental holding was associated with significantly reduced crying in

infants receiving multiple immunization injections. Parents stated found the intervention injection techniques easy to apply.

**Szudek EA et al., (2002)** conducted a study on “Evaluating the effectiveness of audio visual distraction compared with a blank TV screen in the reduction of pain associated with intramuscular immunization”. The setting of the study was two urban pediatric practices in Halifax, Nova Scotia, Canada. The subjects were randomly assigned to watch television on experimental group of 29 and a blank TV screen of control group is 33 during immunization, and were videotaped. Immediately after the injection, the children rated their pain. Videotapes were coded for pain behaviours and for distraction. T tests determined between group mean differences and chi square tests compared proportions for clinically significant self reported pain. The study results showed that watching cartoons did not distract children during needle injection for reduce their pain. Looking at the TV screen was elated to lower behavioral pain scores in the total sample.

**Webb AV et al., (2002)** conducted “a study regarding Intra-oral administration of sweet tasting substances and infant’s crying response to immunization under a randomized, placebo-controlled trial”. The analgesic effects of four solutions administered intra-orally (25 and 50% sucrose solutions, hydrogenated glucose, and a sterile water placebo) were tested in groups of babies receiving routine DTP (diphtheria, tetanus, and pertussis) and HIB (Haemophilus influenza type B) injections at the first, second, or third immunization. The duration of the baby’s cry during three min following DTP and HIB injections was measured as main outcome. For all three immunization groups, the babies receiving the placebo generally spent most time crying. For both the DTP and HIB injections, the difference between 50%

sucrose and placebo was most evident in the group receiving the third immunization. Intra-oral administration of the 50% sucrose solution, compared to placebo, appeared to reduced the cry response to painful experience in babies beyond the neonatal period.

**Cohen LL(2002)** conducted a study “to reduce infant immunization distress through distraction” This study examined nurse-directed distraction for reducing infant immunization distress .Ninety infants and their parents were randomly assigned to a distraction condition or a typical care condition. Outcome measures were an observational scale, parent and nurse ratings, and infant heart rate. Results indicated that infants engaged in distraction reduced their behavioral distress; however, ratings and heart rate were in conclusive. Analysis of procedural phases indicated that infants exhibited elevated distress immediately prior to and during an injection, but this distress was fleeting.

**Houston T et al., (2002)** Conducted a study “to measure the antibody response to DTaP-IPV-Hib and hepatitis B vaccines, to measure pain reduction associated with the use of the lidocaine–prilocaine(EMLA) patch and to assess safety comparing adverse reactions”. The study was conducted in Dalhousie University and Pediatrics Health Centre, Canada. One hundred and nine healthy six-months-old infants were in Part A and 56 healthy infants birth to two months of age were in Part B undergoing primary immunization in an outpatient setting. The design is randomized, double blind, control trial. The EMLA patch or placebo before DTaP-ipv-hIb and Hepatitis B immunization and antibody titers measured at 0-2,6 and 7 months as intervention. The study results showed that, the EMLA patch has no adverse effect on the antibody response to the vaccine antigens, is effective in

reducing pain associated with DTaP-IPV-Hib and hepatitis B immunizations and does not result in any significant or unexpected adverse reactions.

**Finley GA et al., (2001)** conducted a study on, “The effectiveness of placebo-controlled trial of the EMLA patch for the reduction of pain associated with intramuscular injection in four to six year old children”. The study was conducted in Izaak Killam Health Centre, Canada. 161 children four to six years old undergoing diphtheria, pertussis, tetanus and polio immunization in five urban and five rural private office settings were randomly assigned to an EMLA patch number 83 or a placebo patch control group number 78. Pain measurements include child’s self-report on a Faces pain scale, facial coding system, Eastern Ontario pain scale, and visual analogue scale. The EMLA patch group had significantly less pain on all four pain measures compared with the placebo group. Of the children in the placebo group, 43 percent had clinically significant pain, compared with 17% of children in the EMLA patch group. No severe adverse symptoms occurred as a result of either EMLA or placebo patch application. The study results showed that, the EMLA patch reduced immunization pain in four to six years old children during needle injection.

**Stevens B et al., (2000)** conducted a study on, “To determine the efficacy, effect of dose, and safety of sucrose for relieving procedural pain as assessed by physiologic and or behavioral indicators”. The selection criteria was RCTs in which term and preterm neonates undergoing heel lance, venepuncture or intramuscular injection received sucrose, or water or no intervention. Trial quality was assessed according to the methods of the neonatal collaborative review group. Quality measures included; blinding of randomization, blinding of intervention, completeness of follow up, and blinding of outcome measurement. The study results showed that,

there was inconsistency in the dose of sucrose that was effective and an optimal dose to be used in preterm and or term infants could not be identified. Considerations for future research are to describe the painful procedure and intervention in detail, to use appropriate sample size to show a statistically significant reduction in pain, to use a multidimensional conceptualization of pain, to select outcome measures that are reliable and valid pain indicators and to account for the variation in the infant's response and context in which the pain is experienced .The use of repeated administrations of sucrose in neonates needs to be investigated .Use of sucrose in neonates that are very low birth weight, unstable and or ventilated also needs to be addressed.

## **SECTION - B**

### **Studies Related to Positioning on Pain Reduction During**

#### **Immunization**

**Taddio A et al., (2009)** conducted a study on “Effectiveness of physical interventions and injection techniques for reducing pain during vaccine injection in children”. Nineteen Randomized control trails involving 2814 infants and children 0 to 18 years old were included in this study. The methods used are different formulations of the same vaccine, position of the child during injection, intramuscular versus subcutaneous injection, cooling of the skin at the injection site, with ice before injection, stroking the skin or applying pressure close to the injection site before and during injection, order of vaccine injection when two vaccines were administered sequentially, simultaneous versus sequential injection of two vaccines, anatomic location of injection, aspects of the needle and combinations of these interventions. In conclusion, pain during immunization can be decreased by injecting the least painful

formulation of a vaccine, having the child sit up, stroking the or applying pressure close to the injection site before and during injection, injecting the least painful vaccine first performing a rapid intramuscular injection without aspiration. Discomfort of childhood immunizations in children four to six years old.

**Hollen EC et al., (2004)** conducted a study on, “Effectiveness of parental positioning and distraction on the pain, fear, and distress of pediatric patients undergoing venipuncture”. The study was conducted in Children’s medical center of Dallas, USA. An experimental –comparison group design was used to evaluate 43 patients, in that 20 of them in experimental and 23 become control group, who were 4 to 11 years old. Experimental participants used parental positioning and distraction. In control group no intervention was given. All participants rated their pain and fear. The parental positioning-distraction intervention has the potential to enhance positive clinical outcomes with a primary benefit of decreased fear, pain , and distress.

**Lacey MA et al.,** conducted a study “to explore the impact of a child’s position on the level of pain and perception during an immunization injection”. One hundred and seven children, ages 4 to 6, participated in a random- assignment, two group design study to evaluate the effect of positioning on fear and perceived pain. Group I was placed in the supine position and group II in the sitting position prior to immunization. The results substantiated the belief that children are significantly less fearful about receiving an injection when they are sitting up as compared to when they are lying down. There was no difference in perception of pain.

**Whitfield,M.D.,** conducted a study “to examine the influence of prone and supine position in preterm infants during acute pain of blood collection”. The setting of the study was level III intensive care unit. Thirty eight preterm infants were in two

groups depending on their position in the isolette prior to and during heel lance at 32 weeks post-conceptual age. The study design was a comparison between groups (supine, prone) during 2 events (baseline, heel lance). Both group of infants displayed statistically significant shifts in sleep- wake state to quarter arousal, and increased facial activity and heart rate, from Baseline to Lance. Prone position was associated with significantly more deep sleep during baseline compared with supine position.

## CHAPTER – III

### RESEARCH METHODOLOGY

Research methodology refers to the techniques used to structure a study and to gather and analyze information in a systematic fashion (**Polit & Hungler, 2008**). Methodology includes the steps, procedures and strategies for gathering and analyzing the data in the research investigation.

This chapter consists of research approach, research design, variables, setting, population, sample, sample size, sampling technique, criteria for sample selection, development and description of the tool, scoring key, grading, content validity, reliability, pilot study, procedure for data collection, plan for data analysis and protection of human rights.

#### RESEARCH APPROACH

Quantitative approach was adapted for this study.

#### RESEARCH DESIGN

Research design used in this study was two group design comes under multiple group experimental design. It can be diagrammatically represented as:

Group	Pre test	Intervention	Post test
I	-	$X_1$	$RO_1$
II	-	$X_2$	$RO_2$

Fig 2: Schematic Representation of Research design

- Group I        -        Supine position
- Group II      -        Sitting up position
- $X_1$             -        Intervention (supine position) for Group I



X <sub>2</sub>	-	Intervention (sitting up position) for Group II
R	-	Randomization
O <sub>1</sub>	-	Post test of Group I
O <sub>2</sub>	-	Post test of Group II

## **VARIABLES**

The variables of the study are as follows:

### **Independent Variables**

Position (supine and sitting up position)

### **Dependent Variables**

Pain perception

## **SETTING OF THE STUDY**

The study was conducted in the pediatric outpatient department of William Hospital and Annammal Hospital at Marthandam. This William hospital is located 0.5 kilometers far from Marthandam town. It is a 150 bedded hospital which consists of 100 beds exclusively for pediatric cases. Approximately 100 to 300 cases are coming for OPD every day. This hospital has neonatal intensive care unit, isolation ward, normal newborn ward, and pediatric ICU. And this Annammal hospital is located 2.5 kilometers far from Marthandam town. It is a 150 bedded hospital which consists of 35 beds exclusively for pediatric cases. Approximately 100 to 150 cases are coming for OPD every day. This hospital has neonatal intensive care unit, isolation ward, normal newborn ward, and pediatric ICU.

## **POPULATION**

The study population composed of infants who are receiving DPT immunization from one month to four months of age.

## **SAMPLE**

The study samples composed of infants receiving DPT immunization from one month to four months, who are attending the pediatric outpatient department of William Hospital and Annammal Hospital, Marthandam.

## **SAMPLE SIZE**

The sample size for the study was 60 infants. Out of which 30 of them in group I with supine position and 30 in group II with sitting up position.

## **SAMPLING TECHNIQUE**

The investigator conducted a survey to find out the number of pediatric hospitals at Marthandam town and it was ten. Using the simple random sampling technique two hospitals were selected and one was assigned for group I and another one for group II randomly. Again the hospitals randomly selected were, William hospital for group I those who were placed in supine position during intramuscular immunization and Annammal hospital for group II those who were placed in Sitting up position during intramuscular immunization.

## **CRITERIA FOR SAMPLE SELECTION**

### **Inclusive Criteria**

1. Infant between the age group of one month to four months.
2. Mothers and children who are willing to participate in this study.
3. Infant receiving DPT immunization at vastuslateralis site.

### **Exclusive Criteria**

1. The children who are admitted in the ward and receiving immunization.
2. Infants who are receiving other intramuscular immunization

## **DEVELOPMENT AND DESCRIPTION OF TOOL**

### **Section – I**

#### **Demographic data**

Questionnaire was used to collect the demographic data of the samples which consists of ten items. It consists of variables such as age, gender, religion, economic status, type of family, type of feeding, health status, weight of the child, congenital anomalies and area of residence.

### **Section – II**

#### **Modified FLACC Scale**

Consists of Modified FLACC Scale(MFS). It consists of face, legs, activity, cry. Distress behaviors, such as vocalization, facial expression, and body movement, have been associated with pain. These behaviors are helpful in evaluating pain in infants and children with limited communication skills.

#### **Scoring Key**

FACE	-	(0-2)
LEGS	-	(0-2)
ACTIVITY	-	(0-2)
CRY	-	(0-2)

## Grading

S. No	Level of pain	Grading
1.	No pain	1-2
2.	Mild pain	3-4
3.	Moderate pain	5-6
4.	Worst pain	7-8

## INTERVENTION

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage. The intramuscular immunization is the most common painful procedure that nurse performed to the infants. Positioning is useful to reduce pain. The investigator selected infants from one month to four months of age and they were divided into two groups. Group I infants were placed in supine position and Group II infants were placed in sitting up position during DPT immunization. The level of pain was assessed by Modified FLACC Scale.

Sitting position is better than supine position. In supine position the infants constrict the muscles and struggle to get up. But in sitting position the infants are held by mother's arms. The sensation of touch competes with the sensation of pain and it provides comfort to the child. Therefore, sitting position is the effective and comfortable intervention during intramuscular immunization for reducing infants pain.

## CONTENT VALIDITY

The content of the tool was established on the basis of opinion of one medical expert and five nursing experts in the field of pediatric nursing. Slight modifications were done as per the suggestion of the experts and the tool was finalized.

## **RELIABILITY OF THE TOOL**

Reliability of the tool was established by the test retest method with the same sample at different timings. The reliability score was  $r=0.8$  showed higher degree of consistency and correlation of the tools. Hence the tool was considered reliable for proceeding with the main study.

## **PILOT STUDY**

It is a rehearsal for the main study. The researcher got permission from the Principal, and Research ethical committee. A formal permission was obtained from the Director of PPK Hospital and C.S.I. Mission Hospital at Marthandam. The pilot study was conducted in Outpatient Department of PPK Hospital Marthandam from 9am to 1 pm and at C.S.I. Mission Hospital from 3 to 6 pm for the period of one week (28.03.2011 to 02.04.2011). The concerned OPD in charge and duty doctors were also informed and their co-operation was also obtained. The sample size was six infants and they were selected by simple random sampling technique, in that three of them were allotted to group I and three of them to group II.

Rapport was established with the mothers and a brief introduction about the study was given. Consent was obtained from each mother and reassurance was provided that the collected data would be kept confidential. The data related to demographic variables were collected from the mothers by interview method. Group I infants were placed in supine position and Group II infants were placed in sitting up position during intramuscular immunization. Level of pain perception was assessed by using Modified FLACC Scale. The results of the pilot study showed that the infants in group II, who were in sitting up position had reduced pain perception compared to the group I. The study was found to be feasible and hence the same

procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study. The samples selected for the pilot study were not included in the main study.

## **PROCEDURE FOR DATA COLLECTION**

The researcher got permission from the Principal, Research Ethical Committee and HOD of child health nursing of Sri K. Ramachandran Naidu College of Nursing. Before the data collection, formal permission was obtained from the Director of William Hospital and Annammal Hospital, Marthandam for conducting the main study.

The investigator conducted a survey to find out the number of pediatric hospitals at Marthandam town and it was ten. Using the simple random sampling technique two hospitals were selected and one was assigned for group I and another one for group II randomly. Again the hospitals randomly selected were, William hospital for group I those who were placed in supine position during intramuscular immunization and Annammal hospital for group II those who were placed in Sitting up position during intramuscular immunization.

The data were collected from 04.04.2011 to 30.04.2011, between nine to one p.m at William Hospital and three to six p.m at Annammal Hospital, Marthandam for the period of four weeks, six days in a week. During data collection procedure, the investigator introduced herself to mother and established rapport with mother. They were assured that, no physical and emotional harm would be done in the course of study. Infants who required DPT intramuscular immunization were selected according to the inclusive criteria after obtaining the consent from the mothers of the infants. The researcher collected the infants demographic data from the mothers by

interview method. Group I infants were placed in a supine position and Group II infants were placed in a sitting up position during intramuscular immunization. During the procedure, the researcher assessed the infant's pain perception for two minutes with the Modified FLACC Scale. The data were collected for four to six samples per day. The study was conducted for a period of one month with sixty study subjects.

## **PLAN FOR DATA ANALYSIS**

The data were analyzed by using descriptive and inferential statistics.

### **Descriptive Statistics**

1. Frequency and percentage distribution were used to analyze the demographic data.
2. Mean and Standard deviation were used to assess the effectiveness of supine versus sitting up position during intramuscular immunization among infants.

### **Inferential Statistics**

1. Unpaired 't' test was used to compare the effectiveness of supine versus sitting up position among infants in group I and group II.
2. Chi-Square test was used to find out the association of the effectiveness of supine versus sitting up position among infants in group I and group II.

## **PROTECTION OF HUMAN RIGHTS**

The researcher got permission from Principal and the Research ethical committee of Sri. K. Ramachandran Naidu College of nursing and HOD of child health nursing. A formal permission was obtained from the Director of William Hospital and Annammal Hospital, Marthandam. The concerned OPD in charge and

duty doctors were also informed and their co-operation was also obtained. Verbal consent was obtained from the mothers before providing the intervention. Assurance was given to the subjects that anonymity of each subject would be maintained.





## CHAPTER- IV

### DATA ANALYSIS AND INTERPRETATION

Data analysis is the systematic organization and synthesis of research data, and the testing of research hypothesis using those data (**Polit & Hungler 2003**).

This chapter deals with the analysis and interpretation of collected data from 60 infants to assess the effectiveness of supine versus sitting up position on reduction of pain perception during intramuscular immunization among infants at selected Hospitals, Marthandam.

Descriptive and inferential statistics were used to analyze data on the basis of the objectives of the study.

### ORGANIZATION OF DATA

The data has been tabulated and organized as follows:

**Section - A** : Analysis of demographic data of infants in group I and group II.

- ❖ Frequency and percentage distribution of demographic variables of infants in Group I and Group II.

**Section – B** : Assessment of pain perception of the infants in group I and group II during intramuscular immunization.

- ❖ Frequency and percentage distribution of level of pain in Group I and Group II.

**Section – C** : Comparison of pain perception of the infants between group I and group II during intramuscular immunization.

- ❖ Comparison of level of pain perception between Group I and Group II.

**Section – D** : Association of pain perception of the infants between group I and group II with selected demographic variables.

- ❖ Association of pain perception of infants in group I with demographic variables.
- ❖ Association of pain perception of the infants in group II with demographic variables.

## SECTION - A

## Analysis of Demographic Data of Infants in Group I and Group II

**Table-1: Frequency and Percentage Distribution of Demographic Variables of Infants in Group I and Group II (N=60)**

S. No	Demographic Variables	Group-I		Group-II	
		f	%	f	%
<b>1.</b>	<b>Age</b>				
	1-2 Months	18	60	11	36.66
	2.1-3 Months	4	13.33	4	13.33
	3.1-4Months	8	26.66	15	50
<b>2.</b>	<b>Gender</b>				
	Male	13	43.33	18	60
	Female	17	56.66	12	40
<b>3.</b>	<b>Religion</b>				
	Christian	14	46.66	17	56.66
	Hindu	9	30	9	30
	Muslim	7	23.33	4	13.33
<b>4.</b>	<b>Economic Status</b>				
	5000 /Month	7	23.33	4	13.33
	5000-10000/ Month	15	50	16	53.33
	Above 10000 /Month	8	26.66	10	33.33
<b>5.</b>	<b>Type of Family</b>				
	Nuclear	17	56.66	16	53.33
	Joint	13	43.33	14	46.66
<b>6.</b>	<b>Type of Feeding</b>				
	Breast feeding	18	60	12	40
	Bottle feeding	0	0	0	0
	Others	12	40	18	60
<b>7.</b>	<b>Health Status</b>				
	Healthy	21	70	24	80
	Un healthy	9	30	6	20
<b>8.</b>	<b>Weight of the Child</b>				
	Less than 4 Kg	7	23.33	3	10
	4.1-6 Kg	10	33.33	11	36.66
	Above 6 Kg	13	43.33	16	53.33
<b>9.</b>	<b>Congenital Anomalies</b>				
	Yes	0	0	0	0
	No	30	100	30	100
<b>10</b>	<b>Area of Residence</b>				
	Rural	14	46.66	14	46.66
	Urban	16	53.33	16	53.33

Table 1 depicts the frequency and percentage distribution of demographic variables of infants with respect to age, gender, religious status, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence.

With regard to infantal age, majority of infants 18 (60%) were between the age group of one to two months and 8 (26.66%) were between the age group of 3.1 to 4 months and 4(13.33%) were between the age group of 2.1 to 3 months in group I whereas, 15(50%) were between the age group of 3.1 to 4 months,11(36.66%) were between the age group of one to two months and 4(13.33%) were between the age group of 2.1 to 3 months of age in group II.

With regard to gender classification, 13 (43.33%) infants were males and 17 (56.66%) infants were females in group I where as 18(60%) were males and 12(40%) were females in group II.

With regard to religion 14(46.66%) were Christians, 9 (30%) were Hindus and 7 (23.33%) were Muslims in group I where as 17(56.66%) were Christians,9(30%) were Hindus and 4(13.33%) were Muslims in group II.

With regard to economic status, 15(50%) were between 5000-10000 Rs income,8(26.66%) were above 10000 Rs income and 7(23.33%) were less than 5000 Rs income in group I where as 16(53.33%) were between 5000-10000 Rs income, 10(33.33%) were above 10000 income and 4(13.33%) were less than 5000 Rs of income in group II.

With regard to type of family, 17(56.66%) belongs to nuclear family and 13(43.33%) belongs to joint family in group I where as 16(53.33%) belongs to nuclear family and 14(46.66%) belongs to joint family in group II.

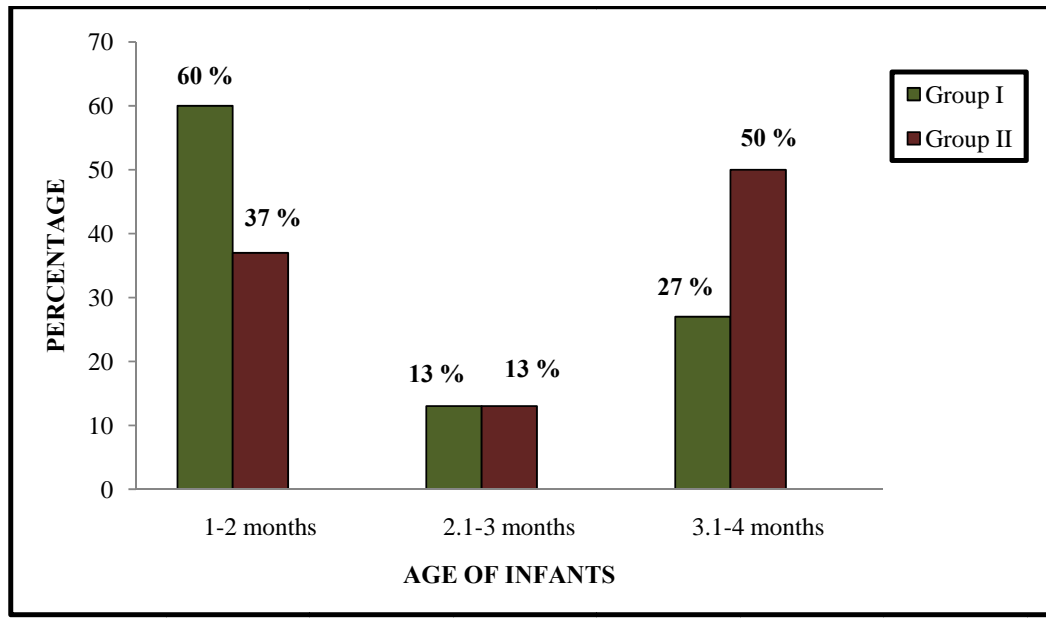
With regard to type of feeding, 18(60) had breast feeding and 12(40%) were taken other feeds. None of them were taken feed by bottle in group I where as 18(60%) were taken other feeds, 12(40%) had breast feeding and none of them had feeding by bottle in group II.

With regard to health status, majority of infants 21(70%) were healthy and 9(30%) were unhealthy in group I where as 24(80%) were healthy and 6(20%) were unhealthy in group II.

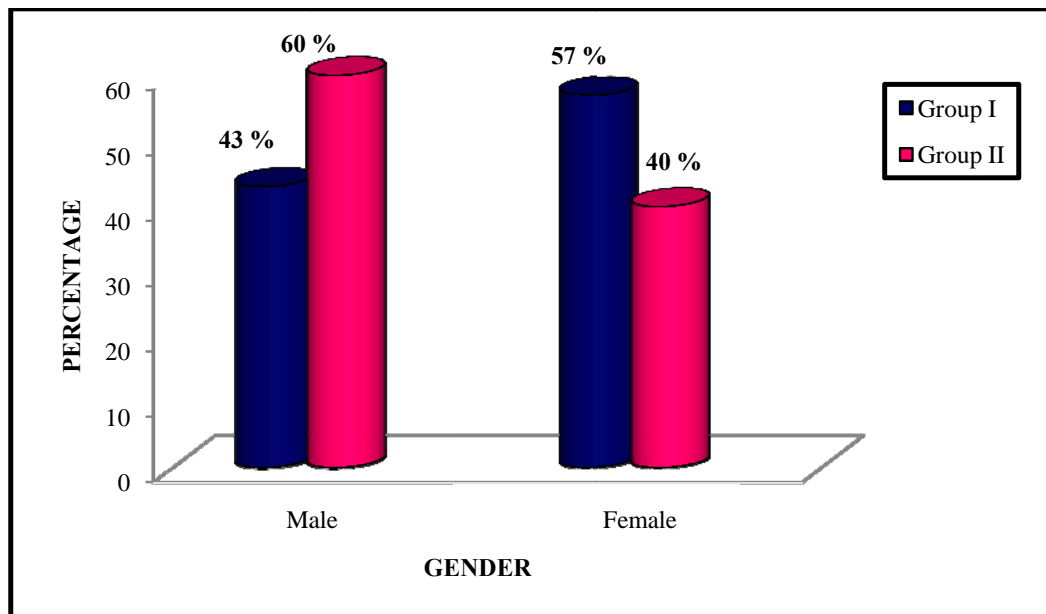
With respect to the weight, majority of infants, 13(43.33%) infants had the weight of above six kg and 10(33.33%) had the weight of less than 4.1-6 kg and 7(23.33%) had the weight of less than 4 kg in group I where as 16(53.33%) had the weight of above six kg, 11(36.66%) had the weight of 4.1-6kg and 3(10%) had the weight of less than 4 kg in group II.

None of the newborns had any congenital anomalies in group I and group II.

With regard to area of residence, majority of infants 16(53.33%) were from urban and 14(46.66%) were from rural in group I where as 16(53.33%) were from urban and 14(46.66%) were from rural in group II.

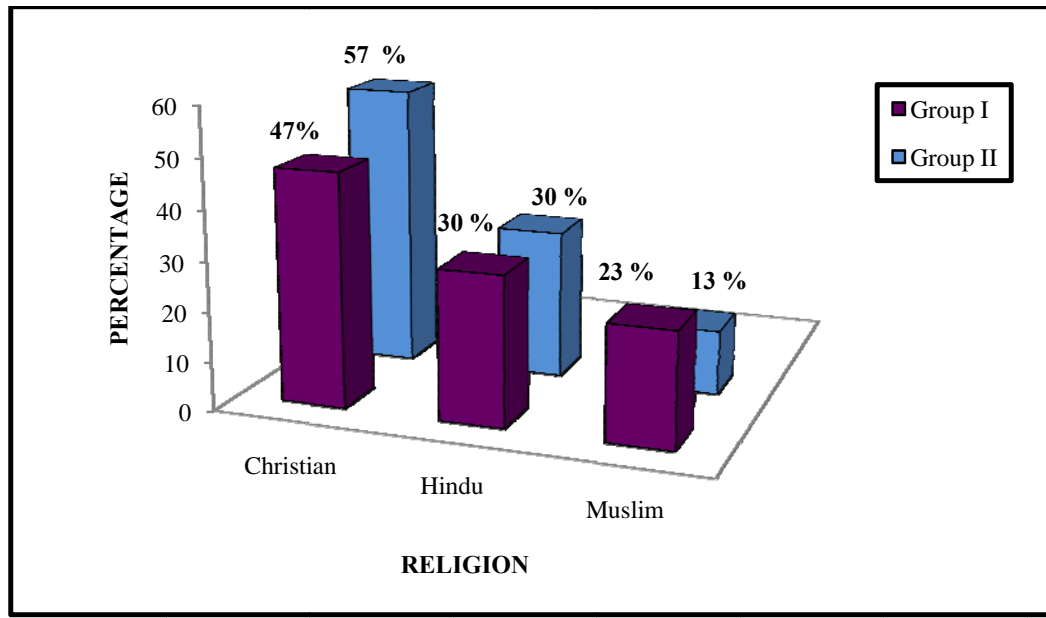


**Figure-4:** Percentage distribution of samples according to age in group I and group II.

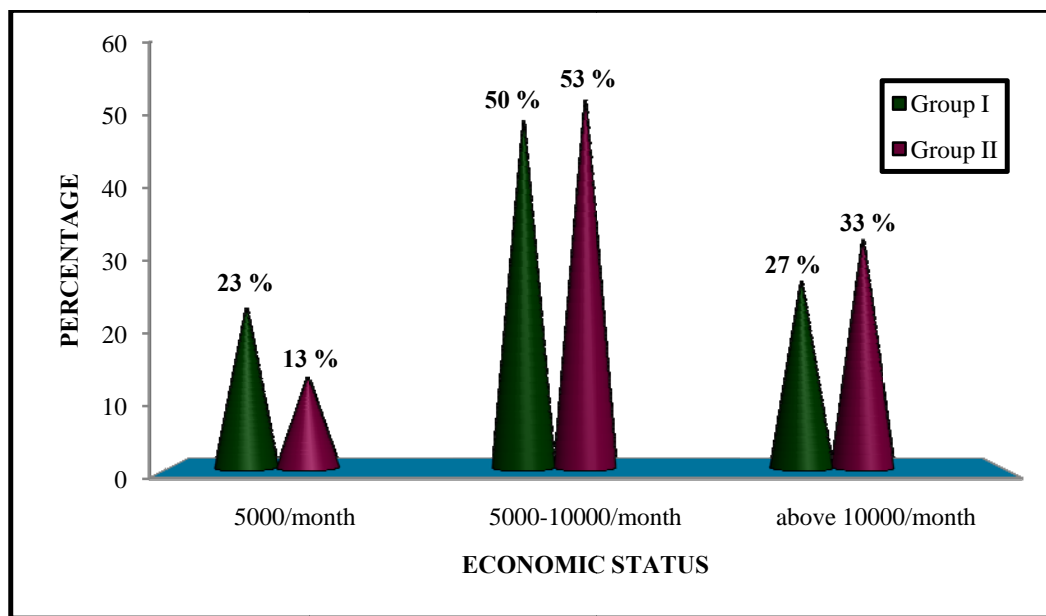


**Figure:5** Percentage distribution of samples according to gender in group I and

Group II.

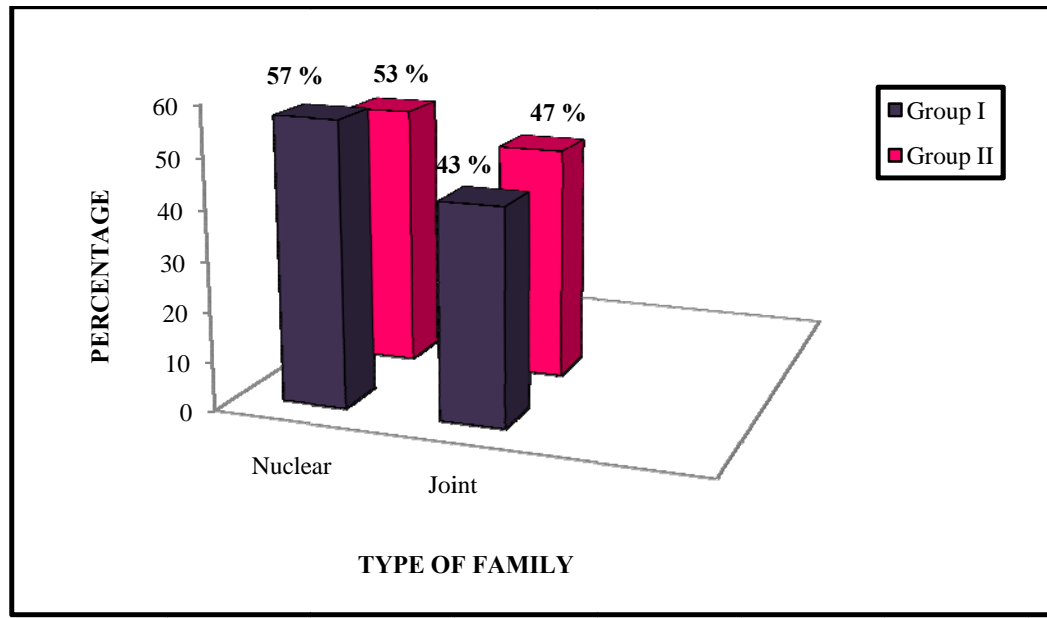


**Figure-6:** Percentage distribution of samples according to religious status in group I and group II.

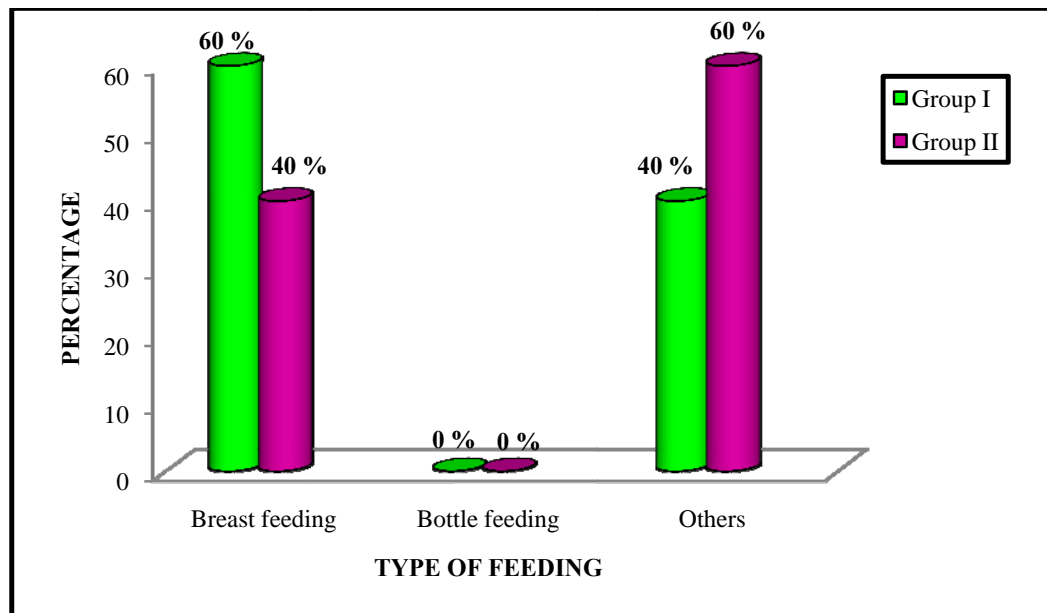


**Figure-7:** Percentage distribution of samples according to economic status in group I and group II.

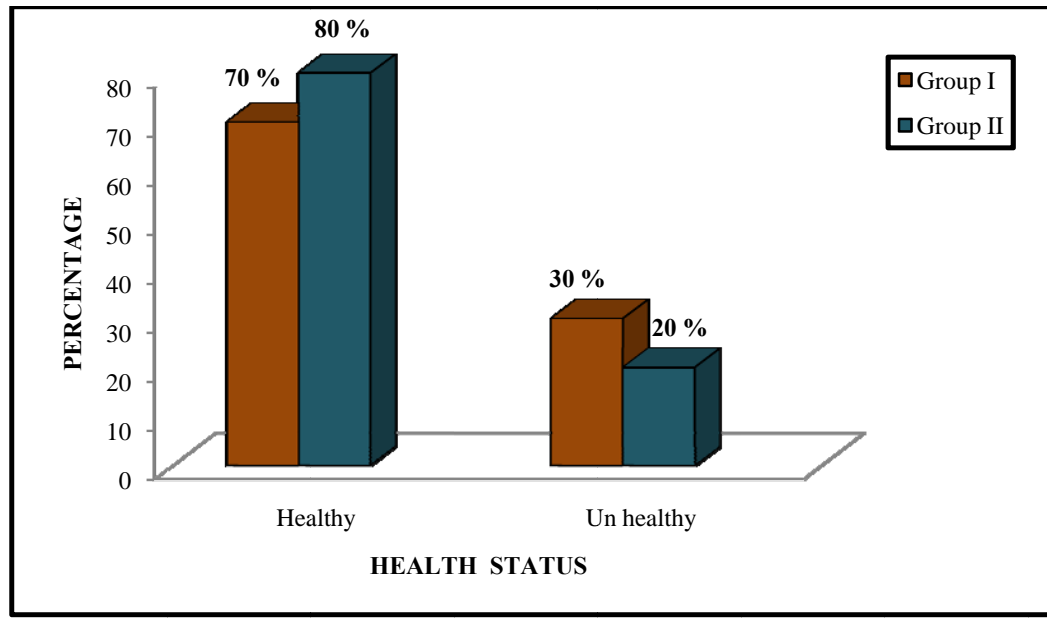




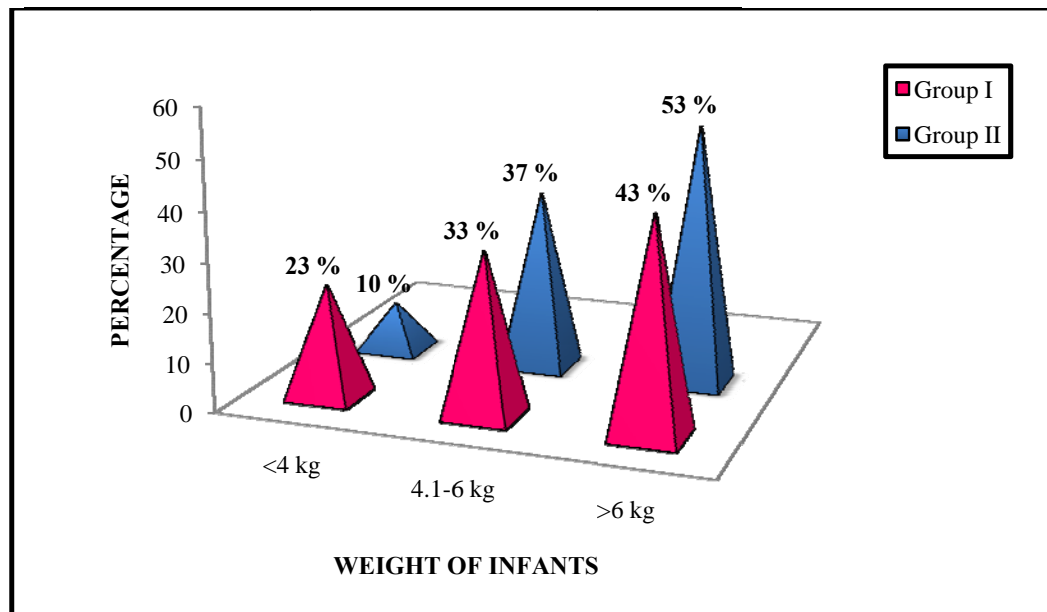
**Figure-8:** Percentage distribution of samples according to type of family in group I and group II.



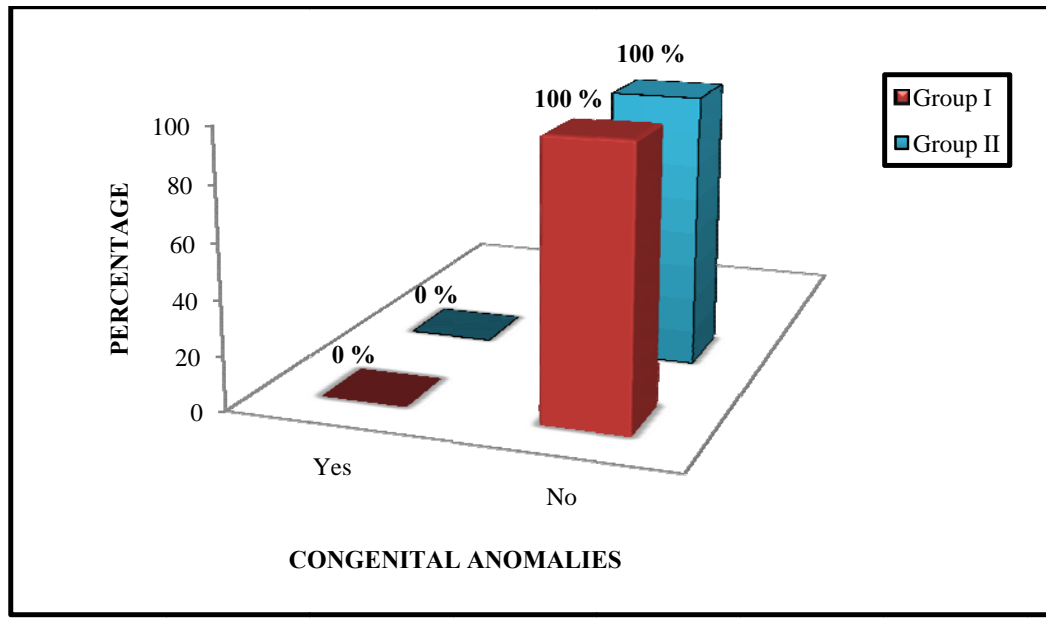
**Figure-9:** Percentage distribution of samples according to type of feeding in group I and group II.



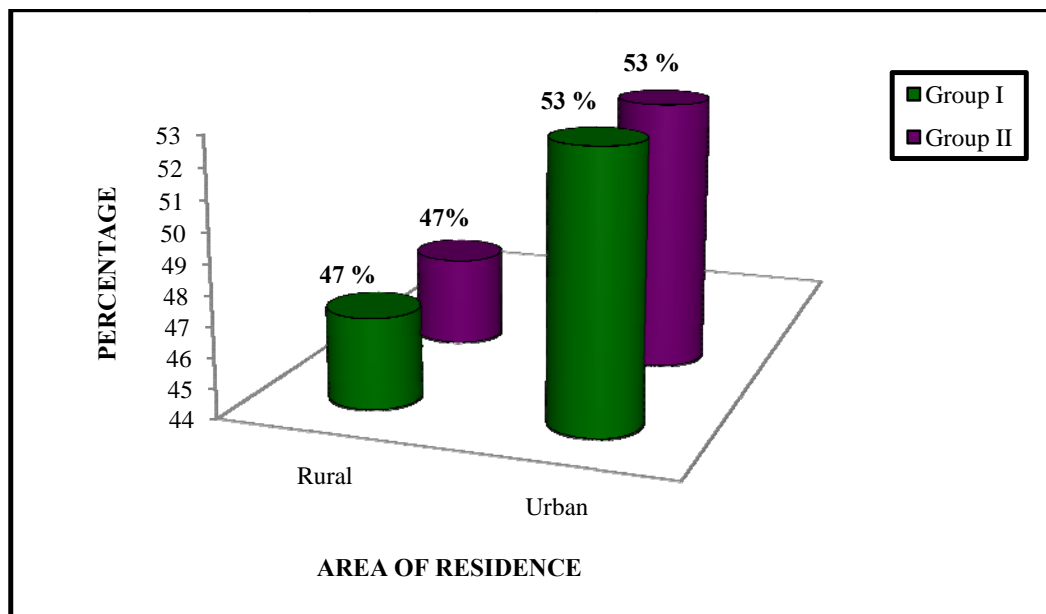
**Figure-10:** Percentage distribution of samples according to health status in group I and group II.



**Figure-11:** Percentage distribution of samples according to weight of infants in group I and group II.



**Figure-12:** Percentage distribution of samples according to congenital anomalies of infants in group I and group II.

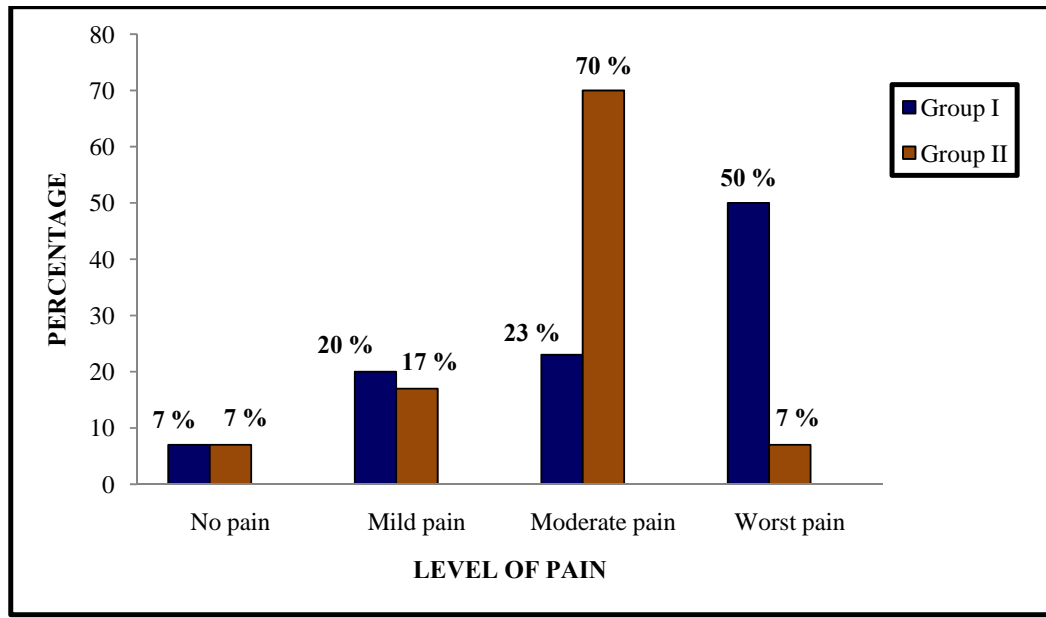


**Figure-13:** Percentage distribution of samples according to area of residence of infants in group I and group II.

**SECTION - B****Assessment of Pain Perception of the Infants in Group I and Group II  
During Intramuscular Immunization****Table-2: Frequency and Percentage Distribution of Level of Pain in Group I and  
Group II (N=60)**

Level of pain	Group -I		Group -II	
	f	%	f	%
No pain	2	6.66	2	6.66
Mild pain	6	20	5	16.66
Moderate pain	7	23.33	21	70
Worst pain	15	50	2	6.66

Table 2 depicts the post test level of pain perception among infants during intramuscular immunization. Majority of the samples 15(50%) infants had worst pain,7(23.33) infants had moderate pain,6(20%)infants had mild pain and 2(6.66%) infants had no pain in group I. In group II, majority of infants 21(70%) had moderate pain, 5(16.66%) of infants had mild pain, 2(6.66%)of infants had no pain and 2(6.66%) of infants had worst pain



**Figure-14:** Percentage distribution of level of pain in group I and group II.

## SECTION-C

### Comparison of Pain Perception of the Infants between Group I and Group II during Intramuscular Immunization

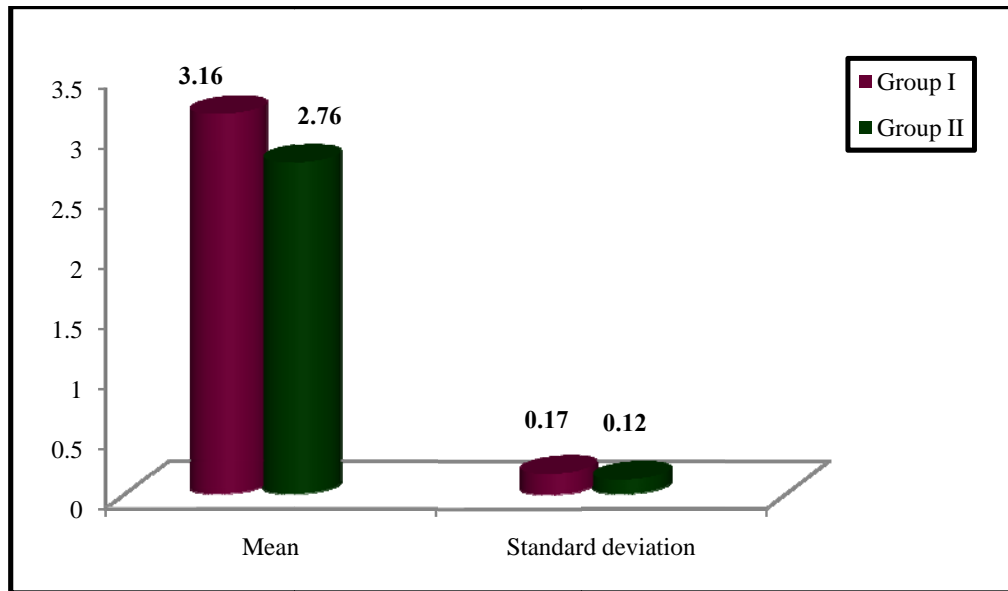
**Table-3: Comparison of Level of Pain Perception between Group I and Group II (N=30+30)**

S.no	Group	Post intervention score		't' value	P-value
		Mean	S.D.		
1.	Group I	3.16	0.17	10.95 S	2.756
2.	Group II	2.76	0.12		df =29

**S: Significant**

The above table 3 shows the comparison of mean and standard deviation value of group I and group II.

The mean post test value of group II was 2.76, which was lower than the mean post test value of group I (ie) 3.16. The calculated 't' value was 10.95 which shows that there was significant difference between supine versus sitting up position during intramuscular immunization between group I and group II at  $p < 0.05$  level. The difference between the group I and group II response showed that sitting position was effective in the reduction of pain perception among infants. Hence, the research hypothesis stated that, "There will be a significant difference on the level of pain perception during intramuscular immunization between group I and group II" was accepted. This revealed that, sitting up position was very effective in reducing the pain perception during intramuscular immunization.



**Figure-15:** Mean and Standard deviation value of pain perception between group I and group II.

## SECTION - D

**Association of Pain Perception of the Infants between Group I and Group II with Selected Demographic Variables**

**Table-4: Association of Pain Perception of Infants in Group I with Demographic Variables (N=30)**

S. No	Demographic Variables	No	No Pain		Mild Pain		Moderate Pain		Worst Pain		$\chi^2$ Value
			f	%	f	%	f	%	f	%	
<b>1.</b>	<b>Age</b>										
	1-2 Months	18	2	6.66	5	16.66	6	20	5	16.66	8.694 df=2 S
	2.1-3 Months	4	-	-	-	-	1	3.33	3	10	
	3.1-4Months	8	-	-	1	3.33	0	0	7	23.33	
<b>2.</b>	<b>Gender</b>										
	Male	13	-	-	3	10	4	13.33	6	20	0.072 df=1 NS
	Female	17	2	6.66	3	10	3	10	9	30	
<b>3.</b>	<b>Religion</b>										
	Christian	14	-	-	5	16.66	3	10	6	20	4.822 df=2 NS
	Hindu	9	1	3.33	1	3.33	2	6.66	5	16.66	
	Muslim	7	1	3.33	-	-	2	6.66	4	13.33	
<b>4.</b>	<b>Economic Status</b>										
	5000/Month	7	-	-	2	6.66	2	6.66	3	10	5.443 df=2 NS
	5000-10000/Month	15	1	3.33	1	3.33	2	6.66	11	36.66	
	Above 10000/Month	8	1	3.33	3	10	3	10	1	3.33	
<b>5.</b>	<b>Type of Family</b>										
	Nuclear	17	1	-	4	13.33	3	10	9	30	1.474 df=1 NS
	Joint	13	1	-	2	6.66	4	13.33	6	20	
<b>6.</b>	<b>Type of Feeding</b>										
	Breast feeding	18	2	-	5	16.66	6	20	5	16.66	4.432 df=2 NS
	Bottle feeding	0	-	-	0	0	0	0	0	0	
	Others	12	0	-	1	3.33	1	3.33	10	33.33	
<b>7.</b>	<b>Health Status</b>										
	Healthy	21	2	6.66	4	13.33	4	13.33	11	36.66	2.331 df=1 NS
	Un healthy	9	-	-	2	6.66	3	10	4	13.33	



S. No	Demographic Variables	No	No Pain		Mild Pain		Moderate Pain		Worst Pain		$\chi^2$ Value
			f	%	f	%	f	%	f	%	
<b>8.</b>	<b>Weight of the Child</b>										
	Less than 4 Kg	7	2	6.66	2	6.66	1	3.33	2	6.66	1.247 df=2 NS
	4.1-6 Kg	10	-	-	3	10	4	13.33	3	10	
	Above 6 Kg	13	-	-	1	3.33	2	6.66	10	33.33	
<b>9.</b>	<b>Congenital Anomalies</b>										
	Yes	0	-	-	0	0	0	0	0	0	0
	No	30	2	-	6	20	7	23.33	15	50	
<b>10</b>	<b>Area of Residence</b>										
	Rural	14	2	6.66	2	6.66	1	3.33	9	30	4.694 df=1S
	Urban	16	-	-	4	13.33	6	20	6	20	

**S:Significant ; NS: Non significant**

The above table 4 shows the association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence with the post test level of pain perception of group I.

Chi Square test was carried out to find out the association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence with group I. In group I, the calculated chi -square value was 8.694,0.072,4.822,5.443,1.474,4.432,2.331,1.247,0,4.694 respectively which showed that there was no association between gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomaly and area of residence at  $p < 0.05$  level. Hence the research hypotheses stated that, "There will be a significant association between the post test level of pain perception of group I with their demographic variables such as age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence during intramuscular immunization" was rejected, except age and area of residence.

**Table-5: Association of Pain Perception of Infants in Group II with Demographic Variables**

(N=30)

S. No	Demographic Variables	No	No Pain		Mild Pain		Moderate Pain		Worst Pain		$\chi^2$ Value
			f	%	f	%	f	%	f	%	
<b>1.</b>	<b>Age</b>										
	1-2Months	11	0	0	3	10	8	26.66	0	0	2.528 df=2 NS
	2.1-3 Months	4	2	6.66	0	0	2	6.66	0	0	
	3.1-4 Months	15	0	0	2	6.66	11	36.66	2	6.66	
<b>2.</b>	<b>Gender</b>										
	Male	18	1	3.33	3	10	13	43.33	1	3.33	0.014 df=1 NS
	Female	12	1	3.33	2	6.66	8	26.66	1	3.33	
<b>3.</b>	<b>Religion</b>										
	Christian	17	2	6.66	1	3.33	13	43.33	1	3.33	0.808d f=2 NS
	Hindu	9	0	0	4	13.33	4	13.33	1	3.33	
	Muslim	4	0	0	0	0	4	13.33	0	0	
<b>4.</b>	<b>Economic Status</b>										
	5000/Month	4	1	3.33	0	0	3	10	0	0	0.08df =2NS
	5000-10000 /Month	16	0	0	4	13.33	11	36.66	1	3.33	
	Above 10000/Month	10	1	3.3	1	3.33	7	23.33	1	3.33	
<b>5.</b>	<b>Type of Family</b>										
	Nuclear	16	1	3.33	2	6.66	13	43.33	0	0	0.4 df=1 NS
	Joint	14	1	3.33	3	10	8	26.66	2	6.66	
<b>6.</b>	<b>Type of Feeding</b>										
	Breast feeding	12	0	0	3	10	9	30	0	0	0.261 df=2 NS
	Bottle feeding	0	0	0	0	0	0	0	0	0	
	Others	18	2	6.66	2	6.66	12	40	2	6.66	
<b>7.</b>	<b>Health Status</b>										
	Healthy	24	1	3.33	4	13.33	17	56.66	2	6.66	0.431d f=1 NS
	Un healthy	6	1	3.33	1	3.33	4	13.33	0	0	
<b>8.</b>	<b>Weight of the Child</b>										
	Less than 4 Kg	3	0	0	1	3.33	2	6.66	0	0	2.164 df=2 NS
	4.1-6 Kg	11	1	3.33	3	0	7	23.33	0	0	
	Above 6 Kg	16	1	3.33	1	3.33	12	40	2	6.66	

S. No	Demographic Variables	No	No Pain		Mild Pain		Moderate Pain		Worst Pain		$\chi^2$ Value
			f	%	f	%	f	%	f	%	
<b>9.</b>	<b>Congenital Anomalies</b>										
	Yes	0	0	0	0	0	0	0	0	0	0
	No	30	2	6.66	5	16.66	31	70	2	6.66	
<b>10</b>	<b>Area of Residence</b>										
	Rural	14	2	6.66	2	6.66	9	30	1	3.33	0.405 df=1 NS
	Urban	16	0	0	3	10	12	40	1	3.33	

**NS- Non Significant**

The above table 5 shows the association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence with the post test level of pain perception of group II.

Chi Square test was carried out to find out the association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence with group II. In group II, the calculated chi –square value was 2.528,0.014,0.808,0.08,0.4,0.261,0.431,2.164,0,0.405 respectively which showed that there was no association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomaly and area of residence with the post test level of pain perception of group I. Hence the research hypotheses stated that, “There will be a significant association between the post test level of pain perception of group II with their demographic variables such as age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence during intramuscular immunization” was rejected.

## **CHAPTER V**

### **DISCUSSION**

This chapter deals with the discussion of the result of the data analysis to evaluate the effectiveness of supine versus sitting up position during intramuscular immunization among infants.

The discussion is based on the objectives of the study and the hypothesis specified in the study.

### **MAJOR FINDINGS**

1. Majority of infants 18 (60%) were between the age group of one to two months in group I.
2. Majority of infants 15 (50%) were between the age group of 3.1 to 4 months in group II.
3. Majority of infants 17 (56.66%) were females in group I.
4. Majority of infants 18(60%) were males in group II.
5. Majority of infants 15(50%) had worst pain in group I.
6. Majority of infants 21(70%) had moderate pain in group II.
7. The calculated 't' value was 10.95, which shows that there was a significant difference between group I and group II during intramuscular immunization at  $P < 0.05$  level.

**The first objective was to assess the post test level of pain perception during intramuscular immunization among infants of group I with supine position.**

With regard to the post test level of pain perception during intramuscular immunization among infants of group I, majority of, 15(50%) infant's had worst pain,7(23.33) infants had moderate pain,6(20%) infants had mild pain and remaining 2(6.66%) infant's perceived no pain. The mean level of pain in group I was 3.16. Thus findings showed that, group I infants perceived more pain than group II infants during intramuscular immunization.

**The second objective was to assess the post test level of pain perception during intramuscular immunization among infants of group II with sitting up position.**

With regard to the post test level of pain perception during intramuscular immunization among infants of group II, majority of, 21(70%) infants had moderate pain,5(16.66) infants had mild pain, and remaining 2(6.66%) infants perceived mild and worst pain. The mean level of pain in group II was 2.76. Thus findings showed that group II infants perceived less pain during intramuscular immunization.

The above result was supported by **Taddio A et al(2009)** conducted a study to determine the effectiveness of physical interventions and injection techniques for reducing pain during vaccine injection in children. Nineteen Randomized control trails involving 2814 infants and children 0-18 years of age were included in this study. The methods used are different formulations of the same vaccine, position of the child during injection, intramuscular versus subcutaneous injection, cooling of the

skin at the injection site, with ice before injection, stroking the skin or applying pressure close to the injection site before and during injection, order of vaccine injection when 2 vaccines were administered sequentially, simultaneous versus sequential injection of 2 vaccines, anatomic location of injection, aspects of the needle and combinations of these interventions. In conclusion, pain during immunization can be decreased by injecting the least painful formulation of a vaccine, having the child sit up, stroking the or applying pressure close to the injection site before and during injection, injecting the least painful vaccine first performing a rapid intramuscular injection without aspiration.

**The third objective was to compare the level of pain perception between group I and group II infants.**

With regard to compare the reduction of pain perception between group I and group II infants, the mean value of group I was 3.16 with the standard deviation of 0.17 and the mean value of group II was 2.76 with the standard deviation of 0.12. The calculated 't' value was 10.95 which showed that there was significant difference between group I and group II at  $p < 0.05$  level. The result revealed that the infants who were placed in sitting up position during intramuscular immunization had a significant reduction of pain perception compared to infants who were placed in supine position during intramuscular immunization.

Hence, the research hypothesis ( $H_1$ ) stated that "There will be a significant difference on the level of pain perception during intramuscular immunization between the group I and group II" was accepted.

The above result was reported by **Hollen EC et al(2004)** conducted a study in Children's Medical Centre of Dallas, USA to determine the effectiveness of parental positioning and distraction on the pain, fear, and distress of pediatric patients undergoing venipuncture. An experimental –comparison group design was used to evaluate 43 patients (20 experimental and 2comparison)who were 4-11 years old. Experimental participants used parental positioning an distraction. All participants rated their pain and fear. The parental positioning-distraction intervention has the potential to enhance positive clinical outcomes with a primary benefit of decreased fear.

**The fourth objective was to associate the level of pain perception among infants of group I with their demographic variables (age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies & area of residence).**

With regard to associate the reduction of pain perception among infants of group I with their demographic variables, the calculated chi–square value was 8.694,0.072,4.822,5.443,1.474,4.432,2.331,1.247,4.694 which showed that there was no association between gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and level of pain perception in group I.

Hence, the research hypotheses (H2)stated that “There will be a significant association between the post test level of pain perception of group I with their demographic variables” was rejected, except age and area of residence in group I.

**The fifth objective was to associate the level of pain perception among infants of group II with their demographic variables (age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies & area of residence).**

With regard to associate the reduction of pain perception among infants of group II with their demographic variables, the calculated chi square value was 2.528,0.014,0.808,0.08,0.4,0.261,0.431,2.164,0.405 which showed that there was no association between age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence and level of pain perception in group II.

Hence the research hypotheses (H3) stated that, “There will be a significant association between the post test level of pain perception of group II with their demographic variables during intramuscular immunization” was rejected.

The demographic variables such as age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence of the infants of both groups were not having any association and thus they were not confounded with the level of pain perception during intramuscular immunization.

Hence, the research hypothesis (H<sub>2</sub>& H<sub>3</sub>) stated that “There will be a significant association between the level of pain perception among group I and group II with selected demographic variables during intramuscular immunization” (age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence) was rejected.



From the above analysis and interpretations, the hypothesis (H<sub>1</sub>), “There will be a significant difference on the level of pain perception during intramuscular immunization between group I and group II” was accepted and the hypothesis (H<sub>2</sub>&H<sub>3</sub>) “There will be a significant association between the post test level of pain perception among group I and group II with their selected demographic variables” such as age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence was rejected.

The above rejection of (H<sub>3</sub> &H<sub>4</sub>) and acceptance of (H<sub>1</sub>) were attributed to the effectiveness of supine versus sitting up position during intramuscular immunization among infants. The study results showed that infants placed in sitting up position (in mother’s lap) perceived less pain compared to supine position.

## **CHAPTER - VI**

### **SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS**

This chapter deals with summary, findings, conclusion, implications, recommendations and limitations, which create a base for evidence based practice.

#### **SUMMARY**

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage. The intramuscular immunization is the most common painful procedure that nurse performed to the infants. Although the injection short in duration, it can trigger an immediate pain response. Immediate effects and the adverse effects include localized trauma, minor discomfort and pain, persistent redness, fever, and warmth at the injection site. Management of pain in the child must be individualized. The infants are unable to localize and describe the severity of pain. The nurse must be aware of the child's response to pain through assessment of behavioral responses and differentiation of crying.

Positioning is useful to reduce pain. Sitting position is better than supine position. In supine position the infants constrict the muscles and struggle to get up. But in sitting position the infants are held by mother's arms and sensation of touch provides comfort. Therefore, sitting position is the effective and comfortable intervention during intramuscular immunization for reducing infant's pain.

The study was undertaken to assess the effectiveness of supine versus sitting up position during intramuscular immunization among infants.

The **objectives** of the study were:

1. To assess the post test level of pain perception during intramuscular immunization among infants of group I with supine position.
2. To assess the post test level of pain perception during intramuscular immunization among infants of group II with sitting up position.
3. To compare the level of pain perception between group I and group II infants.
4. To associate the level of pain perception among infants of group I with their demographic variables.
5. To associate the level of pain perception among infants of group II with their demographic variables.

The **hypotheses** formulated were:

- H<sub>1</sub>** There was significance difference on the level of pain perception during intramuscular immunization between group I and group II.
- H<sub>2</sub>** There was significant association between the post test level of pain perception of group I with their demographic variables during intramuscular immunization.
- H<sub>3</sub>** There was a significant association between the post test level of pain perception of group II with their demographic variables during intramuscular immunization.

The **assumptions** of the study were:

1. Immunization is needed for all children.
2. Children experience pain when they are immunized.
3. Sitting up position is better in reducing the level of pain perception during intramuscular immunization.

The review of literature related to studies which provided a strong foundation for the study. It provides the basis for the conceptual frame work and formation of the tool.

**Section A:** Studies related to pain and immunization.

**Section B:** Studies related to positioning on pain reduction during Intramuscular immunization.

The conceptual frame work of this study was based on Roy's Adaptation Model and it provided a complete frame work for achieving the central purpose of the study. The methodology adopted for the study was two group design.

The setting was out patient department of William Hospital and Annammal Hospital, Marthandam. The data were collected from 04.04.2011 to 30.04.2011, between 9 to 1 p.m at William Hospital and three to six p.m at Annammal Hospital for four weeks. Infants who required DPT immunization were selected by simple random sampling technique according to the inclusive criteria after obtaining the consent from the mothers of the infants. The researcher collected the infant's demographic data from the mothers. Group I infants were placed in a supine position and Group II were placed in a sitting up position during intramuscular immunization. During the procedure, the researcher assessed the infant's pain perception for two minutes with the Modified FLACC Scale. The data were collected approximately for four to six study subjects per day. The study was conducted for a period of one month with sixty study subjects.

Pilot study was conducted in outpatient department of PPK Hospital and C.S.I.Mission Hospital, Marthandam and the findings revealed that the tool was feasible, reliable and practicable to proceed with the main study.

Researcher selected the infants between the age group of one month to four months of age, who received DPT immunization by simple random sampling technique.

The content validity of the tool was established by five experts from the pediatric nursing department.

The main study was conducted in outpatient department of William Hospital and Annammal Hospital, Marthandam. The total sample size was sixty. Samples who fulfilled the inclusive criteria were allotted to group I (N = 30) and in group II (N=30) by simple random sampling technique. The collected data was analyzed and interpreted based on objectives using descriptive and inferential statistics.

The findings of the study revealed that there was a significant difference on level of pain perception of infants between group I and group II. The findings showed that sitting up position is very effective in reducing pain perception compared to supine position during intramuscular immunization. There was no significant association between the effectiveness of supine versus sitting up position with selected demographic variables (age, gender, religion, economic status, type of family, type of feeding, health status, weight, congenital anomalies and area of residence).

## **CONCLUSION**

This study assessed the effectiveness of supine versus sitting up position during intra muscular immunization among infants. The study findings revealed that there was a significant difference on the level of pain perception in supine versus sitting up position during intramuscular immunization in group I and group II. On the basis of the study, the researcher concluded that sitting up position had a significant effect on reduction of pain perception during intramuscular immunization. Sitting up position was an effective position and the child perceives less pain and more comfort during intramuscular immunization.

## **IMPLICATIONS**

Investigator has derived from the study the following implications that are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

## **IMPLICATIONS FOR NURSING PRACTICE**

1. Pediatric nurse working in hospital has a vital role to provide effective nursing care for the children.
2. Pediatric nurses need to develop knowledge and skills in pain assessment and pain reduction of infants.
3. Pediatric nurses need to understand and interpret infant's pain perception by accurately observing their level of pain.
4. Nurse should be equipped with updated knowledge in relation to procedural pain.
5. Pediatric nurse should use wide variety of interventions to reduce pain in infants.

6. Nurses need to practice evidence based approach while giving care to the infants.
7. During intramuscular immunization, Nurse has to place infants in sitting up position specially in mother's lap, in order to reduce fear and pain associate with immunization.
8. The pediatric nurse must impart various non pharmacological pain relief methods to reduce pain perception among infants in their day to day practice.

### **IMPLICATIONS FOR NURSING EDUCATION**

Before nurses enter into their practice, they need to have strong foundation in terms of education. Nurse educator not only has a role to educate the student but also to educate the staff nurses in order to prepare them and update their knowledge.

1. Updating the knowledge of the staff nurses by providing relevant in-service education programme emphasizing mechanism of supine versus sitting up position on reduction of pain perception among infants.
2. Nursing curriculum should ensure that students learn about the importance of pain assessment and pain management skills, both pharmacological and non pharmacological methods to reduce the infant's pain and to alleviate their suffering in future.

## **IMPLICATIONS FOR NURSING RESEARCH**

1. Nurse researcher should disseminate the findings of the studies through conference, seminar and publishing in professional journals to the nursing staffs.
2. Nurse researcher should encourage and conduct further researches related to non pharmacological interventions prior to intramuscular immunization.
3. The findings of the research study will help in building and strengthening the body of knowledge.
4. Evidenced based nursing practice must take higher profile in order to increase the knowledge about non pharmacological interventions of pain management in infants.

## **IMPLICATIONS FOR NURSING ADMINISTRATION**

1. The nurse administrator should formulate policies regarding the planning of supine versus sitting up position during intramuscular immunization, and emphasis on implementation of intervention by the pediatric nurse for pediatric OPD infants.
2. Nursing administrator should plan and implement collaborative training programme on the use of non pharmacological measures to relieve procedural pain involving health team members.



## LIMITATIONS

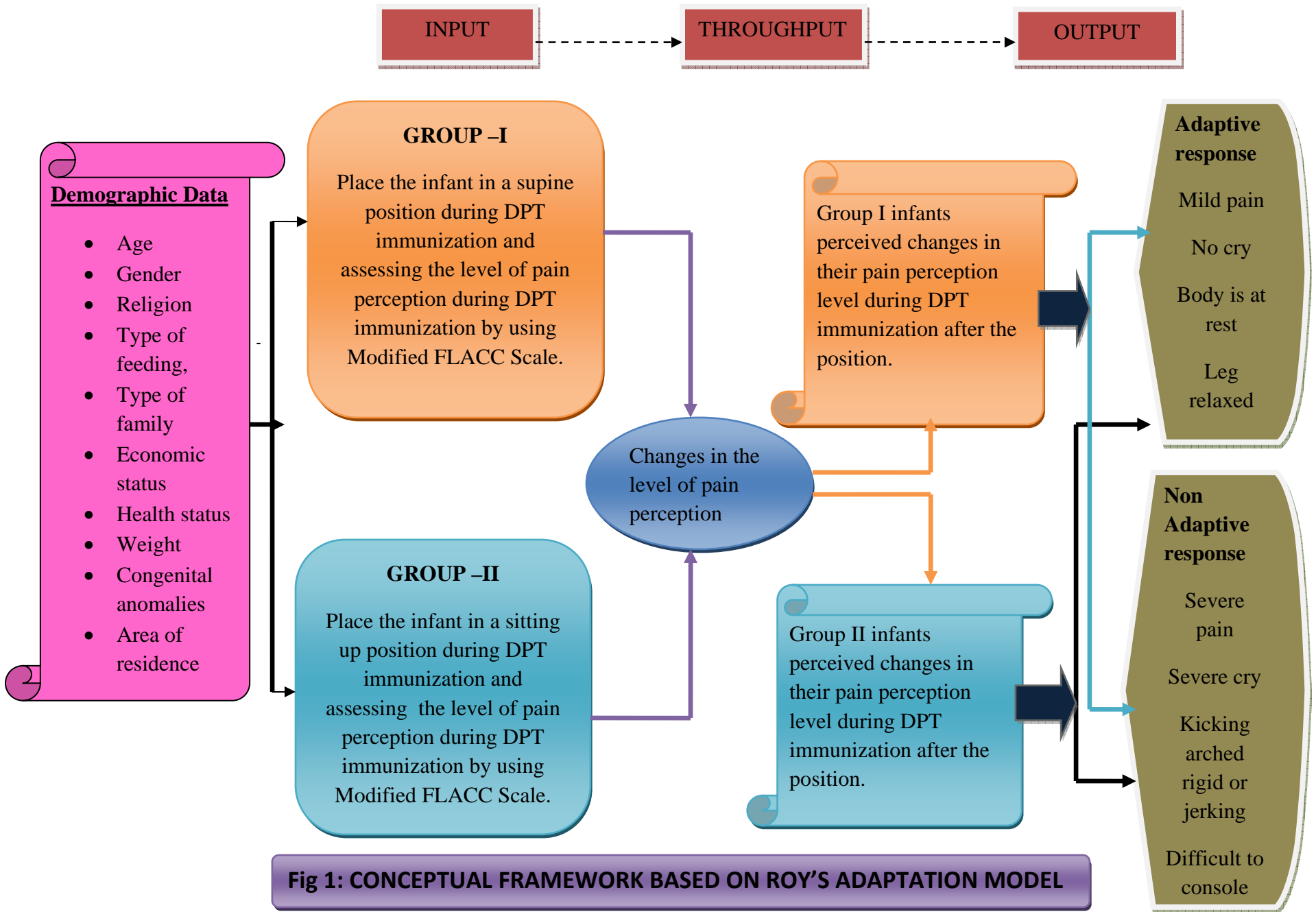
During the period of study the limitations faced by the investigator were as follows,

1. The study was limited to the small sample hence the generalization should be done with many samples.
2. The investigator had difficulty in collecting study material for review of literature from the Indian context.

## RECOMMENDATIONS

Based on the findings of the present study the following recommendations are made:

1. Similar study can be replicated on a large sample.
2. A study can be conducted to evaluate the effectiveness of audiovisual distraction compared with a blank TV screen in the reduction of pain associated with intramuscular immunization.
3. A comparative study can be conducted by the efficacy, effect of dose ,and safety of sucrose for relieving procedural pain as assessed by physiologic and behavioural indicators.
4. A study can be conducted to assess the effectiveness and tolerability of various pharmacologic and combined interventions for reducing the pain experienced by children during immunization.
5. A comparative study can be conducted by using expressed breast milk and other non-pharmacological intervention in reduction of pain in neonates.
6. A study can be conducted to assess the effectiveness of play therapy on reduction of pain perception during intramuscular immunization.



## SITTING UP POSITION

It refers to the rest position, in which the baby is supported by buttocks over the mother's lap during intramuscular immunization at vastuslateralis site. The Childs thigh muscles will be less tensed and feel more comfort.



## SUPINE POSITION

It refers to baby lies flat with the back resting on the mattress and facing upwards during intramuscular immunization at vastuslateralis site. The child's thigh muscles will be more tensed and feel less comfort.



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