

**EFFECTIVENESS OF HELPER SKIN TAP TECHNIQUE
ON PERCEPTION OF PAIN DURING IM INJECTION
AMONG POST OPERATIVE ADULT ORTHOPEDIC
PATIENTS**



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“Oh, give thanks to the ‘lord’, for he is good!

For his mercy endures forever”

(Psalms – 136:7)

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ABSTRACT

This study is intended to assess the effectiveness of Helfer skin tap technique on the perception of pain during intramuscular injection among post operative adult orthopedic patient in selected hospital of Madurai District. An experimental approach with cross over design was adopted. For this study samples were adult post operative patients who received intramuscular injection of Tramadol 50mg. The total sample size was 60, out of which 30 patients were assigned to group I (Helfer skin tap technique vs standard technique) and 30 samples to group II (standard technique vs Helfer skin tap technique). Numerical pain rating scale was used to assess the level of pain. Majority of the samples (86.66%) in the experimental group I and (90%) in the experimental group II perceived moderate pain with standard technique. In contrast, most of the samples (90%) in experimental group I and 83.3% in experimental group II perceived only mild pain with standard technique. Helfer skin tap technique was effective in reducing IM injection for experimental group I (Helfer skin tap technique vs standard technique) obtained 't' value (6.66) was statistically significant at 0.001 level. Experimental group II (standard technique vs Helfer skin tap technique) obtained 't' value (5.15), was significant at 0.001 level. During 1st administration of injection Helfer skin tap technique vs standard technique calculated 't' value (7.3), 'P' value (0.001); and 2nd administration of injection standard technique vs Helfer skin tap technique the calculated 't' value (9.8) was significant at 0.001 level. The study findings revealed that, Helfer skin tap technique helped to reduce intramuscular pain in adult patient.

CHAPTER – I

INTRODUCTION

“To understand life, endure pain”

- Kingdom

BACKGROUND OF THE STUDY:

Comfort is an important need and ensuring a patient’s comfort is a major nursing responsibility. Health care interventions can be undertaken on the basis of customs and habits that practitioner no longer critically question. The context of comfort is an umbrella under which pain and pain management option are viewed. Procedural pain is an important source of discomfort for hospitalized patients from which, all instinctually try to escape. Among all, intramuscular injections is a common procedure the nurses frequently carry out, which causes pain and distress to the recipient. Pain management during invasive procedure is a challenge to the direct care procedures. Comfort is a concept central to the art of nursing. Variety of nursing theorist refers ‘comfort’ as a basic client need for which nursing care is delivered (Gitanjali, Zore, and Ragina Dias, 2012).

Every human being is born with the responsibility to protect one’s own health and has experienced some type (or) degree of pain. A person with pain feels distress (or) suffering and seek relief. The International Association for the Study of Pain (IASP, 1976) define pain as an unpleasant, subjective, sensory and emotional experience associated with actual or potential tissue damage (as cited by Farhadic and Esmailzadh, 2011). Pain is one of the most common reason for seeking help from health care providers (Nellie, 2004).

In the medical practice, intramuscular (IM) injection is one of the most frequent procedures done almost everyday. It is a fact that any intra muscular injection will cause pain at the site of injection. Intra muscular injection is common yet a complex technique used to deliver medication deep into the large muscles of the body. Intra muscular injection route provides faster drug absorption than the subcutaneous route because the muscles have greater vascularity. It is used for particular forms of medication that are administered in small volumes. Depending on the chemical properties of the drug the medication may either be absorbed fairly quickly (or) more gradually. There are several factors which influences person experiences of pain during intra muscular injection for example anxiety, culture, age, gender, and expectation of pain relief. These factors may increase or decrease the experience of pain during intra muscular injection. Also intramuscular injection are frequently referred to as a 'basic skill', but involve a complex series of consideration and decision relating to preparation of medication, technique, site selection and equipments (Malkin, 2008).

Helfer skin tap technique offers a painless injection experience. In this technique rhythmic tapping before and during injection over the skin at the site of injection keeps the muscle relaxed and stimulates large diameter fibers. It provide a mechanical stimulation and distraction during injection and thus helps to reduce pain as described by gate control theory (Roger Melzack and Past Wall, 1965).

Helfer skin tap technique uses basic concepts of pain theory mechanical stimulation of the larger diameter muscle fibers diminishes the influence of small, pain carrying fibers. Tapping several times helps to relax the muscle more and counting to

three helps the nurse synchronize the muscle tap with the needle insertion and helps to standardize the technique (Manju, 2012)

Pain management is an integral part of nursing. Nurses have a responsibility to effectively manage patient's pain. Nurses play a greater role in minimizing the pain and discomfort during any invasive procedure. The nurse can minimize the discomfort and pain during intra muscular injection by helping the client to assume a proper position and by implementation of different physical and psychological interventions. Physical interventions and injection techniques that minimize pain during injection offer an advantage over other techniques because they can be easily incorporated into clinical practice without added cost of time (Gitanjalai Zore and Ragina Dias, 2012).

SIGNIFICANCE AND NEED FOR THE STUDY:

Pain is common and an ever present sensation for children and adult. Acute pain and chronic pain are major health problems that affect millions of people (Manju, 2014).

Pain management is one of the main facets of nursing care, where nurses need to be competent. Pain management during invasive procedure is a challenge to the direct care providers. If there is a technique, by which the nurses can provide painless injections that will be a great relief for those clients who are afraid of needles (Serena, 2010).

Injections are the most frequently used medical procedure, with an estimated 12 billion administered throughout the world on an annual basis. A conservative estimate of the average number of injection ranged from 0.9 to 8.5 per person per year (Kermode, 2000), with median of 1.5 injections per person per year. According to World Health Organization, intramuscular injection is an administration of medications parenterally

through a skin puncture by a syringe and a needle deep into a large muscle of the body for prophylactic or curative purposes (Kamalesh, 2010)

More than 15 million IM injections administered annually throughout the world. Injections of any kind can hurt. It is estimated that 25% of adults have fear of needles and in most cases their fear developed in adult (Nicoll, 2008).

The intramuscular route provides faster medication absorption are associated with many risks. Therefore, when ever administering the medication in IM route, first verify that injections is justified (Nicoll and Hosby, 2002).

Intramuscular injections are the most widely practiced percutaneous injection. IM injection is an invasive and painful method of medication (Farhadi and Esmailzadah, 2011). The most common side effects are apprehension and pain. Pain is a subjective phenomenon influenced by multiple factor including age, anxiety level previous experience, approach of provider and culture. Concern and anxiety about injection are common for all ages. Several method are found effective to relief this apprehension and discomfort in different stages of injection procedure.

The annual ratio of injection per person ranged from 1.7 to 11.3 (Yvan, 2003). Nurses play a greater role in minimizing pain and discomfort during an invasive procedure. According to Mainhart and MC Caffery “the failure to treat pain in human and constitutes professional negligence” (Babu, 2010). It is an accepted fact that there is reduced pain while giving injection into relaxed muscle (George, 2011). Numerous modalities exist to decrease the procedural pain, both the pharmacological and the non pharmacological management (Potter and Perry, 2012). One of the non pharmacological management to reduce pain is Helfer skin tap technique. Helfer skin tap technique which

is simple and cheap treatment method that has an important place in non drug therapies for pain management (Yauuz, 2006).

There are many theories of pain and it is possible that a number of proposed mechanisms in combination can causes pain relief with Helfer skin tap technique.

Possible Mechanisms are,

- Keeping the muscle relaxed and stimulates large diameter fibres.
- Providing a mechanical stimulation and distraction during intramuscular injection.

The use of Helfer skin tap technique to reduce pain during IM injections have been proved effective in different studies (Maria Theresa, Suriya Devi, (2012), Manju, (2014), Serna (2010)) reported that Helfer skin tap tapping is a simple and in-expensive procedure to reduce pain during IM injection. No adverse effect of using Helfer skin tap technique will be noted in the previous studies (George). Providing pain relief is considered a most basic human right, so it is the responsibility of the nurse to use most effective approach to pain control. Nurses are ethically and legally responsible for managing pain and reliving suffering. Effective pain management is not only reduces physical discomfort, but also improves quality of life (Gitanjali Zore, Ragina Dias, 2012).

After extensive literature review researcher found there are less number of studies evaluating the effectiveness of Helfer skin tap technique in reducing IM injection pain. Thus it motivated the researcher to pursue the current study which will serve as evidenced based nursing practice.

PROBLEM STATEMENT:

“An experimental study to assess the effectiveness of Helfer skin tap technique on the perception of pain during intramuscular injection among postoperative adult orthopedic patient admitted in selected hospital of Madurai district”.

OBJECTIVES:

1. To assess the level of pain among post operative adult orthopedic patients during IM injections in the experimental group I who had Helfer skin tap technique.
2. To determine the level of pain among post operative adult orthopedic patients during IM injections in the experimental group II who had usual standard technique.
3. To compare the level of pain among post operative adult orthopedic patients during IM injections between experimental group I and II
4. To find out the association between pain level and demographic variables Such as age, sex, occupation, religion, education, height, weight and body mass index.

HYPOTHESES:

H1: The mean pain score of patient during IM injections using Helfer skin tap technique will be significantly lower than the mean pain scores of those who received IM injection using standard technique in experimental group I and II.

H2: There will be a significant association between the perception of pain and selected demographic variables (age, sex, occupation, education, height, weight, body mass index) of experimental group I and II.

OPERATIONAL DEFINITIONS:**Effectiveness:**

Effectiveness is the capacity of producing a desired result. In this study it refers to the outcome of the Helfer skin tap technique on pain perception during IM injection among OPD patient, as measured by numerical pain rating scale.

Pain:

Pain is defined as an unpleasant sensory and emotional experience associated with the actual (or) potential tissue damage.

In this study, pain refers to an unpleasant, sensation resulting from the administration of IM injections as rated by the a numerical pain intensity scale.

Helfer Skin Tap Technique:

It is a technique of giving rhythmic tapping before and during injection over the skin at the site of injection and it keeps the muscle relaxed and stimulates large diameter fibres.

In this study Helfer skin tap technique refers to rhythmic skin tapping. It was given to the injection site for 5 seconds before and during administration of IM injection of Inj. Tramadol 50mg.

Intramuscular Injection:

It is introduction of medicine directly into the muscle. In this study, it refers to the introduction of 2ml of inj .Tramadol 50 mg into the gluteus medius muscle of the gluteus region of the patient, using 23 gauge needle of 2.5cm length.

Adult Patients:

In this study adult patients refers to patients above 18 years of age who had receive 2ml of injection tramadol 50mg via IM route at gluteus medias muscle during their post operative periods in the orthopedic wards of selected hospital during data collection periods.

ASSUMPTIONS:

1. Intramuscular injections will cause pain
2. Every individual is unique and respond to pain in a unique way.

DELIMITATIONS:

1. The study is limited to the patient received injection of tramadol 50mg in orthopedic post operative ward.
2. Data collection period is delimited to 6 weeks.

PROJECTED OUTCOME:

The study will reveal the extent of pain during IM injections, and the effect of Helfer skin tap technique on perception of pain in selected hospital in Madurai. . The findings of the study will help health professional to plan Helfer skin tap technique in adult patients to reduce the IM pain.

CONCEPTUAL FRAMEWORK**Gate Control Theory:**

The gate control theory of pain was first. Proposed by Ronald Melzack and Patrick Wall (1965), they suggested that there is a ‘gating system” in the central nervous system (in the spinal cord where the nerve come in from an injury) that open to let pain message through the brain and closes to block them. Melzack and Wall suggested the

gate inhibitor facilitates passage rather than completes opening (or) closing so it opens more or restricts the passage of pain signals. According to the gate control theory of pain our thought, beliefs and emotions may affect how much pain we feel from a given physical sensation and the subsequent response. These emotions and attention open and shut the 'gate'. Although the physical causes of pain may be identical, the perceptions of pain can dramatically differ. Pain perception was conceptualized in the gate control theory as many no pharmacological interventions are based on this theory (Melzack and Wall, 1997). This theory provided the conceptual framework for this study. The inception of this theory was in 1965. Melzack and Wall (1983) proposed that a neural mechanism of the dorsal horns of the spinal cord acts like a gate to increase (or) decrease neural impulses from the peripheral nerves to the central nervous system. Before pain is perceived or responded to, the gate serves as a modulating factor. The gate is influenced by large and small diameter fibers, chemical substances such as acetylcholine and serotonin, and descending influences from the brain. A pain response is activated when the number of impulses passing through the gate exceeds a critical level. Before nerve impulses can ascent to the brain a portion of them must go through the densely packed, diffusely interconnected nerve fibers called the substantiagelatinosa. This region is found on both sides and throughout the length of the spinal cord within the dorsal horns. Between these transmissions, from sensory neurons to ascending spinal cord neurons, that impulse pattern can be modified. Some fibers continued to the thalamus and others penetrate the reticular formation in the lower part of the brain and then go to other sensory portions of the brain of the fibres are carried along pathways to the limbic system (Melzack and Wall, 1983).

Stimulation of the skin helps relieve pain. A massage, warm bath, ice bag, and Transcutaneous Electrical Nerve Stimulator stimulate the skin reduce pain perception (Potter and Perry, 2012)]. How cutaneous stimulation works is unclear. One suggestion is that it causes release of endorphins, thus blocking the transmission of painful stimuli. The gate control theory suggests that cutaneous stimulation activates larger, faster transmitting a beta sensory nerve fibers. This closes the gates thus decreasing pain transmission through small diameter fibers [Melzack and Wall, 1965) (as cited by Potter and Perry, 2012)].

In this study the Helfer skin tap techniques was used before, during and after administering, intramuscular-injections. The theoretical reasons attributed for reduction in perception of pain after Helfer skin tap technique is as follows.

1. Decrease the nerve transmission in pain fibers
2. Helfer skin tapping stimulates large diameter fibres.
3. Tapping procedure is a mechanical stimulation and distraction during intramuscular injection and thus helps to reduce pain.

While using Helfer skin tap technique while administering the IM injection it is thought to activate the large diameter fiber carrying non pain impulses to brain. According to this theory, there is an interaction between pain and sensory modalities. Helfer skin tap technique during IM injection. Stimulates large diameter fibres. It provides a mechanical stimulation and distraction during intramuscular injection and thus helps to reduce pain (Metzack and Past Wall in 1965).

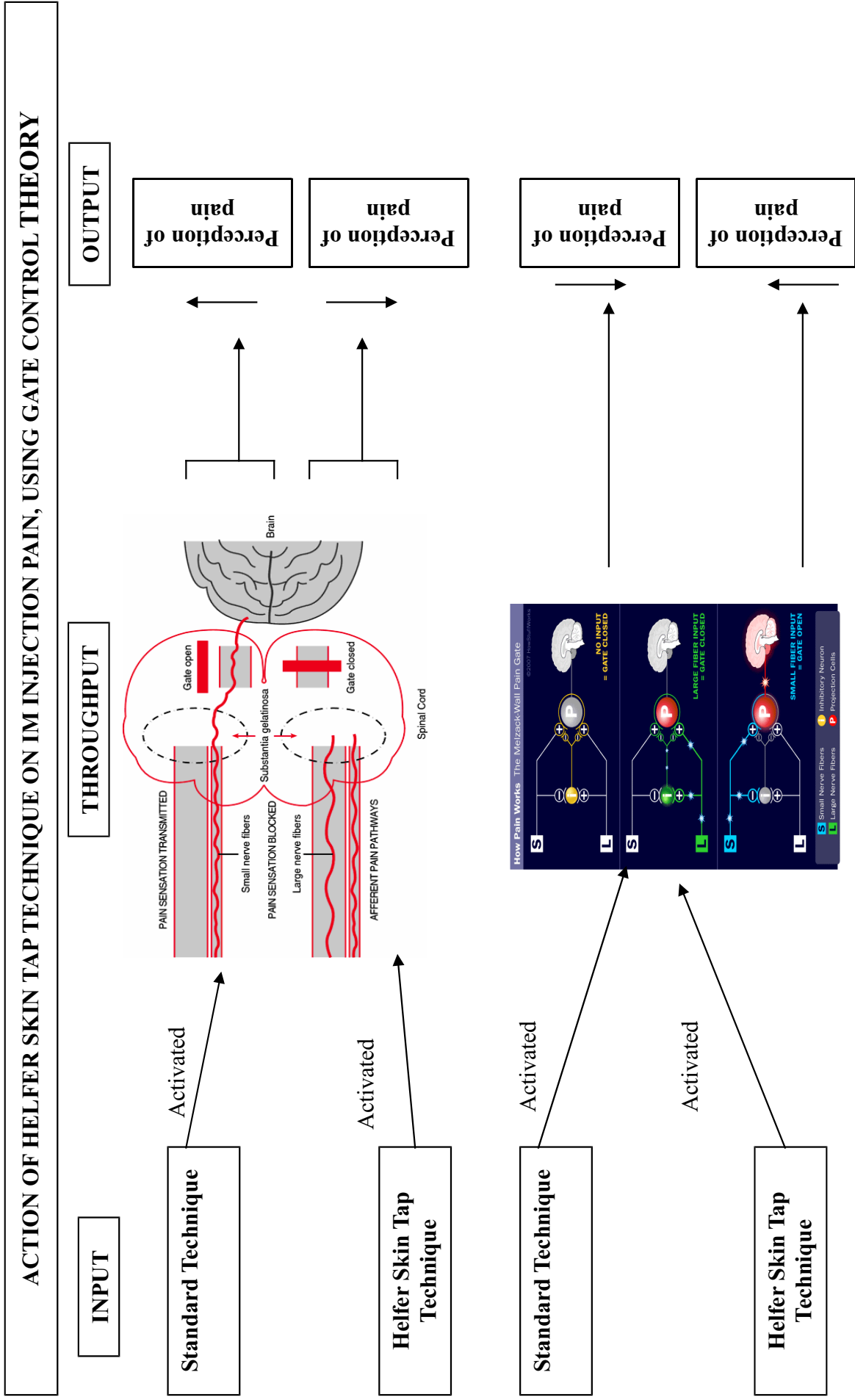


Fig 1: CONCEPTUAL FRAMEWORK BASED ON GATE CONTROL THEORY

CHAPTER – II

REVIEW OF LITERATURE

According to the Polit & Hungler (2004) a thorough literature review provides a foundation on which new knowledge is based and usually conducted well before data collection in quantitative studies.

An attempt is made in this chapter to peruse different reviews and related insight to the problem area. The literature related to the present study is organized under the following headings:

- I. Literature related to Pain caused by IM injection
- II. Literature related to IM Injection.
- III. Studies related to effectiveness of Helfer skin tap technique for reduction of pain during IM Injection.

SECTION – I

PAIN

I. a) DEFINITION

Pain is an unpleasant and highly personal experience that may be imperceptible to others, while consuming all the person's life. The widely agreed upon definition of pain is that "pain is an unpleasant sensory emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (American Pain Society, 2003) Pain is whatever experiencing person says, it is existing whenever he says it does" [(McCaffery & Pasero, 1999) as cited by Potter & Perry, 2012)]. Severe or persistent pain affects all body system, causing potentially serious health problems while increasing the

risk of complications, delays in healing and an accelerated progressions of fatal illnesses. (Kozier & Erb, 2008).

Most pain resolves promptly once the painful stimulus is removed and the body has healed, but sometimes pain persists despite removal of the stimulus and apparent healing of the body and sometimes pain rises in the absence of any detectable stimulus, damage or disease (Kreitter & Diego, 2007). Pain is the most common reason of physician consultation in the United States (Dworkin, 2004). It is a major symptom in any medical conditions, and can significantly interface with a person's quality of life and general functioning (Kozier & Erb.2008).

Psychological factor such as social support, hypnotic suggestion, excitement or distraction can significantly modulate pain intensity or unpleasantness (Elzinga 2000).

I. b) Classification of Pain:

Pain is categorized by duration (acute or chronic) or by pathologic condition.

Acute Pain:

It is protective, has an identification cause, is of short duration and has limited tissue damage and emotional response. It is important to realize that unrelieved acute pain progress to chronic pain [(Cousins & Power, 2003) (as cited by Potter & Perry 2012)].

Chronic Pain:

It lasts longer than anticipated, does not always have an identifiable cause and leads to great personal suffering. Health care workers are usually less willing to treat chronic non-cancer pain with opioids, although a recent policy statement (American pain society, 2002) supports the use of opioids for non – cancer pain.

Idiopathic Pain:

It is a chronic pain in the absence of identifiable physical or psychological cause or pain perceived as excessive for the extent of an organic pathological condition.

Nociceptive pain:

Nociceptive pain is caused by stimulation of peripheral nerve fibers that respond only to stimuli approaching or exceeding harmful intensity (nociception), and may be classified according to the mode of noxious stimulation: the most common categories being “thermal” (heat or cold), “mechanical” (crushing, tearing, etc.) and “chemical” (iodine in a cut, chilli powder in the eyes).

Neuropathic

Neuropathic pain is caused by damage or disease affecting any part of the nervous system involved in bodily feelings. Peripheral neuropathic pain is often described as “burning”, “electrical”, “tingling”, “stinging”, “stabbing”, or “pins and needles”. Bumping the “funny bone” elicits acute peripheral neuropathic pain.

Phantom

Pain felt in a part of the body that has been lost or from which the brain no longer receives signals. It is a type of neuropathic pain.

I.c) Theories of Pain:

Before the relatively recent discovery of neurons and their role in pain, different body functions were proposed to account pain. There were several competing early theories of pain among the ancient Greeks.

- Aristotle believed that pain was due to evil spirits entering the body through injury.

- Hippocrates believed that it was due to an imbalance in the vital fluids. Dworkin, (2005).
- In 1644, Rene Descartes, theorized that pain was a disturbance that passed down along nerve fibers until the disturbance reached the brain.(Merskey, 2000).
- Descarte's work, along with Avicenna's prefigured the 19th century development of specificity theory. It deals with "a specific sensation, with its own sensory apparatus independent of touch and other senses (Dworkin, 2005).
- Another theory that came to prominence in the 18th and 19th centuries was intensive theory, which conceived of pain not as a unique sensory modality, but an emotional state produced stronger than normal stimuli such as intense light, pressure or temperature (Dworkin, 2005).
- In 1955, DC Sinclair and G Weddell developed "Peripheral pattern theory" based on a 1934 suggestion by John Paul Nafe. They proposed that all skin fiber endings (with the exception of those innervating hair cells) are identical and that pain is produced by intense stimulation of these fibres.
- Another 20th century, theory was 'gate control theory', introduced by Ronald (Melzack & Patrick Wall 1965). The authors proposed that both thin (pain) and large diameter (touch, pressure, vibration) nerve fibers carry information from the site of injury to two destinations in the dorsal horn of the spinal cord, and that the more large fiber activity relative to thin fiber activity at the inhibitory cell, the less pain is felt (Melzack, 1965). Both peripheral pattern theory and gate control theory has been superseded by more modern theories of pain.

- **Three dimensions of pain theory:** In 1968, Ronald Melzack Kenneth Casey described pain in terms of its three dimensions, “Sensory – discriminative” (sense of the intensity, location, quality, and duration of the pain), “affective motivational” (unpleasantness and urge to escape the unpleasantness) and “cognitive evaluative” (cognitions such as appraisal, cultural values, distraction and hypnotic suggestion). (Melzack, 2001).
- **Modern Theory of Pain:** Discovered by Wilhelm Erb’s (1874) “intensive” theory, that a pain signal can be generated by intense enough stimulation of any sensory receptor, has been soundly disproved. Some sensory fibers do not differentiate between noxious and non – noxious stimuli, while others, nocieptors respond only to noxious, high intensity stimuli. At the peripheral end of the nocieptors, noxious stimuli are transudated into currents that, above a given threshold, begin to generate action potential that travel along the nerve fiber to the spinal cord.

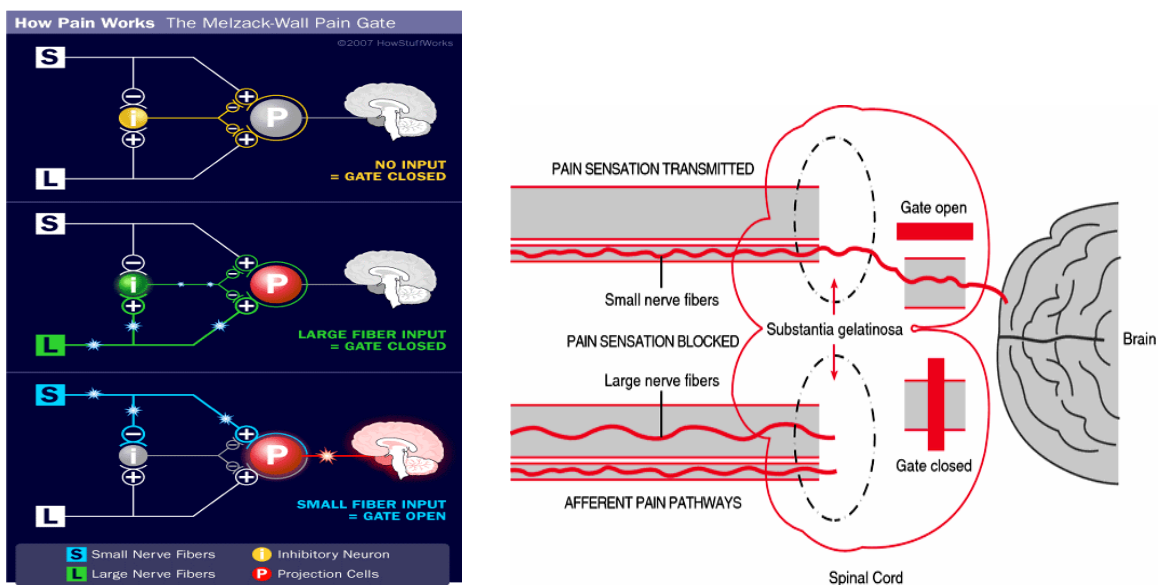


Fig.2 GATE CONTROL THEORY

I. d) Factors Influencing Pain:

Pain is complex, involving physiological, social, spiritual, psychological and cultural influences.

Physiological Factor:

- Age
- Fatigue
- Genes
- Neurological function
- Gender

Social Factor:

- Attention
- Previous experience
- Family & social support.

Spiritual Factor:

- Religion

Psychological Factors:

- Anxiety
- Coping Style

Cultural Factor:

- Ethnicity

I. e) Assessment of Pain (ANA, 2005):

The American Nurses Association (ANA,2005) believes that pain assessment and management is within the scope of every nurse's practice.

TYPES OF PAIN RATING SCALE:

Visual Analogue Scale:

The visual analogue scale or visual analog scale (VAS) is a psychometric response scale which can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured.

Numerical Rating Scale (NRS):

Instruct the patient to choose a number from 0 to 10 that best describes their current pain. 0 would mean "No Pain" and 10 would mean "worst possible pain".

Faces Rating Scale [(Wong – Baker, 2005) (as cited by Potter & Perry, 2012)]:

Adult who have difficulty using the numbers on the visual / numerical rating scale can be assisted with the use of the six facial expressions suggesting various pain intensities.

Behavioral Rating Scale:

It is used to assess non – verbal patients, unable to provide self – reports of pain. Oucher Pain Scale [(African & American, version, 1990) (as cited by Potter & Perry, 2012)].

I.f). Management of Pain:

Inadequate treatment of pain is wide spread throughout surgical wards, intensive care units, accident and emergency department, in management of all the forms of chronic pain including cancer pain end of life. This neglect is extended to all ages, from

neonates to elderly (Selbet, 2000). The IASP advocates that the relief of pain should be recognized as human right and that chronic pain should be considered a disease in its own right, and that pain medicine should have full status of specialty (Horllocker, 1999).

Pharmacological Management:

Pharmacological pain management involves the use of opioids (narcotics), non – opioids (NSAIDs) & (co analgesic drugs).

<p>Non – opioids Analgesics / NSAIDS</p> <ul style="list-style-type: none"> • Acetaminophen • Aspirin • Diclofenac sodium • Ibuprofen • Celecoxib • Piroxicam • Meloxicam • Indocin <p>Mixed or Weak opioids Analgesic:</p> <ul style="list-style-type: none"> • Butorphanol • Hydrocodone • Codeine • Tramadol 	<p>Strong opioids Analgesics:</p> <ul style="list-style-type: none"> • Fentanyl citrate • Morphine sulphate • Methadone • Meperidine hydrochloride <p>Co analgesics:</p> <ul style="list-style-type: none"> • Tricyclic antidepressants • Anticonvulsant • Topical local Anesthetic
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Non – Pharmacological Management:

A number of non- pharmacological interventions are available that lessen pain however, they are to be used with and not in place of pharmacological measures [(Gruenes and Lande, 2006) (as cited by Potter & Perry, 2012)]. Non – pharmacological non – invasive therapy.

A. Physical Interventions:

- Cutaneous stimulation
- Massage
- Heat / Cold
- Acupressure
- Contra lateral Stimulation
- Immobilization / brace
- Transcutaneous Electrical Nerve Stimulator

B. Cognitive Behavioral Interventions:

- Distraction
- Relaxation
- Repatterning unhelpful thinking
- Facilitating coping

C. Spiritual Interventions:

Non – Pharmacological Invasive Therapy:

- Nerve block
- Cordotomy

- Rhizotomy
- Neurectomy
- Sympathectomy
- Spinal cord Stimulation

I.e.) Nurses Role in Reducing Pain: (Workman, 1999)

1. Assessment of pain include location, onset, duration, characteristics, frequency, Quality, intensity or severity.
2. The nurse need be knowledgeable about the non-pharmacological strategies of pain management (i.e.acupressure, head, cold)
3. Identify and encourage Patient to use strategies that have been successful with previous pain.
4. Instruct the patient & family about potential side effects of analgesics.
5. Reassure patient that you know the pain is real & will assist him/her in dealing with it .
6. Educate on pain relieving measure.
7. Administrate analgesics as per doctor's order.

Simini, Brunotudy (2000) conducted a study on injections and pain (2000) showed that, pain felt after an injection depends on the size and gauge of the needle, and on the substance or drug that is being injected, it concentration (or dilution), the volume injected, the site of the injection, and the ability of the healthcare provider to carry out the procedure.

Keen (2000), done a comparative study on intramuscular injection techniques to reduce discomfort and lesions, the Z-track intramuscular injection technique was

compared with the standard injection technique for incidence and severity of discomfort and lesions at the injection site. The Z-track technique significantly decreased incidence of selected descriptors of discomfort and lesions at selected time intervals, severity of discomfort at selected time intervals, and severity of lesions at all time intervals post injection.

Gitanjali Zore and Ragina Dias (2012) conducted an experimental study to assess the effect of nursing interventions on pain associated with intramuscular injection. The sample composed of 50 patients in age group of 15-55 years who diagnosed as RHD and who receive IM injection benzathine penicillin in cardiology OPD. Fifty patients were selected by non-probability convenient sampling technique. The findings were noted after administration of selected nursing intervention, there was a shift in the number of subjects from severe and moderate response to mild and no response, which showed the effectiveness of nursing interventions in management of pain. In pre test 39 (78%) subjects had moderate response followed by 11 (22%) subjects with severe response; none of the subjects were there in no and mild response. The post intervention score revealed that 47 (94%) subjects were in mild response.

Kusumadevi, Dayanand, Veeraiah, (2010), conducted a comparative study to assess the perception of intramuscular injection pain in men and women among 300 samples. Pain was assessed using visual analogue pain scale. All the data were statistically analyzed. Moderately significant higher pain scores was associated with women (1.94+/-1.10) as compared to men (1.74+/-1.24) (P=0.060). Statistically higher pain scores were observed in women (2.24+/-1.19) as compared to men (1.7+/-1.06) in age group of 21-30 (P=0.036).

II. Literature related to IM Injection:

The intramuscular route provides faster medication absorption than subcutaneous route because of muscle's greater vascularity. However, IM Injections are associated with many risks.

2. a) Definition:

It is introduction of medicine directly into the muscle.

2.b) Sites of IM Injection (Workman, 1999):

Ventrogluteal Site:

It is a safer option which accesses the gluteus medius muscle. It has relatively consistent thickness of adipose tissue. It has less chance of contamination in incontinent clients or infants. The site can be easily identified by the prominent bony land marks. It is a preferred site for medications.

Deltoid:

It an easily accessible site but muscle is not well development in most clients. It is used for a small amount of medications, which it used for vaccines such as hepatitis B and TT.

Dorsogluteal Site:

It is using gluteus maximums muscle, the traditional site in the United Kingdom. (Potter & Perry, 2012).

Vastus Lateralis:

It is quadriceps muscle situated on the outer side of the femur. The site has been primary site for children, but risk associated with this muscle includes accidental injury to the femoral nerve.

2c) Advantages & Disadvantages (Workman, 1999):

Advantages	Disadvantages
➤ Simple & easily accessible	➤ Slower absorption than intravenous
➤ No indwelling medical devices required	➤ Painful
➤ Irritants or painful injection can administered.	➤ Limited volume only can be administered.

2.d) Reducing IM Injection Pain (Workman, 1999):

Patients are often afraid of receiving injections because they perceive that it will be painful. Number of factors which cause pain.

- The needle
- Chemical composition of drug or its solution
- The technique
- The speed of injection
- The volume of drug

Twelve Steps towards a painless injection and safe injection technique (Workman, 1999):

- Prepare patients with appropriate information before the procedure, so that they understand what is happening and can comply with instruction.
- Change the needle after preparation of the drug and before administrations to ensure it is clean, sharp and dry and the right length.

- Make the ventrogluteal site your first choice, to ensure the medication reaches the muscle layer.
- Position the patient so that the designated muscle group is flexed and therefore relaxed.
- If Cleaning the skin before needle entry is done,ensure the skin is dry before injections.
- Consider using an ice or freezing spray to numb the skin before injection.
- Use the Z track technique (Beyea & Nicoll, 1995)
- Rotate sites so that right & Left sites are used in turn and document rotation.
- Enter the skin firmly with a controlled thrust positioning the needle at an angle as near 90° as possible, to prevent shearing and tissue displacement.
- Inject the medication steadily and slowly, about 1 ml per 10 seconds to allow the muscle to accommodate the fluid.
- Allow ten seconds after completion of Injection to allow the medication to diffuse and than withdraw needle at the same angle as it entered.
- Do not massage the site after wards, but be prepared to apply gentle pressure with gauze swab.

2.e. Complications of IM Injections (Workman, 1999):

- Infection
- Abscess
- Edema
- Paralysis
- Nerve Injury (Kozier & Erb's 2010).

2. f. Prevalence for IM Injection Pain:

Pain management is one of the main facets of nursing care, where nurse need to be competent. Nurses are obligated to mitigate every kind of pain, even minor procedural pain. 10% of adults in the United States have needle phobia (Serena, 2010).

A study was conducted to evaluate the influences of patients on characteristics of pain perception due to IM Vaccine injection in healthy adult volunteers. The Injection of hepatitis B Vaccine using a 24 mm, 24 G needle was performed as a uniform stimulus, and the intensity of injection pain was measured immediately after the injection using a 100mm visual analogue score. One hundred sixty volunteers (65 males, 95 females) were enrolled in this study. The average VAS score was 20.8 ± 17.1 (range 0 to 67) in males and 34.4 ± 19.7 (range 2 to 76) in females ($P < 0.001$). However, there were no correlation between VAS score and age, BMI or maximal pain score from previous experience (Naham, 2012).

Systematic review done by Taddio (2008) on measures for reducing pain during adult immunization which included six studies representing 853 participants, one study evaluating pharmacological intervention (Iidocaine – prilocaine) found to be effective in reducing pain from immunization. Similarly two studies evaluated physical pain reliving technique, either skin cooling intervention (fluri – methane) or tactile stimulation (manual pressure at the site of injection) found to reduce the pain.

A Study was conducted in USA, by Ching and Wong (2002) to determine the effect of pressure on pain during IM Injection. Out of 93 subjects received a 10 second pressure treatment prior to injection and 45 received injections in which pressure was not applied. The mean pain Score intensity after the two techniques as measured on 100 mm

VAS was 13.6 for experimental group and 21.5 mm for control group. Pressure was found to be a useful technique in reduction of pain during IM injection.

Morrison et.al.(2004) done a systemic review to elicit the best nursing practices for IM injections. The databases searched from CINAHL, scholars, & pub med. The practices supported and discouraged by evidence from the study findings were as follows.

Practice supported by evidence	Practice Discouraged
<ul style="list-style-type: none"> ➤ Rapid injection without aspiration ➤ Two needle technique. ➤ Cold needle temperature ➤ Needle length specific to patient ➤ Do not use dorsal gluteal site ➤ Use of lidocaine, Vapocoolant Spray, or Tactile stimulation. 	<ul style="list-style-type: none"> ➤ Slow injection with aspiration. ➤ Use of dorsal gluteal site

III. Studies related to effectiveness of Helfer skin tap technique for reduction of pain during IM injection:

Helfer Skin Tap:

Helfer skin tap, a simple and cheap treatment method has an important place in non-drug therapy for pain management.

Maria Therese and Suriya Devi, (2012) done an experimental study to assess the effect of Helfer skin tap technique on perception of pain during IM injection. Subjects were first assigned for intra muscular injection using Helfer skin tap technique followed by routine technique for the next dose of injection and other 25 subjects were first assigned for intramuscular injection using standard technique followed by Helfer skin for

the next dose of injection. It was indicated that the perception of pain intensity is less when intramuscular injection is administered using Helfer skin tap technique. They recommended Helfer skin tap technique can be implemented in IM injection technique while caring for patients in various clinical setting.

Serena (2010) conducted an experimental study in New Delhi, to assess the effect of rhythmic skin tapping on perception of pain during IM injection. The total 60 adult patients who were on inj.Tramadol 50mg or inj.Piroxicam 40mg IM. Thirty samples received inj.Tramadol and remaining half received inj.piroxicam. Pain assesment was done soon after each injection by using 0-10 numerical pain intensity scale. The over all mean pain intensity by using skin tap technique (1.5 ± 1.1) was much lower than the routine technique.

Manju, (2014) done a study to evaluate the effectiveness of Helfer skin tap technique on pain during intramuscular injection among infants. True experimental post test only design was adopted for the study. In summary the pain level was measured by FLACC (Face, legs, activity, cry and consolability) pain scale. The study concluded that experimental group experienced less ($t'=11.78$, $P=0.000$) pain than control group.

Maj Suapouya, and Col Lenna Leumari, (2013) conducted a study to assess the effectiveness of Helfer skin tap technique on pain during intramuscular, injection among neonates. Study design used was true experimental post test control group. The study findings revealed that 86% of the neonates in the experimental group had mild pain, only 14% perceived severe pain during IM injection by using Helfer skin tap technique. Eighty Six of the neonates in the control group had severe pain, only 14 perceived moderate pain during IM injection by using conventional routine technique. There was a significant

decrease in the pain score between the administration of IM injection with Helfer skin tap technique with $P < 0.05$. This study explored the effect of Helfer skin technique (rhythmic tapping) over the skin before and during IM injection in relation to pain. The present study findings supported that there was a significant difference in the pain score in the IM administration with Helfer skin tap technique.

George, (2007) done a study to assess the effectiveness of Helfer skin tap technique on pain during intramuscular injection among adult patients. A quasi experimental design was adopted for this study. There were 60 subjects received four injections in which two injections with standard technique and two injection with Helfer skin tap technique. Pain assessment was done by 6-10 numerical intensity pain scale. The mean pain score using Helfer skin tap technique (15 ± 1.1) was less than the pain scored by standard technique (2.9 ± 1.9). The pain level was significantly reduced in treatment group ($P < 0.001$).

Jose et al., (2012) conducted a study on effectiveness of skin tap technique in reducing pain response during DPT injection. A post test only control group design was adopted for the study. The study revealed that the pain response was less in experimental group. Majority (80%) of the infants in experimental group had mild pain whereas only (17%) of the infants in control group experienced mild pain. The 't' value was found to be 7.401 at $P < 0.001$.

CHAPTER – III

RESEARCH METHDOLOGY

The methodology of research indicates the general pattern of organizing the procedure for gathering valid and reliable data for investigation. The chapter provides a brief description of pilot study, data collection procedure, research approach research design setting sample size, sampling technique and plan for data analysis.

RESEARCH APPROACH:

An quantitative approach was adopted for this study.

RESEARCH DESIGN:

Cross over design was used for the study.

Cross over design involves the exposure of the same subjects to more than one experimental treatment. This type of within subjects design has the advantage of ensuring the highest possible equivalence among subjects exposed to different conditions (Polit, Cheryl and Tatano Beck, 2010).

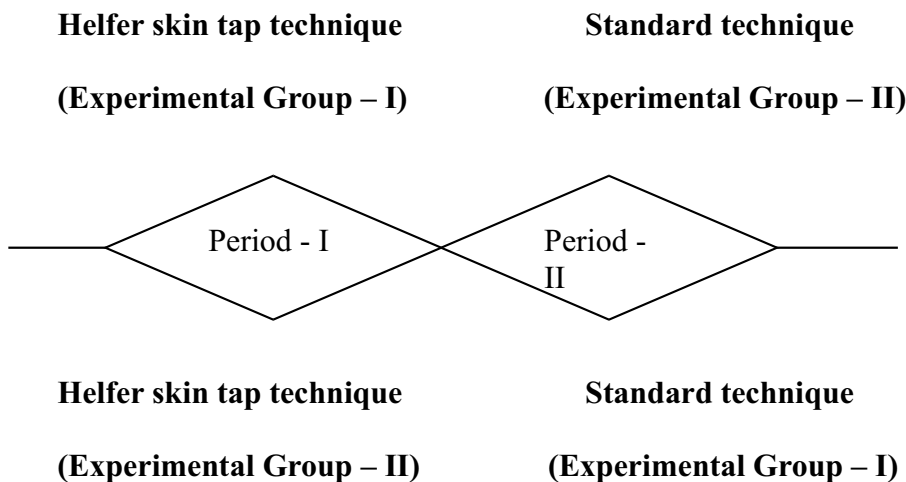


Fig: 3 Schematic representation of cross over design

Dependent Variables:

- Pain

Independent Variables:

- Helfer skin tap technique

Settings:

The study was conducted at the institute of orthopedic research and accidental surgery - Devadoss Hospital which is situated 5km away from the Sacred Heart Nursing College, Madurai. The hospital is 150 bedded on an average 5-10 orthopedic surgery are performed in the hospital for various orthopedic problems. All modern facilities are available in the hospital. In this hospital inj.tramadol 50mg analgesia is used commonly for post operative patients. The average census of the hospital was 100 patients/day. The hospital is staffed with registered nurses.

Study Population

The target population for the study was adults who are attending Post operative Orthopedic adult patient.

Sample:

The adult post operative orthopedic in patients who received IM injections and who fulfilled the inclusion criteria.

Sample Size:

The sample was consisted of 60 patients receiving intramuscular injection.

30 samples was in experimental group I

30 samples was in experimental group II

Sampling Technique:

Simple random sampling using lottery method was used to allot patients to experimental group I and experimental group II.

Simple random sampling is a basic probability sampling involving the selection of sample members from a sampling frame through completely random procedures (Polit and Cheryl Tatano Beck, 2010).

Criteria for Sample Selection:

The sample was selected based on the following inclusion and exclusion criteria.

Inclusion Criteria:

1. Adult patient between 18-60 yrs who was receiving injection.tramadol-50mg IM for continuous 2 days.
2. Both male and female patients
3. Patients those who are willing to participate in the study.
4. Patient who can understand Tamil or English.
5. Capable of giving adequate response to pain

Exclusive Criteria:

- Unconscious or critically ill
- Are unable to assume side lying and prone position.
- Receiving any other type of oral or IV analgesia
- Patient with complication like shock ,DIC, Infection.
- Diagnosed with hip fracture.

Research Tools and Technique:

The research tool consisted of two sections.

Section I:

It consists of semi structured interview schedule. It had questions related to demographic data and clinical variables of the patient.

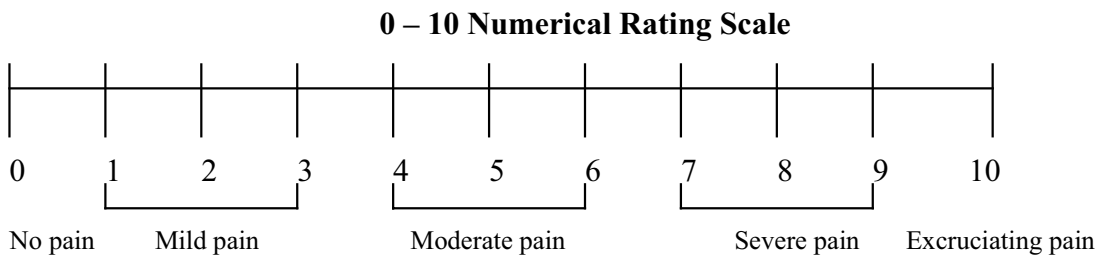
Demographic Data:

It included patients age, sex, religion, occupation, education, and height, weight, BMI.

Section II:

It consisted of numerical pain rating scale. The 0 to 10 pain scale is commonly and successfully used with hospitalized and nursing home patients. This scale asks the person with pain to assign a number from 0 to 10 according to the severity of their pain.

The pain score obtained will interpret as follows.

**Interpretation:**

- 0 - No pain
- 1-3 - Mild pain
- 4-6 - Moderate
- 7-9 - Severe to very severe pain
- 10 - Excruciating pain

In this scale “0” means no pain & “10” means excruciating pain.

Development of Intervention:

The intervention for the present study was developed after extensive Review of Literature and discussing with experts.

Helfer Skin Tap Technique	Standard Technique
<p>Helfer skin tap technique refers to rhythmic skin tapping. It was given to the injection site for 5 seconds before and after administration of IM injection of inj. Tramadol 50mg.</p>	<p>It refers to the usage of 23 gauge sterile disposable needle used for giving intramuscular injection which is at room temperature.</p>
<p>Articles Required:</p> <ul style="list-style-type: none"> a. A sterile injection tray with disposable syringe with appropriate size needle. b. Antiseptic solution c. A sterile cotton balls d. 23 gauge sterile needle to withdraw to the medicine. e. Bottle with pick up clamp [sterile] f. Syringe stand g. Small k basin h. Medicine card 	<p>Articles:</p> <ul style="list-style-type: none"> a. Disposable syringe appropriate size needle b. 23 gauge for in room temperature c. Sterile syringe d. Antiseptic solution e. Sterile cotton ball medicine f. Small ball in needle disposer.
<p>Steps in Procedure:</p> <ul style="list-style-type: none"> a. Check the medicine card with doctor, order for patient name, dry dose and route of administration b. Determine the site of ventro gluteal site, place the palm of your hand over 	<p>Steps in Procedure:</p> <ul style="list-style-type: none"> a. Check the medicine card with doctor, order for patient name, dry dose and route of administration b. Provide privacy & explain the procedure to the

<p>the greater trochanter ,with your fingers facing the patients’s head. The right hand is used for the patient ‘s left hip, or the left hand for the right hip,to identify landmarks. Place the index finger on the anterosuperior iliac spine and extend the middle finger dorsally. Palpating the iliac crest.A triangleis formed ,and the injection is given in the center of triangle.</p> <ul style="list-style-type: none"> c. Tap the skin several time approx 3 sec d. Prepare site with alcohol swab e. Uncap the Syringe in the dominant hand f. Make a large “v” with the thumb and index finger of the dominant hand g. The entire hand is used to tap the muscles h. Simultaneously insert the needle at 90 degree angle into the muscle i. After aspirating, inject the medication slowly while continuing tap to the muscle 	<ul style="list-style-type: none"> c. Load the medication from a ampule into syringe d. Position and expose appropriate size e. Determine the correct site for injection f. Clean the skin with cotton ball moistened with spirt g. Expel air from syringe and stretch the skin tightly and insert the needle at 90 degree angle for intra muscular. h. Withdraw the needle quickly, placing antiseptic swab at injection site. i. Apply gentle pressure at the site with cotton swab avoid massaging to site. j. Handle syringe and needle using universal precaution. k. Position the patient comfortably l. Record the nurse’s procedure and indications date, time, and name of
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<p>j. Remove the needle while simultaneously tapping the skin again using the v tap</p> <p>k. The taps (not slap) must be firm using entire hand to stimulation of the large muscle.</p>	<p>the drug dosage route and signature of the nurse.</p>
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In the present study there are 2 experimental groups. Experimental group I received the First and Second injection with standard technique and experimental group II received it with the Helfer Skin Tap technique. The III and IV injection for two experimental groups was crossed over that is experimental group I was received the III and IV injection with Helfer skin tap technique and experimental group II was received the III and IV with standard technique. The standard safety Precautions and aseptic techniques were followed during the administration of IM injection.

Testing of the Tools:

The Validity of the tool and intervention was obtained by giving to five experts two from the department of Medicine and three from the department of Nursing Based on their valid suggestions reframing of the intervention was done.

Reliability:

Reliability is defined as the extent to which the instrument yields the same result on repeated measures it is thus concerned with consistency, accuracy, stability, homogeneity (Polit, 2010).

Reliability of the scale was assessed by inter rater method, obtained 'r' value for the numerical rating scale was (r) = 0.8.

Pilot – Study:

Pilot Study was conducted a week before the actual study in Devadoss Multispecialty Hospital, Madurai. In order to test the feasibility of the study, pilot study was conducted among six patients in the same manner as the final study. Among six patients, three of them were assigned to experimental group I and three in the experimental group II. Data were analyzed and findings suggested that the study was feasible.

Data Collection:

Data Collection was conducted for 6 weeks at the institute of orthopedic Research and Accidental Surgery. Devadoss Hospital Madurai.

Formal Permission was obtained from the Institute of orthopedic Research and Accidental Surgery, Devadoss Hospital, and from dissertation and ethical committee of Sacred Heart Nursing college. A total of 60 Samples who fulfilled the inclusion criteria were selected by simple random technique and assigned to experimental group I and experimental group II. Informed written consent were obtained from each of the sample. Numerical pain rating Scale was used to assess the perception of pain during IM Injection. Samples who received atleast 4 doses of injection of tramadol 50mg Via IM route from the 2nd post operative day were included for the study. Medications were

administered twice a day in morning and evening. An interview Schedule was conducted to elicit the demographic data and it took 10 minutes per sample. The Steps that were developed for the administration of IM Injection along with standard safety Precautions and aseptic technique was followed by the researcher.

The researcher received good support from the management and staff in executing the procedure. Experimental group I received the First and Second Injection Tramadol 50mg with Helfer skin tap technique and experimental group II received the same with the standard technique. The Third and Fourth injection for the two groups were crossed over, that is experimental group I received the 3rd and 4th injection with the standard technique and experimental group II receiving the 3rd and 4th with the Helfer skin tap technique. The Samples were asked to rate pain levels soon after each injection using Numerical pain scale. The time taken to administer single IM Injection which includes preparation of medication and administration was from 10 – 15 minutes.

Plan for Data Analysis:

After the data collection the collected data were organized tabulated. Summerized and analyzed. The data analysis and interpretation of the study included descriptive statistics such as means, medians, Standard Deviation and inferential Statistics such as paired and unpaired ‘t’ test, and chi Square test.

Protection of Human Rights:

The Proposed study was conducted after the approval of dissertation committee Sacred Heart Nursing College. Written permission was obtained from the institute of orthopedic Research and Accident Surgery Devadoss Hospital Madurai, informed written consent of each subject was obtained before starting the data collection and assurance

was given to them, that the anonymity and confidentiality of each individuals would be maintained.

CHAPTER – IV

ANALYSIS AND INTERPRETATION OF DATA

Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested. The chapter deals with the description of samples, analysis and interpretation of the data collected and achievement of the objectives of the study.

The data were organized under the following sections

Section I:

- Distribution of samples based on the demographic variables.

Section II:

- Distribution of samples in Experimental group I based on their level of pain perception during IM injection.
- Distribution of samples in Experimental group II based on their level of pain perception during IM injection

Section III:

- Comparison of mean pain scores of Helfer skin tap technique Vs Standard technique (Experimental group I)
- Comparison of mean pain scores of Standard technique (Experimental group II) vs Helfer skin tap technique.
- Comparison of mean pain scores between experimental group I vs experimental group II.

Section IV:

- Association between the pain scores of and selected demographic and clinical variables such as age, sex, occupation, religion, education, heights, weight and BMI of samples in experimental group I and II.

SECTION - I

Table 1: Distribution of samples based on the demographic variables

N = 60

Demographic Variables	Experimental group I (n=30)		Experimental group II (n=30)		Total N=60	
	f	%	f	%	f	%
	Age:					
❖ 30 – 40 yrs	11	37	7	23.3	18	30
❖ 41 – 50 yrs	9	30	10	33.3	19	31.6
❖ 51 – 60 yrs	10	33.4	13	43.4	23	38.4
Sex:						
❖ Male	4	13	21	70	25	41.6
❖ Female	26	87	9	30	35	58.4
Occupation:						
❖ Employed	20	67	24	80	44	73.3
❖ Unemployed	10	33	6	20	16	26.7
Religion:						
❖ Hindu	22	73	28	93.3	50	83.4
❖ Christian	6	20	1	3.3	7	11.6
❖ Muslim	2	7	1	3.3	3	5
Education:						
❖ Literate	20	67	12	40	32	53.4
❖ Illiterate	10	3	18	60	28	46.6

Demographic Variables	Experimental		Experimental		Total N=60	
	group I (n=30)		group II (n=30)			
	f	%	f	%	f	%
Height:						
❖ 141 – 160cm	22	73	17	57	39	65
❖ 161 – 180cm	8	27	13	43	21	35
Weight:						
❖ 40 – 60kg	27	90	27	90	54	90
❖ 61 – 80kg	3	10	3	10	6	10
BMI:						
❖ Under weight (<18)	20	93	16	87	54	90
❖ Normal (18 – 24)	10	7	4	13	6	10
❖ Pre obese (25 – 29)	-	-	-	-	-	-
❖ Obese (≥ 30)	-	-	-	-	-	-

Table 1 predicts that majority (37%) of the adults in experimental group I belong to the age group of 30-40 yrs, almost one third (43.4%) of the samples in the experimental group II belong to age group of 51-60 yrs. Females dominated in group I (87%). Where as in the experimental group II male dominated (70%). In both the experimental group I and II, majority of the samples (67%) and (80%) were employed. Majority of the samples in both the experimental group I and II (73% and 93.3%) were Hindus. In experimental group I (67%) of the samples were literate and experimental group II 60% of the samples were illiterate.

Regarding height majority (73%) of the adult in experimental group I and II were between 141-160cm. In both the experimental group I and II, majority of the samples (90%) were between 40-60kgs.

Regarding BMI majority (93%) of the adults in experimental group I and II (87%) were between 18-25.

SECTION – II

Table 2: Distribution of samples in Experimental group I based on their level of pain perception during IM injection

N = 30

Level of pain perception	Helfer skin tap		Standard technique	
	technique (n=30)		(n=30)	
	f	%	f	%
No pain (0)	-	-	-	-
Mild pain (1-3)	27	90	4	13.4
Moderate pain (4-6)	3	10	26	86.6
Severe pain (7-9)	-	-	-	-
Excruciating pain (10)	-	-	-	-

Table 2 reveals that the level of pain perception during IM injection in Experimental group I. Majority of the samples (86.66%) perceived moderate pain with standard technique, where as majority (90%) of them had only mild pain with Helfer skin tap technique.

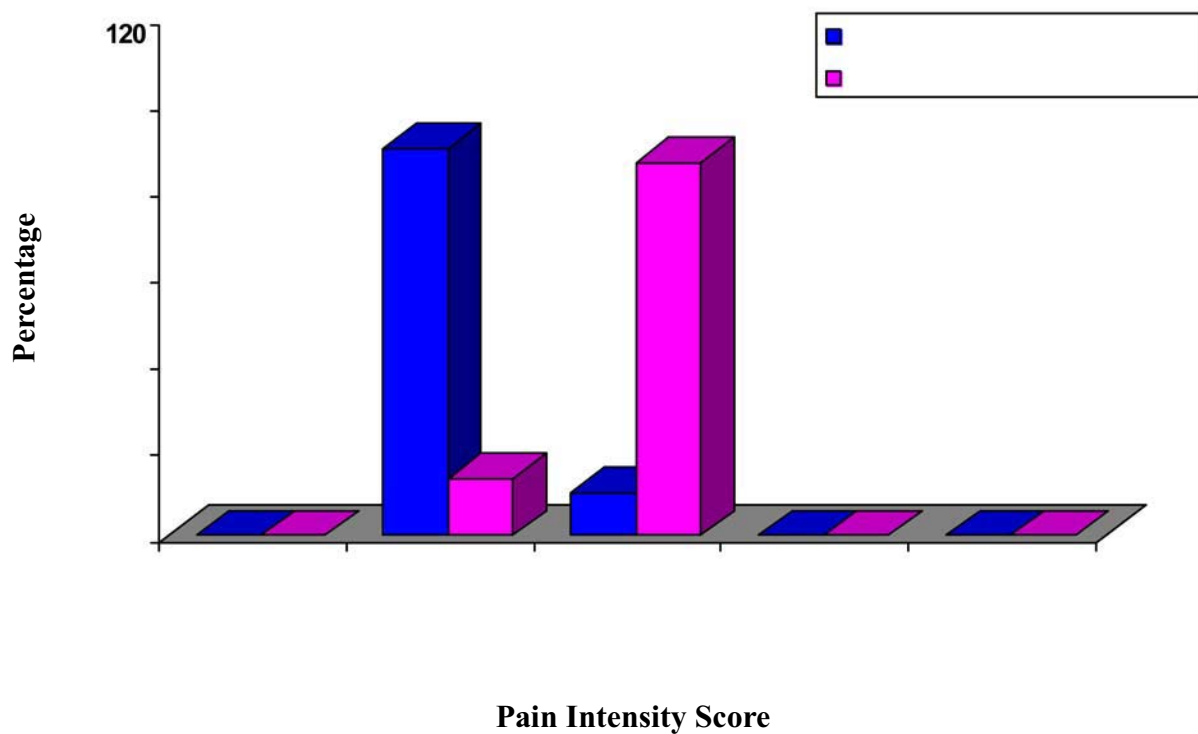


Figure 3: Distribution of samples in Experimental group I based on their level of pain perception during IM Injection

Table 3: Distribution of samples in Experimental group II based on the level of pain perception during IM injection

N = 30

Level of pain perception	Standard technique (n=30)		Helfer skin tap technique (n=30)	
	f	%	f	%
No pain (0)	-	-	-	-
Mild pain (1-3)	3	10	25	83.4
Moderate pain (4-6)	27	90	5	16.6
Severe pain (7-9)	-	-	-	-
Excruciating pain (10)	-	-	-	-

Table 3 reveals that the level of pain perception during IM injection in experimental group II. Majority of the samples (83.4%) perceived mild pain with Helfer skin tap technique, where as majority (90%) of them had moderate pain with standard technique.

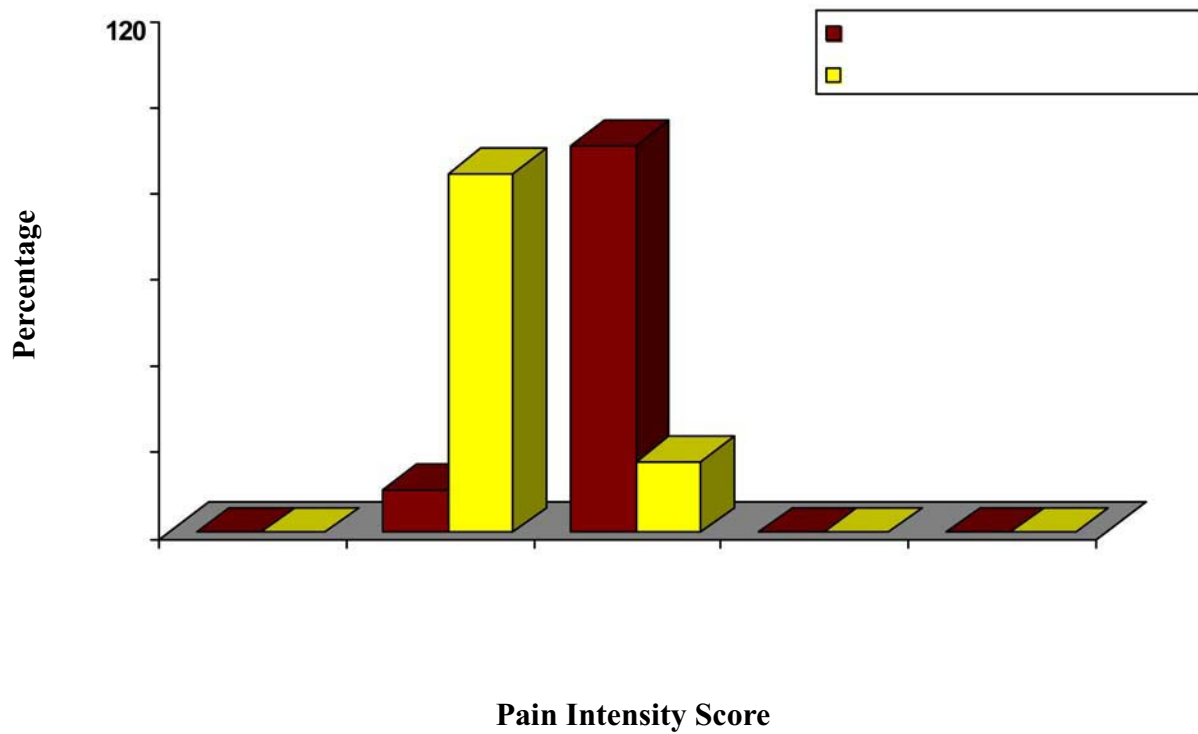


Figure 4: Distribution of samples in Experimental group II based on their level of pain perception during IM Injection

SECTION – III

Table 4: Comparison of mean pain scores of Helfer skin tap technique vs standard technique in experimental group I.

N = 30

	Mean	SD	't' value	df	'p' value
Helfer skin tap technique	3.2	0.93	6.66	29	0.001*
Standard technique	8.33	1.0			

* Significant at 0.001 level

To compare the mean pain scores during IM injection using Helfer skin tap technique vs standard technique of adult patients in experimental group II, the null hypothesis was stated as follows.

H₀:

The mean pain score of patient during IM injections using Helfer skin tap technique will not be significantly lower than the mean pain scores of those who received IM injection using standard technique in experimental group I and II.

The hypothesis was tested using paired 't' test method. Table 4 shows that the mean pain scores using Helfer skin tap technique (3.22) was lesser than the mean pain score of standard technique (8.33). The obtained 't' value 6.66 was statistically highly significant at 0.001 level. So the researcher rejects the null hypothesis and accepts the research hypothesis.

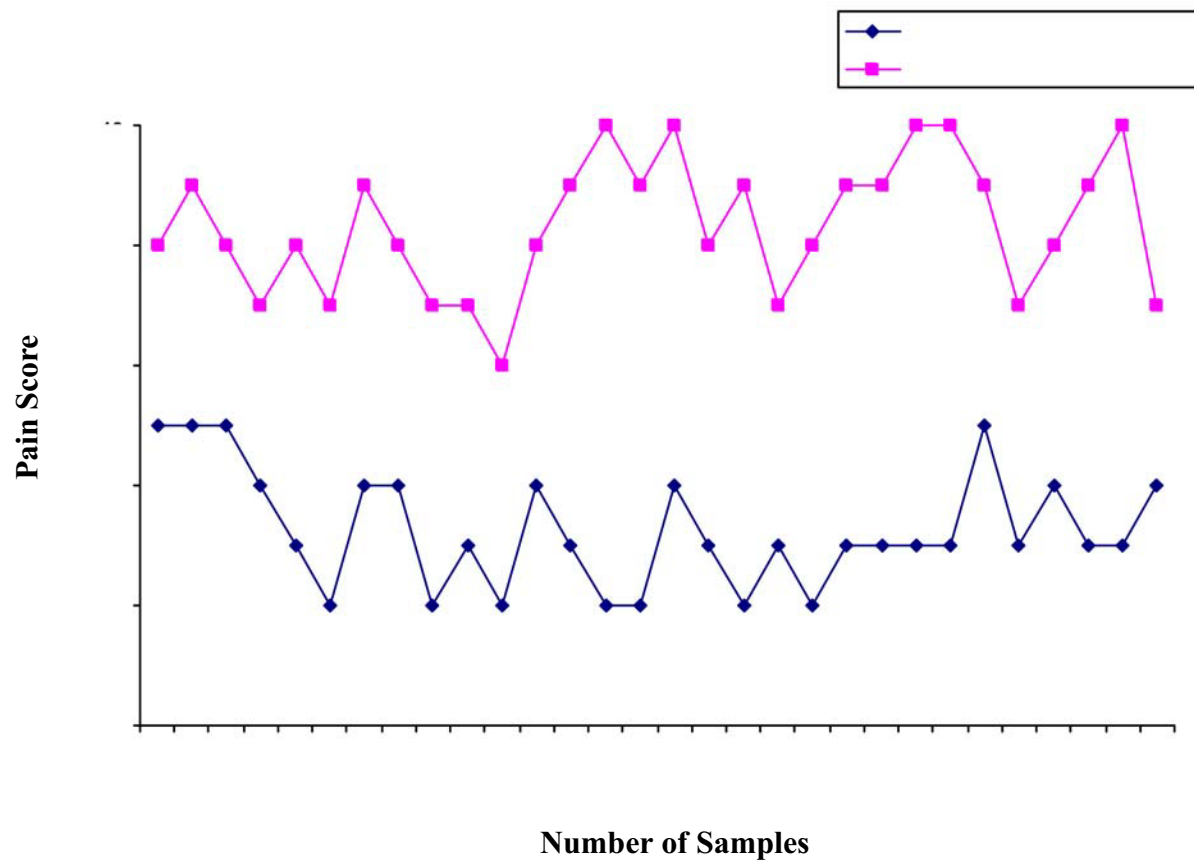


Figure 5: Comparison of mean pain scores of Helper skin tap technique vs standard technique (Experimental group I)

Table 5: Comparison of mean pain scores of standard technique vs Helfer skin tap technique in experimental group II.

N = 30

	Mean	SD	't' value	df	'p' value
Standard technique	8.93	1.0	5.15	29	0.001*
Helfer skin tap technique	2.86	0.44			

* Significant at 0.001 level

To compare the post IM injection mean pain scores using standard technique vs Helfer skin tap technique of adult patients in experimental group II, the null hypothesis was stated as follows.

H₀₁:

The mean pain score of patient during IM injections using Helfer skin tap technique will not be significantly lower than the mean pain scores of those who received IM injection using standard technique in experimental group I and II.

Table 5 shows that the mean pain score using Helfer skin tap technique (2.86) was lesser than the mean pain score of standard technique (8.93). The obtained 't' value 5.15 was statistically highly significant at 0.001 level. So the researcher rejects null hypothesis and accepts the research hypothesis.

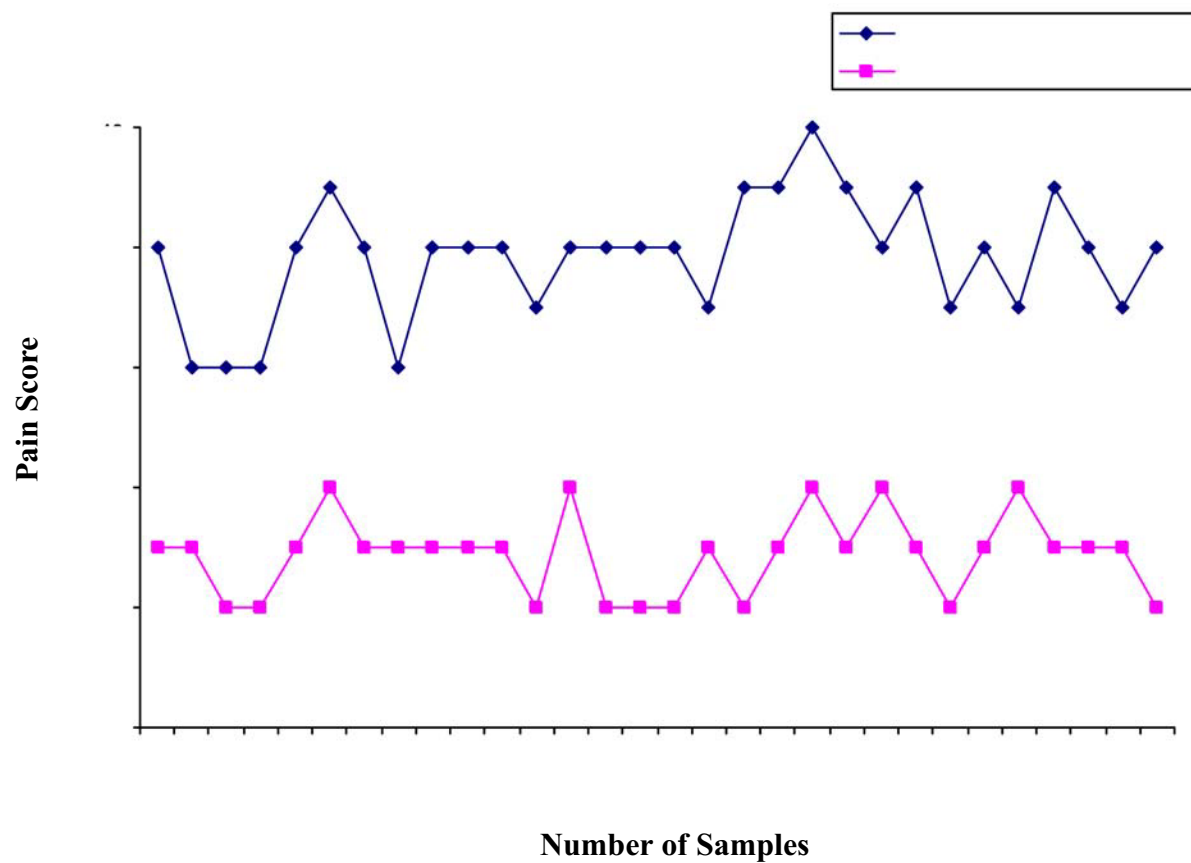


Figure 6: Comparison of mean pain scores of Standard technique vs Helfer skin tap technique (Experimental group II)

Table 6: Comparison of mean pain scores between experimental group I vs experimental group II

Comparison		Mean	SD	't' value	df	'p' value
I time administration	Helfer skin tap technique in Experimental group I	3.2	0.93	7.3	58	0.001*
	Standard technique in Experimental group I	8.5	1.0			
	Standard technique in Experimental group II					
II time administration	Standard technique in Experimental group I	8.3	1.0	9.8	58	0.001*
	Helfer skin tap technique in Experimental group II	2.8	0.44			

* Significant at 0.001 level

To compare the mean pain score during IM injection was between experimental group I vs experimental Experimental group II, the null hypothesis was stated as follows.

H₀₁:

The mean pain score of patient during IM injections using Helfer skin tap technique will not be significantly lower than the mean pain scores of those who received IM injection using standard technique in experimental group I and II.

Table 6 shows that the mean pain scores using Helfer skin tap technique in experimental group I (3.2) was lesser than the mean pain score of standard technique in experimental group I (8.5). The obtained 't' value 7.3 was statistically highly significant at 0.001 level. So the researcher rejects the null hypothesis and accepted the research hypothesis. In experimental group II the mean pain scores during IM injection using Helfer skin tap technique (2.8) was lesser than the mean pain score of standard technique

(8.3). The obtained 't' value 9.8 was statistically highly significant at 0.001 level. So the researcher rejects null hypothesis and accepts the research hypothesis.

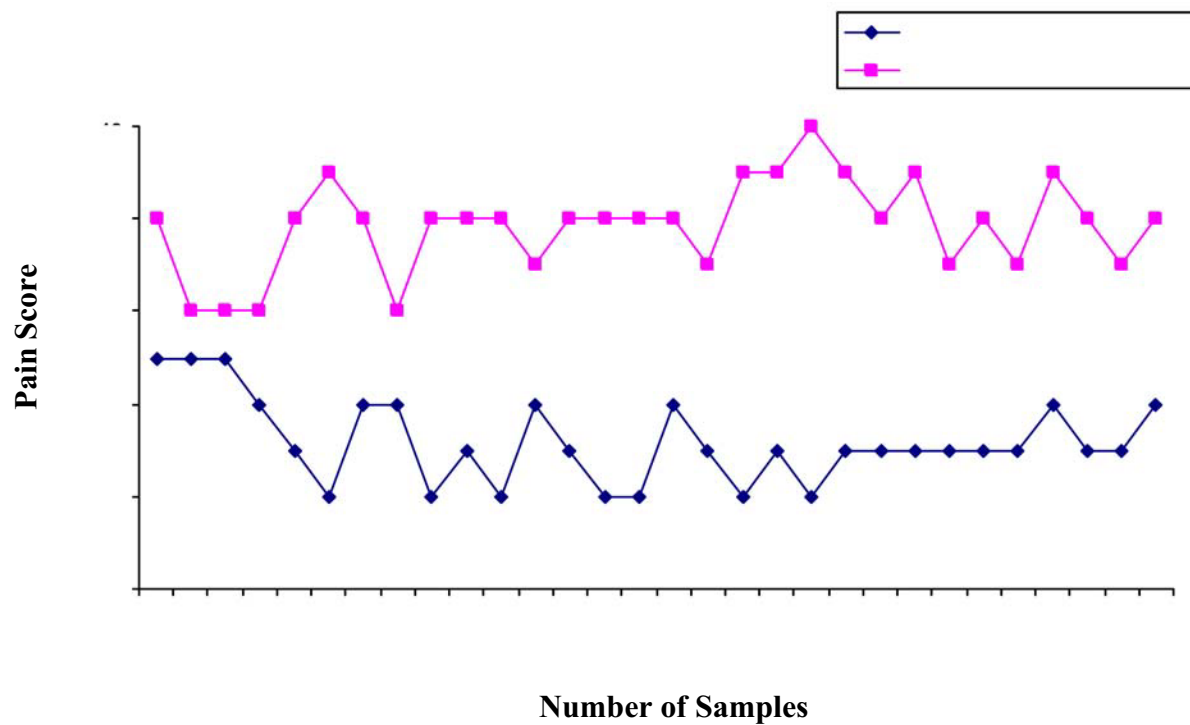


Figure 7: Comparison of mean pain scores between experimental group I vs experimental group II (I Administration)

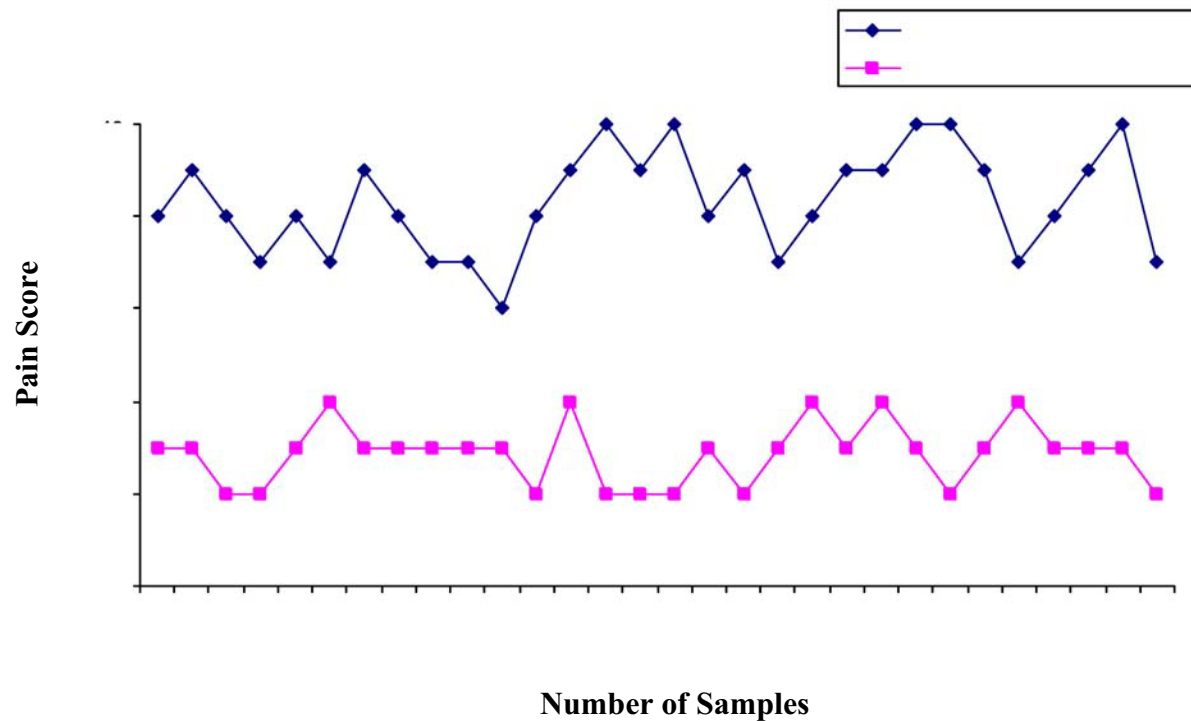


Figure 8: Comparison of mean pain scores between experimental group I vs experimental group II (II Administration)

SECTION – IV

Table 7: Association between the mean pain scores of samples in experimental group I & II with selected demographic variables. N = 60

Demographic Variables	Mild		Moderate		χ^2	P-value
	f	%	f	%		
Age:						
❖ 30 – 40 yrs	15	25	3	5	0.61	>0.05#
❖ 41 – 50 yrs	16	26.6	3	5		
❖ 51 – 60 yrs	21	35	2	3.4		
Sex:						
❖ Male	22	36.6	3	5	0.64	>0.05#

❖ Female	30	50	5	8.4		
Occupation:						
❖ Employed	38	63.3	6	10	0.07	>0.05#
❖ Unemployed	14	23.3	2	3.4		
Religion:						
❖ Hindu	46	76.6	4	6.6		
❖ Christian	4	6.6	3	5	11.81	>0.05#
❖ Muslim	2	3.6	1	1.6		
Education:						
❖ Literate	12	50	2	3.4	2.27	>0.05#
❖ Illiterate	2	36.6	6	10		
Demographic Variables	Mild		Moderate		χ^2	P-value
	f	%	f	%		
Height:						
❖ 141 – 160cm	35	58.4	4	6.6	1.07	>0.05#
❖ 161 – 180cm	17	28.4	4	6.6		
Weight:						
❖ 40 – 60kg	48	80	6	10	2.3	>0.05#
❖ 61 – 80kg	4	6.6	2	3.4		
BMI:						
❖ Under weight (<18)	49	81.6	5	8.4		
❖ Normal (18 – 24)	3	5	3	5		
❖ Pre obese (25 – 29)	-	-	-	-	7.75	>0.05#
❖ Obese (≥ 30)	-	-	-	-		

Not significant

H₀:

There will be no significant association between the perception of pain and selected demographic variables (age, sex, occupation, education, height, weight, body mass index) of experimental group I and II.

Table 7 shows there was no significant association between the Helfer skin tap technique and the selected demographic variables at 0.05% level of significance. So the researcher rejects the research hypothesis and accepts the null hypothesis.

CHAPTER – V

DISCUSSION

Pain is a common and a ubiquitous sensation for children and adult. Every individual has his or her own perception of pain (Maj Sivapriya, Col Leena Kumari, 2015). Effective pain management not only reduces physical discomfort, but also improves quality of life (Gitanjali Zore, Ragina Dias, 2014).

The aim of the present study was to assess the effectiveness of Helfer skin tap technique on perception of pain during IM injection among adult post operative orthopedic patients. A total of 60 samples were selected randomly. Numerical pain rating scale was used.

MAJOR FINDINGS OF THE STUDY:

Majority (37%) of the adults in experimental group I belong to the age group of 30-40 yrs, almost one third (43.4%) of the samples in the experimental group II belong to age group of 51-60 yrs. Females dominated in group I (87%). Where as in the experimental group II male dominated (70%). In both the experimental group I and II, majority of the samples (67%) and (80%) were employed. Majority of the samples in both the experimental group I and II (73% and 93.3%) were Hindus. In experimental group I (67%) of the samples were literate and experimental group II 60% of the samples were illiterate. Regarding height majority (73%) of the adult in experimental group I and II were between 141-160cm. In both the experimental group I and II, majority of the samples (90%) were between 40-60kgs. Regarding BMI majority (93%) of the adults in experimental group I and II (87%) were between 18-25.

Kenneth (1992) assessed the nature and extend of group differences in pain tolerance according to age and sex. Results showed that on the average, (1) pain tolerance decreases with age, (2) men tolerate more pain than women.

The findings of the present study was similar, to the study of Gitanjali Zore and Ragina Dias (2014) conducted a study on effectiveness of nursing intervention on pain during Im injection. In the study, maximum subjects 48% belong to age group of 15-25 years. With regard to gender, majority of the subjects (60%) were females (74%) were Hindus.

For the discussion to be more perceptive the objectives of the study discussed here.

Objectives 1 and 2:

To determine the level of pain during intramuscular injection using Helfer skin tap technique and standard technique among adult patients. Majority of samples in both the experimental groups I and II in (86.66%) had perceived moderate pain with standard technique. In contrast, most of the samples (90%) in experimental group I and 90% in experimental group II perceived only mild pain with Helfer skin tap technique. There was difference in the scores clearly portrays the effectiveness of Helfer skin tap technique.

Pain originating from IM injection should not be under estimated because the painful injection might induce severe fear of injection, which may lead the patient to delay in seeking medical help (Ozdemir and Bergu, 2009). Non pharmacological management to reduce pain are based on 'gate control theory' Helfer skin tap technique

keeps the muscle relaxed and stimulate large muscle diameter fibres. This technique could have caused the above effect in decreasing the pain perception after IM injections.

The findings are supported by a study of Maj Sivapriya and Col Lenna Leumari, (2013). They conducted study on effectiveness of Helfer skin tap technique among neonates. Pain scores were compared between Helfer skin tap technique vs standard technique among 100 samples in which 86% of the neonates in the experimental group had mild pain, with Helfer tap technique using FLACC scale.

Objective 3:

2. To evaluate the effectiveness of Helfer skin tap technique in reducing IM injection pain.

Helfer skin technique to administer IM injections has proved to be effective in reducing pain, which is evident in the following results:

Table 4 shows the comparison of mean pain scores of Helfer skin tap technique vs standard technique the obtained 't' value (6.66) was statistically significant at 0.001 level.

Table 5 shows the comparison of mean pain scores of standard technique vs Helfer skin tap technique, the obtained 't' value (5.15) was statistically significant at 0.001 level.

Table 6 shows the comparison of mean pain score between experimental group I vs experimental group II. The obtained 't' value for 1st administration (Helfer skin tap technique vs standard technique) was (7.3) and 't' value of 2nd administration (standard technique vs Helfer skin tap technique) was (9.8) which was statistically significant at 0.001 level.

The present study findings configured with the following study findings (Rosario and Morrison, 2010) conducted a systematic review to select the best nursing practices for IM injection. One of the practices supported by evidence in their study was the use Helfer skin tap technique.

Jose et al., (2012) conducted a study to assess the effectiveness of skin tap technique in reducing pain response. The study revealed that the pain response were less in experimental group. Independent 't' test was done to establish the effectiveness of skin tap technique 't' value was found to be 7.401 at $P < 0.001$.

Serena (2010) conducted an experimental study in New Delhi, to assess the effect of rhythmic skin tapping on perception of pain during IM injection. Pain assessment was done soon after each injection by using 0-10 numerical pain intensity scale. The over all mean pain intensity by using Helfer skin tap technique (1.5 ± 1.1) was much lower than the routine technique.

Manju, (2014) done a study to evaluate the effectiveness of Helfer skin tap technique on pain during intramuscular injection among infants. True experimental post test only design was adopted for the study. In summary the pain level was measured by FLLACC/face, legs, activity, cry and consolability, pain scale. The study concluded that experimental group had less ('t'=11.78, $P=0.000$) pain than control group.

Objective 4:

To find out the association between pain level and demographic variables such as age, sex, occupation, religion, education, height, weight and body mass index.

Table 7 shows there was no significant association between pain level and selected demographic variables. The study findings are supported with the study of

Manju, (2014). In this study there was no significant association between pain level of infants and demographic variables age and sex.

CHAPTER – VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATION

This chapter contains the summary of the study and conclusion drawn. It clarifies limitations of the study and the implications. The recommendations are given for different areas like nursing education, administration and nursing practice and nursing research.

The study was undertaken to determine the effectiveness of Helfer skin tap technique on perception of pain during IM injections among adult orthopedic patients admitted in Devadoss Hospital. The design adopted was a cross over design. The total sample size was 60 patients, 30 patients in experimental group I and 30 patients in experimental group II. Simple random sampling technique was adopted to allot the patients to group I and group II. Numerical pain rating scale was used to assess pain.

MAJORITY FINDINGS OF THE STUDY:

Table 1 predicts that majority (37%) of the adults in experimental group I belong to the age group of 30-40 yrs, almost one third (43.4%) of the samples in the experimental group II belong to age group of 51-60 yrs. Females dominated in group I (87%). Whereas in the experimental group II male dominated (70%). In both the experimental group I and II, majority of the samples (67%) and (80%) were employed. Majority of the samples in both the experimental group I and II (73% and 93.3%) were Hindus. In experimental group I (67%) of the samples were literate and experimental group II 60% of the samples were illiterate.

Regarding height majority (73%) of the adult in experimental group I and II were between 141-160cm. In both the experimental group I and II, majority of the samples (90%) were between 40-60kgs.

Regarding BMI majority (93%) of the adults in experimental group I and II (87%) were between 18-25.

Helfer skin tap technique to administer IM injection has proved to be effective in reducing pain which is evident in the following result.

Table 4 shows the comparison of mean pain scores of Helfer skin tap technique vs standard technique the obtained 't' value (6.66) was statistically significant at 0.001 level.

Table 5 shows the comparison of mean pain scores of standard technique vs Helfer skin tap technique, the obtained 't' value (5.15) was statistically significant at 0.001 level.

Table 6 shows the comparison of mean pain score between experimental group I vs experimental group II. The obtained 't' value for 1st administration (Helfer skin tap technique vs standard technique) was (7.3) and 't' value of 2nd administration (standard technique vs Helfer skin tap technique) was (9.8) which was statistically significant at 0.001 level.

There was no statistically significant association between Helfer skin tap technique pain score and the selected demographic variables such as age, sex, occupation, education, height, weight and BMI.

CONCLUSION:

1. Every individual experiences varying level of pain with IM injection.
2. Helfer skin tap technique to administer IM injection has proved to be effective in reducing the pain.

IMPLICATIONS FOR NURSING:

The nurses play an important role in reducing IM injection pain using a cost effective, safe, non-pharmacological treatment. One of the method is Helfer skin tap technique.

IMPLICATION FOR NURSING PRACTICE:

- Nurses play a major role in the management of pain among the adult patients by adopting appropriate pain management technique.
- The effectiveness of Helfer skin tap technique in reducing IM injection pain proved through the present study and is a source for evidence based practice.
- This will motivate the nurses to utilize current evidence based practice in improving the quality and standards of care given to the patient by reducing the IM injection pain.

IMPLICATION FOR NURSING EDUCATION:

- Education plays an important role in the modification of behavior and practice among the nurses as well as student nurses. Non pharmacological management of pain can be further strengthened in the nursing curriculum.
- Current evident based practices in reducing IM injection pain – including Helfer skin tap technique can be taught to the nursing students and staff nurses.

IMPLICATION FOR NURSING ADMINISTRATION:

- Nurse administrators along with hospital administration can formulate policy guidelines and procedure manual based on the current evidence based practices for reducing IM injection pain, one among them being Helfer skin tap technique.
- Nurse administrators can organize continuing nursing education on best practices for safe IM injection proved by evidence based researchers, one of being then Helfer skin tap technique.

IMPLICATION FOR NURSING RESEARCH:

- The findings of the present study has added knowledge to the already existing literature and implication for nursing research are given in the form of recommendation.
- This study can be baseline for future studies to build upon and motivate other investigators to conduct further studies.

LIMITATIONS:

- The study was conducted among the adult patients from a selected hospital, Madurai.
- The study was done on a small sample size of 60, hence generalization is possible only for the selected populations.
- The response were based on self report of the study samples with could not be counter checked.

RECOMMENDATIONS:

- Replication of the study in larger sample in different setting and different population in order to validate the findings and make generalizations.
- Further research on effectiveness of Helfer skin tap technique on IM pain can be undertaken which will further add strength to the evidence based findings.

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APPENDIX – A



SACRED HEART NURSING COLLEGE ULTRA TRUST

4 / 235, COLLEGE ROAD,
THASILDAR NAGAR,
MADURAI - 625 020.
TAMILNADU, INDIA.
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Email : ultratrust@rediffmail.com

Ref : UT : SHNC:Ph.D(N) : 2015

Date : 13.07.2015

ETHICAL COMMITTEE

The following members of the ethics committee were present at the meeting held on 13.07.2015 at 2.15 pm in Sacred Heart Nursing College.

CHAIR PERSON

1. Dr.SABHESAN, M.B.B.S. DPM, MNAMS, Ph.D.
Head, Department of Psychiatry
CSI Mission Hospital, Madurai.

DEPUTY CHAIRMAN

2. Dr.NALINI JEYAVANTH SANTHA, M.Sc., (N) Ph.D.
Principal, Sacred Heart Nursing College, Madurai - 625 020.

MEMBER SECRETARY

3. Dr. S.CHANDRAKALA, M.Sc., (N) Ph.D
Vice Principal, Sacred Heart Nursing College, Madurai - 625 020.

MEMBERS PRESENT

4. Dr. JULIET SYLVIA, M.Sc., (N) Ph.D.
Head, Department of Community Health Nursing,
Sacred Heart Nursing College, Madurai - 625 020.
5. Prof. DEVAKIRUBAI, M.Sc., (N) Ph.D.
Professor, Department of Medical Surgical Nursing,
Sacred Heart Nursing College, Madurai - 625 020.

...2...



**SACRED HEART NURSING COLLEGE
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Date : 13.07.2015

-2-

6. Dr. VIJAYA, M.Pharm., Ph.D
Dean, Clinical Pharmacologist
Ultra College of Pharmacy, Madurai
7. Mr. CHINNAKARUPPAN M.A., B.L., DCFSC
Advocate and Notary Public,
14, Asari Street, Thallakulam, Madurai - 2.
8. Dr. RAJASEKARAN, M.B.B.S, D.F.M. D.Diab
Pathologist
Best Dental Science College,
Ultra Trust,
Ultra Nagar, Madurai

RESOLUTION - 1/2015

It is resolved to accept Ms. DHANALAKSHMI T. to conduct a study "An Experimental study to assess the effectiveness of Heifer Skin tap technique on the perception of pain during intra muscular injection among Postoperative adult orthopedic patient admitted in selected hospital at Madurai district".

The institutional Ethics Committee expects to be informed about the progress of the study, any changes in the protocol, patient information and asks to be provided a copy of the final report.

Yours Sincerely

Chair Person
Ethics Committee

Dr.SABHESAN, M.B.B.S. DPM, MNAMS, Ph.D.

Member Secretary
Ethics Committee

Dr. S.CHANDRAKALA, M.Sc., (N) Ph.D
S. CHANDRAKALA, MSc (N)
VICE PRINCIPAL, HOD OF MED. SUR. DEPT;
SACRED HEART NURSING COLLEGE,
ULTRA TRUST, MADURAI-20

APPENDIX – B (English)

CONSENT FORM

All the details of this study had been explained to me. I am aware that the information collected from me will be used for the purpose of the study. I am also assured that there is no complication in doing and that all the information collected will be highly confidential. Thereby I am willing to participate in this study on my own interest and wish.

Place:

Participant's Signature

Date:

Researcher's Signature

APPENDIX – C

COPY OF LETTER SEEKING PERMISSION TO CONDUCT THE STUDY IN SELECT THE HOSPITAL

Dr. NALINI JEYAVANTH SANTHA
Principal.

4/235, COLLEGE ROAD
THASILDAR NAGAR
MADURAI – 625 020
PHONE: 2534593

Ref. UT : SHNC : 2014

Date:

To

The HR,
Devadass Institute of Orthopaedic Hospital and Research Centre,
Surveyer Colony,
Madurai.

Respected Sir / Madam,

Sub: Sacred Heart Nursing College, Madurai – Project work of
M. Sc (Nursing) student – permission requested – reg.

We wish to state that Ms.Dhanalakshmi, II year M. Sc (Nursing) student of our college has to conduct a Research project, which is to be submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfillment of University requirements. The topic of research project is "An experimental study to assess the effectiveness of Heifer skin tap technique on the perception of pain during intramuscular injection among postoperative adult orthopedic patient admitted in selected hospital of Madurai district".

We therefore request you to kindly permit her to do the research work in your organization under your valuable guidance and suggestions.

Thanking you,

Yours faithfully,

Nalini

Principal
(Dr. NaliniJeyavanthaSantha)

C. NALINI JEYAVANTH SANTHA, M.Sc., Ph.D.
Principal
SACRED HEART NURSING COLLEGE
Madurai - 625 020.

Can be allowed
S/m
29/6/2015

Approved
Nalini

APPENDIX - D
CONTENT VALIDITY CERTIFICATE

This is to certify that the tool developed by **Mrs.T.Dhanalakshmi**, II year M.Sc (N) student of Sacred Heart Nursing College, Madurai. (Affiliated to Dr.M.G.R. Medical University, Chennai) is validated by the undersigned, can proceed with this tool and conduct the main study for dissertation entitled “**An experimental study to assess the effectiveness of Helfer skin tap technique on the perception of pain during intramuscular injection among postoperative adult orthopedic patient admitted in selected hospital of Madurai district**”.

PLACE:

DATE:

SIGNATURE:

NAME:

DESIGNATION:

ADDRESS:

APPENDIX – E

LIST OF EXPERTS

1. **Dr.Sathesh Devadoss, M.B.B.S., M.S (Ortho), M.ch., Orth(UK), FASIF Aust),**
Director – Orthopedic Surgeon,
Devadoss Hosptial, Madurai.
4. **Dr.C.Nalini Jeyavantha Santha, M.Sc(N), Ph.D.,**
Principal,
Sacred Heart College of Nursing, Madurai
5. **Dr. S.Chandrakala, M.Sc(N), Ph.D.,**
Vice Principal,
Sacred Heart College of Nursing, Madurai.
6. **Prof.E.Devakirubai, M.Sc(N), Ph.D.,**
Professor,
Sacred Heart College of Nursing, Madurai.
7. **Mrs. P.Andal, M.Sc(N), Ph.D.,**
Professor,
Sacred Heart College of Nursing, Madurai.
8. **Mrs.Thangapappa, M.Sc(N),**
Asso. Professor,
Sacred Heart College of Nursing, Madurai.
9. **Mr.Mani, M.Sc., M.Phil.,**
Bio-Statistician,
Meenakshi Mission, Madurai.

APPENDIX – F
DEMOGRAPHIC PROFILE
PART – I

1. Age in Years

- a. 30-40 years
- b. 41-50 years
- c. 51- 60 years

2. Sex

- a. Male
- b. Female

3. Occupation

- a. Employed
- b. Unemployed

4. Religion

- a. Hindu
- b. Christian
- c. Muslim

5. Education

- a. Literate
- b. Illiterate

6. Height

- a. 141-160cm
- b. 161-180cm

7. Weight

- a. 40-60kg
- b. 61-80kg

8. Body Mass Index

- a. Under weight (<18)
- b. Normal (18-24 kg/wt)
- c. Pre Obese (25-29kg/wt)
- d. Obese (≥ 30 kg/wt)

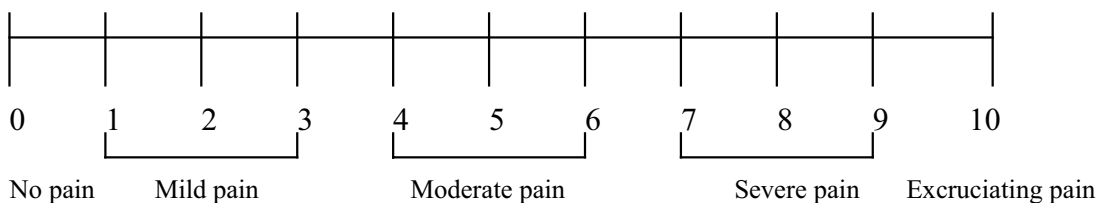
APPENDIX – G

NUMERICAL PAIN RATING SCALE (ENGLISH)

It consisted of numerical pain rating scale. The 0 to 10 pain scale is commonly and successfully used with hospitalized and nursing home patients. This scale asks the person with pain to assign a number from 0 to 10 according to the severity of their pain.

The pain score obtained will interpret as follows.

0 – 10 Numerical Rating Scale



INTERPRETATION:

0	-	No pain
1-3	-	Mild pain
4-6	-	Moderate
7-9	-	Severe to very severe pain
10	-	Excruciating pain

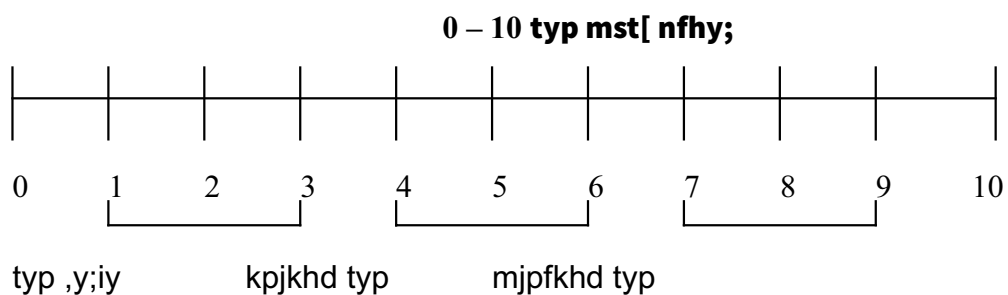
In this scale “0” means no pain & “10” means excruciating pain.

APPENDIX – H

NUMERICAL PAIN RATING SCALE (TAMIL)

It consisted of numerical pain rating scale. The 0 to 10 pain scale is commonly and successfully used with hospitalized and nursing home patients. This scale asks the person with pain to assign a number from 0 to 10 according to the severity of their pain.

The pain score obtained will interpret as follows.



INTERPRETATION:

- 0 - No pain
- 1-3 - Mild pain
- 4-6 - Moderate
- 7-9 - Severe to very severe pain
- 10 - Excruciating pain

In this scale “0” means no pain & “10” means excruciating pain.

APPENDIX – I

HELPER SKIN TAP TECHNIQUE INTERVENTION

Definition:

Helper skin tap technique refers to rhythmic skin tapping. It was given to the injection site for 5 seconds before and after administration of IM injection of inj. Tramadol 50mg.

Aim:

1. To reduce intensity of the pain
2. To relieve discomfort

Articles Required:

- a. A sterile injection tray with disposable syringe with appropriate size needle.
- b. Antiseptic solution
- c. A sterile cotton balls
- d. 23 gauze sterile needle to withdraw to the medicine.
- e. Bottle with pick up clamp [sterile]
- f. Syringe stand
- g. Small k basin
- h. Medicine card

Steps in Procedure:

- a. Check the medicine card with doctor, order for patient name, dry dose and route of administration

- b. Determine the site of **ventro gluteal site**, place the palm of your hand over the greater trochanter ,with your fingers facing the patient's head. The right hand is used for the patient 's left hip, or the left hand for the right hip,to identify landmarks. Place the index finger on the anterosuperior iliac spine and extend the middle finger dorsally. Palpating the iliac crest.A triangleis formed ,and the injection is given in the center of triangle.
- c. Tap the skin several time approx 3 sec
- d. Prepare site with alcohol swab
- e. Uncap the Syringe in the dominant hand
- f. Make a large "v" with the thumb and index finger of the dominant hand
- g. The entire hand is used to tap the muscles
- h. Simultaneously insert the needle at 90 degree angle into the muscle
- i. After aspirating, inject the medication slowly while continuing tap to the muscle
- j. Remove the needle while simultaneously tapping the skin again using the v tap
- k. The taps (not slap) must be firm using entire hand to stimulation of the large muscle.