EFFECTIVENESS OF ICHTHAMMOL GLYCERIN DRESSING AND HIRUDOID OINTMENT ON INFILTRATION AND PHLEBITIS AMONG PATIENTS WITH INTRAVENOUS INFUSION IN THE SELECTED WARDS OF GOVERNMENT RAJAJI HOSPITAL, MADURAI.

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EFFECTIVENESS OF ICHTHAMMOL GLYCERIN DRESSING AND HIRUDOID OINTMENT ON INFILTRATION AND PHLEBITIS AMONG PATIENTS WITH INTRAVENOUS INFUSION IN THE SELECTED WARDS OF GOVERNMENT RAJAJI HOSPITAL, MADURAI.

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ABSTRACT

The study on “effectiveness of ichthammol glycerin dressing and Hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai.

Objectives: Assess the effect of ichthammol glycerin dressing and Hirudoid ointment on intravenous infiltration and phlebitis among patients with intravenous infusion.To compare the effect of ichthammol glycerin dressing and Hirudoid ointment on intravenous Infiltration and phlebitis**. Conceptual Frame work**: The study was based on Imogene King’s open system model (1981). **Design:** Experimental approach and comparative experimental design as adopted for this study. **Setting**: The study was conducted in selected wards in Govt. Rajaji Hospital, Madurai**. Sample Size:** The sample size was 60 patients of both sexes.**Sampling Technique**: The probability simple random sampling by lottery method was used to assign the subjects. **Intervention:** Application of ichthammol glycerin dressing and hirudoid ointment. **Data collection Procedure**: The Visual Infusion Phlebitis score and Infiltration scale was used to assess the patients with intravenous infiltration and phlebitis. The data collected were tabulated and analyzed by descriptive and inferential statistics. .**Results**: The findings of the study revealed that the pre test and post test phlebitis score in Hirudoid ointment application and Ichthammol Glycerin dressing is significance (t-3.72,P-0.001,DF-58). But the reduction of infiltration symptoms in Hirudoid Ointment application was 90.80% to 13.00%, whereas Itchthammol Glycerin dressing was 93.30% to 29.30%. The study shows that there was significant reduction in intravenous infiltration and phlebitis after application of Hirudoid ointment and ichthammol glycerin dressing. But comparing to these two intervention hirudoid ointment is more effective than ichthammol glycerin.**Conclusion**: The Researcher was found thatthe hirudoid ointment application is effective in intravenous infiltration and phlebitis comparing to ichthammol glycerin, but it needs more nursing practice and supervision to improve the quality of care.

CHAPTER – I

INTRODUCTION

"Take Care of Your body; it is the only place you have live"

An Intravenous infusion is the introduction of large amount of solution into the vein directly to increase the volume of blood in the circulation, to supply blood constituents and to administer medicines. It is a critical element in the treatment of patients. One out of eight persons are getting intravenous therapy (Yatin B & Thakore, 2000.)

Common intravenous sites are,

1. Dorsal surface of the hand (Superficial dorsal veins, Basilic vein, Cephalic vein)
2. Inner Arm: (Cephalic vein, Basilic vein, Median Cubital vein, Median vein of forearm and Radial vein).
3. Dorsal surface of the foot: (Great saphenous vein, dorsal plexus).
4. For children; Jugular, Femoral and Popliteal veins.

Common complications of intravenous therapy are infiltration, phlebitis, and fluid over load, infection at the needle site, injury to the vein, pulmonary edema, air embolism, pyogenic reactions, nerve damage etc.

Prevention of intravenous complications can be reduced by four interventions as follows:

1. The Nurse used hand-washing techniques to remove microorganisms before applying gloves for the venipuncture procedure (Tomford & Hershey, 1996).
2. The Nurse changes "Kept Open" Intravenous solution at least every two hours. (Potter & Perry).
3. The Nurse should replace all peripheral venous catheters, including heparin locks, at least 24 hours (CDC 1997).
4. The Nurse must maintain sterility of the intravenous system when changing tubing, solutions and dressings (Axnick & Yarbrough, 1990).

Intravenous infiltration is a serious problem associated with infusion therapy. It is usually accompanied by pain, erythema, and swelling at the needle insertion site. Severe infiltration may lead to necrosis requiring skin debridement, skin grafting, and/or amputation. Early detection of infiltration prevents the occurrence of serious incidents. This occurs when the catheter unintentionally enters the tissue surrounding the blood vessel. In this case the IV fluid and associated medications will go into the tissues and there will be a lump where the IV has been inserted. It would be cool to touch (this differentiates it from inflammation due to infection, which is warm to the touch). Early recognition of the infiltration can prevent unnecessary discomfort. When infiltration has taken place, stop the infusion immediately, raise the extremity, apply warm towel over the site of infusion. Which increases the circulation and reduces the pain and edema? Restart the infusion at another site (Potter& Perry-2001).

Phlebitis is the inflammation of the vein. It is a common complication associated with the use of intravenous infusion, affecting between 27% and 70% of all patients receiving intravenous therapy (Denise& Macklin, 2003).

Phlebitis: Inflammation of a vein. With phlebitis there is infiltration of the walls of the vein and, usually, the formation of a clot (thrombus) in the vein (thrombophlebitis). Phlebitis in a leg, for example, will cause the leg to swell with edema fluid and feel stiff and painful.(Medical Dictionary,2011).

Phlebitis symptoms include pain, edema, erythema, which usually appears as a red streak along “the vein, thrombus formation and “cording” of the vein. Factors that increase a patients risk of developing phlebitis include increasing age (risk rises with age, beginning at age 10), female sex, malnutrition, larger catheter gauge, catheter insertion sites such as those in areas of flexion, over bony prominences, restraints, and drugs. Slow solution rates have greater potential to irritate the vein wall than faster rates. Other factors that influence risk include the number of catheter insertions, the frequency of tubing changes, and whether proper aseptic technique is used or not.

The management of intravenous complication is according to the severity of complication. The common management for infiltration and phlebitis are ice application, warm application, heparin ointment or gel moist heat application, antiseptic cream, anti-inflammatory cream, analgesics and antibiotics.

Ichthammol Glycerin (Ammonium Ichthosalphonate) belongs to a class of preparations containing constituent salts or compounds of a mixture of acids sulphate, and designated by the group name sulphoicthyolic acid. This is formed by the sulphonation of the oil obtained in the destructive distillation of certain Bituminous schists.

Ichthammol is blackish –brown liquid, viscous in nature with a strong characteristic aromaticodour. Ichthammol is soluble at 20^0C in parts of glycerin, soluble in water, partly soluble in alcohol.Actions of ichthammol glycerine are bacteriostatic, antiseptic, antiparasitic, demulacent, emollient and analgesic (Bentley, 1988). It is also used in reducing the inflammation, lymphadenitis and thrombophlebitis. According to the "Merck Index (2003)" of chemical and drugs, ichthammol has been used in the treatment of chronic skin diseases in the form of ointment and creams. It has been administered internally by mouth as an expectorant and intestinal antiseptic, but it caused irritation to gastric mucosa.

Hirudoid is a substance similar to heparin. It acts by dissolving blood clots and improving the blood supply to the skin. It can be used as a cream to reduce bruising to the skin.Each gram contains mucopolysaccharide polysulfuric acid ester 3 mgActive ingredient of Hirudoid is MPS. MPS stands for mucopolysaccharide and the MPS in Hirudoid is similar to the bodys naturally occurring mucopolysaccharides. The healing tendency of the skin relies on the presence of MPS in the tissue. The effectiveness of any skin cream depends on its absorption and scientific studies have shown that the MPS in Hirudoid penetrates the skin and is able to reach the dermal layers in effective concentrations, thats why Hirudoid is used for healing agent for decades.

MPS accelerates healing in the following way:

- Improves blood flow to the area.
- Promotes tissue regeneration by increasing collagen and elastin fibres in the connective tissue matrix.
- Improves moisturising capacity of the skin by increasing the hyaluronic acid content.
- Accelerates the absorption of bruises.
- Reduces swelling and inflammation.
- Impressive success in the treatment of scars.
- Anti-inflammatory effect on veins.
- Dissolves bruises up to 50% faster.
- Reduces the healing time of sprains.

Today in any hospital intravenous therapy is a routine nursing task, though it is not free of potential hazards to patient. It has become a major component of patient care. In hospital practice intravascular lines are used for purposes varying from monitoring pressures, administering drugs and fluids. The Infusion Nurses Society National standards of practice stated that a nurse who administers IV medication or fluid must know its adverse effects and appropriate interventions to be taken before starting the infusion.

1.1 NEED FOR STUDY

My interest in intravenous therapy began during my student nurse days. I completed my nursing training at a very large hospital in South (Government Rajai Medical college Hospital, Madurai.) in 1991-1994. During our training we learnt about intravenous therapy, venepuncture and cannulation, working alongside the doctors and anaesthetistsAs students we would watch the doctors, Nursing Tutors and then they would teach us how to carry out the procedures. We were fully aware of our limitations and the fact that we had to practice under the standing orders.

About 25 million patients have intravenous catheters placed each year. Intravenous catheters (or IVs) are a very important part of medical treatment for acute illnesses, cancer, surgery, anesthesia, and trauma, allowing medications to reach as quickly and effectively as possible, via the bloodstream, the parts of the body where they work.

Infusion therapy is now an integral part ofprofessional practice for the majority of nurses. Nursing involvement ranges from caring for anindividual with a peripheral cannula *in situ*, tonursing a patient with multiple parenteral andhaemodynamic therapies in the critical careenvironment. Whatever the route, peripheral orcentral, infusion therapy is not without risk. Infusion nursing is notlimited just to the care of the patient and the device.Increasingly nurses are responsible for the insertionand removal of the device and are also oftenresponsible for procurement of the consumablesassociated with infusion therapy. Consequently, therange and depth of professional involvement relatedto infusion therapy will depend on the extent of anindividual nurse's commitment.(Gabriel*et al*., 2005; Scales, 2008).

The Infusion Nurses Society's national standards of practice require that a nurse who administers IV medication or fluid know its adverse effects and appropriate interventions to take before starting the infusion. A serious complication is the inadvertent administration of a solution or medication into the tissue surrounding the IV catheter--when it is a nonvesicant solution or medication, it is called infiltration; when it is a vesicant medication, it is called extravasations. Both infiltration and extravasations can have serious consequences: the patient may need surgical intervention resulting in large scars, experience limitation of function, or even require amputation. Another long-term effect is complex regional pain syndrome, a neurologic syndrome that requires long-term pain management. These outcomes can be prevented by using appropriate nursing interventions during IV catheter insertion and early recognition and intervention upon the first signs and symptoms of infiltration and extravasations. Nursing interventions include early recognition, prevention, and treatment (including the controversial use of antidotes, and heat and cold therapy). Steps to manage infiltration and extravasations are presented. (Am J Nurs. 2007 Oct).

According to Wilkinson (1996) between seventy and ninety per cent of all patients admitted to hospital will receive some form of intravenous therapy during their hospital stay. This means that these patients will be cared for by nurses, who will need to have the IV related education in order to care for them. During the time of intravenous infusion, most of the patients are having intravenous infusion complications like infiltration, thrombophlebitis, and extravasations, hematoma, and air embolisms. The infiltration and thrombophlebitis is the frequent and main complications of the intravenous infusion.(Davies (1997), Josephson (1999), Walker et al., (2006)).

The NMC's Code (2008) clearly states that individual nurses have a responsibility to deliver evidence-based care. Patients have the right to receive a uniformly high standard of care, regardless of who they are and where they are treated (DH, 2000b). The protection, implementation, audit and regular updating ofclinical standards to reflect the latest research findings will ensure that all patients can benefit from safe and appropriate care.The importance of using effective infection control measures is integral to all aspects of infusion therapy. Aseptic technique is a common term used to define necessary infection control measures to prevent pathogenic micro-organisms on hands, surfaces or equipment from being introduced to susceptible sites such as IV devices during clinical practice. A best practice example is aseptic non-touch technique components including reducing environmental risks, hand cleansing, non-touch technique protection for 'key parts', correct cleaning of 'key parts', use of gloves and sterile fields (Rowley & Laird, 2006).

A peripheral intravenous catheter (PIC) is a thin tube that is inserted via a cannula into a vein, usually in the hand or arm. PIC insertion is a common procedure used in health care to administer fluids, nutrients, blood products, and medications to patients. A complication related to the use of PIC is the development of thrombophlebitis, ie, a concurrent inflammation and blood clot in a peripheral vein. A positive correlation has been found between the indwelling time of a catheter and the risk for developing thrombophlebitis. Hence, one hypothesis is that thrombophlebitis rates can be reduced if catheters are replaced at regular intervals. The target group for this method includes all patients in need of peripheral intravenous catheters.(Sofia Tranæus, (2005).

While determining the site of cannula placement, several factors shouldbe assessed (Pearson 1996). These include patient-specific factor(e.g., pre-existing cannulas, anatomic deformity, bleeding diathesis),relative risk of mechanical complications (e.g., bleeding, pneumothorax)and risk of infection. reported that cannulasinserted into the veins of the hand have a lower risk of phlebitis thanthose inserted on the upper arm or into the veins on the wrist. Use an upper extremity site in preference to one on a lower extremityfor cannula insertion. Transfer a cannula inserted in a lower extremitysite to an upper extremity site as soon as the latter is available. (Maki (1992).

The most commonly used IV device is the short peripheral venous cannula which is mainly used in the forearm and hands. Due to its relatively short duration of use, it is rarely associated with BSI (Gantz et al 1984; Maki and Ringer 1991; Ena et al 1992).

Phlebitis is the most important complication associated with peripheral venous cannulas, and is largely a physiochemical or mechanical, rather than an infectious, phenomenon. Risk factors for the development of phlebitis include type of infusate, cannula material, size, and host factors. When phlebitis does occur, the risk of local cannula-related infection may also increase (Gantz et al 1984; Larson and Hargiss 1984; Hoffman et al 1988).

The clinical Nurse should follow the all aseptic technique applied during intravenous infusion therapy. But some of the factors like prolonged intravenous infusion, site of cannulation, frequent manipulation of devices, patient's handling etc, it leads to develop a intravenous complications. The complications of the intravenous infusion is not treated earlier it becomes leads to a severe complications.

Ichthammol has slight bacteriostatic properties and is used in a wide range of topical preparations, for a variety of skin disorders; it has also been used in suppositories for anorectal disorders. Ichthammol is often used with zinc oxide in medicated bandages for chronic lichenified eczema. Ichthammol may be slightly irritant to the skin and there have been rare reports of hypersensitivity.

Hirudoid ointment- The healing process. To understand the process of healing, we need to have a basic understanding of the way skin functions. The skin has three major layers: the epidermis, the dermis, and the sub cutis.

The top layer of the epidermis is actually dead skin. Every few days this layer is sloughed off and is replaced by new cells. New cells are produced at the bottom layer of the epidermis. As they grow they push other cells upward to the surface where they become flattened and lose most of their water content. The dermis is a upper layer of connective tissue matrix which make up 90% of the skins thickness. This matrix consists of ground substance composed of acid mucopolysaccharides and other proteins. Running through this dense meshwork are fibres made up of collagen and elastin. Collagen fibres give skin its strength and elastin fibres maintain the skins elasticity. With age, the collagen begins to deteriorate causing the skin to become thinner and sac and the elastic breaks down causing wrinkling. The connective tissue matrix also contains specialized cells such as hyaluronic acid which hold water in the skin. These cells are the skins true moisturizers. The acid mucopolysaccharides play an important role in the tissue regeneration of the skin as they have a stimulating effect on the connective tissue cells.(DiNisio M, Wichers IM, Middeldorp S (2010) pharmacy express.co.in).

The researcher wanted to identify whether hirudoid ointment is more effective than ichthammol glycerin dressing. It help to decrease edema, pain, and discomfort caused by phlebitis the researcher selected two interventions, ie. Ichthammol glycerin dressing and hirudoid ointment application. The researcher felt the need to study this area because intravenous therapy is a common procedure, having encountered number of phlebitis cases during her work as a staff nurse, and was interested to identify an effective intervention in reducing the discomfort caused by the phlebitis. The aim of the investigator is to compare the effect of each intervention, and to find out the most effective intervention for the management of phlebitis.

Neither ichthammol glycerin, nor Hirudoid ointment shows any allergic or other adverse reactions. No special precaution is needed to use this application.With this background, the researcher intended to study the effect of ichthammol glycerine and hiurdoid ointment on intravenous infiltration and phlebitis in selected wards of Govt. Rajaji Hosipital, Madurai.

1.2 STATEMENT OF THE PROBLEM

Effectiveness of ichthammol glycerin dressing and Hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai.

1.3 OBJECTIVES

1. To assess intravenous infiltration and phlebitis among patients with intravenous infusion.
2. To assess the effect of ichthammol glycerin dressing on intravenous infiltration and phlebitis among patient with intravenous infusion.
3. To assess the effect of Hirudoid ointment on intravenous infiltration and phlebitis among patient with intravenous infusion.
4. To compare the effect of ichthammol glycerin dressing and Hirudoid ointment on intravenous Infiltration and phlebitis.
5. To evaluate the response of the clients with intravenous infiltration and phlebitis to ichthammol glycerin dressing and hirudoid ointment application.

1.4 HYPOTHESES

1. There will be significant difference between the mean pre and post assessment score on Ichthammol Glycerine dressing on patients with intravenous infiltration and phelebitis.

2. There will be significant difference between the mean pre and post assessment score on Hirudoid ointment application on patient with intravenous infiltration and phelebitis.
3. The mean post assessment score of patients with Hirudoid ointment application will be lower than the mean post assessment score of the patients with ichthammol glycerine dressing on intravenous infiltration and phlebitis.

1.5 OPERATIONAL DEFINITIONS

Intravenous Infusion

In this study it refers to, introduction of a large amount of fluid into the body via veins.

Infiltration

In this study it refers to, the passage or escape of fluids or drugs into the tissue, occurring when a cannula is dislodged from a vein or leakage between the cannula and the wall of the vein. It will recognized by pain, erythema, and swelling at the needle insertion.

Phlebitis

In this study it refers to, the inflammation of the vein wall. It is recognized as a warm, red area surrounding the insertion site. The vein above and below the insertion site may be cord – like, sore and very tender to touch.

Ichthammol

In this study it refers to, it has bacteriostatic, antiseptic, analgesic actions it is soluble at 20^0 C in a part of glycerin. It is the moist heat application.

Hirudoid

It refers to application of Hirudoid ointment (containing heparin) by gentle massage, three times a day at the site of superficial thrombophlebitis and intravenous infiltration.

Selected wards:

In this study it refers to, the patients form the pre and post operative surgical wards in Govt,Rajaji Hospital, Madurai.

1.6 ASSUMPTIONS

"Infiltration and phlebitis is commonly occurred among patients receiving intravenous infusion and application of Hirudoid ointment and ichthammol glycerin dressing will reduce it".

1.7 DELIMITATIONS

This study is delimited to -

a. A period of four weeks
b. The clients who are in the pre and post-operative wards with intravenous infusion after general surgeries.
c. Clients between the age group of 20-60 years.

CHAPTER – II

REVIEW OF LITERATURE

This chapter deals with the selected studies, which are related to the objectives of the proposed study. A review of research and non-research literature relevant to the study was undertaken, which helped the investigator to develop deeper insight into the problem and gain information on what has been done in the past.

A review of related research and theory on a topic has become a standard and virtually essential activity of scientific research projects. The primary purpose of reviewing relevant literature is to give broad background knowledge and understanding of the information that is available related to the researcher's problem of interest (Polit & Hungler,1999).

According to Polit and Hungler (1999) researcher almost never conduct a study in an intellectual vacuum, their studies are undertaken within the context of an existing base of knowledge. Researchers generally undertake a literature review to familiarize them about the topic under study.

Research and non-research literature were reviewed and organized under the following heading.

2.1 Literature and studies related to the phlebitis

2.2 Literature and studies related to infiltration.

2.3 Literature and studies related to ichthammol glycerin.

2.4 Literature and studies related to Hirudoid ointment.

2.1 Literature and Studies related to the Phlebitis.

Gaukroger PB., et.,al.,(2009). Conducted a prospective study of the incidence and severity of infusion thrombophlebitis in peripheral intravenous infusions used for anaesthetic and postoperative purposes in 645 patients over a four-month period. Conditions of insertion were carefully controlled while ward management was according to standard practice. A total of 330 polyurethane Vialon and 315 FEP-A Teflon cannulae were used. The results show that the nature of the cannula was the single most important factor in the incidence and severity of infusion thrombophlebitis, Vialon cannulae being associated with a 46% lower incidence than the Teflon type. Less important but significant factors included intravenous antibiotics, duration of infusion, cannula tip damage and caesarean section. Factors not associated with infusion thrombophlebitis included potassium therapy, blood transfusion or site of insertion in the upper limb. The author foundout that and recommended it,Heparinisation increased duration of infusion without affecting the incidence of infusion thrombophlebitis.

Jency Joseph. (2008). Conducted study to compare the effectiveness of selected nursing interventions on patients with phlebitis related to peripheral intravenous infusion in selected hospitals at mangalore. In this study, populations were adults of age 18-45 years, as measured by phlebitis measurement scale, erythema observation checklist and sample size was 45 samples, 15 for each selected intervention. Applications of hot fomentation three times a day, warm ichthammol glycerine magnesium sulphate once a day and thrombophob application once a day. The researcher concluded that the thrombophob application was significantly more effective than Ichthammol glycerin and Hot fomentation (p-0.001).

Zamanzadeh. V et all.,(2008). Conducted a study on Comparison of the Effect of Chlorhexidine Gluconate 2%,Ichthammol glycerin70% and Povidone-Iodine10% in Prevention of Phlebitis. A quasi-experimental study was done on hospitalised patients in Tabriz Imam Khomeini hospital at internal units, collectively 90 patients were studied in chlorhexidine gluconate 2%, ichthammol glycerin 70%, and Betadine10%. Samples were

selected through available sampling and divided into 3 groups randomly. This research showed that incidence of phlebitis in Chlorhexidine group was 36.7%; in ichthammol glycerin group was 53.3% and in Betadine group was 46.7%. There were no significant differences between groups ($P > 0.05$). There were no significant differences between using of three solutions on prevention of phlebitis, but incidence and signs and symptoms of phlebitis in chlorhexidine group was lower than ichthammol glycerin and Betadine groups.

Ahlquist (2006),conducted a cross section survey to evaluating the outcome of implemented evidenced based clinical guidelines for frequency of thrombophlebitis, nurses care, handling and documentation of peripheral intravenous cannulae. A structured observational protocol was used to review the frequency of thrombophlebitis, the nurses care, handling and the documentation of intravenous cannulae in the patients record. 107 and 99 cannulae respectively were observed before and after the implementation of the guidelines. The finding of this study revealed that the sign of thrombophlebitis increased by 21% ($P < 0.01$) and the use of cannula size 0.80 mm increased by 22% ($P< 0.001$). Nurses' documentation of peripheral intravenous cannula improved significantly ($P < 0.001$). This study conclude that implementation of the guidelines resulted in significant improvement by means of decrease frequency of signs of thrombophlebitis, increased application of smaller cannula size (0.80 mm) as well as of the nurses documentation in the patients record.

Lanbeck Peter (2004),conducted a descriptive study to analyze the perception of risk factors for infusion phlebitis among Swedish nurses. Questionnaire was developed to assess the perception of nurses. The finding revealed that a majority of the nurses believed that insertion of a peripheral venous catheter in the forearm and catheter rotation within 48 hours was protective.

Biswas. D, (2005) conducted a study on effectiveness of hot fomentation, glycerin magnesium sulphate application and ichthammol magnesium sulphate on intravenous phlebitis among 30 samples in each intervention. The study reveals through phlebitis measurement chart, observational checklist and visual analogue scale. The researcher found that among 4 modalities of management of phlebitis, ichthammol belladonna along with hot fomentation was more effective in reducing pain, erythema, swelling, indurations, palpable venous cord at $p<0.01$ as compared to ichthammol belladonna dressing, glycerin magnesium sulphate dressing with hot fomentation. The pre-test mean score of pain related to peripheral intravenous infusion were 71.13 and post-test mean pain score 23.17 in treatment with ichthammol belladonna dressing with hot fomentation.

2.2 Literature and studies related to Infiltration

Pyakurel Bhatta M.(2011).The researcher conducted **a**comparative study was conducted in Pune on effectiveness of hot fomentation versus cold compress for reducing intravenous infiltration. The sample size was sixty patients (30 for hot fomentation and 30 for cold compress) with mild to moderate degree of infiltration stayed in hospital for 8-14 days and data was analyzed using descriptive and inferential statistics. Findings prove that the pre-treatment mean score was 7.1667 reduced to 0.7071 on the third day of treatment with hot fomentation. In cold compress pre-treatment mean score 6.9333 reduced to 0.70571. The research concluded that both hot fomentation and cold compress are effective in treatment of intravenous therapy related infiltration.

Anjum. S, (2010). Conducted a study on hot fomentation versus cold compress, to reveal that the pre-treatment mean score of degree of infiltration was 7.1667 and it was decreased to 0.7071 on the third day of treatment with hot fomentation. In cold compress group, pre-treatment mean score of degree of infiltration was reduced from 6.9333 to 0.7571 on the third day of cold compress treatment. The intensity of pain was reduced from severe (56.66%) to no pain (93.4%) in hot fomentation group. In cold compress group, the intensity of pain was reduced from moderate (60.0%) to no pain (86.6%). The mean score of hot fomentation group was 6.5067 in reducing the degree of infiltration while cold compress the mean score was 6.6. The study concluded that hot fomentation was slightly better than that of cold compress.

MC Mahon M.J. (1998),conducted a study on effectiveness of ice packs versus thrombophob gel for reducing iv infiltration in patients admitted in pediatric wards. The study was conducted on 40 samples (20 for thrombophob gel group and 20 for ice cube group) selected using purposive sampling technique. The infiltration was assessed by using modified infiltration scale. The results showed that before the treatment, majority (65%) of patients had grade two infiltrations after the treatment with thrombophob and 100% of patient's infiltration had reduced to grade one infiltration. In group two majorities (80%) had grade two infiltrations after the treatment with ice cube 100% had grade one infiltration. The researcher concluded that both thrombophob gel and ice pack are effective in reducing intravenous infiltration among pediatric patients.

James JJ. (1991) conducted Experimental study to assess the effectiveness of ice application and ichthammol glycerin application on intravenous infiltration among 80 samples. Application of ichthammol glycerin and ice was three times a day up to three days. The method of data collection is quasi experimental, purposive sampling techniques was followed.This research showed that incidence ofinfiltration in ice application group was 36.7%; in ichthammol glycerin group was 53.3%. There were no significant differences between groups ($P > 0.05$). The researcher conclued that ice application and icthammol glycerine application on the infiltration site was more effective and enhances comfort to the patients. Cooling effect will act as vasoconstrictor. It will reduce the pain and swelling markely.

2.3 Literature and Studies related to Ichthammol Glycerin

Adhikari,P.,et.al.,(2011): conducted a study to assess the effectiveness of steroid antibiotic packing and Ichthammol glycerin packs on otitis externa patients in TU Teaching Hospital, Kathamandu. The study showed that the prospective quasi-randomized clinical trial was completely carried out in 65 patients at Department of ENT and Head and Neck Surgery, The study find out, there were 33 patients in IG pack group and 32 patients in steroid antibiotic group. In less than 4 years, there were 30 children and in more than 4 years children, there were 35 children. There was statistical significant decrease in

number of visits in steroid group in both children less than and more than 4 years. There was also significantly less pain in children with steroid antibiotic group. The author concluded, Use of steroid antibiotic pack in children presenting with acute otitis externa causes earlier relief of pain as well as significantly lesser number of visits. Thus, steroid antibiotic pack is better than 10% ichthammol glycerin packs in relieving pain in acute otitis externa in children.

Bhandari S,(2010).Conducteda study on effectiveness of nursing interventions (ichthammol glycerin, thrombophob, hot fomentation) on patients with phlebitis related to peripheral intravenous infusion in Mangalore. The sample consists of 45 subjects and three treatments were administered to 15 patients for three days two times a day. The collected data were analysed by using ANOVA and t test. The researcher concluded that treatment with warm ichthammol glycerine dressing was most effective,pre treatment score 7.67 reduce to 1.47 on the third post treatment day with warm ichthammol glycerin.

Masood,A.et.al., (2007):conducted astudy to assess the effectiveness of glycerine ichthammol and Triadcortyl amomg 64 ottits externa patients.A prospective single-blind randomized controlled trial was performed to compare the efficacy of 10% glycerine-ichthammol (GI) solution and Triadcortyl (TAC) ointment, both applied as ear canal dressings, in the initial management of severe acute otitis externa. Although there was a statistically significant improvement of pain parameters in the TAC group, the researcher found no significant differences in clinical findings between the two groups. The author recommended that Glycerin itchthammol dressing can be used instead of an antibiotic dressing as an initial treatment of severe acute otitis externa on thebasis of cost, avoidance of resistance and toxicity.

Panesar.J., (2008)**.** Conducted a study on effectiveness of four modalities (hot fomentation, glycerin magnesium sulphate application, ichthamol magnesium sulphate and ichthamol belladonna) among IV infiltration patients in west Bengal. The study reveals through phlebitis measurement chart, observation checklist and visual analogue scale The pre test mean pain score related to peripheral IV infiltration were 61.23 and

post test mean pain scores were 13.27 in treatment with ichthamol belladonna dressing with hot fomentation which was found to be most effective out of all the 4 interventions. Thus, the researche study showed that ichthamol belladonna dressing with fomentation was effective.

Yucha C.B, (1998)conducted an interventional study On 'Effect of elevation, warmth and cold on phlebitis'. Nursing interventions used to treat intravenous Phlebitis generally include application of warmth or cold, elevation, and no treatment at Monarh University. Thestudy showed that Elevation had no effect on pain, surface area of indurations, or volume of infiltrate remaining as quantified by magnetic resonance imaging. A comparison of the effect of warmth versus cold on Phlebitis shows that warmth is better than cold in decreasing the symptoms or speeding re-absorption of the infiltrateIchthammol is reddish- brown to brownish black viscous fluid with a stronger characteristicodor. It is a neutralization product of ammonia it yields not less than 10% of total sulfur and not less than 2.5% of ammonia. It has bacteriostatic and anti-inflammatory properties and is used in a wide range for a variety of skin disorders.

Nilssen E, Wormald PJ, Oliver S(1996) conducted a study on Glycerol and ichthammol (G & I), used for its anti-bacterial properties among 60 patients. The aim of this paper was to ascertain what antibacterial activity G & I had. All ear swabs from 1992-1994 in our unit were reviewed to ascertain the prevalence of the commonly isolated organisms. Fresh isolates of the organisms were collected from the ear swabs and plated with wells of glycerol, ichthammol alone was significantly more effective than G & I ($p < 0.001$). There was no significant activity against Proteus mirabalis and Pseudomonas aeruginosa. The therapeutic benefit of G & I is due in part to the inherent anti-bacterial activity of ichthammol against the Gram positive organisms as well as its anti-inflammatory action and the dehydrating effect of the glycerol.

2.4 Literature and Studies related to Hirudoid Ointment

Wei XL, Feng R., Zhao, ZQ., Jing. ZP.,(2011).conducted a study on efficacy of Chinese herbal medicine Mailuo shutong granule and Hirudoid cream for chronic venous disorder induced pigmentation in lower extremities among 108 patients in shanghai Changhai Hospital.. The study objectives was to evaluate the clinical efficacy of Mailuo Shutong Granule, a compound traditional Chinese herbal medicine, and Hirudoid cream (heparinoid), in treatment of patients with dermal hyperpigmentation of skin caused by CVD. The study found out Thirty-three cases in the Mailuo Shutong group, 34 cases in the Hirudoid group and 31 cases in the combined therapy group were included for analysis. After treatment, area of pigmentation decreased and average gray value of pigmentation declined in all the 3 groups ($P<0.05$). The reductions of area and average gray value in the combined therapy group were more significant than those in the Mailuo Shutong group and Hirudoid group ($P<0.05$). There were no differences in improvement of pigmentation between the Mailuo Shutong group and Hirudoid group ($P>0.05$). The Researcher concluded that, these data suggest that both Mailuo Shutong Granule and Hirudoid cream can improve CVD-induced hyperpigmentation, and combined treatment of the two drugs results in better clinical efficacy.

Marcello Di Nisio, Iris M Wichers, Saskia Middeldorp (2010)to assess the efficacy and safety of topical, medical, and surgical treatments in patients presenting with ST of the legs.Twenty-four studies involving 2469 participants with ST of the legs were included in this review. The methodological quality of mostof the trials was poor. Treatment ranged from low molecular weight heparin (LMWH), to non-steroidal anti-inflammatory agents(NSAIDs), topical treatment, surgery, oral, intramuscular, and intravenous treatments. Both LMWHandNSAIDs significantly reducedthe incidence of ST extension or recurrences by about 70% compared with placebo and both seemed to have a similar efficacy andsafety.Overall, topical treatments improved local symptoms. The author recommended Low molecular weight heparin and NSAIDs appear as the current best therapeutic options for ST of the legs. While the available dataare too limited tomake clear recommendations, an intermediate dose of LMWHfor at least month might be advised. Further researchis needed to assess the role of NSAIDs and LMWH, the

optimal doses and duration of treatment, and whether a combination therapymay be more effective than single treatment. Adequately designed and conducted studies are required to clarify the role of topical andsurgical treatments.

Berrazueta, J.R.,et.al.,(2009). Conducted a study on, the inflammatory and analgesic action of glyceryltrinitgrate and heparinoid cream among 40 patients with infusion related thrombophlebits. Twenty-two patients were included in the glyceryltrinitrate (GTN) ointment group and 18 patients in the control heparinoid group. Pain was assessed by an analogue scale. At 48 hours the analgesic index was 84.6 +/- 18 units with GTN and 49 +/- 45 units with heparinoid ointment ($P < 0.01$). Faster relief of oedema was also observed in the GTN-treated group. The researcher found out, All signs of thrombophlebitis were relieved in less than 4 days in the GTN group compared with 9 days in the controls ($P < 0.005$). The researcher concluded that transdermal GTN is useful therapy for infusion-related thrombophlebitis showing evidence of anti-inflammatory and analgesic effect.

Ababtigoban., (2008).Conducted a study to compare the effectiveness of selected Nursing interventions on patients with phlebitis related to peripheral intravenous infusionin selected hospital at mangalore. The study was quasi experimental, three group pre-test, post-test design. Samples are purposive sampling technique based on erythema observation checklist, phlebitis measurement scale and visual analog scale. Maximum samples are 45, 15 for each selected intervention with simple hot formentation for 20 minutes three times a day. The study results were ichthammol glycerin and thrombophob ointment was significantly more effective than ($P<0.001$) hot water fermentation. The researcher concluded thrombophob gel and ichthammol glycerin is more effective in treatment of intravenous phlebitis than hot water fomentation.

Vecchio, Cesare; Frisinghelli, Anna(2008)Effective treatment of peripheral vascular disorders is important not only for resolution of local symptoms but also for preventing the development of systemic conditions such as deep vein thrombosis. A total of 1055 patients participated in a total of 20 studies that compared topical heparin

formulations with placebo, no treatment, and subcutaneous heparin or with each other in the treatment of superficial thrombophlebitis or venous insufficiency. Heparin gel 1000 IU/g (Lioton 1000 gel, Menaven 1000 gel) was more effective than placebo in reducing the signs and symptoms of superficial thrombophlebitis. Liposomal heparin gel 2400 IU/g (LipoHep Forte) was as effective as subcutaneous low-molecular-weight heparin at relieving local symptoms of superficial venous thrombosis. In head-to-head studies comparing different topical heparin formulations, all preparations appeared effective but heparin gel 1000 IU/g was superior to a heparinoid mucopolysaccharide cream (Hirudoid) in patients with vascular disorders in terms of resolving spontaneous pain, induced pain, oedema and heaviness in the limb.

YANG Xiao-min,HUANG . et all.,(2007)conducted a study on effect of self-prescribed compound Danshen hirudoid ointment in the prevention of complications included by internal arteriovenous fistula in patients undergoing maintenance hemodialysis (MHD) among 60 patients in china.. In this study reveals that complications as embolism,stricture,aneurysm and vascular sclerosis,there were significant differences between the two groups(P0.05).The research found that Compound Danshen hirudoid ointment can reduce the complication rate in internal arteriovenous fistula and effectively lengthen the duration of internal arteriovenous fistula for MHD.

P P Mehta, S Sagar, V V Kakkar(2005)conducted a study to assess the effectiveness of heparinoid cream onsuperficial thrombophlebitis among 100 patients. The study reveals a prospective; double-blind, randomized trial the efficacy of a heparinoid in ointment form was assessed in treating superficial thrombophlebitis developing after continuous intravenous infusion. One hundred surgical patients were studied, and clinical examination and the iodine-125-labelled fibrinogen test used to assess the results. The study found out that the mean time required for the relief of local symptoms and signs and the rate of local decline in radioactivity differed significantly between patients receiving the heparinoid cream and those recieving the placebo.

Wan-Er,T.,et.al.,(2003): The researcher conducted a study to assess the effects of notoginseny cream versus Hirudoid cream in the treatment of post infusion phlebitis among 65 patients inSun Yat-Sen University. Significantly fewer applications of notoginseny cream were required to bring about the disappearance of signs and symptoms of phlebitis in the group the study showed the group B patients for the same effect. The actual time of disappearance of the signs and symptoms of phlebitis also were significantly shorter in patients treated with notoginseny cream than with heparinoid cream. Finally, the researcher recommended that, the notoginseny cream is better than the heparinoid cream to controlling the post infusion thrombophlebitis.

Bergqvist D,et.all.,(1998) conducted a comparative study to assess the effectiveness of Placebo, Hirudoid cream and Piroxicam gel thrombophlebitis patients. A prospective randomized trial on the treatment of superficial thrombophlebitis has been performed in 68 patients randomized to Hirudoid cream, piroxicam gel or placebo. The study reveals through pain intensity with a visual analogue scale, and side effects were registered. The researcher concluded, There was no statistical difference between the treatment groups and no difference between spontaneous and infusion thrombophlebitis.

P P Mehta, S Sagar, and V V Kakkar,.(**1975)** conducted a study to assess the effectiveness of heparinoid cream on 100 superficial thrombophlebitis patients. In this study, prospective, double-blind, randomized trial the efficacy of a heparinoid in ointment form was assessed in treating superficial thrombophlebitis developing after continuous intravenous infusion. Study showed the mean time required for the relief of local symptoms and signs and the rate of local decline in radioactivity differed significantly between patients receiving the heparinoid cream and those recieving the placebo. The researcher concluded the heparinoid cream was best choice to treat the superficial thrombophlebits patients.

Stillman et al (1977). Thrombi and fibrin deposits on cannulas may serve as a nidus for microbial colonization of the IV devices though flush solutions are designed to prevent thrombosis, rather than infection, the use of anticoagulants (e.g. heparin) or thrombolytic agents may have a role in the prevention of cannulation complications like infiltration and phlebitis.

Ashkenazi et al (1986) Ashton et al (1990**)** indicate that 0.9% saline solution is as effective as heparin in maintaining cannula patency and reducing phlebitis among peripheral cannulas. In fact, the routine use of heparin, at 250 to 500 units per day, has been associated with thrombocytopenia and thromboembolic and hemorrhagic complications. Intravenous additive such as hydrocortisone appeared to reduce phlebitis. The risk of phlebitis associated with the infusion of certain fluids (such as potassium chloride lidocaine and anti-microbials may be reduced by the use of hydrocortisone.

Woodhouse 1979; O'Brien et al (1990).topical application of venodilators such as glyceryl trinitrate or anti-inflammatory agents such as cortisone near the cannula site has reduced the incidence of infusion-related thrombophlebitis and increased the life span of the cannulas • Routinely flush peripheral venous locks with normal saline solution, unless they are used for obtaining blood specimens, in which case a diluted heparin (10 units per ml) flush solution should be used.

CONCEPTUAL FRAME WORK

Conceptual frame work based on Imogene King's open system model (1981)

In 1970 King proposed an open system model as a basis for her **Goal attainment approach.**

According to King all system are open, in that there is a continual exchange of matter energy and information. Open system has verifying degree of interaction with the environment from which the system receives inputs and gives feed backs.

Person

Person is a social, rational, purposeful action and time oriented being, who requires fundamental health needs such as timely and useful health information, care that prevent illness and help when the self care demands cannot be met.

Environment

Environment is the open system allows the exchange of matter, energy and the information.

Health

Health is described as the dynamic state in the life, using personal resources to achieve optimal daily living.

Nursing

Nursing promotes, maintains and restores health and cares sick, uses a goal oriented approach in which the client and nurse interact to attain goal, so that they can function their own role independently.

The main concepts of open system model are input, throughput, output and feedback.

In the open system **input** refers to the matter, energy and information that enter into the system through its boundary.

In this study **input** is the application of ichthammol glycerin dressing and hirudoid ointment application on intravenous infiltration and phlebitis among pre and post operative patients.

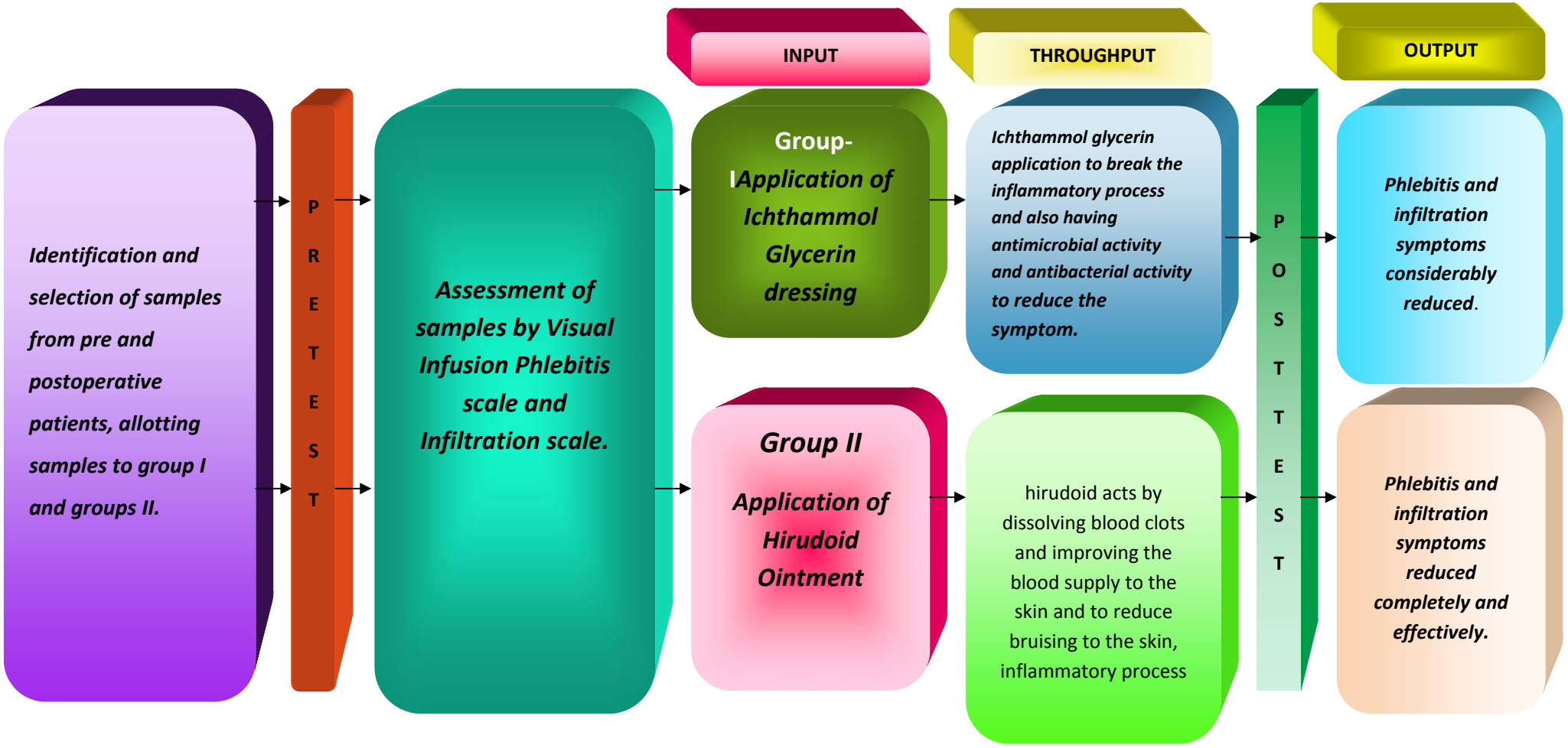
Throughput refers to the processing where the system transforms the energy matter.

In this study **throughput** is the process taking place within the subjects during the intervention procedures.

Output refers to the matter, energy and information in the environment that are in an altered state.

In this study **output** is the improvement of intravenous infusion complications and reduction of further complications.

FIGURE -1 CONCEPTUAL FRAME WORK



Modified Imogene king's open system model

CHAPTER III

RESEARCH METHODOLOGY

Research methodology is a pathway by which the researcher intended to solve the research problems systematically. It involves the series of procedures in which the investigator starts from initial identification of the problem to its final conclusion. This chapter deals with research approach, research design, setting of the study, study population, sample size, sampling technique and criteria for sample selection. It also deals with development of tool, procedure for data collection and plan for data analysis.

3.1 RESEARCH APPROACH

Aquantitative research approach was adopted by the researcher to assess the effectiveness of ichthmmol Glycerin and Hirudoid ointment on intravenous infiltration and phlebitis.

3.2 RESEARCH DESIGN

The Investigator adopted Experimental Research design – comparative research design.

Group – I	**R**	**O_1**	**X_1**	**O_2**
Group – II	R	O_3	X_2	O_4

Group – I - Subjects receiving Ichthammol Glycerin Dressing

Group – II - Subjects receiving Hirudoid Ointment application.

R - Randomization

O_1O_3 - Observation made before Intervention.

O_2O_4 - Observation made after intervention.

X_1 - Ichthammol Glycerin Dressing.

X_2 - Hirudoid Ointment application.

3.3 RESEARCH VARIABLES UNDER THE STUDY

Independent Variables – Ichthammol glycerin dressing and Hirudoid ointment application.

Dependent Variables –patients with intravenous infiltration and phlebitis.

3.4 SETTING OF THE STUDY

The **study conducted in Government Rajaji Hospital Madurai-20**. It is situated at Goripalayam which is the heart of the city. The hospital was started in the year1940. It is a 2218 bedded multi specialty hospital. It is the biggest hospital in south Tamilnadu with adequate transport facilities,Medical College attached hospital and it provides comprehensive care to all. It consists of seven surgical wards and separate post operative ward, the bed strength is 110. In each ward more than 50 patients are being admitted for surgical problems. Majority of abdominal surgeries performed were appendicectomy, laparotomy, herniorrhaphy, pyloromyotomy, pyeloplasty, colostomy and colostomy closure.Data will be collected from the selected surgical wards.

3.5 STUDY POPULATION

Both male and female patients who had infiltration or phlebitis on intravenous infusion site. The study population is selected in surgical wards (pre and post operative wards) of Government Rajaji Hospital, Madurai-20 is determined as population for the study.

3.6 SAMPLING TECHNIQUE

Probability sampling technique – simple random sampling – lottery method.

3.7 SAMPLE SIZE

Sixty subjects who undergone general surgeries in pre and postoperative ward at Government Rajaji Hospital, Madurai. Among the sixty samples thirty samples were allocated for group-I and thirty samples for group-II.

3.8 CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria

1. Patients who are all admitted in surgical ward and had intravenous infusion complications.
2. Patients who are all having minimum score of 3 in infiltration and phlebitis scale.
3. Patients who are all conscious and able to follow the instructions.
4. Patients who are all able to speak and understand in Tamil.
5. Patient who are all co-operative and willing to participate in study.

Exclusive Criteria

1. Patients below 12 years and above 60 years
2. Patients who have undergone chemotherapy
3. Patients who have Burns
4. Patients who are in Hemodialysis
5. Patients who have previous surgery in the same hand
6. Patient who have thrombosed vein or lymphoedema
7. Patients who have loss of sensation over the hand

3.9 DESCRIPTION OF THE TOOL

A structured observational checklist is used for observing the samples in both the experimental group I and II. It consists of three sections.

Section A

Deals with demographic data in relation to age and sex of the patient. It also deals with patient's information relation to diagnosis, literacy level, economic status of the person, intravenous infusion site, size of venflon, time duration of infusion, name of the application, response of the patient.

Section B

Observation checklist is used to differentiate the infiltration and phlebitis by the signs and symptoms.

Section C

The standard tool: VIP Score (visual Infusion Phlebitis Score) and Infiltration scaleis used for this study, which consists of scores. The score indicates according to the signs and symptoms of the infusion site. The signs and symptoms include pain, Erythema, Indurations, Palpable venous cord, Pyrexia.

3.10 CONTENT VALIDITY:

The Standard Visual Infusion Score Scale, Infiltration Scale and Demographic variables and clinical variables was given to five experts in the field of Nursing and Medical specialist for content validity. Suggestions were considered and appropriate changes were made and found to be valid.

3.11 PILOT STUDY

Pilot study was conducted among 10 subjects in Surgical Post operative ward at Government Rajaji Hospital, Madurai-20. The pilot study period is (from11.7.2011to17.7.2011). Among 10 subjects, 5 are experimental group-I and remaining 5 subjects are experimental group-II. Pilot study will reveal the feasibility for the main study.

3.12 RELIABILITY

Reliability of the tool was assessed by using split half method. After pilot study it was assessed using interrater method. Calculated Correlation coefficient r value is 0.81(infiltration) and 0.84(phlebitis). These correlation coefficients is very high and it is excellent tool for assessing effectiveness of ichthammol glycerin dressing and Hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion.

3.13 DATA COLLECTION PROCEDURE

The data collection period is one month. The investigator obtained prior permission from respective authorities to conduct the study. The informed consent was obtained from each samples' guardian. Subjects were selected based on the inclusion criteria. The groups were selected based on the observational checklist (Visual Infusion score, Infiltration scale). Subjects for the study were undergone the pre assessment of intravenous infiltration and phlebitis by Visual Infusion Score and Infiltration scale. The experimental group-I and experimental group-II received ichthammol glycerin dressing and Hirudoid ointment application respectively for two times per day for 3 days consecutively.

3.14DESCRIPTION OF INTERVENTION

The intervention followed in this study was application of ichthammol glycerin dressing and hirudoid ointment application. The subjects were assigned to the experimental group-I was applied ichthammol Glycerin dressing and hirudoid ointment was applied to experimental group-II. The Visual Infusion Score Scale and Infiltration Scale were used for pre and post assessment of the subjects.

In group-II hirudoid ointment applied on the infiltration and phlebitis site. The patients are instructing, not to wipe or rub the area. It will be absorbed by the skin within 30 seconds. The intervention procedure from Monday to Saturday, two times a day, (6 am – 11 am, 6pm – 11 pm). The initial observation is done to obtain the baseline data

and then Ichthammol glycerin dressing and hirudoid ointment is applied to respective experimental group I and Experimental Group II. A time of 15 to 30 minutes is spent for observation and dressing for group I and a time 10 to 15 minutes spent for observation for Hiurdoid ointment application for Group II in every 12 hrs interval. The post test assessment is done after three days of each application.

3.15 ETHICAL CONSIDERATION

All respondents were carefully informed about the purpose of the study and their part during the study and how the privacy was guarded. The confidentiality of the study result was ensured. Thus the investigator followed the ethical guidelines which were issued by the research committee.

3.15 STATISTICAL ANALYSIS

Demographic variables in categorical/dichotomous were given in frequencies with their percentages.Infiltration and phlebitis score were given in mean and standard deviation.

Pretest and posttest differences were analyzed using student paired t-test.

Repeated values are analyzed using repeated measures ANOVA F-test.

ichthammol glycerin dressing and Hirudoid ointment group differences were analysed using student independent t-test .

Association between demographic variables and level of pain score were analysed using pearson chi-square test/Yates corrected chi square test.

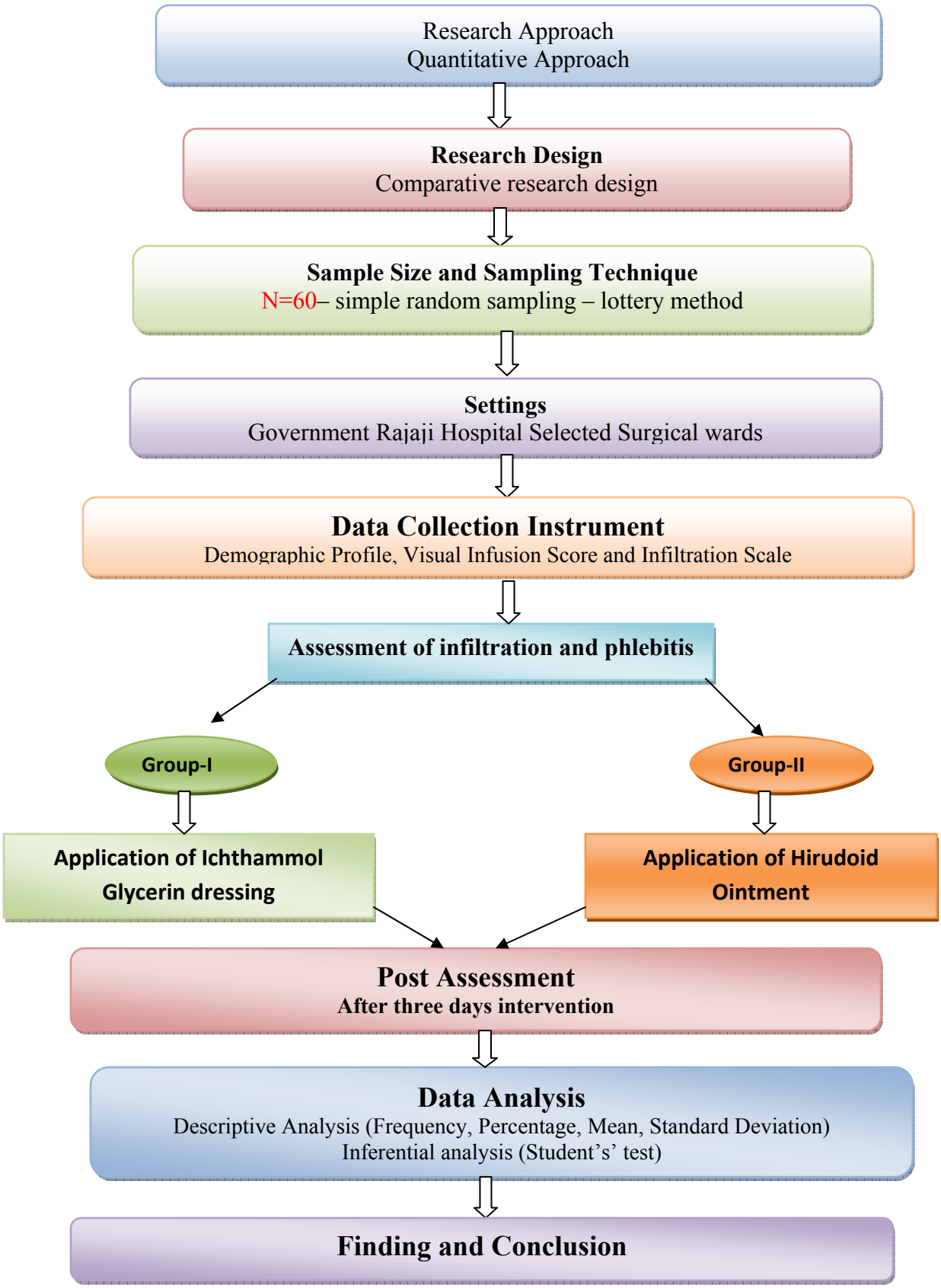
Multiple bar diagram, Pie diagram, percentage bar diagram and line graph were used to represent the data.

$P<0.05$ was considered statistically significant.

3.16 PROTECTION OF HUMAN SUBJECTS

Prior to pilot study and main study approval was obtained from the dissertation committee for research proposal. Permission was obtained from the Principal, College of Nursing, Madurai Medical College, Medical Superintendent, GovtRajaji Hospital, Madurai-20 and Head of the Department, Department of Surgery, Govt.Rajaji Hospital, Madurai-20 to conduct the study. The purpose and other details were explained to the patient / relatives of the study participants and consent was obtained from them.

Schematic Approach of the study



CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the data collected. Analysis is a method for rendering quantitative, reliable, meaningful and providing intelligible information. So that the research problem can be studied and tested which including the relationship between the variables.

The data collected was analyzed using appropriate statistical methods, tabulated and the results are described as follows.

SECTION-I

Table1: Distribution of subjects according to their demographic variables.

Table 2: Distribution of subjects according to their clinical variables.

SECTION-II

Table3: Assessment of ichthammol glycerin dressing on intravenous infiltration and phlebitis

Table 4: Effectiveness of ichthammol glycerin dressing on intravenous infiltration and phlebitis

Table5: assessment of hirudoid oinment on intravenous infiltration and phlebitis

Table 6: effectiveness of hirudoid oinment on intravenous infiltration and phlebitis

SECTION-III

Table 7: comparison of intravenous infiltration score

Table 8: comparison of phlebitis score

Table 9: comparison of effectiveness

SECTION-IV

SECTION-I

TABLE - 1

DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR DEMOGRAPHIC VARIABLES

Demographic variables		Group-I		Group-II	
		Ichthammol glycerin dressing		Hirudoid ointment	
		n	%	n	%
Age	20 -30 yrs	6	20.0%	8	26.7%
	31 -40 yrs	9	30.0%	11	36.7%
	41 -50 yrs	13	43.3%	9	30.0%
	51 -60 yrs	2	6.7%	2	6.7%
Sex	Male	13	43.3%	19	63.3%
	Female	17	56.7%	11	36.7%
Education	Educated	26	86.7%	23	76.7%
	No formal education	4	13.3%	7	23.3%
Locality	Rural	17	56.7%	20	66.7%
	Urban	13	43.3%	10	33.3%
Type of family	Nuclear family	19	63.3%	20	66.7%
	Joint family	11	36.7%	10	33.3%
Language	Tamil	30	100.0%	30	100.0%
	Others	0	0.0%	0	0.0%

Table 1 shows the demographic information of subjects those who are participated for the following study “effectiveness of ichthammol glycerin dressing and Hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai.”

The above table represents the demographic profile of the subjects in the Group-I (Ichthammol Glycernin) and Group-II (Hirudoid ointment)

In considering the age wise distribution of subjects 6 (20%) were in 20-30 years of age, 31-40 & 41-50 years of age grouped patients were 9 (30%) and 13 (43.3%) and 2 (6.7%) patients were 51-60 years of age in Group-I. In group two 8 (26.7%) of subjects were 20-30 years of age, 11 (36.7% of subjects were 31-40 years of age, 9 (30%) of subjects were 41-50 years of age and 2 (6.7%) were 51-60 years age.

In sex wise distribution, 13 (43.3%) were males and 17 (56.7%) were females in Group-I. In Group two, 19 (63.3%) were males and 11 (36.7%) were females.

In education wise distribution, 26 (86.7%) were educated and 4 (13.3% were no formal education in Group-I. In Group two, 23 (76.7%) were educated and 7 (23.3%) were no formal education.

In Locality wise distribution, 17 (56.7%) were rural area, 13 (43.3%) were urban area in Group-I. In group two, 20 (66%) were rural area and 10 (33.3%) were urban area.

In family wise distribution, 19 (63.3%) were nuclear family and 11 (36.7%) were joint family in Group-I. In Group two, 20 (66.7%) were nuclear family and 10 (33.3%) were joint family. In Group-I and Group two, 30 (100%) were speaking Tamil language.

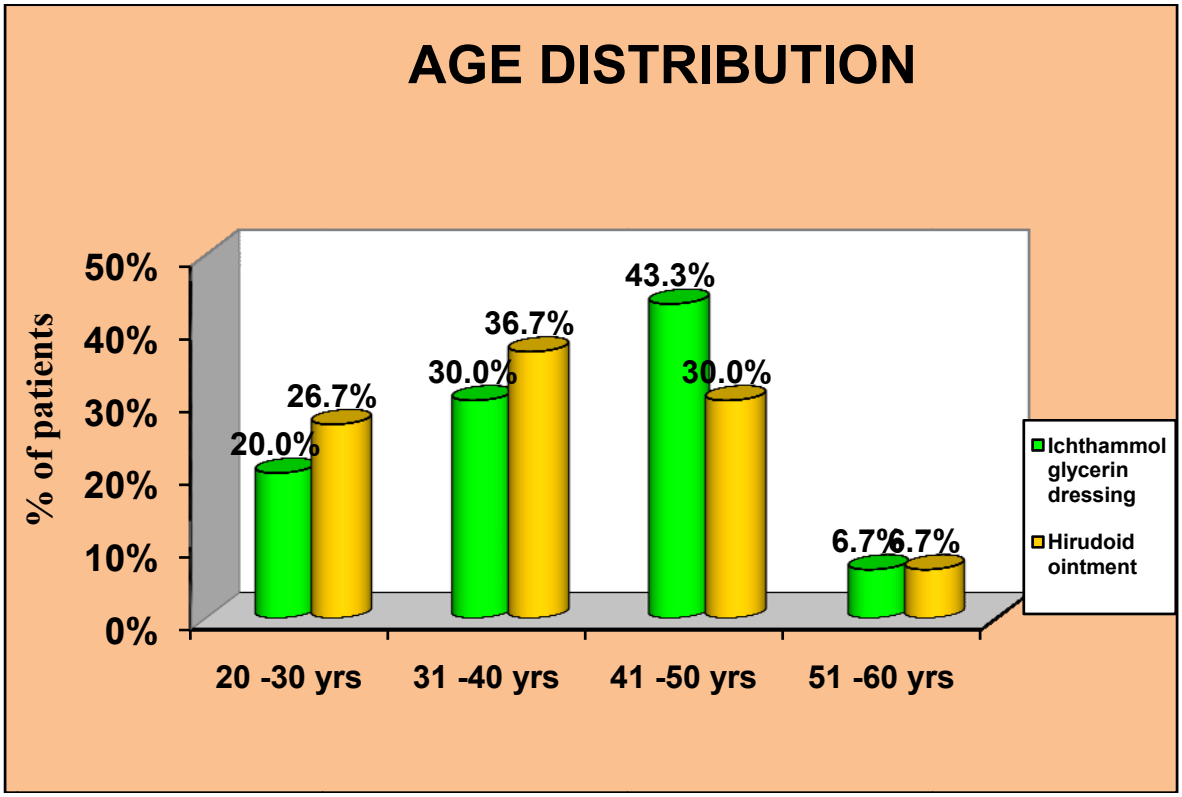


Fig-3 Percentage distribution of subjects in Group-I (ichthammol glycerin) and Group-II (Hirudoid) according to age.

Figure 3 shows that majority of subjects were 41-50 years of age group in experiment group-I and 31-40 years in experimental group-II.

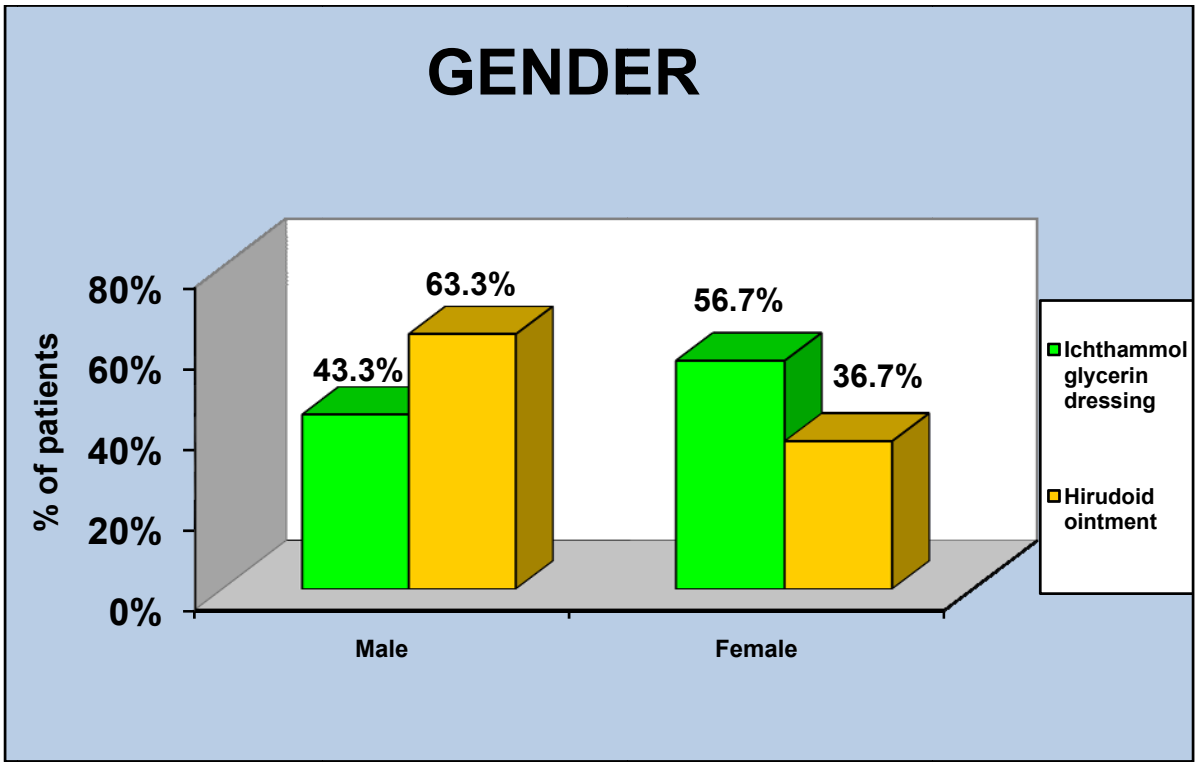


Fig-4: Distribution of subjects in Group-I and Group-II according to their sex.

Figure 4 shows that majority of Males participated in experimental group-I and majority of females participated in experimental group-II.

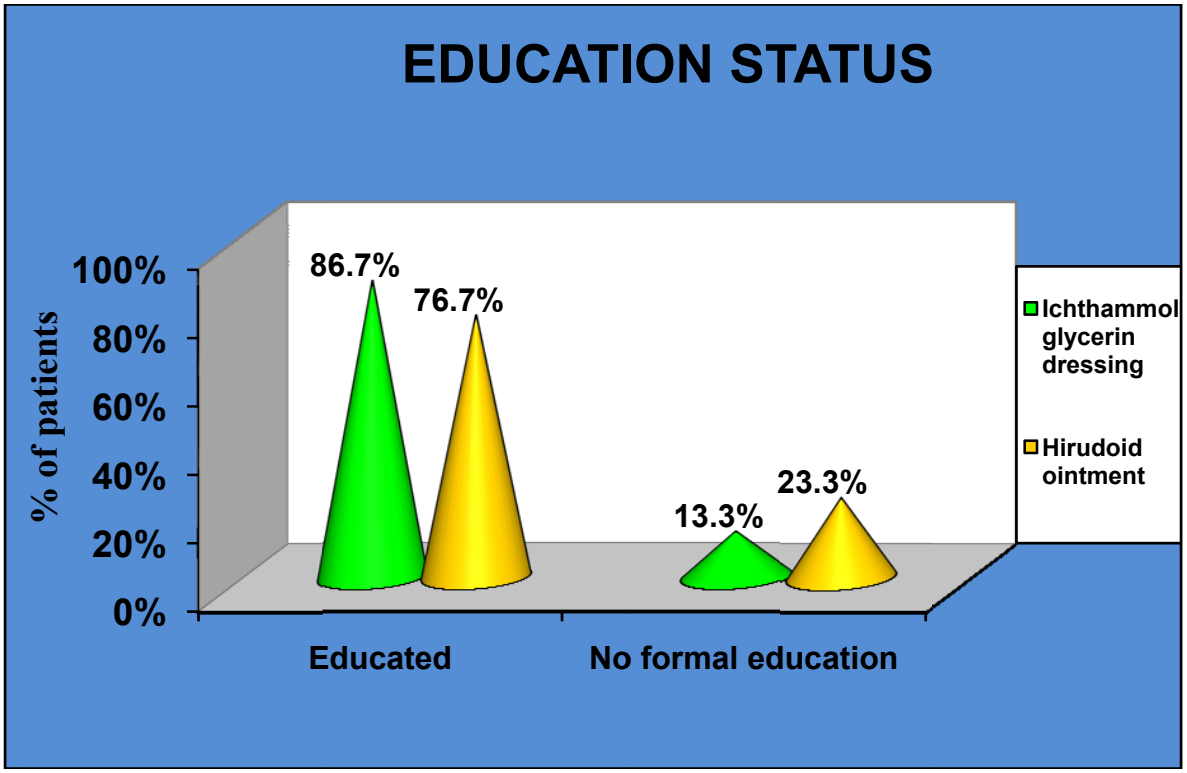


Fig-5: Distribution of Subjects in Group-I and Group-II according to their education.

Figure-5 shows majority of educated subjects participated in both group-I and II.

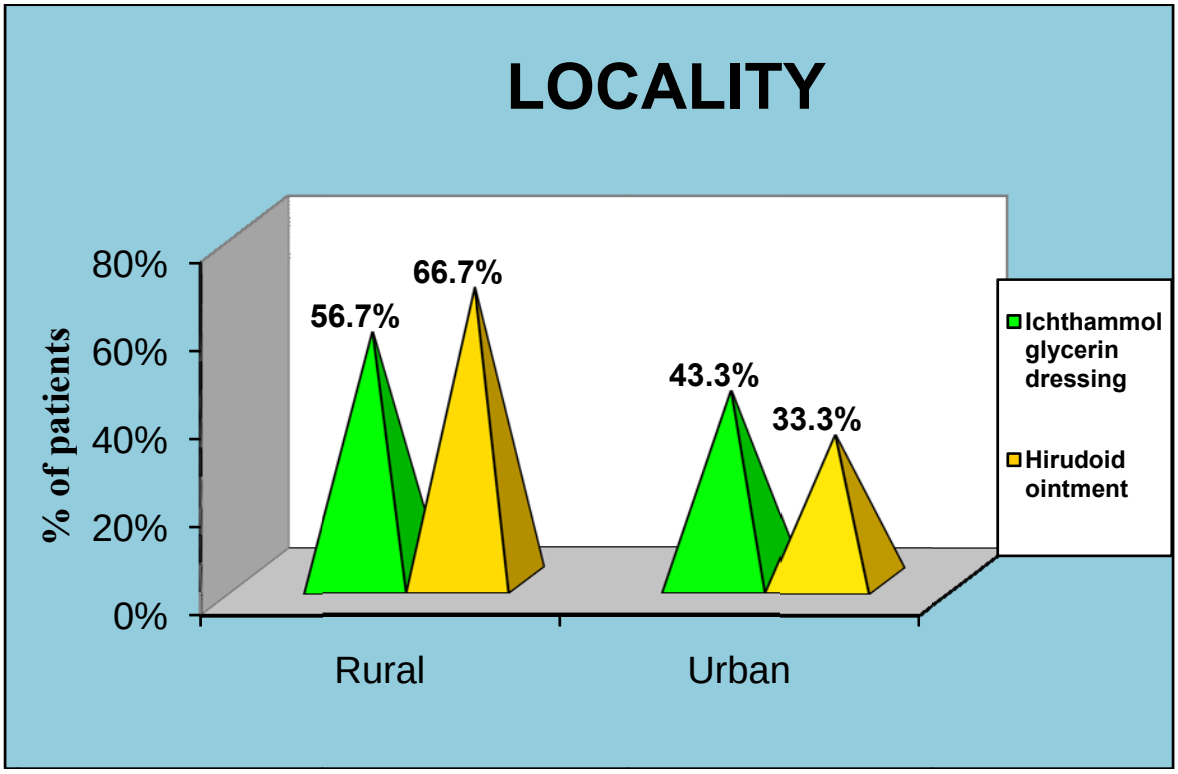


Fig-6: Distribution of Subjects in Group-I and Group-II according to their locality.

Figure-6 shows majority of rural subjects were participated in group-I and II.

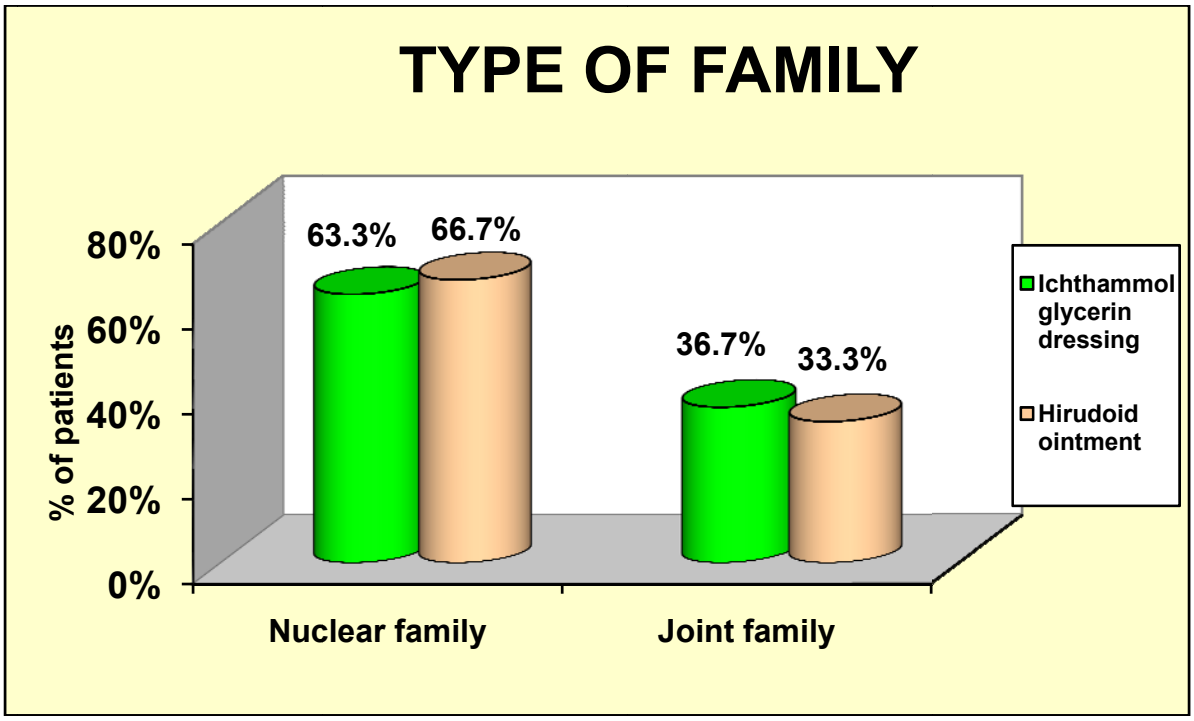


Fig-7: Distribution of subjects in Group-I and Group-II according to their family.

Figure-7 shows majority of nuclear family subjects were participated in this study.

SECTION-II

TABLE - 2

DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR CLINICAL VARIABLES.

CLINICAL VARIABLES		Group-I		Group-II	
		Ichthammol glycerin		Hirudoid ointment	
		n	%	n	%
Period of IV	3 - 4 days	28	93.3%	27	90.0%
	5 - 6 days	2	6.7%	3	10.0%
Types of surgery	Major	29	96.7%	29	96.7%
	Minor	1	3.3%	1	3.3%
Complication	Infiltration	14	46.7%	14	46.7%
	Phlebitis	16	53.3%	16	53.3%
Infusion site	Cephalic vein	20	66.7%	20	66.7%
	Basilic vein	5	16.7%	4	13.3%
	Medial cubital	5	16.7%	6	20.0%
Infusion side	Dominant hand	14	46.7%	19	63.3%
	Non dominant hand	16	53.3%	11	36.7%
Size of venflon	18 gauze	30	100.0%	30	100.0%
Pattern of infusion	Continuous	4	13.3%	6	20.0%
	Intermittent	26	86.7%	24	80.0%
Comfort of the patient	Comfort	9	30.0%	24	80.0%
	Discomfort	21	70.0%	6	20.0%

Table -2 represents theclinical information of patients those who are participated in Group-I and Group-II

In period of intravenous distribution 28 (93.3%) had 2-3 days infusion and 2 (6.7%) had 4-6days infusion in Group-I. In Group two, 27(90.0%) had 2-3 days infusion and 3 (10%) had 4-6 days infusion.

Types of surgery showed in Group-I, 29 (96.7%) were underwent major surgery and 1 (3.30%) were underwent minor surgeries. In Group two, 29 (96.7%) were underwent major surgery and 1 (3.3%) were underwent minor surgery.

In complication distribution showed 14 (46.7%) and 16 (53.3%) patients had infiltration, phlebitis in both Group-I and II.

In infusion site distribution, 20 (66.7%), 5 (16.7%), 5 (16.7%) patients had infusion in cephalic vein, Basilic vein and Medial cubital vein infusion in Group-I. In Group two, 20 (66.7%), 4 (13.3%), 6 (20.0%) patients had infusions line in cephalic vein, Basilic vein and Medial cubital vein infusion.

Table showed infusion side distribution in Group-I, 14(46.7%) were dominant hand and 16 (53.3%) were non dominant hand. In Group-II, 19 (63.3%) were dominant hand and 11 (36.7%) were non dominant hand.

In venflon size distribution, 30 (100%) patients had infusion through 18 gauze venflon in both Group-I and II.

In pattern of infusion distribution, 4 (13.3%) were continues infusion, 26 (86.7%) were intermittent infusion in Group-I. In Group two, 6 (20.0%) were continues infusion, 24 (80.0%) were intermittent infusion.

While considering comfort of the patients distribution, 9 (30.0%) were felt about comfort and 21 (70.0%) were felt about discomfort in Group-I. In Group two, 24 (80.0%) were felt about comfort and 6 (20.0%) were felt about discomfort.

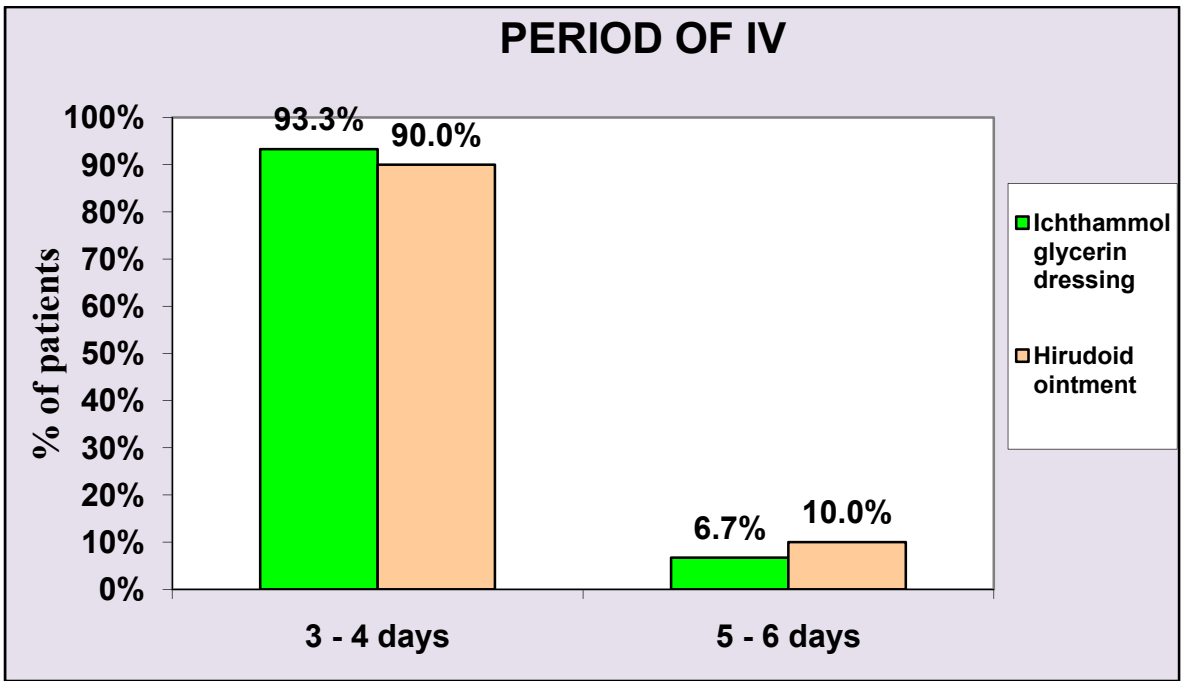


Fig-8: Distribution of subjects in Group-I and Group-II according to their period of intravenous infusion

Figure- 8 shows majority of the subjects were 3-4 days of intravenous infusion in l group I and II.

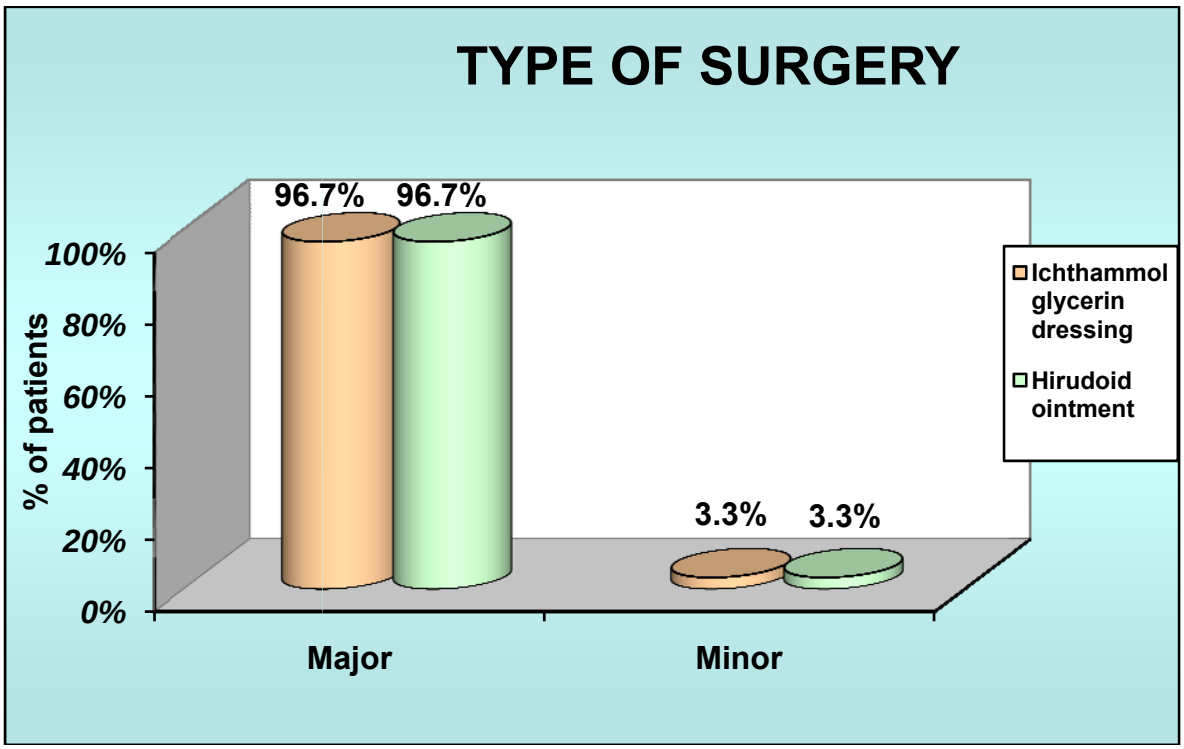
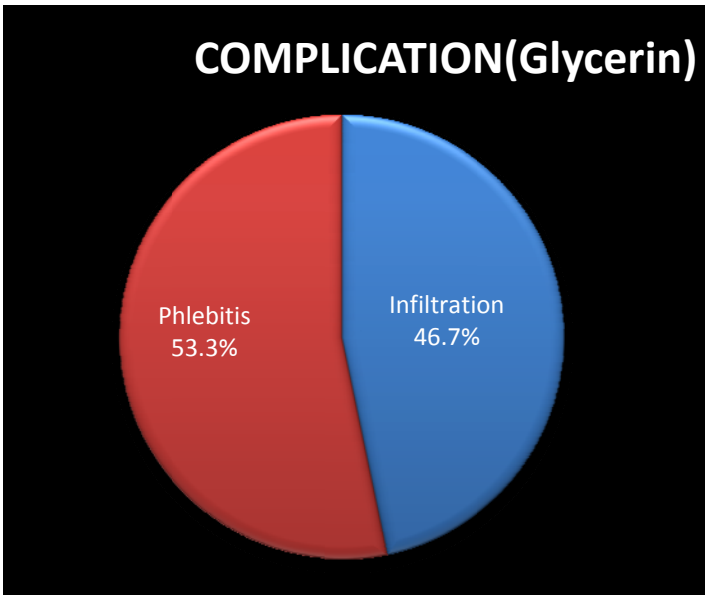


Fig-9: Distribution of subjects in Group-I and Group-II according to their type of surgery

Figure – 9 shows 96.7% of subjects were undergone major surgeries ingroup-I and II respectively.



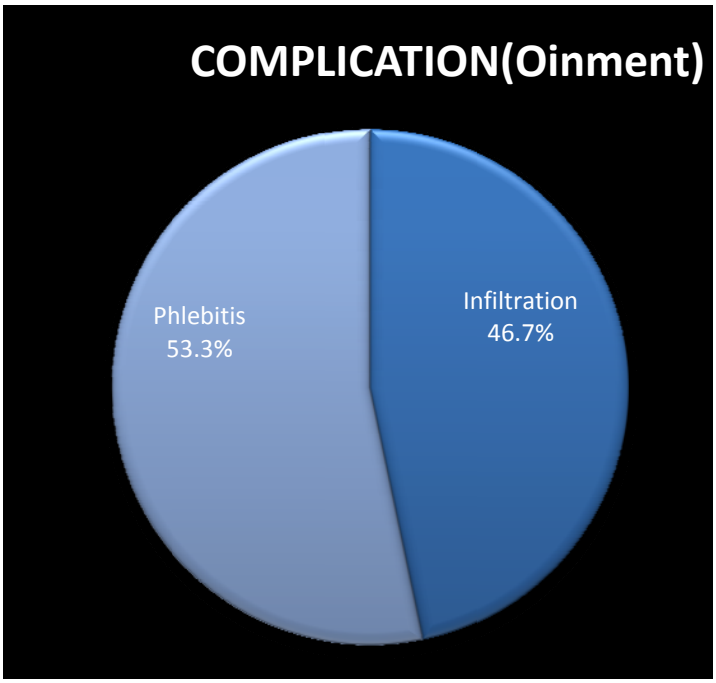


Fig-10: Distribution of subjects in Group-I and Group-II according to their complication

Figures – 10 shows 53.3%of Phlebitis and 46.7% of infiltration subjects were equally participated in group-I and II.

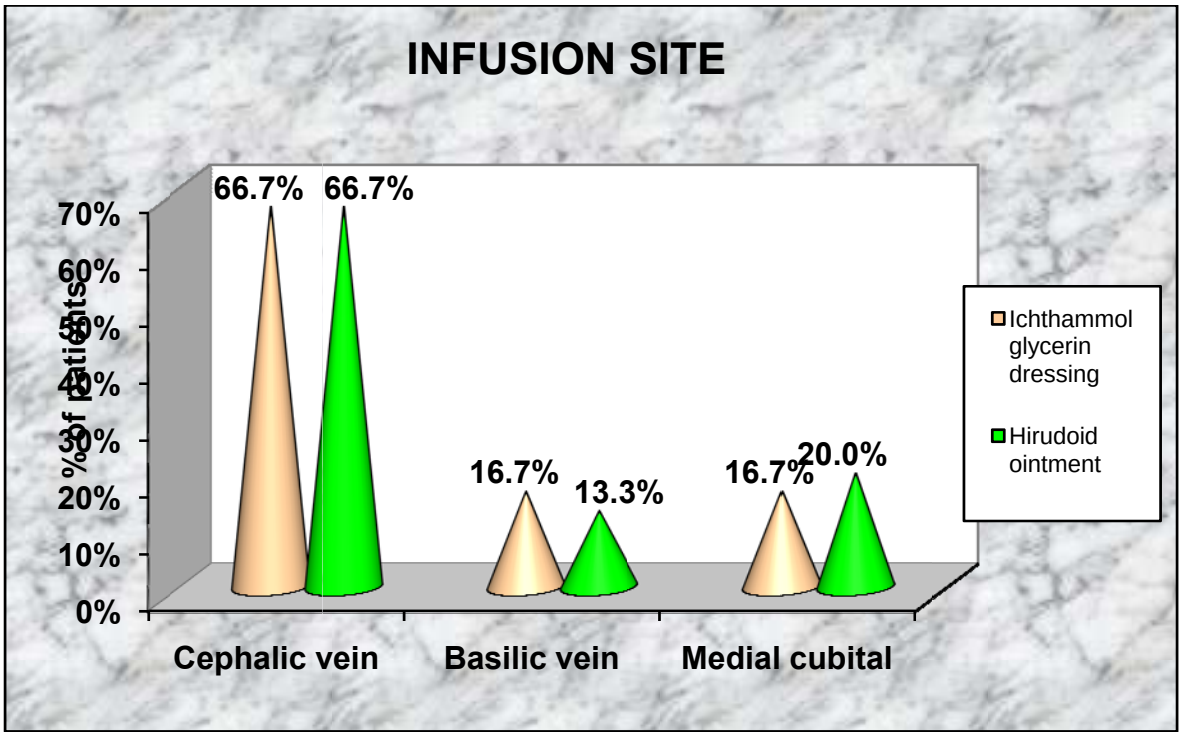


Fig-11: Distribution of subjects in Group-I and Group-II according to their infusion site

Figure – 11 shows majority of the subject infusion site is cephalic vein infusion in both l groups.

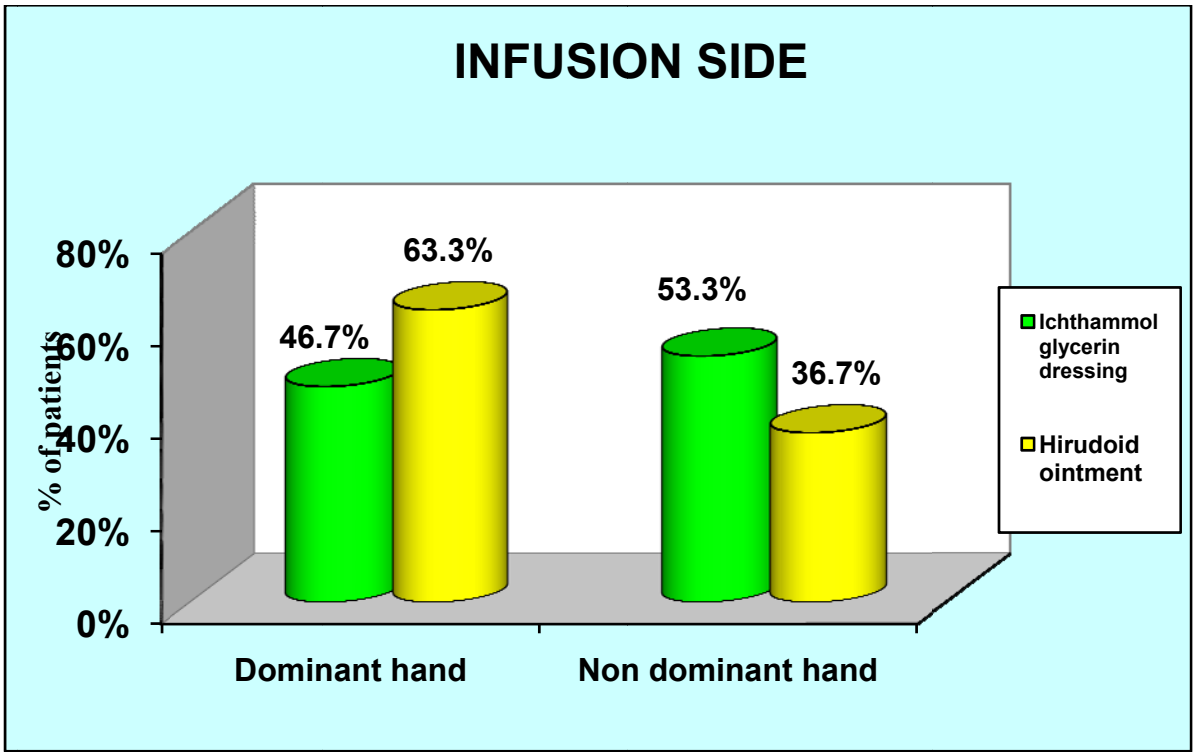


Fig-12: Distribution of subjects in Group-I and Group-II according to their infusion side

Figure showed infusion side distribution in Group-I, 14(46.7%) were dominant hand and 16 (53.3%) were non dominant hand. In Group two, 19 (63.3%) were dominant hand and 11 (36.7%) were non dominant hand.

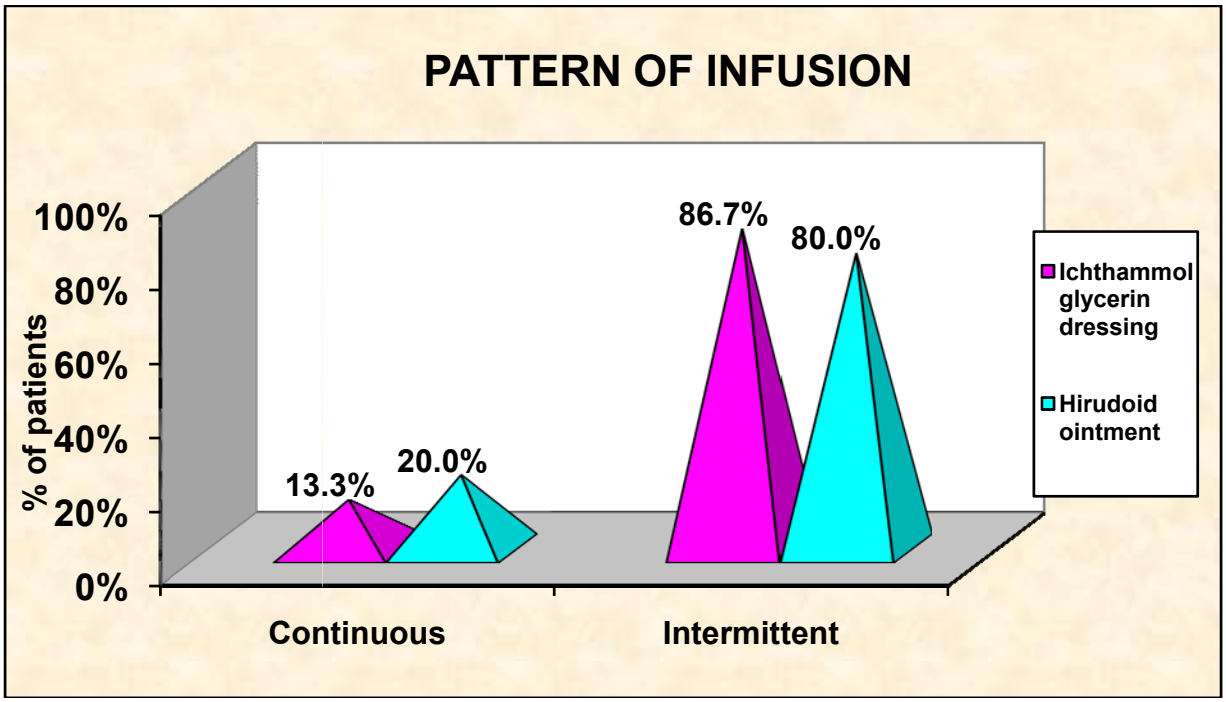


Fig-13: Distribution of subjects in Group-I and Group-II according to their pattern of infusion.

Figure-13 shows majority of the subjects had intermittent intravenous infusion in both l groups.

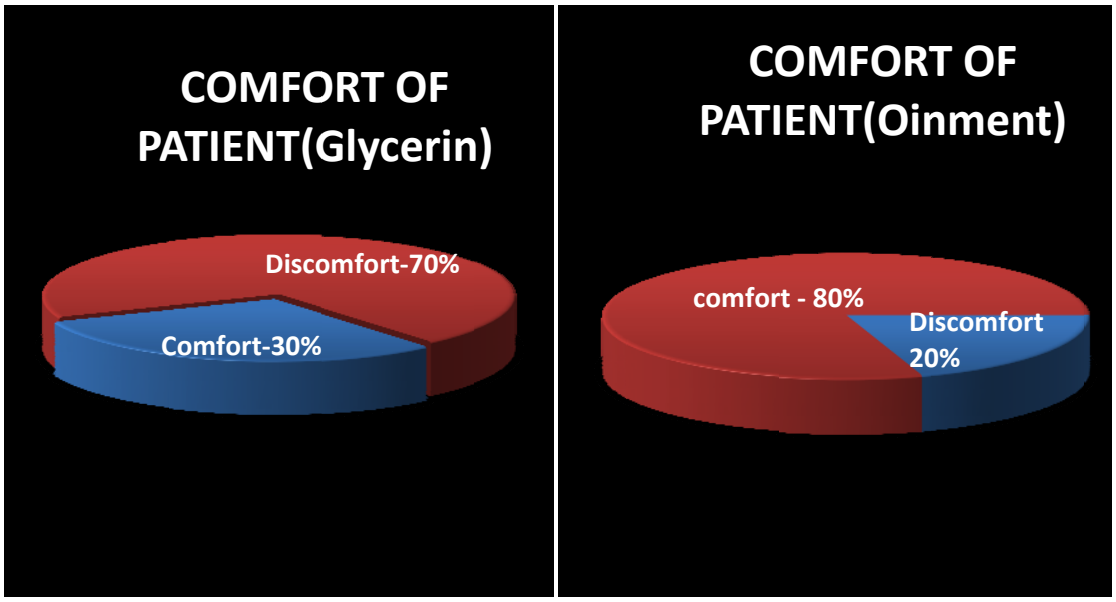


Fig-14: Distribution of subjects in Group-I and Group-II according to their comfort of the patient.

Figure-14 shows 80% of the patients felt comfort in group II while comparing group-I.

TABLE- 3

ASSESSMENT OF ICHTHAMMOL GLYCERIN DRESSING ON INTRAVENOUS INFILTRATION AND PHLEBITIS

	Ichthammol glycerin dressing					
	Infiltration			Phlebitis		
	Mean	SD	Repeated measures of ANOVA	Mean	SD	Student's Paired t-test
pretest	3.73	0.45		4.07	0.58	F=90.07
day1	-	-	T=26.42	4.07	0.58	P=0.001***
day2	-	-	P=0.001***	3.03	0.61	DF=28
day3	-	-	DF=28	2.13	0.68	
posttest	1.17	0.75		1.03	0.72	

Table 3 assesses the ichthammol glycerin dressing on intravenous infiltration and phlebitis.

In Infiltration scale, pretest score is 3.73 and posttest score is 1.17, so the difference is 2.56. This difference is large and it is statistically significant Statistical significance was assessed by using students paired t-test.

In Phlebitis, pretest score is 4.07 and posttest score is 1.03, so the difference is 3.04. This difference is large and it is statistically significant. Statistical significance was assessed by using repeated measures ANOVA F-test.

TABLE - 4

EFFECTIVENESS OF ICHTHAMMOL GLYCERIN DRESSING ON INTRAVENOUS INFILTRATION AND PHLEBITIS

	Max score	Baseline Pain score	Day3 Pain score	Mean Difference in score with 95% Confidence interval	Percentage Difference in score with 95% Confidence interval
Infiltration	0 -4	3.73	1.17	2.56(2.21 – 2.90)	64.0%(55.2% –72.5%)
Phlebitis	0 -5	4.07	1.03	3.04(2.70 – 3.37)	60.8%(54.0% –67.4%)

Table no 4 shows the effectiveness of ichthammol glycerin dressing on intravenous infiltration and phlebitis.

In Phlebitis reduction is 60.8% and infiltration reduction is 64%.

Differences between pretest and posttest score was calculated using and mean difference with 95% CI and proportion with 95% CI.

TABLE - 5

ASSESSMENT OF HIRUDOID OINTMENT ON INTRAVENOUS INFILTRATION AND PHLEBITIS

	HIRUDOID OINTMENT					
	Infiltration			Phlebitis		
	Mean	SD	Repeated measures of ANOVA	Mean	SD	Student's Paired t-test
pretest	3.63	.49		4.10	0.61	t=125.43
day1	-	-	t=38.53	3.37	0.85	P=0.001***
day2	-	-	P=0.001***	2.33	0.84	DF=28
day3			DF=28	1.30	0.75	
posttest	0.52	0.57		0.50	0.57	

Tables 5 assess the Hirudoid ointment dressing on intravenous infiltration and phlebitis.

In Infiltration, pretest score is 3.63 and posttest score is 0.52, so the difference is 3.11. This difference is large and it is statistically significant. Statistical significance was assessed by using paired t-test.

In Phlebitis scale, pretest score is 4.10 and posttest score is 0.50, so the difference is 0.60. This difference is large and it is statistically significant. Statistical significance was assessed by using students repeated measures ANOVA F-test.

TABLE – 6

EFFECTIVENESS OF HIRUDOID OINMENT ON INTRAVENOUS INFILTRATION AND PHLEBITIS

	Max score	Baseline Pain score	Day3 Pain score	Mean Difference in score with 95% Confidence interval	Percentage Difference in score with 95% Confidence interval
Infiltration	0 -4	3.63	0.52	3.11(2.83 – 3.38)	77.8 %(70.8% –84.5%)
Phlebitis	0 -5	4.10	0.50	3.60(3.27 – 3.86)	72.0 %(65.4% –77.2%)

Table no 6 shows the effectiveness of Hirudoid ointment on intravenous infiltration and phlebitis.

In Phlebitis reduction is 72.0% and infiltration reduction is 77.8%.

Differences between pretest and posttest score was calculated using and mean difference with 95% CI and proportion with 95% CI.

SECTION-III

TABLE - 7

COMPARISON OF INTRAVENOUS INFILTRATIONSCORE

	Hirudoid ointment	**ichthammol glycerin**	**Student's independent t-test**
Pretest	3.63 ± 0.49	3.73± 0.45	t=0.82 P=0.41 DF= 58 not significant
Posttest	0.52 ± 0.57	1.17 ± 0.75	**t=3.72 P=0.001*** DF= 58 significant**
Student's paired t-test	**t=19.44 P=0.001*** DF= 29 significant**	**t=17.44 P=0.001*** DF= 29 significant**	

*** Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

In pretest, Hirudoid ointment group patients are having 3.63 score and ichthammol glycerin Group patients are having 3.73 score. The difference is 0.10 score. It is a small difference. This difference is statistically not significant. Statistical significance was calculated by using student's independent 't'test.

In posttest, Hirudoid ointment group patients are having 0.52 score and ichthammol glycerin Group patients are having 1.17 . The difference is 0.65 score. Difference is large. This difference is statistically significant. Statistical significance was calculated by using student's independent 't'test.

In Hirudoid ointment group patients are reduced their score from 3.63 to 0.52. Due to intervention, they are able to reduce 3.11 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

In ichthammol glyceringroup patients are reduced their score from3.73 to 0.52. They are able to reduce 2.21 score from base line. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

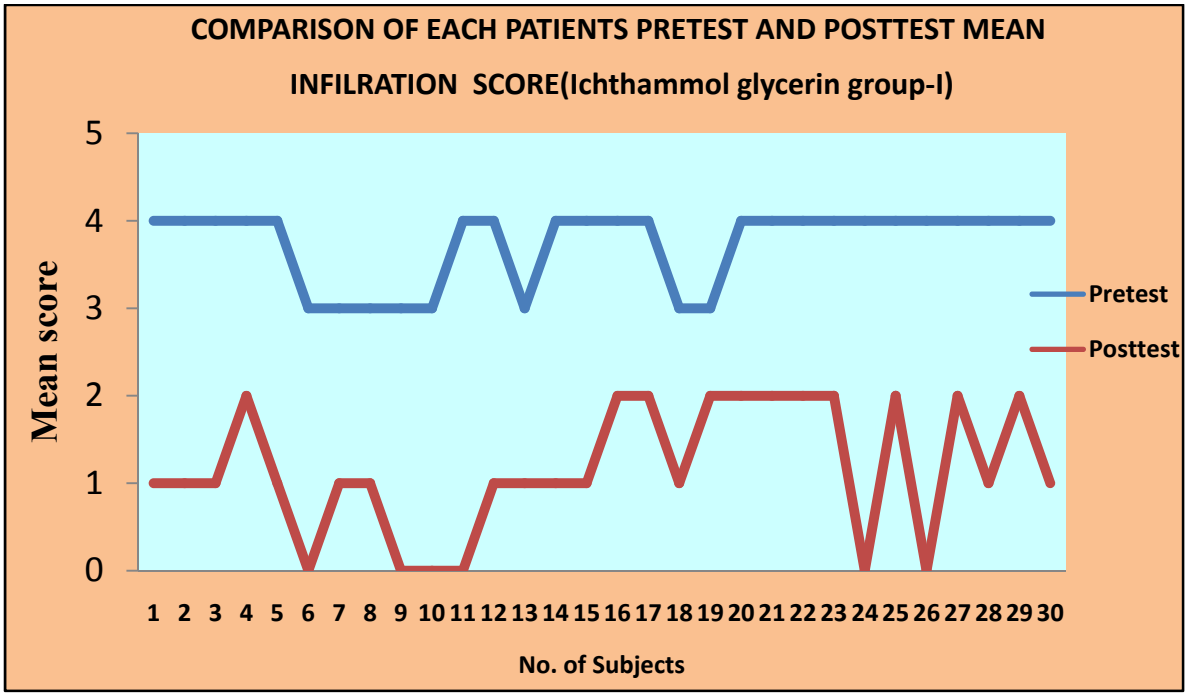


Fig15: comparison of each subjects pretest and posttest mean Infiltration Score (Ichthammol glycerin)

The above figure shows that ichthammol glycerin dressing subjects pre test mean score were reduced while comparing to post test mean score. This improvement is statistically significant.

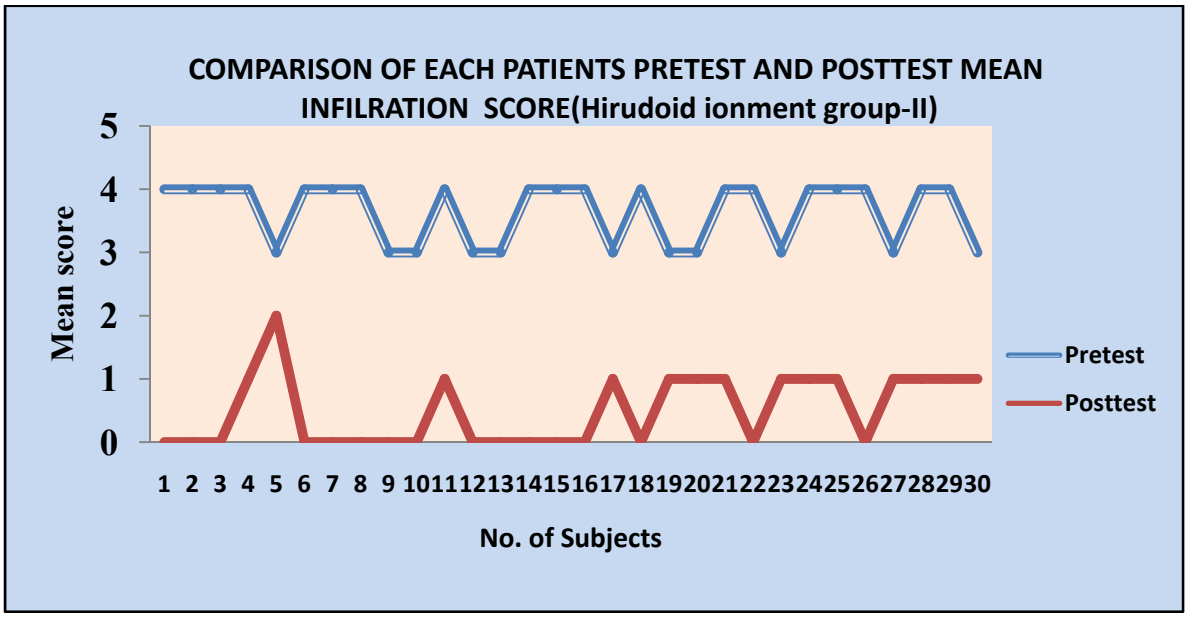


Fig.16: comparison of each subjects pretest and posttest mean Infiltration Score (Hirudoid Ointment)

This figure shows that hiurdoid ointment application subjects pre test mean score is reduced while comparing to post test mean score of the subjects. This reduction is statistically significant.

TABLE– 8

COMPARISON OF PHLEBITIS SCORE

	Hirudoid ointment	**ichthammol glycerin**	**Student's independent t-test**
Pretest	4.10 ± 0.50	4.07± 0.58	t=0.82 P=0.41 DF= 58 not significant
Posttest	0.50 ± 0.57	1.03 ± 0.72	**t=3.72 P=0.001*** DF= 58 significant**
Student's paired t-test	**t=39.57 P=0.001*** DF= 29 significant**	**t=27.04 P=0.001*** DF= 29 significant**	

*** significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

In pretest, Hirudoid ointment group patients are having 3.63 score and ichthammol glycerin Group patients are having 3.73 score. The difference is 0.10 score. It is a small difference. This difference is statistically not significant. Statistical significance was calculated by using student's independent 't'test.

In posttest, Hirudoid ointment group patients are having 0.52 score and ichthammol glycerinGroup patients are having 1.17 . The difference is 0.65 score. Difference is large. This difference is statistically significant. Statistical significance was calculated by using student's independent 't'test.

In Hirudoid ointment grouppatients are reduced their score from 4.10 to 0.50. Due to intervention they are able to reduce 3.60 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

In ichthammol glycerinGroup patients are reduced their score from4.07 to 1.03. They are able to reduce 3.04 score from base line. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

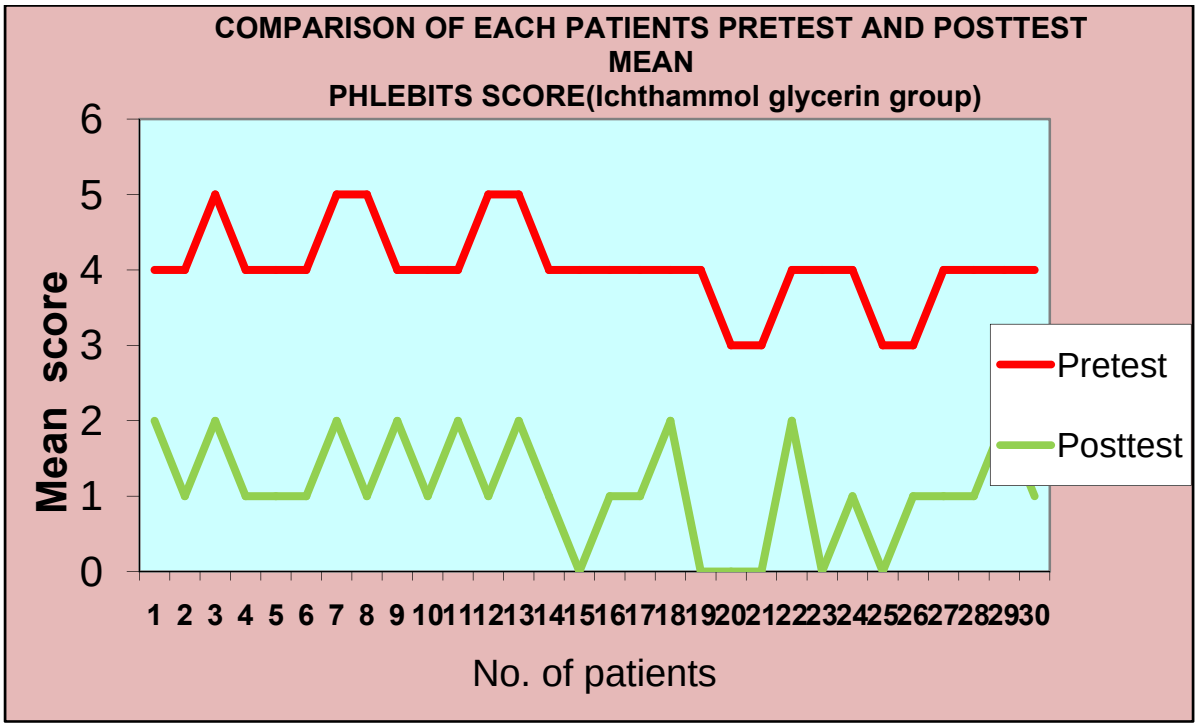


Fig-17: comparison of each patients pretest and posttest mean Phlebitis Score (Ichthammol glycerin)

The above figure shows that the ichthammol glycerin dressing on phlebitis subjects pretest mean score is considerably reduced while comparing to mean post score. This reduction is statistically significant.

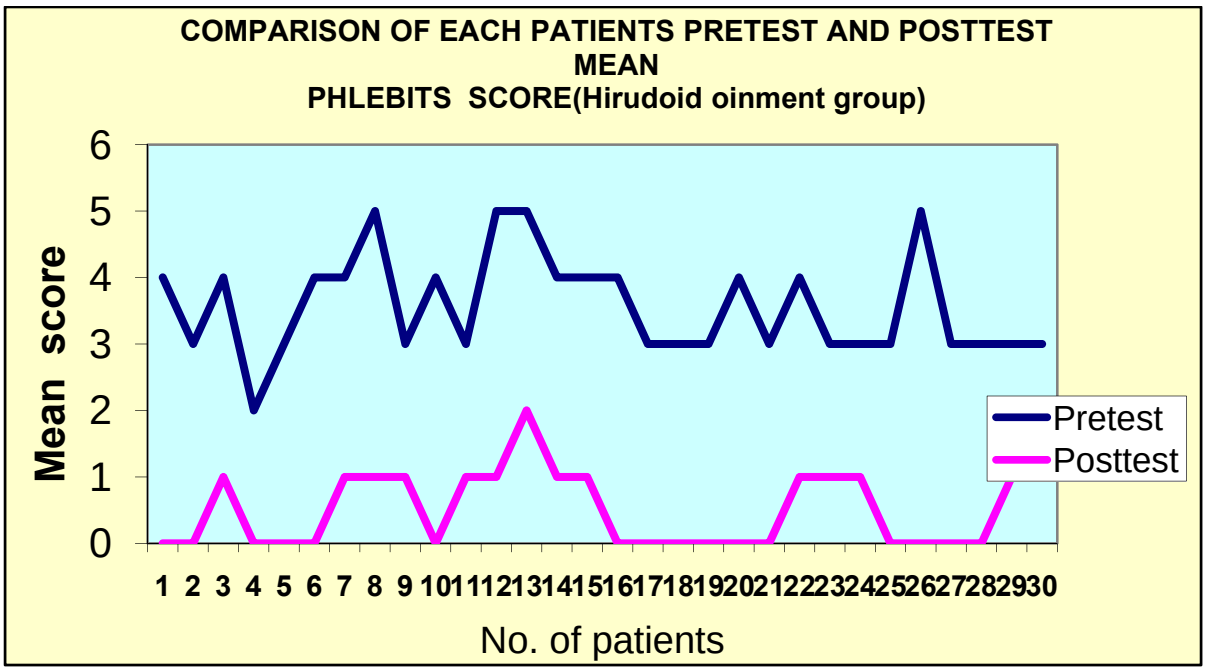


Fig-18: comparison of each patients pretest and posttest mean Phlebitis Score (Hirudoid Ointment)

The figure shows that the hirudoid ointment application on phlebitis subjects pretest mean score is reduced while comparing to mean posttest score. This reduction is statistically significant.

TABLE - 9

COMPARISON OF EFFECTIVENESS

		Min – Max score	Mean score		% of mean score		Difference
			Pretest	Posttest	Pretest	Posttest	
Infiltration	Hirudoid ointment	**0 -4**	**3.63**	**0.52**	90.80%	13.00%	↓77.80%
	Ichthammol glycerin	**0 -4**	**3.73**	**1.17**	93.30%	29.30%	↓64.00%
Phlebitis	Hirudoid ointment	**0-5**	**4.10**	**0.50**	82.00%	10.00%	↓72.00%
	Ichthammol glycerin	**0 -5**	**4.07**	**1.03**	81.40%	20.60%	↓60.80%

Table no 9 shows the effectiveness of the Hirudoid ointment and Ichthammol Glycerin in reduction of Infiltration and Phlebitis

Considering the infiltration score, Hirudoid ointment patients reduced 77.8 percent score and Ichthammol Glycerin 64.0% reduced score This percentage of difference 77.8- 64.0= 13.8% reduction shows ointment method is the more beneficial method than glycerin method.

Considering the Phlebitis score, Hirudoid ointment patients reduced72.0 percent score and Ichthammol Glycerin 60.8% reduced score.This percentage of difference 72.0-60.8= 11.2% more reduction shows ointment method is the more beneficial method than glycerin method.

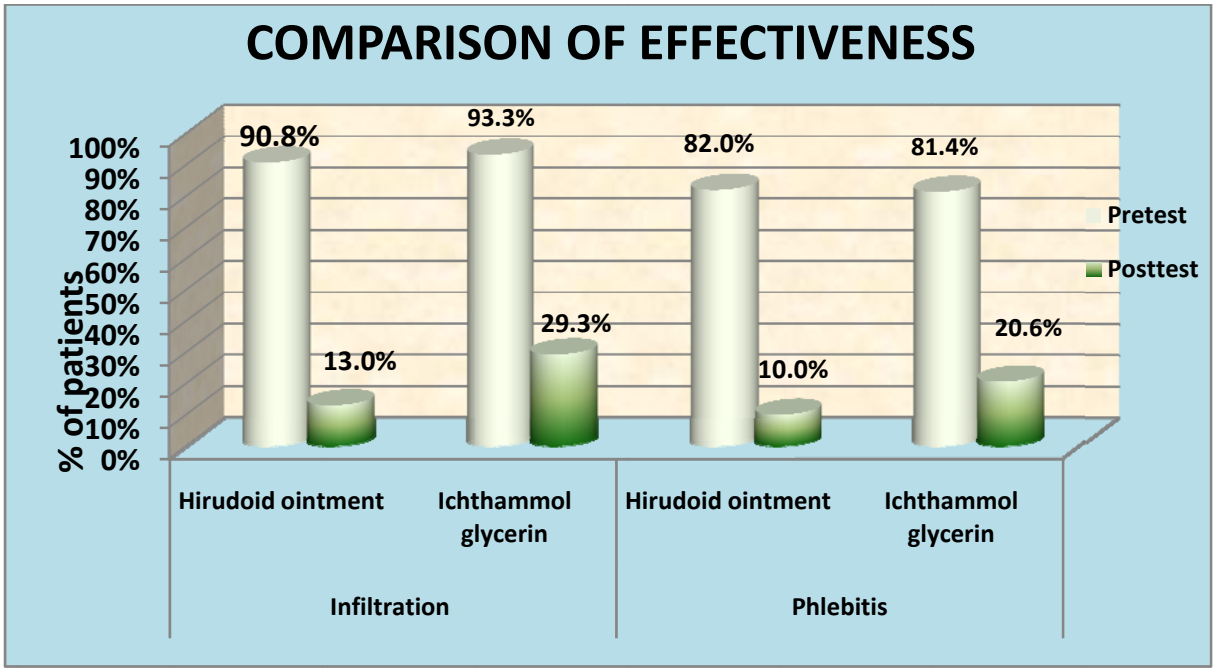


Fig-19: Comparison of effectiveness of pretest posttest value of ichthammol Glycerin and Hirudoid Ointment on Infiltration and Phlebitis

Considering the infiltration score, and phlebitis score, the hirudoid ointment percentage score is considerable reduced comparing to icthammol glycerin percentage score.

SECTION-IV

TABLE - 10

ASSOCIATION BETWEEN LEVEL OF PHLEBITIS AND DEMOGRAPHICVARIABLES (Ichthammol glycerin dressing)

Demographic variables		phlebitis				Total	Pearson $\chi 2$test/Yates corrected $\chi 2$test
		Below median(≤2)		Above median(>2)			
		n	%	n	%		
Age	20 -40 yrs	4	26.7%	11	73.3%	15	**$\chi 2$=6.53 P=0.01 DF=1 S**
	41 -60 yrs	11	73.3%	4	26.7%	15	
Sex	Male	10	76.9%	3	23.1%	13	**$\chi 2$=6.65 P=0.01 DF=1 S**
	Female	5	29.4%	12	70.6%	17	
Education	Educated	14	53.8%	12	46.2%	26	$\chi 2$=1.15 P=0.28 DF=1NS
	No formal education	1	25.0%	3	75.0%	4	
Locality	Rural	9	52.9%	8	47.1%	17	$\chi 2$=0.14 P=0.71 DF=1NS
	Urban	6	46.2%	7	53.8%	13	
Type of family	Nuclear family	11	57.9%	8	42.1%	19	$\chi 2$=1.29 P=0.25 DF=1NS
	Joint family	4	36.4%	7	63.6%	11	
Period of IV	3 - 4 days	15	53.6%	13	46.4%	28	$\chi 2$=2.14 P=0.14DF= NS
	5 - 6 days	0	0.0%	2	100.0%	2	
Types of surgery	Major	15	51.7%	14	48.3%	29	$\chi 2$=1.03 P=0.31 DF= NS
	Minor	0	0.0%	1	100.0%	1	
Complication	Infiltration	7	50.0%	7	50.0%	14	$\chi 2$=0.0 P=1.00 DF=1 NS
	Phlebitis	8	50.0%	8	50.0%	16	
Infusion site	Cephalic vein	9	45.0%	11	55.0%	20	$\chi 2$=0.60 P=0.43 DF=1NS
	Basilicvein/ medial cubital	6	60.0%	4	40.0%	10	
Infusion side	Dominant hand	10	71.4%	4	28.6%	14	**$\chi 2$=4.82 P=0.02 DF=1 S**
	Non dominant hand	5	31.3%	11	68.8%	16	
Pattern of infusion	Continuous	1	25.0%	3	75.0%	4	$\chi 2$=1.15P=0.28DF=1 NS
	Intermittent	14	53.8%	12	46.2%	26	
Comfort of the patient	Comfort	4	44.4%	5	55.6%	9	$\chi 2$=0.16 P=0.69 DF=1NS
	Discomfort	11	52.4%	10	47.6%	21	

*** significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

Table 10 shows the association between level of phlebitis and demographic variables.Younger, males and non dominant hand patients are benefitted more than

others.Statistical significance was calculated using pearson chi square test /Yates corrected $\chi 2$ test

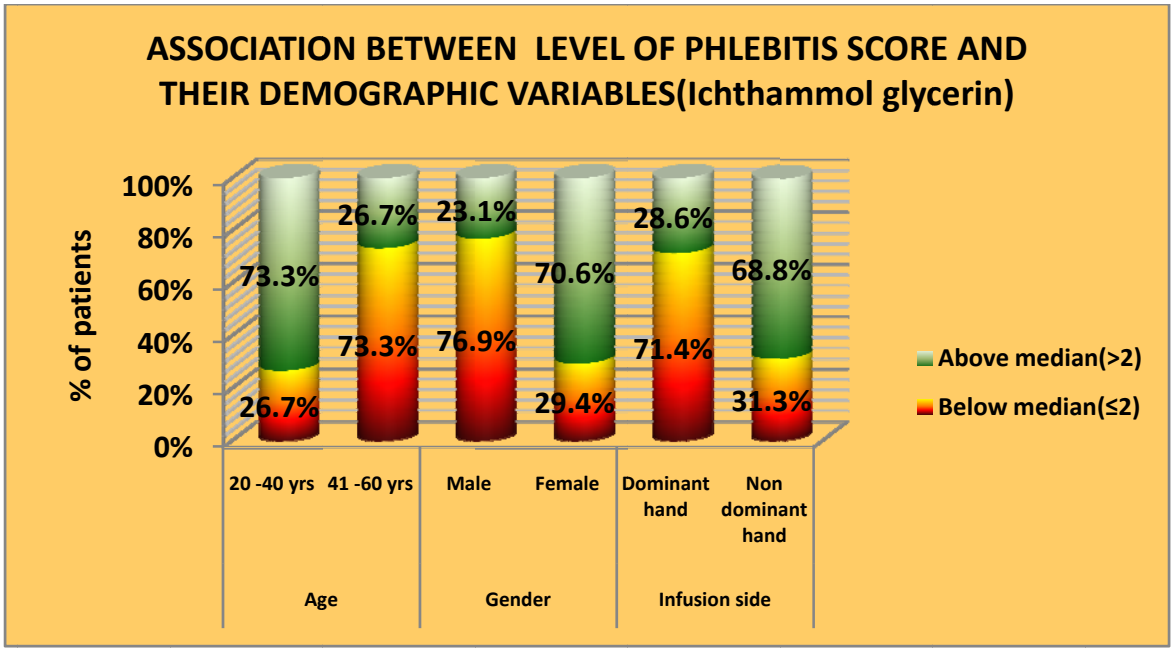


Fig-20: Association between the level of phlebitis score and their demographic variables (Ichthammol Glycerin)

The figure shows that the association between demographic variables and application of ichthammol glycerin dressing on phlebitis group. The findings demonstrated that, younger (20-40) male and non dominant subjects are benefited more than others.

TABLE-11
ASSOCIATION BETWEEN LEVEL OF PHLEBITIS AND DEMOGRAPHIC VARIABLES (Hirudoid ointment)

Demographic variables		phlebitis				Total	Pearson χ2test/Yates corrected χ2test
		Below median(≤2)		Above median(>2)			
		n	%	n	%		
Age	20 -40 yrs	2	10.5%	17	89.5%	19	**χ2=4.75 P=0.03 DF= S**
	41 -60 yrs	5	45.5%	6	55.5%	11	
Sex	Male	6	31.6%	13	68.4%	19	χ2=1.96 P=0.15 DF=NS
	Female	1	9.1%	10	90.9%	11	
Education	Educated	7	30.4%	16	69.6%	23	χ2=2.77 P=0.10 DF=1NS
	No formal education	0	0.0%	7	100.0%	7	
Locality	Rural	3	15.0%	17	85.0%	20	χ2=2.32 P=0.12 DF= NS
	Urban	4	40.0%	6	60.0%	10	
Type of family	Nuclear family	6	30.0%	14	70.0%	20	χ2=1.49 P=0.22 DF=1NS
	Joint family	1	10.0%	9	90.0%	10	
Period of IV	3 - 4 days	7	25.9%	20	74.1%	27	χ2=1.01P=0.31DF=1 NS
	5 - 6 days	0	0.0%	3	100.0%	3	
Types of surgery	Major	7	24.1%	22	75.9%	29	χ2=0.31 P=0.57 DF=1NS
	Minor	0	0.0%	1	100.0%	1	
Complication	Infiltration	4	28.6%	10	71.4%	14	χ2=0.40 P=0.52 DF=1NS
	Phlebitis	3	18.8%	13	81.3%	16	
Infusion site	Cephalic vein	5	25.0%	15	75.0%	20	χ2=0.09 P=0.76 DF=1NS
	Basilicvein/ medial cubital	2	20.0%	8	80.0%	10	
Infusion side	Dominant hand	7	36.8%	12	63.2%	19	**χ2=5.28 P=0.02 DF=1 S**
	Non dominant hand	0	0.0%	11	100.0%	11	
Pattern of infusion	Continuous	0	0.0%	6	100.0%	6	χ2=2.28P=0.13DF=1 NS
	Intermittent	7	29.2%	17	70.8%	24	
Comfort of the patient	Comfort	2	11.1%	16	88.9%	15	**χ2=4.65 P=0.03* DF=1S**
	Discomfort	5	41.7%	7	58.3%	15	

*** significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

Table 11shows the association between level of phlebitis and demographic variables.

Younger, non dominant hand and comfort of patients are benefitted more than others.

Statistical significance was calculated using pearson chi square test /Yates corrected $\chi 2$ test

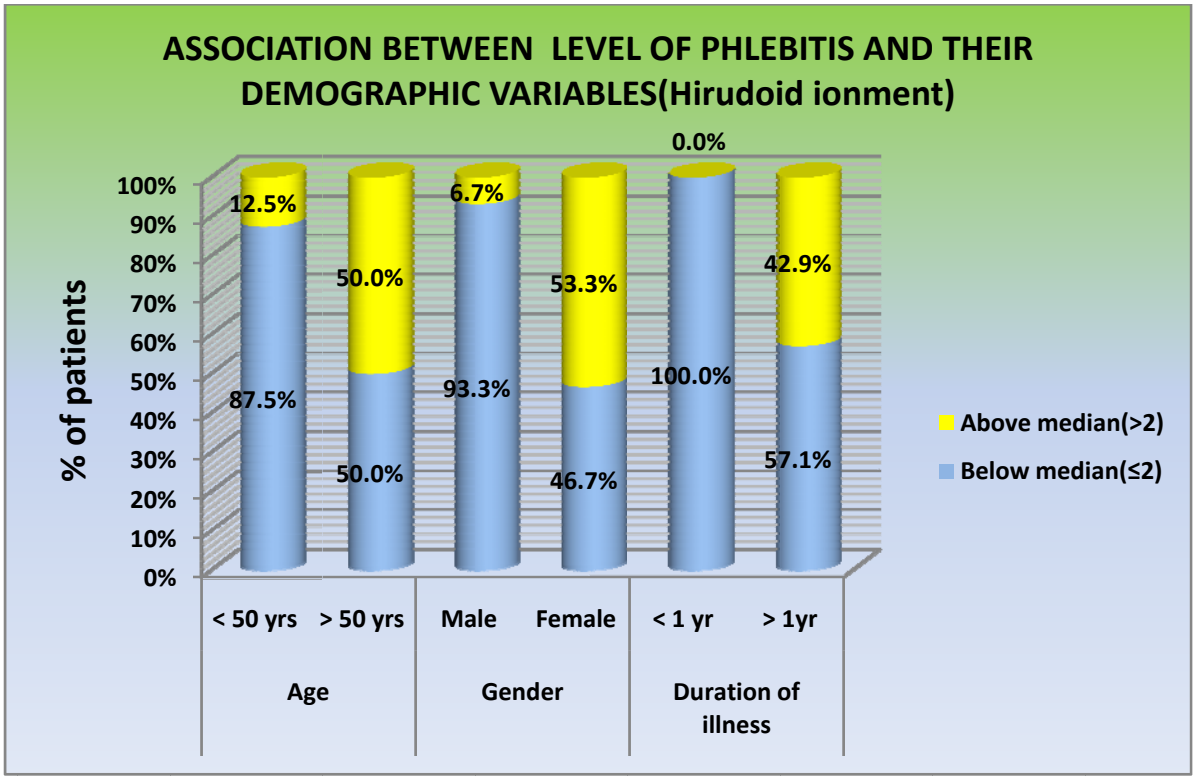


Fig-21: Association between the level of phlebitis score and their demographic variables (Hirudoid Ointment)

The figure shows that the association between demographic variables and application of hirudoid ointment on phlebitis group. The findings demonstrated that, younger (20-40) male, non dominant and comfort of the subjects are benefited more than others.

TABLE-12

ASSOCIATION BETWEEN LEVEL OF INFILTRATION AND DEMOGRAPHIC VARIABLES(Ichthammol glycerin dressing)

Demographic variables		Infiltration				Total	Pearson χ^2test/Yates corrected χ^2test
		Below median(≤3)		Above median(>3)			
		n	%	n	%		
Age	20 -40 yrs	2	13.3%	13	86.7%	15	**χ^2=3.97 P=0.05* DF=1 S**
	41 -60 yrs	7	46.7%	8	53.3%	15	
Sex	Male	4	30.8%	9	69.2%	13	χ^2=0.01 P=0.96 DF=1 NS
	Female	5	29.4%	12	70.6%	17	
Education	Educated	6	23.1%	20	76.9%	26	**χ^2=4.45 P=0.03* DF=1 S**
	No formal education	3	75.0%	1	25.0%	4	
Locality	Rural	6	35.3%	11	64.7%	17	χ^2=0.52 P=0.47 DF=1 NS
	Urban	3	23.1%	10	76.9%	13	
Type of family	Nuclear family	4	21.1%	15	78.9%	19	χ^2=1.97 P=0.16 DF=1 NS
	Joint family	5	45.5%	6	54.5%	11	
Period of IV	3 - 4 days	7	25.0%	21	75.0%	28	**χ^2=5.0 0P=0.03* DF=1 S**
	5 - 6 days	2	100.0%	0	0.0%	2	
Types of surgery	Major	8	27.6%	21	72.4%	29	χ^2=2.41 P=0.12 DF=1 NS
	Minor	1	100.0%	0	0.0%	1	
Complication	Infiltration	4	28.6%	10	71.4%	14	χ^2=0.03 P=0.87 DF=1 NS
	Phlebitis	5	31.3%	11	68.8%	16	
Infusion site	Cephalic vein	6	30.0%	14	70.0%	20	χ^2=0.00 P=1.00 DF=1 NS
	Basilicvein /medial cubital	3	30.0%	7	70.0%	10	
Infusion side	Dominant hand	4	28.6%	10	71.4%	14	χ^2=0.02 P=0.87 DF=1 NS
	Non dominant hand	5	31.3%	11	68.8%	16	
Pattern of infusion	Continuous	2	50.0%	2	50.0%	4	χ^2=0.87P=0.34DF=1 NS
	Intermittent	7	26.9%	19	73.1%	26	
Comfort of the patient	Comfort	1	11.1%	8	88.9%	9	χ^2=2.18 P=0.13 DF=1 NS
	Discomfort	8	38.1%	13	61.9%	21	

*** significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

Table 10 shows the association between level of infiltration and demographic variables.

Younger, educated and less period of IV patientsare benefitted more than others. Statistical significance was calculated using pearson chi square test /Yates corrected $\chi 2$ test

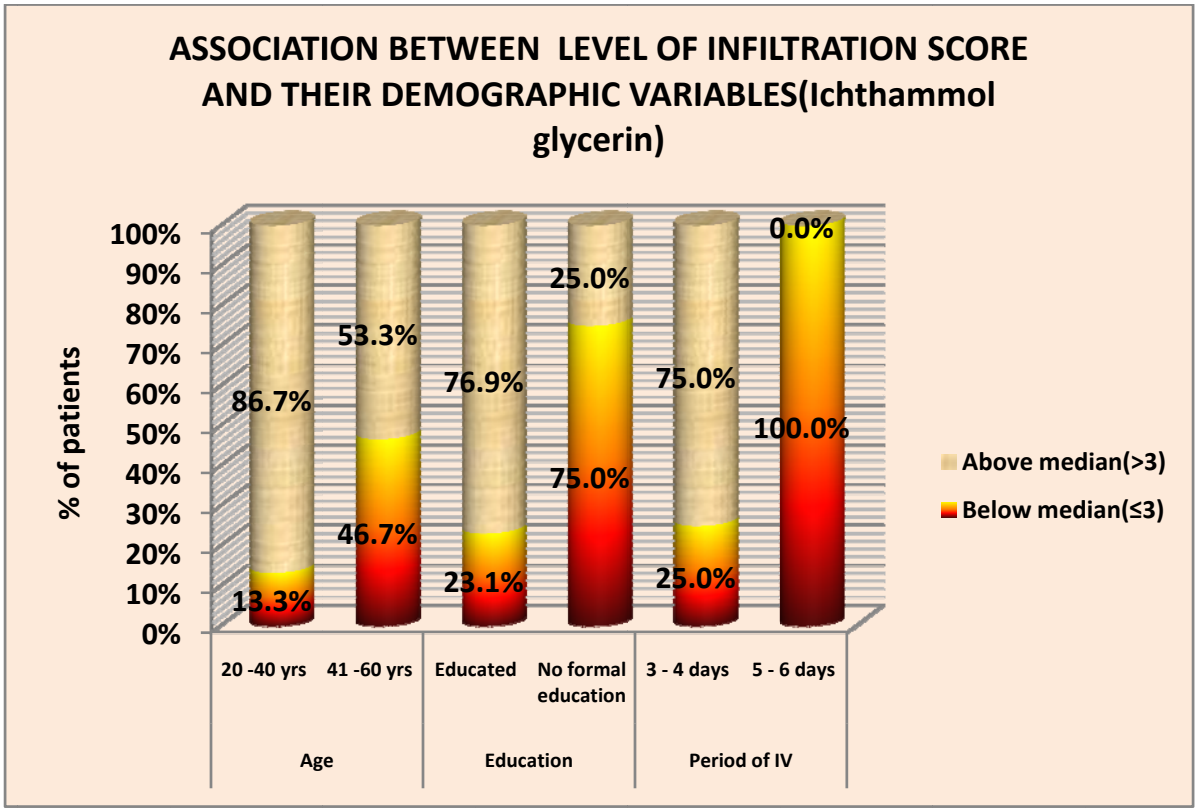


Fig-22: Association between the level of Infiltration score and their demographic variables (Ichthammol Glycerin)

The figure shows that the association between demographic variables and application of ichthammol glycerin dressing on infiltration group. The findings demonstrated that, younger, educated and less IV subjects are benefited more than others. It is statistically significant.

TABLE-13

ASSOCIATION BETWEEN LEVEL OF INFILTRATION AND DEMOGRAPHIC VARIABLES(Hirudoid ointment)

Demographic variables		Infiltration				Total	Pearson χ2test/Yates corrected χ2test
		Below median(≤3)		Above median(>3)			
		n	%	n	%		
Age	20 -40 yrs	3	15.7%	16	84.3%	19	**χ2=4.98 P=0.02* DF=1 S**
	41 -60 yrs	6	54.5%	5	45.5%	11	
Sex	Male	4	21.1%	15	78.9%	19	χ2=1.97P=0.16 DF=1 NS
	Female	5	45.5%	6	54.5%	11	
Education	Educated	4	17.3%	19	82.7%	23	**χ2=7.46 P=0.01** DF=1 S**
	No formal education	5	71.4%	2	28.6%	7	
Locality	Rural	6	30.0%	14	70.0%	20	χ2=0.00 P=1.00 DF=1 NS
	Urban	3	30.0%	7	70.0%	10	
Type of family	Nuclear family	5	25.0%	15	75.0%	20	χ2=0.71 P=0.39 DF=1 NS
	Joint family	4	40.0%	6	60.0%	10	
Period of IV	3 - 4 days	8	29.6%	19	70.4%	27	χ2=0.0 1P=0.89 DF=1 NS
	5 - 6 days	1	33.3%	2	66.7%	3	
Types of surgery	Major	9	31.0%	20	69.0%	29	χ2=0.44 P=0.51 DF=1 NS
	Minor	0	0.0%	1	100.0%	1	
Complication	Infiltration	4	28.6%	10	71.4%	14	χ2=0.03 P=0.87 DF=1 NS
	Phlebitis	5	31.3%	11	68.8%	16	
Infusion site	Cephalic vein	6	30.0%	14	70.0%	20	χ2=0.00 P=1.00 DF=1 NS
	Basilic vein/medial cubital	3	30.0%	7	70.0%	10	
Infusion side	Dominant hand	5	26.3%	14	73.7%	19	χ2=0.33P=0.56 DF=1 NS
	Non dominant hand	4	36.4%	7	63.6%	11	
Pattern of infusion	Continuous	1	16.7%	5	83.3%	6	χ2=0.63P=0.42DF=1 NS
	Intermittent	8	33.3%	16	66.7%	24	
Comfort of the patient	Comfort	2	13.3%	13	86.7%	15	**χ2=3.97 P=0.05* DF=1 S**
	Discomfort	7	46.7%	8	53.3%	15	

*** significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001**

Table 10 shows the association between level of infiltration and demographic variables. Younger, educated and Comfort of patients are benefitted more than others.

Statistical significance was calculated using pearson chi square test /Yates corrected $\chi 2$ test

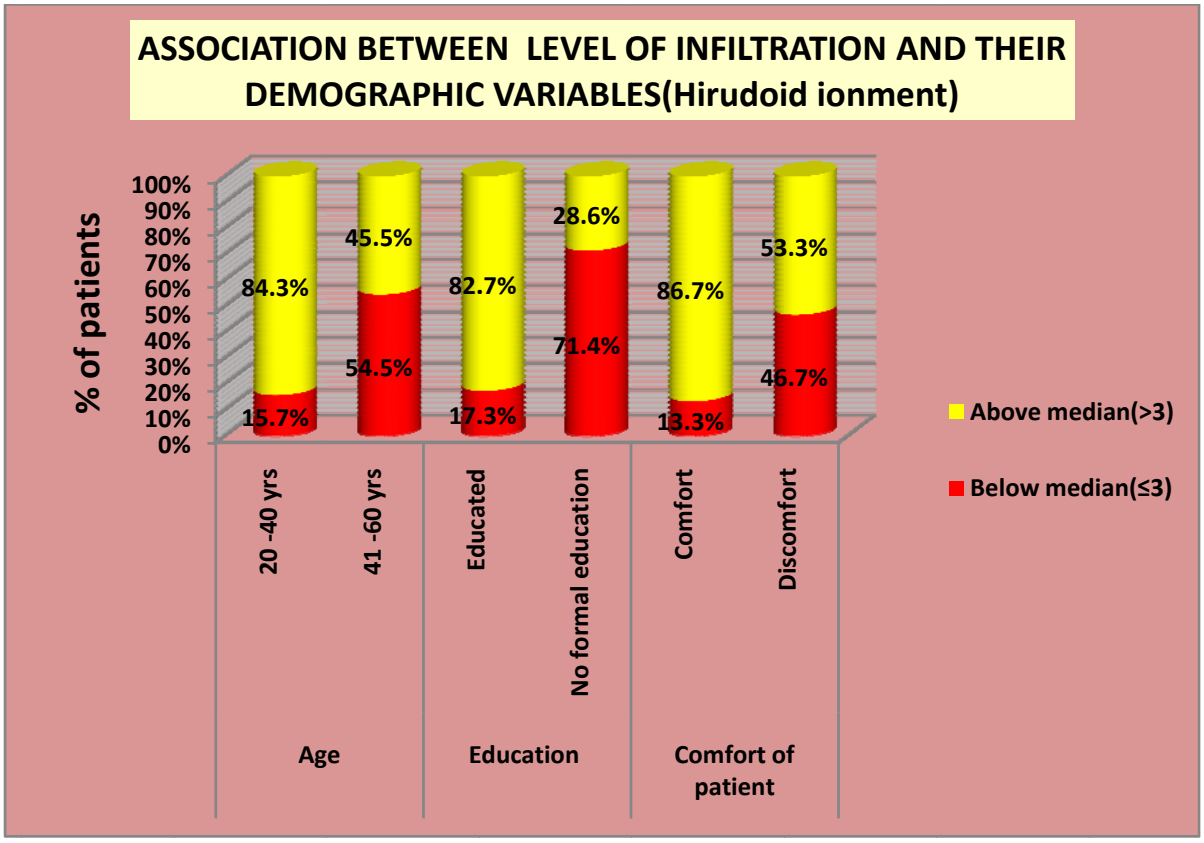


Fig-23: Association between the level of Infiltration and their demographic variables
(Hirudoid Ointment)

The figure shows that the association between demographic variables and application of hirudoid ointment on infiltration group. The findings demonstrated that, younger, educated and comfort of the subjects are benefited more than others. It is statistically significant.

CHAPTER-V

DISCUSSION

Intravenous infusion (IV infusion) is a medical term that describes the way certain kinds of medicines or other substances are delivered to the body. While many medicines or things like fluids can be taken orally, sometimes this is not an option due to time concerns or the need to bypass the gut and get medicines or other treatments directly into the veins. In these circumstances doctors and/or nurses can establish a small intravenous line that goes directly into a vein, and they use this line for drug or other substance delivery. A plethora of medications are delivered in this manner at hospital settings, at certain treatment centers, and sometimes at home.

When the IV site is established, intravenous infusion can begin and what is infused can greatly vary. For someone coming into a hospital with dehydration, possibly the only medicine infused is a balanced electrolyte solution. If needed, medicine can be injected into the solution to accomplish other things. An anti-nausea medicine, for example, might be added to the electrolyte solution.Often the intravenous infusion is administered in what is called a drip, which means the medicine of any sort drips into the IV site at planned intervals, through a tube. In many cases people have a continuous drip, where medication or fluids go in at regular times until the bag of medicine or fluids is empty. Depending on reason for intravenous infusion people might require several “bags” of medicine. Control of administration is via an IV pump, which is programmed by the

medical practitioner to administer medication at a set rate compatible with a person's age, size and other factors.

There are many medicines that are given by intravenous infusion. These include many chemo medicines, antibiotics, steroids, and almost anything else. Sometimes certain therapies that boost immunities are also given in this manner. Any time a patient cannot take something orally or rectally, intravenous infusion or injection could be considered instead.

While IVs are used fairly frequently, they do run some risks, such as risk for infection or infiltration. Infiltration occurs when fluid infused escapes the vein and begins to swell the tissue around it. Since this can look dramatic quickly, the matter is usually noticed and resolved.

The aim of the study was to assess the effectiveness of ichthammol glycerin and Hirudoid ointment on intravenous infiltration and phlebitis among patient with intravenous infusion. Pre experimental time series design was adopted for doing this study. The sample was selected by using a purposive sampling technique. A total number of 60 samples were selected, among that 30 samples were treated with ichthammol glycerin dressing and remaining 30 samples were treated with hirdoid ointment application.

This Research Study has been discussed based on the objectives and the following supported studies.

The demographic characteristics of the 30 subjects in each experimental majority among 30 patients in experimental Group two, 6 (20.0) were in the age group of 20-30 years, 9 (30.0) were in the age group of 31-40 years, 13 (43.3) were I the age group of 41-50 years and 2 (6.7) were in the age group of 51-60 years. In experimental Group-II among 30 patients 8 (26.7) were in the age group of 20-30 years, 11 (36.7) were in the

age group of 31-40 years, 9 (30.0) were in the age group of 41-50 and 2 (6.7) were in the age group of 51-60 years. With regards to gender majority of them 13 (43.3%) were males and 17 (56.7%) were females in Group-I. Whereas in Group-II, 19 (63.3%) were males and 11 (36.7%) were females.

While considering the education in Group-I 26 (86.7%) were educated and 4 (13.3%) were no formal education. Whereas Group two, 23 (76%) were educated and 7 (23%) were no formal education.

Among 60 patients most of them 28 (93.3%), 27 (90.0%) had 3-4 days intravenous infusion in both Group-I and II respectively. Likewise 29 (96.7%), 29 (96.7%) underwent major surgery in Group-I and II.

This finding is supported by Bray S.K. (1991) conducted a study related to causes of phlebitis. His findings reveals that (40%) of clients developed phlebitis due to long time intravenous infusion. (20%) due to mechanical damage, (20%) due to negligence of the health team, and (20%) due to other exogenous factors.

While considering the complication 14 (46.7%), 16 (53.3%) had infiltration and phlebitis among 60 patients in group-I and group-II.

This study is supported by the findings of MC Mahon M.J. (1998) his findings reveal that phlebitis (50.80%) is often occurring than the infiltration (30%-60%).

On considering infusion side 14 (46.7%) were dominant hand and 16 (53.3%) were non dominant hand in Group-I. Whereas Group two, 19 (63.3%) were dominant hand and 11 (36.7%) were non dominant hand.

The study is supported by National Infusion Nursing Network (INS 2003), stated that surgical patients are more vulnerable to get phlebitis.

Pattern of infusion among 60 patients 10 (10.0%), 50 (80.0%) were continuous and intermittent infusion in group-I and II respectively.

While considering comfort of the patients distribution, 9 (30.0%) were felt about comfort and 21 970.0%) were felt about discomfort in Group-I. In Group-II, 24 (80.0%) were felt about comfort and 6 (20.0%) were felt about discomfort.

The major findings of the study are discussed in regard to the formulated objectives as follows.

The first objective was to assess the effect of ichthammol glycerin dressing on intravenous infiltration and phlebitis.

Table 2 shows the effectiveness of ichthammol glycerin on intravenous infiltration and phlebitis. The findings of the study reveal that when the client was applied with ichthammol glycerin dressing, he / she showed a marked improvement in the healing process. As the ichthammol glycerin dressing was very effective in controlling the redness, edema, echymosis, tenderness and further infection. It also had moist heat effect on the site. Because of warmth of the ointment few of the patients expressed it to be more soothing.

In Infiltration scale, pretest score is 3.73 and posttest score is 1.17, so the difference is 2.56. This difference is large and it is statistically significant.In Phlebitis, pretest score is 4.07 and posttest score is 1.03, so the difference is 3.04. This difference is large and it is statistically significant. In Phlebitis reduction is 60.8% and infiltration reduction is 64%.Differences between pretest and posttest score was calculated using and mean difference with 95% Confidence Interval and proportion with 95% Confidence Interval (CD).

The finding were supported by MC Mahon M.J. (1998), conducted a study to know the effect of dry heat and moist heat application on infiltration and phlebitis site. He found out moist heat applications had more effective (68%) on phlebitis site, dry heat application had more effect (71%) on infiltration site.

The second objective was to assess the effect of Hirudoid ointment application on intravenous infiltration and phlebitis.

Table 3 shows the effectiveness of hirudoid ointment on intravenous infiltration and phlebitis. The findings of the study in relation to the application of hirudoid ointment, found that it was an effective way of treatment. Hirudoid ointment was considered to be effective, since it is easily and quickly absorbed and does not need application of a dressing over the site.

The findings were supported by a study conducted by Ababtigoban., (2008),he found that ichthammol glycerin is more effective (70%) than the moist heat on infiltration site.S

In Infiltration, pretest score is 3.63 and posttest score is 0.52, so the difference is 3.11. This difference is large and it is statistically significant. In Phlebitis scale, pretest score is 4.10 and posttest score is 0.50, so the difference is 0.60. This difference is large and it is statistically significant. In Phlebitis reduction is 72.0% and infiltration reduction is 77.8%.Differences between pretest and posttest score was calculated using and mean difference with 95% Confidence Interval and proportion with 95% Confidence Interval (CD).

The third objective was to compare the effect of ichthammol glycerin dressing and Hirudoid ointment on intravenous Infiltration and phlebitis.

In pretest, Hirudoid ointment group patients are having 3.63 score and ichthammol glycerin Group patients are having 3.73 score. The difference is 0.10 score. It is a small difference. This difference is statistically not significant. Statistical significance was calculated by using student's independent 't'test.

In posttest, Hirudoid ointment group patients are having 0.52 score and ichthammol glycerin Group patients are having 1.17 . The difference is 0.65 score. Difference is large. This difference is statistically significant. Statistical significance was calculated by using student's independent 't'test.

In Hirudoid ointment group patients are reduced their score from 3.63 to 0.52. Due to interventionthey are able to reduce 3.11 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

In ichthammol glycerin Group patients are reduced their score from 3.73 to 0.52. They are able to reduce 2.21 score from base line. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

This finding supported by P P Mehta, S Sagar, and V V Kakkar,.(1975) heparinoid cream was best choice to treat the superficial thrombophlebits patients.

The fourth objective was "To evaluate the Response of the client to the ichthammol glycerin dressing and Hirudoid ointment application.

Table 2 shows the response of the client towards ichthammol glycerin dressing and Hirudoid ointment application. It shows that hirudoid ointment was considered to be more comforting and smoothening as compared to ichthammol glycerin dressing. Among 30 patients, 24 patients (80%) were comfortable to hirudoid ointment and 6 patients (20%) were not comfortable, in ichthammol glycerin dressing 9 patients (30%) was comfortable and 21 patients (70) were not comfortable to ichthammol glycerin dressing. X^2= 4.65, and it significant at .05 levels.

The study findings were supported by james, J.J. (1991). Suggested cooling effect will enhances the patient's comfort.

There it signifies that patient on hirudoid ointment application is comfortable, the study findings suggest that the clients preferred hirudoid ointment over ichthammol glycerin dressing. Since hirudoid ointment has a sweet fragrance and is cool on application, does not need a dressing and has a smoothening effect, while ichthammol glycerin dressing has aromatic odour and is warm on application, needs a dressing and there is a high chances of soiling the linen of the client if not properly done and inconvenient to the patients. The patients also need to care of the dressing.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter includes the summary, conclusion and implications, recommendations and limitations of the study in the field of nursing.

6.1 SUMMARY:

Evaluate the effectiveness of ichthammol glycerin dressing and Hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai.

Objectives

1. To assess intravenous infiltration and phlebitis among patients with intravenous infusion.
2. To assess the effect of ichthammol glycerin dressing on intravenous infiltration and phlebitis among patient with intravenous infusion.
3. To assess the effect of Hirudoid ointment on intravenous infiltration and phlebitis among patient with intravenous infusion.

4. To compare the effect of ichthammol glycerin dressing and Hirudoid ointment on intravenous Infiltration and phlebitis.
5. To evaluate the response of the clients with intravenous infiltration and phlebitis toichthammol glycerin dressing and hirudoid ointment application.

The study was conducted based on the assumptions that

"Infiltration and phlebitis is commonly occurred among patients receiving intravenous infusion and application of Hirudoid ointment and ichthammol glycerin dressing will reduce it".

The following research hypothesis were formulated for the study

1. There will be significant difference between the mean pre and post assessment score on Ichthammol Glycerine dressing on patients with intravenous infiltration and phlebitis.
2. There will be significant difference between the mean pre and post assessment score on Hirudoid ointment application on patient with intravenous infiltration and phlebitis.
3. The mean post assessment score of patients with Hirudoid ointment application will be lower than the mean post assessment score of the patients with ichthammol glycerin dressing on intravenous infiltration and phlebitis.

Subjects with infiltration and phlebitis who receive ichthammol glycerin dressing and hirudoid ointment application. The conceptual frame work adopted was Imogene King's open system model. An evaluative approach and quasi experimental time series design was adopted for the study. The sample size was 60; non-probability purposive sampling technique was adopted for assigning the subjects.

The tool contains patient demographic profile, Visual Infusion Phlebitis (Score) Scale, Infiltration Scale, Demographic profile comprises of variables such as age, sex, education, family, and locality.

Descriptive statistics (mean, standard deviation) and the inferential statistics ('t' test & chi-square test) were used to analyze the data and to test the study hypothesis.

The tool was found to be valid and reliable through pilot study. Data were collected for a period of one month. The subjects in the experimental group-I received ichthammol glycerin dressing and the experimental group-II received hirudoid ointment application. Based on the objectives and hypothesis, data were analyzed using frequency percentage, standard deviation, mean, chi-square and paired' test.

6.2THE MAJOR FINDINGS OF THE STUDY

Both groups have improved in intravenous infusion complications like infiltration and phlebitis, as investigators tries to identify difference between these two groups the following statistical analysis have been done;

According to the characteristics of the 60 participants, with regard to distribution of age 25% patients were belonged to 20-30 years of age group. Among them 26.66% developed phlebitis and 73.33% developed infiltration. In the age group of 31-40 years (31.66%), 36.84% of the patients were developed phlebitis and 63.15% patients were developed infiltration. In this study 36.66% patients were belonged to 41-50 years of age group. Among them 77.27% patients were developed phlebitis and 22.72% patients were developed infiltration. in the age group of 51-60 years of age (6.66%), 50% of the patients were developed phlebitis and infiltration respectively.

With regard to sex 53.33% patients were belonged to males. Among them 62.5% patients were developed phlebitis and 37.5% patients were developed infiltration. The patient's belonged to female sex was 46.66%. Among them 42.85% patients were developed phlebitis and 57.14% patients were developed infiltration. According to

these, there is increase number of phlebitis in females and increase number of infiltration in males. With regard to period of intravenous therapy, 1.66% patients were selected from 1-2 days of infusion. The patients selected from 3-4 days of infusion were 88.33%. Among them 45.28% patients were developed phlebitis and 54.47% patients were developed infiltration. The patients selected from 5-6 days of infusion were 10%. Among them 83.33% patients were developed phlebitis and 16.66% patients were developed infiltration. These finding shows that, as the day of infusion increases the phlebitis and infiltration rate also increased.

With regard to type of surgery 96.7% patients were selected from major surgeries and 3.3% patients were selected from minor surgeries. Among major surgeries 48.3% patients were developed phlebitis and 51.7% patients were developed infiltration. with regard of complications 53.33 patients were developed phlebitis and 46.66 patients were developed infiltration.

- There is significant difference between mean pre test and post test assessment score of Ichthammol Glycerin dressing on intravenous infiltration and phlebi (P-0.001, df-28,'t'-26.42) and Hirudoid Ointment application.
- There is significant difference between mean pre test and post test intravenous infiltration score in Hirudoid ointment ('t'-19.44, P-0.001,DF-29) and Ichthammol Glycerin dressing. ('t'-17.44, P-0.001, DF-29).
- There is no significant difference between mean pre test score of Hirudoid ointment and pre test score of Ichthammol Glycerin dressing on infiltration (t-3.72,P-0.001,DF-58).
- There is significant difference between mean post test score of Hirudoid ointment application and post test score of Ichthammol Glycerin dressing on phlebitis(t-3.72,P-0.001,DF-58).
- There is significant difference between mean pre test and post test phlebitis score in Hirudoid ointment application (t-39.57,P-0.001,DF-29) and pre test and post test phlebitis score in Ichthammol Glycerin dressing (t-27.04,P-0.001, DF-29).

- There is no significant difference between mean pre test score in Hirudoid ointment application and Ichthammol Glycerin dressing on phlebitis (t-0.82, P-0.41,DF-58).
- There is significant difference between mean pre test and post test phlebitis score in Hirudoid ointment application and Ichthammol Glycerin dressing (t-3.72,P-0.001,DF-58)
- The reduction of infiltration symptoms in Hirudoid Ointment application was 90.80% to 13.00% (↓77.80%)whereas Itchthammol Glycerin dressing was 93.30% to 29.30%
  (↓64.00%).
- The reduction of phlebitis symptoms in Hirudoid ointment application was 82.00% to 10.00% (72.00%). Whereas Ichthammol glycerin dressing was 81% to 20.60%(60.80%).↓ Thus study shows the effectiveness of Hirudoid ointment application to reduce the symptoms of intravenous infiltration and phlebitis.
- Association between level of phlebitis and demographic variables on Ichthammol Glycerin dressing, the younger females and non dominant hand patients are benefitted more than others.
- Association between level of phlebitis and demographic variables on Hirudoid ointment application, younger female, non dominant hand and comfort of patients are benefitted more than others.
- Association between level of infiltration and demographic variables on ichthammol glycerin dressing, younger female, non dominant educated and period of IV patients are benefitted more than others.
- Association between level of phlebitis and demographic variables on Hirudoid ointment application, younger female, and comfort of patients are benefitted more than others.

6.3 CONCLUSION

This intervention was found to be, the hirudoid ointment application is effective in intravenous infiltration and phlebitis comparing to ichthammol glycerin, but it needs more nursing practice and supervision to improve the quality of care.

6.4 IMPLICATIONS

The findings of the study have practical application in the field of nursing. The implications of the study could be discussed in four areas namely Nursing Practice, Nursing Administration, Nursing Education and Nursing Research.

Nursing Practice:

The findings of the study will help the nurse in following ways:

1. Early identification and prevention of the complication of intravenous infusion.
2. As the application has no adverse effects, the nurse can apply it without doctors orders, if need.
3. As the Hirudod ointment has smoothening effect, patients are more comfortable.
4. As dressing done for ichthammol glycerin application, the patients were psychologically feels that a better care is being done.

Nursing Administration:

1. It helps to provide critical thinking regarding intravenous therapy and its management.
2. A separate intravenous infusion team can be incorporated for the administration of all intravenous procedures, which will prevent complications and improve the standard of nursing care as well as the hospital.
3. These findings help the administrator to arrange Continuing Education Programme for nurses regarding intravenous infusion, its complications and its management.
4. Formulation of standard policy to avoid complications.

Nursing Education:

1. This study enhances the nursing students to acquire knowledge in complications and management of intravenous infiltration and phlebitis.
2. This study enhances the student to think comprehensively in planning her/his intervention in managing the client with infiltration and phlebitis.

3. This study provokes critical thinking to the student.
4. This study enables the student compare the other possible ways of managing.
5. This study arouses motivation to the student to intelligibility care for client on intravenous infusion.

Nursing Research:

1. This study motivates for further studies related to this field.
2. This study calls for further studies on the comfort aspect of the client on intravenous infusion.
3. This study will help the researcher to formulate new methods to prevent infection rate during intravenous infusion.
4. This study can be a base line for further studies.

6.5 LIMITATIONS:

1. The sample size was limited to 60 patients who were equally divided into two groups.
2. This study was conducted among the participants from selected wards of Government Rajaji Hospital, Madurai. So generalization must be done with cautions.

6.6 RECOMMENDATIONS:

1. A similar study can be replicated with larger sample.
2. A similar study can be conducted by using true experimental design.
3. A similar study can be conducted in various settings like Infectious ward, and pediatric ward.
4. A study can be done to find out the occurrence of infiltration and phlebitis rate in patients with intravenous daily injections without infusion and patients on continuous intravenous flow.
5. A study can be done to find out the precaution followed by diploma nurses and graduate nurses while starting an intravenous line.

6. A study can be done to conduct a common site preferred by nurses for intravenous and most common site easily affected.
7. This study can be conducted to evaluate the knowledge and attitude of nurses regarding prevention of intravenous infusion complications.

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APPENDIX -I

SECTION A - DEMOGRAPHIC DATA

Sample no ☐

1) Name of the subject :

2) Age Group :
   a) 20-30 Years ☐
   b) 31-40 Years
   c) 41-50 Years
   d) 51-60 Years

3) Sex :
   a) Male ☐
   b) Female

4) Education :
   a) Educated ☐
   b) No formal education

5) Living area :
   a) Rural ☐
   b) Urban

6) Family :
   a) Nuclear family ☐
   b) Joint family

7) Language :
   a) Tamil ☐
   b) English
   c) Others

தனிநபர் விபரம்

1. **பெயர்** _____

2. **வயது**

   அ. 20 வயதுமுதல் 30 வயதுவரை

   ஆ. 31 வயதுமுதல் 40 வயதுவரை

   இ. 41 வயதுமுதல் 50 வயதுவரை

   ஈ. 51 வயதுமுதல் 60 வயதுவரை

3. **பாலினம்**

   அ. ஆண்

   ஆ. பெண்

4. **கல்விநிலை**

   அ. படித்தவர்

   ஆ. முறைசாராக்கல்வி

5. **வசிப்பிடம்**

   அ. கிராமப்பகுதி

   ஆ. நகரப்பகுதி

6. **குடும்பவகை**

   அ. தனிக்குடும்பம்

   ஆ. கூட்டுக்குடும்பம்

7. **மொழி**

   அ. தமிழ்

   ஆ. ஆங்கிலம்

   இ. மற்றவை

SECTION-B - CLINICAL VARIABLES

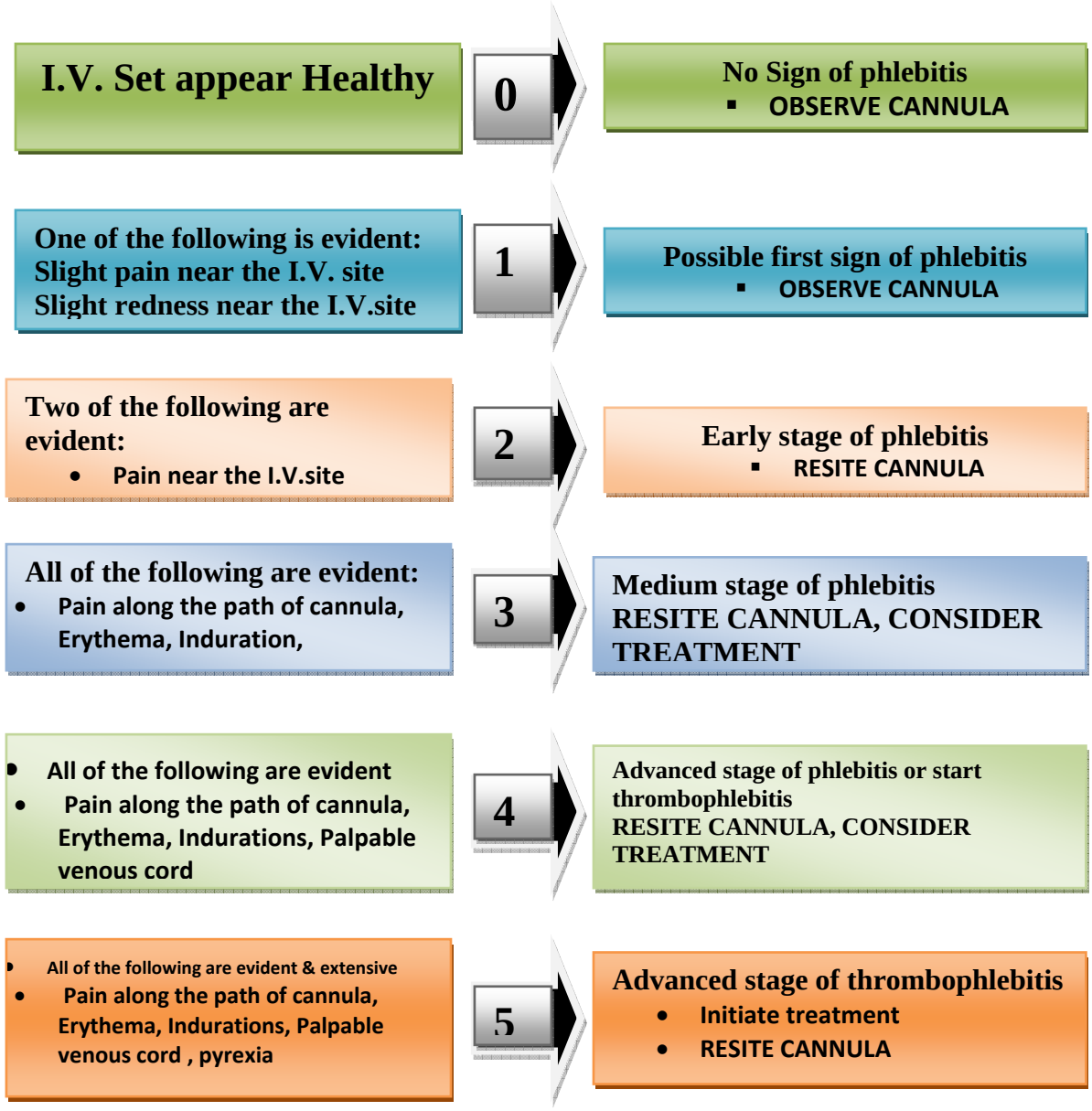
1) Period of IV therapy : a) 1-2 days

			b)	3-4 days	
			c)	4-5 days	
2)	Types of Surgery	:	a)	Major Surgery	☐
			b)	Minor Surgery	
3)	Intravenous complication	:	a)	Infiltration	
			b)	Phlebitis	☐
4)	Site of Infusion	:	a)	Cephalic Vein	
			b)	Basilic Vein	☐
			c)	Medical Cubital	
5)	Side of Infusion	:	a)	Dominant hand	☐
			b)	Non dominant hand	
6)	Size of Venflon	:	a)	18 gauze	
			b)	22 gauze	☐
			c)	24 gauze	
7)	Pattern of Infusion	:	a)	Continuous	☐
			b)	Intermittent	
8)	Comfort of the patient	:	a)	Comfort	☐
			b)	Discomfort	

SECTION-C

VISUAL INFUSION PHLEBITIS SCORE (VIP SCORE)

V.I.P SCORE (VISUAL INFUSION PHLEBITIS SCORE)



SECTION-D

INFILTRATION SCALE

INFILTRATION SCALE

Grade	Clinical Criteria
0	No symptoms
1	Skin blanched Edema < 1 inch in any direction Cool to touch With or without pain
2	Skin blanched Edema 1-6 inches in any direction Cool to touch With or without pain
3	Skin blanched, translucent Gross edema > 6 inches in any direction Cool to touch Mild – moderate pain Possible numbness
4	Skin blanched, translucent Skin tight, leaking Skin discolored, bruised, swollen Gross edema. 6 inches in any direction Deep pitting tissue edema Circulatory impairment Moderate – severe pain Infiltration of any amount of blood product Irritant or vesicant

SECTION-E

Observation checklist for Infiltration

S.No.	Description	yes	No
1.	Cool		
2.	Pale Skin		
3.	Rounded swollen area		
4.	Absence of blood back flow		

Observation checklist for Phlebitis

S.No.	Description	Yes	No
1	Warm		
2	Red area		
3	Very tender to touch		
4	Cord like insertion site		

APPENDIX-II

INTERVENTION DRUG REVIEW

Ichthammol glycerin:

Ichthammol is derived from marine sediments in Mesozoic era rock formations. It has a high hydrogen/carbon ratio and is low in nitrogen. This is opposite to a tar with which it is often confused. Ichthammol is generated from low temperature carbonisation of shale oil. It is obtained by distillation from certain bituminous schists, sulphonation of the distillate and neutralisation of the product with ammonia topharmacopeial specifications after which it is available for medical use [British Pharmacopoeia grade (BP)]. Ichthammol is also referred to as ammonium bituminosulphate, sulfonated shale oil and ichthyol although the latter usually refers to the pale version. Dark ichthammol is a result of strong acid treatment and pale ichthammol is the result of light acid treatment. Dark ichthammol is a dense, blackish-brown liquid which is miscible with glycerol (BP). Glycerol, a clear liquid possessing humectant and moisturising actions, therefore serves as a suitable vehicle for topical preparations containing ichthammol, and the resultant preparation is called ichthammol glycerin.

Ichthammol is purported to have antibacterial, antiphlogistine, anti-inflammatory,antiseborrhoic, antieczematous, antimycetic, antiprurinous and blood flow stimulating effects.

Hirudoid Ointment:

Active ingredient of Hirudoid is MPS. MPS stands for mucopolysaccharide and the MPS in Hirudoid is similar to the bodys naturally occurring mucopolysaccharides. The healing tendency of the skin relies on the presence of MPS in the tissue. The effectiveness of any skin cream depends on its absorption and scientific studies have shown that the MPS in Hirudoid penetrates the skin and is able to reach the dermal layers in effective concentrations.

Composition: Mucoplolysaccharidepolysulphate corresponding to 250 U in a cream base.Preservatives: Methylparaben IP-0.16%w/w, Propylparaben IP-0.04% w/w.

Action: Heparinoid is a substance similar to heparin. It acts by dissolving blood clots and improving the blood supply to the skin. It can be used as a cream to reduce bruising to the skin.Hirudoid is strong inhibitor of inflammation, prevents the development of superficial thrombi and promotes their regression. Hirudoid absorption of hematoma and swelling (edema) and promotes the regeneration of connective tissue. Pain and any feeling of tension will quickly disappear owing to the even and persistent effect of the product on the affected tissue. Hirudoid is distinguished by its great tissue affinity and excellent tolerability.Promotes tissue regeneration by increasing collagen and elastin fibres in the connective tissue matrix.Improves moisturizing capacity of the skin by increasingthe hyaluronic acid content. Accelerates the abosorption of bruised. Reduces swelling.

Indications: Thrombophlebitis, variscoe vein, prevention and treatment of injection and infusion phlebitis, hematoma,contusions,blunt injuries, loosening of scar tissue.

Application:hiurdoid ointment is applied and gently massaged once or twice daily or more often if thought necessary.

Contraindications: No contraindications are known except hypersensitivity to the active ingredient or the excipients in hirudoid.Broken skin or open wounds,Children under 5 years of age,Large areas of skin, Lining of the body's cavities (mucous membranes), Sensitive skin

Adverse effect:hirudoid cream is extremely well tolerated.

The Institutional Review Board/ Independent Ethics Committee of the Govt. Rajaji Hospital and Madurai Medical College, Madurai 625020 met on the 31.03.2011 at 12 noon, when the following members were present.

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1. Dr.S.M.Sivakumar, M.S (Gen. Surgery)	M.S, Govt. Rajaji Hospital, Madurai.	Convener
2. Dr.N.Vijayasankaran, M.Ch (Uro.)	Sr. Consultant Urologist Madurai Kidney Centre, Sivagangai Road, Madurai	Chairman
3. Dr.T.Meena, MD or Dean I/c (MMC)	Professor of Physiology, Madurai Medical College	Member
4. Dr.MosesK.Daniel MD (Gen.Medicine)	Professor of Medicine Madurai Medical College	Member
5. Dr.M.Gobinath, MS (Gen. Surgery)	Professor of Surgery Madurai Medical College	Member
6. Dr.B.K.C.MohanPrasad, M.ch, (Surg. Oncology)	Professor of Surg.Oncology Madurai Medical College	Member -Secy.
7. Shri.M.Sridher, B.Sc.B.L.	Advocate, 623-B.ll.Floor, East II Cross, K.K.Nagar, Madurai.20.	Member
8. Shri.O.B.D.Bharat, B.sc.,	Businessman Plot No.588, K.K.Nagar.Madurai.20.	Member
9. Shri.S.Sivakumar, M. A (Social) M.Phil	Sociologist, Plot No.51 F.F, K.K Nagar, Madurai.	Member

The Committee considers the research study Proposal submitted by PG student Mr.R.Parthipan, II Year M.Sc., Nursing Student of College of Nursing, Madurai Medical College, Madurai as per agenda. After discussion, the following study proposal has approved.

Mr.R.Parthipan	Second Batch M.Sc Nursing M.M.C Madurai.	effectiveness of ichthammol glycerin dressing and hirudoid ointment on infiltration and phlebitis among patients with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai.

Medical Superintendent

APPENDIX – IV

From

The Principal,
College of Nursing,
Madurai Medical College,

Madurai.

To

The Professor & Head of the Department,
Department of Surgery,
Government Rajaji Hospital,
Madurai.

Respected Sir,

Sub: Requesting permission to allow Mr.R.Parthipan, M.Sc (N) I year student of College of Nursing, Madurai Medical College, Madurai, to conduct a Dissertation study at Surgical Post operative wardregarding.

As per the Curriculum recommended by the Indian Nursing Council and The Tamilnadu Dr. M.G.R. Medical University, all the M.Sc. Nursing Students are required to conduct a dissertation study for the partial fulfillment of the course.

.Mr.R.Parthipan is a bonafide student of College of Nursing, Madurai Medical College, and doing M.Sc. Nursing I year (Medical Surgical Nursing). He has selected a study topic "A Comparative study to evaluate the effect of ichthammol Glycerin dressing and Hirudoid ointment on intravenous Infiltration and Phlebitis among patient with intravenous infusion in selected ward at Government Rajaji Hospital, Madurai" for his dissertation. He wants to conduct the study at Surgical Postoperative ward.

I kindly request you to consider his request and allow to conduct the study in your esteemed department

Thanking You,

Madurai – 20

yours sincerely,

24.02.2011.

Professor and Head
Department of Surgery
MADURAI MEDICAL COLLEGE
Govt. Rajaji Hospital
Madurai-20.

Principal
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

APPENDIX-V

LETTER SEEKING PERMISSION FOR PILOT STUDY

From

R.Parthipan.
M.Sc. (N) I year,
College of Nursing,
Madurai Medical College,
Madurai — 20.

To

PROFESSOR AND HEAD OF THE DErARIMt1,
DEPARTMENT OF SURGERY,
GOVERNMENT RAJAJI HOSPITAL,
MADURAI.

Through: The proper channel

Respected sir,

Sub: Requesting permission to conduct pilot study on the topic A study to evaluate the effectiveness of ichthammolglycerine and hirudoid ointmenton intravenous infiltration and thrombophlebitis, among inpatient inselected wards Government Rajaji Hospital. Madurai.

I am the First Year M.Sc. Nursing student of College of Nursing, Madurai Medical College, Madurai. In Partial fulfillment of Master Degree in Nursing, I have selected the above topic for the dissertation to submit to the Dr.M.G.R Medical University, Chennai. I request you to kindly give me permission to conduct pilot study in the selected wards of government Rajaji hospital. Kindly do the needful.

Thanking you,

Madurai-20. Yours Sincerely,

Permitted

Professor and Head
Department of Surgery
MADURAI MEDICAL COLLEGE
Govt Rajaji Hospital
Madurai-20

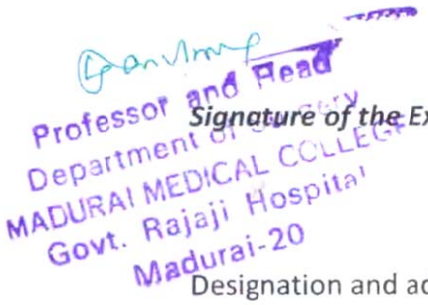
APPENDIX-VI

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed for data collection by R.Parthipan, II Year M.Sc, (Nursing) on thesis entitled, **A comparative study to evaluate the effectiveness of ichthammol glycerin and hiurdoid ointment on infiltration among patient with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai,** is relevant, valid and fulfill the study objectives.

Date: 10.4.2011.



Signature of the Expert

Designation and address

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed for data collection by R.Parthipan, II Year M.Sc, (Nursing) on thesis entitled, **A comparative study to evaluate the effectiveness of ichthammol glycerin and hiurdoid ointment on infiltration among patient with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai,** is relevant, valid and fulfill the study objectives.

Date: 15.04.2011.

Signature of the Expert

10/4

Designation and address

Asso. PROF, CON,

SRIPMS.

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed for data collection by R.Parthipan, II Year M.Sc, (Nursing) on thesis entitled, **A comparative study to evaluate the effectiveness of ichthammol glycerin and hiurdoid ointment on infiltration among patient with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai,** is relevant, valid and fulfill the study objectives.

Date: 22.04.2011. signature

CONTENT VALIDITY CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed for data collection by R.Parthipan, II Year M.Sc, (Nursing) on thesis entitled, **A comparative study to evaluate the effectiveness of ichthammol glycerin and hiurdoid ointment on infiltration among patient with intravenous infusion in the selected wards of Government Rajaji Hospital, Madurai,** is relevant, valid and fulfill the study objectives.

DATE: 15/04/11

SIGNATURE OF THE EXPERT

NAME : B. SARA

DESIGNATION: READER IN NURSING

APPENDIX-VII

ஒப்புதல் அறிக்கை

எனக்கு இந்தஆய்வைப்பற்றிய முழு விவரம் விளக்கமாகஎடுத்துரைக்கப்பட்டது. இந்தஆய்வில் பங்குபெறுவதில் உள்ளநன்கைகள் மற்றும் தீமைகள் பற்றிநான் புரிந்துகொண்டேன். நான் இந்தஆய்வில் தானாகவேமுன்வந்துபங்குபெறுகிறேன். மேலும் எனக:கு இந்தஆய்வில் இருந்தஎந்தநேரமும் விலகிக்கொள்ள முழு அனுமதிவழங்கப்பட்டுள்ளது. என்னுடையசிகிச்சைஆவணங்களைப் பார்வையிட்டுஅதில் உள்ளவிவரங்களைஆய்வில் பயன்படுத்திக் கொள்ளஅனுமதிஅளிக்கின்றேன். என்னுடையபெயர் மற்றும் அடையாளங்கள் ரகசியமாகவைத்துக் கொள்ளப்படும் என்றும் எனக்குஉறுதியளிக்கப்பட்டுள்ளது.

இப்படிக்கு,

…….