EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI

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A dissertation submitted to

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In partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE IN NURSINIG

OCTOBER – 2017

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Approved by Dissertation Committee on _____

Research Guide _____

Prof. Mrs. S. POONGUZHALI. M.Sc. (N)., M.A(Psy)., M.B.A(HM)., Ph.D
Principal,
College of Nursing,
Madurai Medical College,
Madurai-20

Clinical Speciality Guide___ _____

Mrs. S.MUNIAMMAL. M.Sc. (N)., MBA (HM).,
Lecturer,
College of Nursing,
Madurai Medical College,
Madurai-20.

Medical Expert _____

Dr. D. MARUTHUPANDIAN. M.S (General Surgery)., FICS., FAIS.
Dean,
Madurai Medical College,
Madurai-20.

A dissertation submitted to

THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY,

CHENNAI- 600 032.

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MASTER OF SCIENCE IN NURSING

OCTOBER 2017

CERTIFICATE

This is to certify that this dissertation titled, **"EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI"** is a bonafide work done by **Mrs. V. BALASARASWATHY**, M.Sc. (N) student, College of Nursing, Madurai Medical College, Madurai- 20, submitted to **THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI- 32** in partial fulfilment of the university rules and regulations towards the award of the degree of **MASTER OF SCIENCE IN NURSING, Branch – I, Medical Surgical Nursing** under our guidance and supervision during the academic period from 2015 – 2017.

Prof. Mrs. S.POONGUZHALI.
M.Sc. (N), M.A., M.B.A., Ph.D
PRINCIPAL,
COLLEGE OF NURSING,
MADURAI MEDICAL COLLEGE,
MADURAI-20.

Dr.D.MARUTHUPANDIAN.M.S,
FICS. FAIS.
DEAN
MADURAI MEDICAL COLLEGE,
MADURAI-20.

CERTIFICATE

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Name and Signature of the Guide _____
Mrs. S. MUNIAMMAL, M.Sc. (N)., M.B.A (HM).,
Lecturer,
College of Nursing,
Madurai Medical College,
Madurai-20

Name and Signature of the Head of the Department_____
Prof. Mrs. S.POONGUZHALI. M.Sc. (N)., M.A(Psy)., M.B.A (HM)., Ph.D
Principal,
College of Nursing,
Madurai Medical College,
Madurai-20

Name and Signature of the Dean_____
Dr.D. MARUTHUPANDIAN. M.S (General Surgery)., FICS., FAIS.
Dean,
Madurai Medical College,
Madura – 20.

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FOR NOTHING WILL BE IMPOSSIBLE WITH GOD.

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ABSTRACT

Title: Effectiveness of prophylactic measures on deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai. **Objectives:** To evaluate the effectiveness of prophylactic measures on probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai.To associate the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai with their selected socio-demographic and clinical variables. **Hypotheses**: There is a significant difference in the post test probability level of developing deep vein thrombosis between intervention and control group among post operative patients at Government Rajaji Hospital Madurai.There is a significant association between the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital with their selected socio-demographic and clinical variables. **Conceptual Framework:** Modified Wiedenbach's Helping Art of Clinical Nursing theory. **Methodology:** Quantitative-True-experimental posttest only design and consecutive sampling technique. Prophylactic measures i.e early mobilization was given to interventional group and control group received only routine hospital care. Posttest was assessed using Modified well's criteria for deep vein thrombosis scale on 5^{th} day morning. **Findings:** The findings revealed that there was a significant difference in the probability level of developing deep vein thrombosis between interventional group and control group. It was proud by student Student's independent t-test value $t = 2.78$, $p= 0.01$. **Conclusion:** The study concluded that prophylactic measures is a non-pharmacological therapy and cost effective to prevent the probability level of developing deep vein thrombosis among post operative patients .

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INTRODUCTION

CHAPTER I

INTRODUCTION

"**Every human being is the author of his own health or illness"**

-Buddha

"Health is wealth and is a basic human right". Good health is always around the corner but never actually reached, but there is always something more to be achieved. In this view health is a goal itself, the end instead of one of the means of fulfilling life's purposes. True health is the strength to live, the strength to suffer, and the strength to die, while ill health or disease brings sorrows, misery, suffering to the family, community and to the whole nation by and large.

The vascular system is vast network of vessels through which blood circulates in the body. Arteries, arterioles, veins, venules, capillaries and lymphatics constitute the structural elements of vascular system. Approximately 75% of total blood volume with in the veins. Vascular system consists of superficial veins which located in the fatty layer under the skin, deep veins which located in the muscles and along the bones, short veins called connecting veins , link the superficial and deep veins.

Deep veins play a significant role in propelling blood toward the heart. The one-way valves in deep veins prevent blood from flowing backward, and the muscles surrounding the deep veins compress them, helping force the blood toward the heart, just as squeezing a toothpaste tube eject tooth paste. The powerful calf muscles are particularly important, forcefully compressing the deep veins in the leg with every step. The deep veins carry 90% or more of the blood from the leg toward the heart. The veins in the legs are particularly at risk of blood clotting or swelling in the veins. Deep vein thrombosis is one of the problems in the venous system especially in the

deep veins . Deep vein thrombosis is one of the vascular disorders characterized by venous stasis, hypercoagulability of the blood and vessel wall injury.

During the past 50 years the health problems of people have changed significantly. Although many of the diseases have been controlled or eradicated, majority of the health problems seen today are acute or chronic in nature and nowadays increasing emphasis is given to the cardiovascular disorders. These disorders disrupt the patency and responsiveness of the blood vessels and the adequacy of circulating volume.

Deep vein thrombosis (DVT) is a condition in which a blood clot (a blockage) forms in a deep vein. While these clots most commonly occur in the veins of the leg (the calf or thigh), they can also develop in other parts of the body. Deep vein thrombosis (DVT) can be very dangerous and is considered as a medical emergency.

Deep vein thrombosis results from a triad of factors: increased “stickiness” of the blood, damage to the blood vessel wall, and sluggish blood flow. Decreased mobility is a major risk factor that affects most hospitalized patients . The other factors which increase the risk of developing Deep Vein Thrombosis include increasing age, obesity, surgery ,estrogen therapy, smoking, central venous catheters, previous history of deep vein thrombosis, and many acute and chronic medical conditions like cancer, inflammatory diseases, acute infections, heart failure, stroke, chronic lung disease, decreased venous circulation and varicose vein.

There is a high incidence of post operative deep vein thrombosis. The risk of deep vein thrombosis in surgery is determined by patient’s age, obesity, type of procedure, extent of surgical trauma, length of procedure, type of anesthesia and duration of immobilization in the perioperative and post operative period.

Surgical patients are at high risk for developing deep vein thrombosis in which major abdominal surgery itself is very traumatic and frequently require bed rest that increases venous stasis. Even those patients permitted to get out of bed, remain in bed because of monitoring equipment, intravenous lines, drainage tubes, catheters, and other necessary medical equipment.

Deep vein thrombosis is the formation blood clot in the veins. It is usually caused by a combination of predisposing factors known as Virchow's triad i.e Venous stasis: immobility reduces the effectiveness of the calf muscle pump and can lead to stasis (slowing of blood flow) and pooling of blood behind the valve cusps; Vein wall trauma/dilation: injury to the endothelial lining of the vein wall activates clotting by triggering the release of tissue factor. Venous dilation, which may occur intra-operatively, can cause endothelial damage resulting in the exposure of collagen and activation of clotting. Hypercoagulability: a variety of hereditary and acquired causes such as pregnancy, malignancy, and thrombophilia are most likely to develop clots in the venous system. Deep vein thrombosis can occur without symptoms 50 percent of the times, but in many cases the affected extremity will be painful, swollen, red, warm , dull ache , tightness, tenderness in the leg and the superficial veins may be engorged.

A world wide survey conducted by World Health Organization showed that Deep vein thrombosis is a common condition with an average incidence rate of more than one per 1000. Every year Deep vein thrombosis occurs in about 1 in 3000 in those below the age of 40 and 1 in 500 in those over 60years of age. Deep vein thrombosis is also a lethal complication mostly owing to Pulmonary embolism, survivors may experience serious and costly long term complications.

Deep vein thrombosis is the major health problems with possible serious outcomes. Deep vein thrombosis can lead to chronic venous insufficiency and affect the 'Quality of life' and at the same time increase the cost of patient's management. Epidemiological data indicate that annual frequency in general population is approximately 160 per 100,000 for Deep vein thrombosis and 20 per 100,000 for the symptomatic nonfatal pulmonary embolism.

Nurses should focus on prevention by the early recognition and adequate prophylaxis of those at increased risk. Patients should be actively involved in their care wherever possible. An awareness of diagnostic and treatment strategies will enable nurses to inform patients. This helps to improve both concordance with treatment and disease outcome. The nurse can observe and assess how the patient is managing her or his treatment and adapting to lifestyle changes, leading to an improved quality of life.

The goals of this study are to promote health, to preserve health, to minimize suffering and distress of the high risk patients. These goals are embodied in the word 'prevention'. Successful prevention of risk factors and risk group, availability of prophylactic or early detection and treatment are the main intervention to prevent the developing of deep vein thrombosis.

Hospitalized post-operative patients are at risk for developing deep vein thrombosis, a variety of interventions are available in the health care settings. Early mobilization which includes changing of position every two hours, dorsiflexion and plantar flexion of the foot and rotation of the ankle at least three times a day, and ambulation of the patients as early as possible if not contraindicated in immediate post-operative period is the easiest and most cost effective method to decrease the risk of developing deep vein thrombosis.

Leg exercises stimulates the calf muscles to contract and compress the veins within the muscles and force the blood to flow upward and towards the heart and improves the venous circulation which prevents the venous stasis. Regular mobility and leg exercises in the post-operative period help to maintain proper blood circulation. Using prophylaxis for deep vein thrombosis is neither complicated nor expensive and preventing this complication is cheaper than treating its consequences.

1.1 Need For the Study

Deep vein thrombosis is a serious problem that affects millions of people annually around the world. World thrombosis day is celebrated every year in 10th October. A comprehensive scientific review by the World Thrombosis Day steering committee revealed that 10 million cases of Venous Thrombosis Embolism occur annually – across low, middle and high income countries and Venous thromboembolism is a leading cause of death and disability worldwide. In Europe and the U.S., it claims more lives than AIDS, breast and prostate cancer, and motor vehicle crashes combined.

Deep vein thrombosis is more serious condition because it presents a greater risk for pulmonary embolism. Immobility predisposes a person to thrombosis. Many patients in hospital are at increased risk of developing deep vein thrombosis. Since surgery is independent risk factor, post-operative patients are high risk for developing deep Vein Thrombosis and it is therefore important for nurses to understand the condition and how to recognize it.

Approximately half of the acute lower extremity thrombi are detected in the operating room, with remainder occurring over the next 2 to 5 days. Risk for development of Deep Vein Thrombosis continues after hospital discharge as well and may extent up to 6 weeks of discharge. A surgical patient may have all the

components of virchow's triad; peri-operative immobilization > 1 hour, transient changes in coagulation and fibrinolysis, and the potential for gross venous injury. Immobilization is associated with a reduction in venous outflow and capacity during the post-operative period. Surgery is also accompanied by a transient, low-level hypercoagulable state, presumable mediated by the release of tissue factor, which is marked by a rise in thrombin activation markers shortly after the procedure begins. Increased levels of plasminogen activator inhibitor -1 are also associated with a decrease in fibrinolytic activity on the first post-operative day, the 'post-operative fibrinolytic shut down'.

According WHO statistics for Deep Vein Thrombosis in the year 2015, as many as 900,000 people could be affected (1 to 2 per 1,000) each year in the United States. Estimates suggest that 60,000-100,000 Americans die of Deep Vein Thrombosis/Pulmonary Embolism (also called venous thromboembolism). 10 to 30% of people will die within one month of diagnosis. Sudden death is the first symptom in about one-quarter (25%) of people who have a Pulmonary Embolism. Among people who have had a Deep Vein Thrombosis, one-half will have long-term complications (post-thrombotic syndrome) such as swelling, pain, discoloration, and scaling in the affected limb. One-third (about 33%) of people with Deep Vein Thrombosis/Pulmonary Embolism will have a recurrence within 10 years. Approximately 5 to 8% of the U.S. population has one of several genetic risk factors, also known as inherited thrombophilias in which a genetic defect can be identified that increases the risk for thrombosis.

According to Journal of the American college of surgeons in the year 2012, high risk for developing deep vein thrombosis is found in patients with the condition such as stroke (59-100%), orthopedic surgery (17-84%), major abdominal surgery

(30-70%) and trauma (40-60%). The five most frequent co-morbidities were hypertension (50%), surgery within 3months (38%), immobility within 30 days (34%), cancer (32%) and obesity (27%).

According to National Institute Health in the year 2008, deep vein thrombosis leads to serious consequences including pulmonary embolism (PE), recurrence of Venous thrombo embolism(VTE), post-thrombotic syndrome and death. Approximately 200,000 individuals die annually as result of Pulmonary Embolism. Approximately 25% of deep vein thrombosis (DVT) patients remain asymptomatic in the long term but severe signs of post-thrombotic syndrome (ulceration) are observed in 2-10% of patients 10 years after deep vein thrombosis(DVT).

CMC Journal article on deep vein thrombosis in South India (Vellore) revealed that post-operative Deep vein thrombosis is a well-recognized complication. The reported incidence ranges from 45% to 85% in patients who have had no prophylaxis. Deep vein thrombosis was determined in 50% of patient aged 50years and more. In patients with malignancy the incidence was 47.6%; 10% had an infusion in to ankle during operation and three of them developed venous thrombosis in the same day. The cost of management of deep vein thrombosis increases by at least Rs.10,000/- for every patient in hospital. If the patient develops complication of deep vein thrombosis, then the cost of management steeply increases. Venous ulcers develop in at least 300 per 100,000 populations and the proportion due to deep vein thrombosis is approximately 25%.

According to 2016 census from Department of Vascular surgery at Government Rajaji Hospital, Madurai , 90 Patients were diagnosed to have deep vein thrombosis and treated with pharmacological and nursing intervention.

Most venous thrombo-prophylactic methods aim to reduce venous stasis and thus the propensity for clot formation. Researchers found that prophylactic methods can be used in patients at low risk to high of venous thromboembolism along with or without pharmacologic therapy. The nurse has an active role in the implementation of prophylactic methods. In the first instance, the nurse will encourage patients to ambulate as early as possible and avoid prolonged bed rest. If the patients are bedridden due to major surgery, nurses will actively do the passive exercises until ambulant.

Immediate post operative period is the most critical situation in every post operative patients. There are various complications like pain, haemorrhage, confusion, nausea and vomiting, wound dehiscence and deep vein thrombosis etc which will affect the health status of the patients during post-operative period. There are many number of patients who developed deep vein thrombosis during the post-operative period and many literature suggest that prophylactic measures i.e early mobilization which includes changing of position, dorsiflexion and plantar flexion of the foot, rotation of the ankle during the post-operative period greatly reduces the probability level of developing of deep vein thrombosis.

Based on the personal experience in the clinical posting, and many literature related to deep vein thrombosis and prophylactic measures , the researcher is interested to take down this problem statement and decided to conduct the research.

1.2 Statement of the Problem

A study to evaluate the effectiveness of Prophylactic measures on deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai.

1.3 Objectives:

1. To evaluate the effectiveness of prophylactic measures on probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai.
2. To associate the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai with their selected socio-demographic and clinical variables .

1.4 Hypotheses:

H_1: There is a significant difference in the post test probability level of developing deep vein thrombosis between intervention and control group among post operative patients at Government Rajaji Hospital Madurai.

H_2: There is a significant association between the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital with their selected socio- demographic and clinical variables.

1.5 Operational Definition

Effectiveness:

In this study it refers to the outcome level of intended result of prevention of probability level of developing deep vein thrombosis after providing prophylactic measures i.e early mobilization which includes leg exercises along with 2^{nd} hourly position changing for four consecutive days, is measured by modified well's criteria for deep vein thrombosis.

Prophylactic measures

In this study, prophylactic measures refers to early mobilization which includes 2^{nd} hourly position changing and leg exercises i.e dorsiflexion (15-20^{o}) and

plantar flexion(45-55^{o}), inversion(15-20^{o}) and eversion(20-30^{o}) of the foot and rotation of ankles for 10-15 minutes, three times a day. On the first day of surgery, prophylactic measures are 2nd hourly position changing from supine to lateral sides along with leg exercises; on the second , third and fourth days changing of position from supine to semi fowler position along with leg exercises, this procedure lasts for four consecutive days .

Deep vein thrombosis

In this study, it refers to the presence of symptoms such as pain and tenderness in the calf muscle, limb swelling, skin discoloration, warmth in the affected leg during post operative period to surgical patients are measured for the probability level of developing deep vein thrombosis by using modified well's criteria for deep vein thrombosis.

Post operative clients

In this study, it refers to patients are being in the period of time after major abdominal surgery under General or Spinal anesthesia lasting more than an hour duration of surgical procedure in the post operative ward which includes open appendectomy, open cholecystectomy, pancreatectomy, hernia repair, gastro-jejunostomy, spleenectomy, gastrectomy, intestinal resection and hemi colectomy.

1.6 Assumption

Post operative patients may have different probability level of developing deep vein thrombosis.

1.7 Delimitation:

The study is limited to the patients who undergone major abdominal surgery only.

The study period is limited to 4-6 weeks only.

1.8 Projected Out Come

Prophylactic measures will prevent the probability level of developing deep vein thrombosis among post operative patients.

REVIEW OF LITERATURE

CHAPTER-II

REVIEW OF LITERATURE

This chapter explains in detail about the review of literature and conceptual framework used for the study. A literature review is an evaluate report of information found in the literature related to selected area of study. The review should describe , summarize, evaluate and clarify this literature. It should give a theoretical base for the research and help to determine the nature of the research. It aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Literature review are secondary sources ,and as such ,do not report any new or original experimental work. Also a literature review can be interpreted as a review of an abstract accomplishment.

Literature review serves a number of important functions in research process .It help the researcher to generate ideas or to focus on a research approach ,methodology, meaning tools and even type of statistical analysis that might be productive in pursuing the research problem. Review of literature in the study is organized under the following headings.

The literature was searched from extensive review from various sources was depicted under the following headings.

2.1 Review of literature related to deep vein thrombosis, incidence and prevalence among post operative patients

2.2 Review of literature related to effectiveness of prophylactic measures on deep vein thrombosis among post operative patients.

2.3 Conceptual frame work

2.1 Review of literature related to deep vein thrombosis, incidence and prevalence among post operative patients

Si-Dong Yang, Huan Liu,et all (2015) conducted a case cohort study to investigate risk factors for postoperative Deep Vein Thrombosis using retrospectively collected data from department of surgery at Hebel Medical Hospital, China between 07/2013 and 07/2014 among 861 patients. The study results showed that increasing age , blood transfusion, increasing length of surgery by using regression analysis were risk factors for postoperative Deep Vein Thrombosis after surgery with in 7 days.

Andrew L.Muleledhu, Moses Galukande , et all (2013) conducted a cross sectional descriptive study in Mugalo Uganda's National Referral hospital to determine the prevalence and risk factors of Deep Vein Thrombosis among post operative patients. A total of 82 eligible patients identified and clinical examination were done on first, second, and fourth post operative day to assess the Deep Vein Thrombosis. The study results showed that post operative patients had moderate risk in which cancer was the most risk factor for developing deep vein thrombosis.

Woo-Suk Lee MD, PhD,Kang-Il Kim MD, PhD, et all (2012) analyzed many prospective studies between 1996 and 2011 among Asian countries. A total of 1947 patients from 18 studies were reviewed for meta-analysis. The incidence of symptomatic Pulmonary Embolism was 0.01%. The incidences of overall Deep Vein Thrombosis, proximal Deep Vein Thrombosis, and symptomatic Deep Vein Thrombosis were 40.4%, 5.8% and 1.9%, respectively. The study revealed that the patients in Asian countries the level of Deep Vein Thrombosis after surgery is moderate.

Emeka Kesieme,Chinenye Kesieme et all (2011) published an article regarding the incidence, causes and management of Deep Vein Thrombosis. They

obtained data from Medline, medical libraries, and Google and revealed that deep vein thrombosis affects 0.1% of 100 persons per year. It is predominantly a disease of the elderly and has a slight male preponderance and recommended that appropriate prophylaxis to be used to prevent extension of thrombi, pulmonary embolism, recurrence of thrombi, and the development of complications such as pulmonary hypertension and post thrombotic syndrome.

Lee AD, Stephen E, Agarwal S, (2009) conducted a retrospective study in India to determine the incidence and predisposing factors of deep vein thrombosis among hospitalized patients and in-patient records were used to collect data while out-patient records were used for follow-up outcomes. The incidence of deep vein thrombosis was 17.46 per 10,000 admissions. Malignancy (31 percent) was the most common predisposing factor, followed by postoperative status (30 percent). The incidence following surgery was 5 per 10,000 operations. General surgery patients had the highest incidence of DVT (40.3 percent), while the incidence in orthopaedic patients was 20 percent. According to this study general surgical operations were the most common causes of post operative Deep vein thrombosis.

Parul J Shukla, Ravichand Siddachari et all (2008) conducted a randomized control trial in Switzerland among 99 patients. The study revealed that Deep vein thrombosis (DVT) is reported to be common post operative complication among patients undergoing surgery for colorectal cancer. The risk of postoperative venous thromboembolism is reported to be twice as high in patients with cancer compared to those without cancer undergoing comparable surgery. This risk is also high in patients undergoing surgery for colorectal cancer as compared to patients having an abdominal surgery without malignancy (9%–15% vs. 6%–9%).

Vijay Kumar J.R, (2008) conducted a descriptive study prospectively to identify the predisposing factors and warning signs of deep vein thrombosis among 50 patients in South India at a tertiary care hospital. The study result revealed that Most of the patients were male (56%), in age group between 20-40 years. Pain with limb swelling (64.5%) were the most common presenting symptoms in limb Deep Vein Thrombosis .

Myint Tun, Ibrahim Lutfi Shuaib, et all (2007) conducted a prospective study in Hospital University , Sains Malaysia situated in Kelantan State, on the east coast of Malaysia, to find out the incidence of post-operative deep vein thrombosis (DVT) after major surgical procedures in general surgical patients in an Asian population among 54 Deep Vein Thrombosis risk group patients by using consecutive sampling technique. This study showed that post operative patients in Asian countries had moderate level of post-operative deep vein thrombosis.

Anderson.F.A (2007) conducted a study on acute-care hospital patients in U.S. The study result showed that the number of patients who are at risk for venous thromboembolism and should receive a recommended prophylaxis strategy will be continued over years in order to prevent recurrence of deep vein thrombosis .

Lewis , Heitkemper et al (2007) described regarding deep vein thrombosis. It is disorder involving a thrombus in a deep vein, most commonly the iliac and femoral vein. It occurs in at least 5% of all surgical patients. It is caused due to three important factors (Virchow triad) are venous stasis, endothelial damage, hypercoagulability of blood. Clinical manifestations are unilateral leg edema, extremity pain, warm skin, erythema and systemic temperature greater than 100.4^{o} F . Early mobilization is the easiest and cost effective method to decrease the risk of deep vein thrombosis.

Deidre Anne De Silva et.al,(2006) conducted a study to determine deep vein thrombosis following ischemic stroke among Asians. The study result revealed that deep vein thrombosis was detected in 30% of patients at days 7-10 and in 45% of patients at days 25-30 after stoke attack. Most thrombosis were significantly associated with the age and degree of weakness with the presence of deep vein thrombosis at days 25-30 .

2.2 Review of literature related to prophylactic measures on deep vein thrombosis among post operative patients

David J. Cote and Timothy R. Smith(2015) conducted a study among hospitalized post operative patients in Brigham and Women's Hospital, Boston, MA, USA regarding pathogenesis and prevention of post operative deep vein thrombosis. The study showed that leg exercises and early ambulation could help to prevent venous stasis which contributes to the development of Venous Thrombo Embolism and it helped to improves blood circulation.

Kaori Toyo, Ken Sasano et al (2015) conducted a study to identify the most effective method of performing ankle pumping exercises in different positions (supine, leg up, head up positions)and exercise intervals(with or without rest interval period) among 84 patients by using consecutive sampling technique in Society of physiotherapy science centre, Tokyo. The study showed that 77 % ankle position (leg up) and exercise intervals (4 seconds rest period) were effective when performing effective ankle pumping exercises

Anna Christakou, PT, MSc, PhD, Spyros Zakynthinos, MD(2014) conducted a study to examine the effectiveness of early mobilization in acute leg Deep Vein Thrombosis of the lower extremity in hospitalized patients. Current evidence shows that early mobilization, i.e., walking and/or exercising, with

anticoagulation and leg compression may be encouraged in patients with acute Deep Vein Thrombosis. This study reported the benefits of reduction in pain and edema, with improvement in quality of life when using the therapeutic strategy of early mobilization in patients with Deep vein thrombosis .

Royal college of Physicians at National Clinical Guideline Centre, London (2010) published a literature by reviewing many Randomized Control Trial to assess the effectiveness of early mobilization , leg exercises, foot elevation , hydration in prevention of post operative deep vein thrombosis in hospitalized surgery patients in reducing the risk of developing deep vein thrombosis in post operative period , these measures helps to contract calf muscles and reduces the venous stasis and improves venous circulation.

Shawkey S.Gad, M.D. and Amal A. El-sheikh, D.N.Sc.(2008) conducted a study in General Surgical Department of Menoufia University Hospital among 120 surgical patients. The study revealed that general surgical patients who exposed to mechanical measures like leg exercises, positioning ,ambulation and stockings were not developed to deep vein thrombosis than those who exposed to routine hospital.

S.Sabari, V.C.Roberts et al (2008) conducted a clinical trial to assess the effect of passive exercises of the lower limb during surgery on the incidence of early post operative deep vein thrombosis among 47 randomly selected undergoing surgery patients in King's Hospital, London. The study revealed that a reduction of 21.2% (absolute) or 77% (relative) incidence (per leg) of deep vein thrombosis by passive dorsiflexion plantar foot exercises in the first three post operative period.

Hilbert P, Teumer P, Stuttmann R(2008) conducted a prospective mailed self-administered survey related to the prevention of venous thrombo embolism in 652 intensive care patients at surgical unit of Municipal Clinical Hospital of Cluj-

Napoca .Thrombo embolism prophylaxis was prescribed in 98 percent of the ICU patients. The study showed that prophylactic measures like elevation of foot , leg exercises and heparin prophylactic usage could prevent post operative deep vein thrombosis among surgical patients in surgical intensive care units.

D. C. Obalum S. O. Giwa, T. O. Adekoya-Cole et al (2008) conducted a study through hand and online detailed literature search with 486 papers to describe risk factors among African- American and Asian and American natives and prevention of Deep vein thrombosis. This study reveals Predominant risk factors for Deep Vein Thrombosis include middle or old age, prolonged surgery, trauma, confinement, presence of malignancy and insertion of deep venous catheters. In women, contraceptive use, hormone replacement therapy, pregnancy and the puerperium are additional risk factors. Prophylactic measures include leg exercises, mechanical and pharmacological measures are directed at eliminating venous stasis and those directed at changes in blood coagulability.

Anthony Limpus, RN,Wendy Chaboyer, RN, PhD(2006) conducted a meta analysis study to assess the evidence available on the effect of leg exercises ,compression and pneumatic devices on thromboprophylaxis in critically ill patients and to obtain an estimate of the pooled effect on the differences between the use of compression and pneumatic devices versus control interventions. This meta-analysis study was performed and ascertained the effect of leg exercises, compression and pneumatic devices on DVT.

Nesurker (2006) conducted a study on deep vein thrombosis is the frequent cause of morbidity and mortality in hospital patients. surgical patients are highly susceptible to thromboembolic events. The route cause of DVT is immobilization. For such immobilized patients, certain physical prophylaxis can be given to mobilize

the muscles and the circulation. These activities are leg exercises, pneumatic compression and compression stocking and it makes the calf muscle to contract and improves venous outflow.

2.3 Conceptual framework

The conceptual framework for research study serves as a measure on which the purpose of the study is based. It also serves as a springboard for theory development. The framework provides the prospective from which the researcher views the problem under investigation.

The investigator adopted the Wiedenbach's Helping Art of Clinical Nursing theory(1964) as a base for developing the conceptual framework.

Ernestine Wiedenbach was born in August 18, 1900 , Hamburg Germany. She completed her nursing from Johns Hopkins School of Nursing in 1925, certificate from Maternity centre and she worked as a instructor, Assistant Professor , Associate Professor in Obstetric Nursing. She was influenced by Ida Orlanda in her works on the framework.

Wiedenbach's prescriptive theory is based on three factors

This theory directs an action towards an explicit goal.

1. Central purpose
2. Prescription
3. Realities

1. Central purpose

Central purpose is a concept the nurse has thought through one she has put into words , believes in , accepts as standard against which to measure the value of her action to the patient. It refers to the nurse wants to accomplish. It is the goal toward which a nurse strives .

In this study the main central purpose is to prevent probability level of developing deep vein thrombosis after prophylactic measures among post-operative patients at Government Rajaji Hospital , Madurai.

2. Prescriptions

A prescription is directive to a activity which specifies both the nature of the action that will most likely lead to fulfillment of the nurse's central purpose and the thinking process that determines it. It refers to plan a care for a patient .

In this study the investigator plans to provide the prophylactic measures includes early mobilization which consists of positioning and leg exercise and assess the probability level of deep vein thrombosis among post operative patients.

3. Realities

It refers to the physical , psychological , emotional and spiritual factors affect the nursing action. The five realities identified by Wiedenbach's theory are agent , recipient , goal , means and activities and framework.

Agent – the agent who is the practicing nurse of her delegate is characterized by the personal attributes , capacities , capabilities, and most important commitment and competencies in nursing, as the agent the nurse is the propelling force that moves her practice its goal.

Recipient –the recipient , the patient is characterized by personal attributes , problems, capacities, aspirations and the most important the ability to cope with the concerns or problems being experienced. The patient is vulnerable, depending on others for help and risk in losing individuality, dignity worth and autonomy.

Goal – the goal is desired outcome the nurse wishes to achieve. The goal is end result to be attained by the nursing action.

Mean –the mean comprise the activities and devices through which the practitioner is enabled to attain her goal. The means include skills, techniques, procedures, and devices that may be used to facilitate nursing practice. The nurse's way of giving treatment of expressing concerns of using the means available is individual and is determined by her central purpose and the prescription.

The conceptualization of nursing practice according to this theory consists of 3 steps follows

- Step I- Identifying the need for help
- Step II- Ministering the needed help
- Step III-Validating the help

Step- I: Identifying the need for help

Within the identification, there are four distinct steps, the first the nurse observes the patient, looking for inconsistency between the expected behavior of the patient and the apparent behavior. Second she attempts to clarify what inconsistency means. Third she determines the causes of inconsistency. Finally she validates with the patient that her help is needed.

In this study, this step involves determining the need for help, identifying and selecting the post operative abdominal surgery patients for interventional and control group and identifying the risk of deep vein thrombosis.

Step-II: Ministering the needed help

In ministering to her patient, the nurse may give advice or information, make referral, apply a comfort measure, or carry out therapeutic procedure.

This step involves provision of required help for identified need. It has 2 components

Prescription: In this study investigator provides prophylactic measures like early mobilization which includes positioning , leg exercises to reduce the probability level of developing deep vein thrombosis.

Realities : In this study , the five realities identified by Wiedenbach theory are

- ❖ Agent : investigator
- ❖ Recipient : major abdominal surgery patients
- ❖ Goal : preventing the probability level of developing deep vein thrombosis
- ❖ Means :

  Interventional group – prophylactic measures (early mobilization)

  Control group – routine hospital care.

Step – III : Validating that the need for help will be met or not

After help has been ministered the nurse validates that the actions were indeed helpful.

The investigator validates the ministered help. It is accomplished by means of post test probability level of deep vein thrombosis assessed by modified well's criteria in interventional and control group.

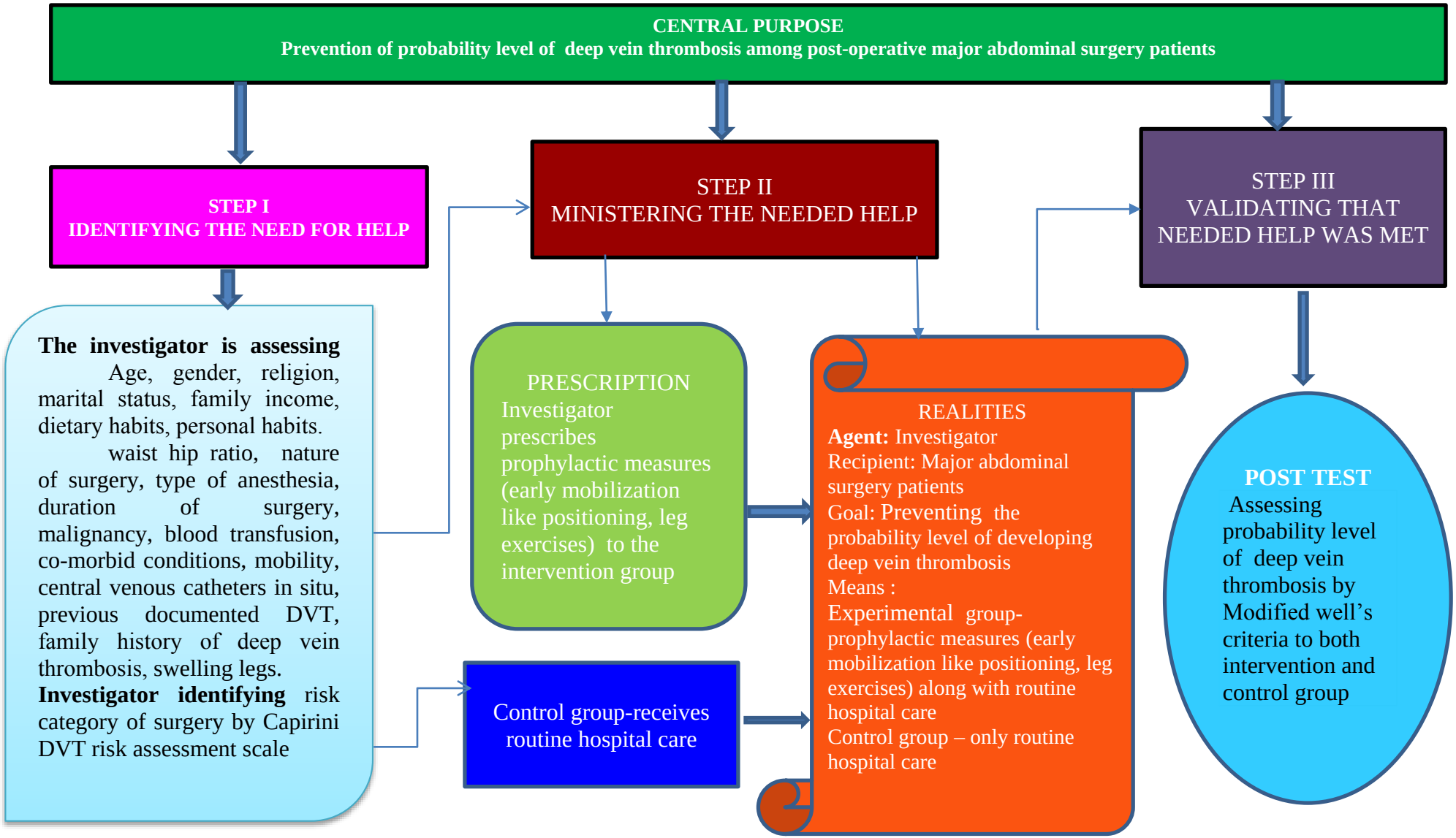


FIG: 1 MODIFIED WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY

RESEARCH METHODOLOGY

CHAPTER III

RESEARCH METHODOLOGY

The methodology of research indicates the general pattern of organizing the procedure for assembling valid and reliable data for investigation. This chapter provides a brief explanation of the method adopted by the investigator in this study. It includes the research approach, research design, and variables, setting of the study, population, sample and sample size, sampling technique, description of the tool, pilot study, data collection procedure and plan for data analysis.

The present study is aimed to evaluate the effectiveness of prophylactic measures on deep vein thrombosis among post operative patients at Government Rajaji Hospital , Madurai.

3.1. Research Approach

The research approach is the most essential part of any research. The entire study is based on it. A research approach tells the researcher about the collection of data that is what to collect, when to collect, how to collect , and how to analyze. It also helps the researcher with suggestions of possible conclusions to be drawn from the data.

A quantitative approach was adopted in the present study as the investigation is aimed at evaluating the effectiveness of prophylactic measures on deep vein thrombosis among post operative patients .

3.2. Research Design

The research design is the plan, structure and strategy of investigations of answering the research question. It is the overall plan or blueprint the researcher select

to carry out the study. The investigator used True experimental post test only design for this study.

Randomization	Group	Intervention	Post test
R	Intervention group	X	O_2
R	Control group	—	O_2

R – Randomization

X – prophylactic measures –early mobilization (10-15 minutes three times a day , 4consecutive days)

O_2 - Post test probability level of developing deep vein thrombosis among post operative patients.

3.3. Research Variables

Independent variable

Prophylactic measures –early mobilization .

Dependent variable

Probability level of deep vein thrombosis

Attributed variable:

Socio demographic variables such as age, gender, religion, mother tongue, educational qualification, occupation, marital status, family monthly income, dietary pattern, personal habits.

Clinical variables such as waist to hip ratio, nature of surgery, type of anesthesia, duration of surgery, mobility, malignancy, co-morbid conditions, perioperative blood transfusion, central venous catheter in situ, previous documented deep vein thrombosis, family history of deep vein thrombosis, swelling of the leg.

3.4. Research settings:

The setting was selected based on acquaintance of the investigator with the institution , feasibility of conducting the study, availability of the sample, permission and proximity of the setting for investigation.

The study was conducted in post operative ward, Government Rajaji Hospital, Madurai. It is the second biggest Government Medical college hospital in Tamil Nadu. It has all specialty departments. The hospital is equipped with bed strength of 3106 beds, post operative ward is equipped with bed strength of 56 beds with an annual census of 3500 post operative abdominal surgery patients in 2016, average of 280-300 per month.

3.5 Population

Target population:

Target population of the study was post operative patients.

Accessible population:

Post operative patients at Government Rajaji Hospital, Madurai was accessible population for the study.

3.6 Sample

In the present study the sample consisted of the post operative patients at Government Rajaji Hospital, Madurai and those who fulfilled the inclusion criteria.

3.7 Sample Size

The sample size was 60 post operative patients (30 in the interventional group,30 in the control group).

3.8 Sampling Technique

Non probability - Consecutive Sampling Technique used in this study.

3.9 Sampling Criteria

The study sample was selected by the following inclusion and exclusion criteria.

Inclusion Criteria

Major abdominal surgery patients

- ❖ Both male and female patients who have risk factors of developing deep vein thrombosis based on Caprini DVT Risk Assessment Scale
- ❖ Who were willing to participate
- ❖ Who can understand Tamil or English
- ❖ Who were present during data collection
- ❖ Who undergone under General or Spinal anesthesia on the first day of surgery

Exclusion Criteria

Major abdominal surgery patients

- ➢ Who were unconscious
- ➢ Who were on anticoagulant therapy
- ➢ Who had vascular problems.

3.10 Description of the Tool and Technique

The Tool consists of three parts

Part 1 A) Deals with socio demographic variables

B) Clinical variables

Part 2 Modified Capirini DVT risk assessment scale

Part 3 Modified Well's criteria for Deep vein thrombosis

Part 1:

A) Socio demographic variables such as age, gender, religion, mother tongue, educational qualification, occupation, marital status, family monthly income, dietary pattern, personal habits.

B) Clinical variables such as waist to hip ratio, nature of surgery, type of anesthesia, duration of surgery, mobility, malignancy, co-morbid conditions, perioperative blood transfusion, central venous catheter in situ, previous documented deep vein thrombosis, family history of deep vein thrombosis, swelling of the leg.

Part 2: Modified Capirini DVT risk assessment scale

It is comprised of age, surgery(minor surgery, major surgery), immobilization, duration of surgery, obesity, varicose vein, malignancy, central venous access, stroke, previous and family history of deep vein thrombosis.

Part 3 : Modified well's criteria for deep vein thrombosis..

It is comprised of items to examine the patient's signs and symptoms of deep vein thrombosis as presented by pain in the calf muscle, localized tenderness along the line of femoral or popliteal vein, increased calf circumference will be more than 3 cm (measured 10 cm below the tibial tuberosity) than the unaffected leg, leg swelling, presence of pitting edema, warm skin in affected distal or proximal leg ,skin discoloration (erythema or purple or cyanosed), elevation of systemic temperature more than 100.4^{O} F, absence of the dorsalis pedis pulse, dilated superficial veins (non varicose vein).

Scoring procedure

Part - 1:

No scoring was allotted for the Socio- demographic variables and clinical variables.

Part –2 : it consists of 4 risk criteria**. Total score 49.**

Risk criteria I – it consists of 7 items, each item scores 1. Total score 7.

Risk criteria II - it consists of 7 items, each item scores 2. Total score 14.

Risk criteria III – it consists of 6 items, each item scores 3. Total score 18

Risk criteria IV – it consists of 2 items, each item scores 5. Total score 10

Risk Interpretation

Total score - 49

1-2 - Low risk

3-4 - Moderate risk

5 and more - High risk

Part - 3 :

Modified well's criteria for deep vein thrombosis consists of 10 items rated in 2 point scale to assess the probability level of developing deep vein thrombosis .

Maximum score 10

Minimum score 0

Each item scored 1

Interpretation

No probability - 0

Very low probability - 1-2

Low probability - 3-4

Moderate probability - 5- 6

High probability	-	7- 8
Very high probability	-	9-10

3.11 Contend Validity

The content validity of the tool with evaluation criteria checklist was submitted to five experts in the field of Surgery Department and Medical surgical Nursing for the opinion of the items in the tool. There was 100% agreement by the experts and minimal modification were made in socio demographic variables and clinical variables based on their suggestions.

3.12 Reliability of the Tool

The reliability of an instrument is the degree of consistency with which it measures the attribute and it is supposed to be measuring over a period of time. The Tool was a standardized one. Test re test method was used to assess the internal consistency which reached satisfactory reliability score of r = 0.78 Hence the tool was reliable and was used in this study.

3.13. Pilot Study

A formal permission was obtained from Ethics Committee and Head of the Department of Surgery, Government Rajaji Hospital, Madurai. Pilot study was conducted from 6th march 2017 to 12th march 2017 to test the feasibility, and practicability of the study in Post operative ward, at Government Rajaji Hospital, Madurai. 10 Samples were selected as per inclusion criteria by and randomly assigning the samples to interventional and control group and risk assessment was done on first day for both group using Modified Caprini DVT risk assessment scale; intervention group received Prophylactic measures i.e early mobilization leg exercise given for 10- 15 minutes, changing of position 2nd hourly along with routine hospital care, and control group received routine hospital care, three times a day for four

consecutive day. Then post test was assessed on 5 th day using Modified well's criteria for deep vein thrombosis to assess the probability level of developing deep vein thrombosis in intervention and control group among post operative patients. Pilot study revealed that it was feasible and practicable to conduct main study.

3.14. Ethical consideration

This study was conducted after the approval from the ethical committee Madurai Medical College, Madurai-20. All the respondents were carefully informed about the purpose of the study and their part during the study and how the privacy was guarded. Confidentiality was ensured. Written permission was obtained from all participants

3.15. Data Collection Procedure

The study was conducted for six weeks from 20.03.2017 to 30.04.2017 among 60 post operative patients (30 in intervention group and 30 in control group) in Post operative ward at Government Rajaji Hospital, Madurai. Prior to data collection, Ethical clearance was obtained from the ethical committee and permission from the professor and HOD, Department of Surgery, Government Rajaji Hospital, Madurai to conduct the study. On the first day of procedure, samples were selected as per inclusion criteria by consecutive sampling technique. After maintaining initial rapport, purpose of the study was explained and a written informed consent was obtained from the study subject. Demographic data was collected and risk assessment was done to assess the level of risk of deep vein thrombosis by using Modified Capirini DVT risk assessment scale**;** then intervention group received prophylactic measures early mobilization i.e leg exercise- dorsiflexion (15-20^{o}), plantar flexion(45-55^{o}), inversion (15-20^{o}) and eversion (20-30^{o}) of the foot and rotation of the ankles,

for 10-15 minutes three times in the morning, afternoon, and night; 2nd hourly position changing along with routine hospital care, and the control group received only routine hospital care, for four consecutive days. After 4 days of intervention, post test was assessed on 5th day morning by using Modified Well's criteria for deep vein thrombosis to assess the probability level of developing deep vein thrombosis in intervention and control group among post operative patients. This procedure was repeated up to 6 weeks until the fulfillment of required samples.

3.16. Plan for Data Analysis

The data collected was analyzed by means of descriptive statistics, and inferential statistics.

Descriptive statistics:

1. Analysis of the baseline data was done by using frequency and percentage.

Inferential statistics:

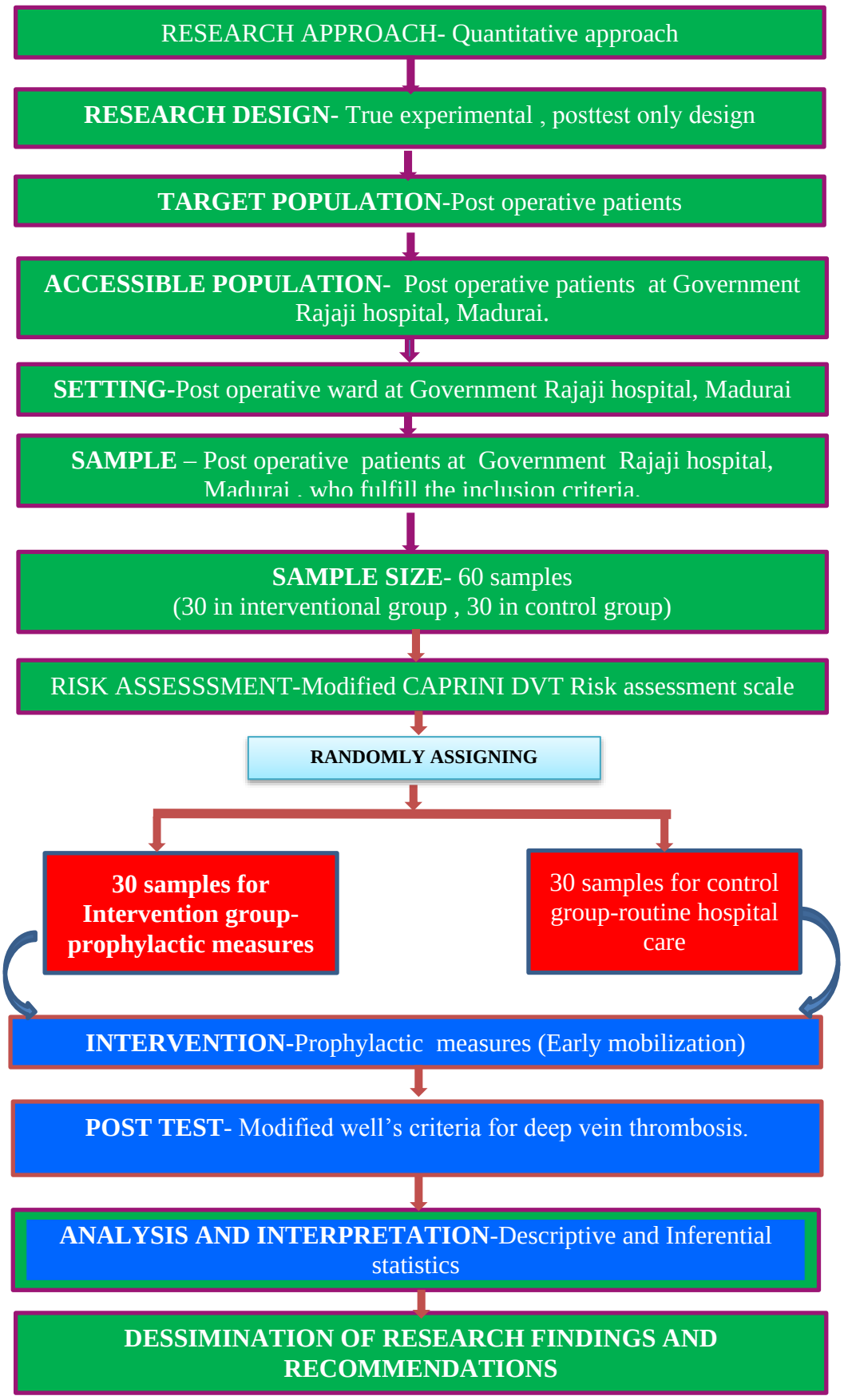
1. Student's independent "t" test, was used to find out the effectiveness of Prophylactic measures on deep vein thrombosis between interventional and control group among post operative patients.
2. Chi-square analysis was used to determine the association between the probability level of developing deep vein thrombosis and selected socio demographic and clinical variables among post operative patients

3.17. Protection of Human Rights

The research proposal was approved by the dissertation committee, College of Nursing, Government Rajaji Hospital, IRB (Institutional Review Board) Madurai, ethical committee, and from the professor and HOD, Department of Surgery , Government Rajaji Hospital, Madurai to conduct the main study. Both verbal and

informed written consent was obtained from all the study participants and the data collected was kept confidential. Positive benefits were explained to all the study subjects. They were also explained that they may withdraw from the study at any time without any penalty. Confidentiality was maintained throughout the study.

3.18. Schematic Representation



ANALYSIS AND INTERPRETATION OF DATA

CHAPTER- IV

DATA ANALYSIS AND INTERPRETATION

Data analysis is a systematic organization and synthesis of research data and testing of research hypothesis using those data. Interpretation is the process of taking sense of the result and examining their implications. This chapter deals with the analysis and interpretation of data collected from 50 samples of critically ill patients to evaluate the achievement of the objectives of the study. This study was done to evaluate the effectiveness of prophylactic measures on deep vein thrombosis among post-operative patients Government Rajaji Hospital, Madurai.

The data collected were interpreted under the following sections

Section – I: Distribution of socio demographic variables , clinical variables and risk level among post operative patients .

Section – II: Effectiveness of prophylactic measures on deep vein thrombosis among post operative patients.

Section – III: Association of the probability level of developing deep vein thrombosis among post operative patients with their selected socio demographic variables and clinical variables.

Section I

Distribution of socio-demographic variable and clinical variables among post operative patients

Table I

Frequency and percentage distribution of socio-demographic variables among post operative patients (Intervention and Control)

n=60

S.No	Demographic variables		Group			
			Intervention (n=30)		Control(n=30)	
			N	%	n	%
1	Age	< 40 years	8	26.7%	9	30.0%
		41 -50 years	6	20.0%	5	16.7%
		51 -60 years	6	20.0%	9	30.0%
		61 -70 years	8	26.7%	5	16.7%
		> 70 years	2	6.6%	2	6.6%
2	Gender	Male	17	56.7%	15	50.0%
		Female	13	43.3%	15	50.0%
3	Religion	Hindu	26	86.6%	24	80.0%
		Christian	2	6.7%	4	13.3%
		Muslim	2	6.7%	2	6.7%
4	Mother Tongue	Tamil	30	100.0%	30	100.0%
		Malayalam	0	0.0%	0	0.0%
		Telugu	0	0.0%	0	0.0%
		Others	0	0.0%	0	0.0%
5	Educational Qualification	Non-formal education	9	30.0%	8	26.7%
		Primary education	9	30.0%	17	56.7%
		SSLC	9	30.0%	2	6.7%
		HSC	3	10.0%	2	6.7%
		Graduate	0	0.0%	1	3.2%
6	Occupation status	Un employee	11	36.7%	7	23.3%
		Self-employee	11	36.7%	15	50.0%
		Daily wages	8	26.6%	8	26.7%
		Govt employee	0	0.0%	0	0.0%

7	Family monthly income	< Rs.1000	0	0.0%	0	0.0%
		Rs.1001-3000	23	76.7%	18	60.0%
		Rs.3001-6000	7	23.3%	12	40.0%
		>Rs.6000	0	0.0%	0	0.0%
8	Marital status	Un married	0	0.0%	1	3.3%
		Married	30	100.0%	29	96.7%
		Widow/widower	0	0.0%	0	0.0%
		Divorce	0	0.0%	0	0.0%
9	Dietary pattern	Vegetarian	1	3.3%	5	16.7%
		Non vegetarian	29	96.7%	25	83.3%
10	Personal habits	Smoking	4	13.3%	4	13.3%
		Alcoholism	2	6.7%	0	0.0%
		Tobacco using	2	6.7%	3	10.0%
		Smoking & Alcoholism	2	6.7%	6	20.0%
		None	20	66.6%	17	56.7%

The above table reveals the socio demographic variable such as Age, Gender, Religion, Mother Tongue, Educational qualification, Occupation , Family Monthly Income, Marital status, Dietary pattern, Personal habits.

Regarding Age, in experimental group, majority of the post operative patients 8 (26.7%) were below 40 and 8 (26.7%) were between 61-70 years, 6 (20%) were between 41-45 years and 6 (20.0%) were between 51-60 years and 2 (6.6%) were above 70. Whereas in control group majority of the post operative patients 9 (30.0%) were below 40 years and 9 (30.0%) were between 51- 60 years, 5 (16.7%) were between 41-50 years and , 5 (16.7%) were between 61-70 years, 2 (6.6%) were above 70 years.

With regard to Gender, majority of the patients in experimental group 17 (56.7%) were male and 13 (43.3%) were females, whereas in control group the post operative patients 15 (50.0%) were female and 15 (50.0%) were males.

Regarding Religion, majority of the patients in experimental group 26 (86.6%) were belongs to Hindu religion, 2 (6.7%) were belongs to Christian and Muslim

religion respectively , but in control group 24 (80.0%) were belongs to Hindu religion, 4 (13.3%) were belongs to Christian religion and remaining 2(6.7%) were belongs to Christian religion.

According to Education, majority of the patients in experimental group 9 (30.0%) had non formal education, 9(30.0%) were in primary education, 9 (30.0%) were SSLC, 3(10%) were studied up to high secondary school and none of them were graduate, but in control group majority 17 (56.7%) were studied up to primary education 8 (26..7%) had non formal education, 2 (6.7%) were studied up to SSLC , (6.7%) were in Higher secondary, and 1 (3.3%) of them were graduate.

By seeing occupational status, majority of the patients in experimental group 11 (36.7%) were unemployed, 11 (36.7%) were self employment, 8 (26.6%) were daily wages and none of them were government employers. In control group 15 (50.0%) were self employers, 7(23.3%) were unemployment 8 (26.7%) were daily wages and none of them were Government employers.

While discussing the family monthly income, majority of the patients in experimental group 23 (76.7%) were earning between Rs. 1001- 3000, 7 (23.3%) were earning between Rs. 3001-6000, none of them were earning less than Rs. 1000 and above Rs. 6000 , But in the control group 18 (60%) were earning between Rs. 1001- 3000, 12 (40%) were earning between Rs. 3001- 6000, none of them were earning less than Rs. 1000 and above Rs. 6000.

While comparing marital status, majority of the patients in experimental group 30 (100%) were married, none of them were unmarried, widow/widower and divorce, whereas in control group majority of the patients 29 (96.7%) were married 1 (3.3%) was unmarried and none of them were widow/widower and divorce.

While discussing the dietary pattern, majority of the patients in interventional group 29 (96.7%) were non vegetarian, and remaining 1 (3.3%) were vegetarian. In control group majority 25 (83.3%) were non vegetarian, and remaining 5 (16.7%) were vegetarian.

In the view of Personal habits, majority of the patients in experimental group 20 (66.7%) had none of having any personal habits, 4 (13.3%) were smoker, 2 (6.7%) had the habit of alcoholism, tobacco using, and both smoking and alcoholism. In control group 17 (56.7%) had none of having any personal habits, 6 (20%) were smoker and alcoholic, 4 (13.3%) were smoker, 3 (10.0%) had the habit of tobacco using.

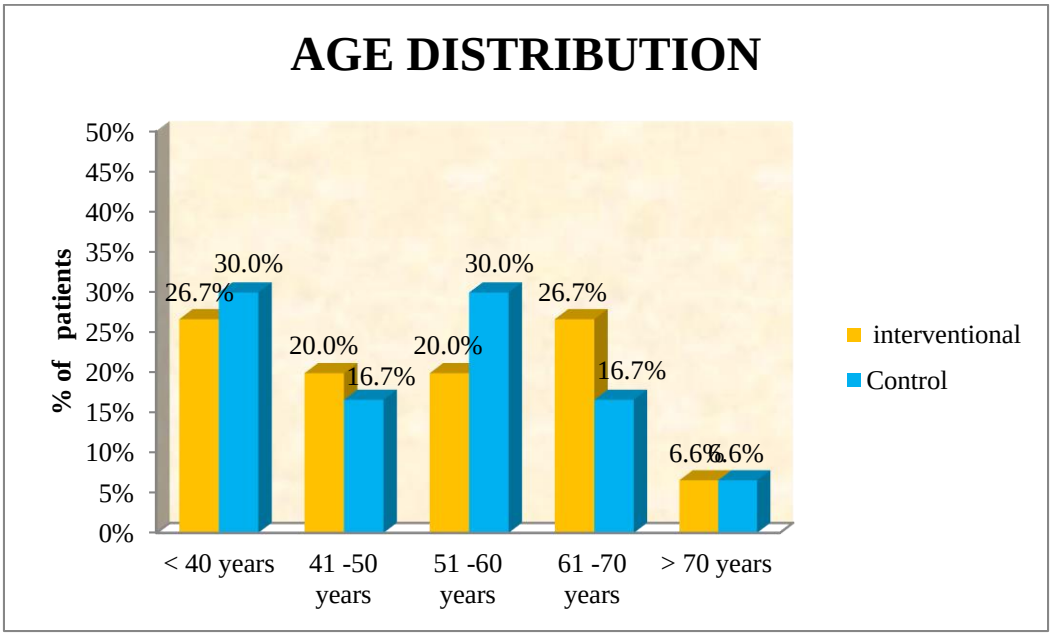


Figure 2: Percentage distribution of age among post operative patients.

The above multiple bar diagram depicts, majority of the post operative patients in Intervention group 8 (26.7%) were below 40 years and 8 (26.7%) were between 61-70 years, and 2 (6.6%) were above 70. Whereas in control group majority of the post operative patients 9 (30.0%) were below 40 years and 9 (30.0%) were between 51- 60 years, and least 2 (6.6%) were above 70 years.

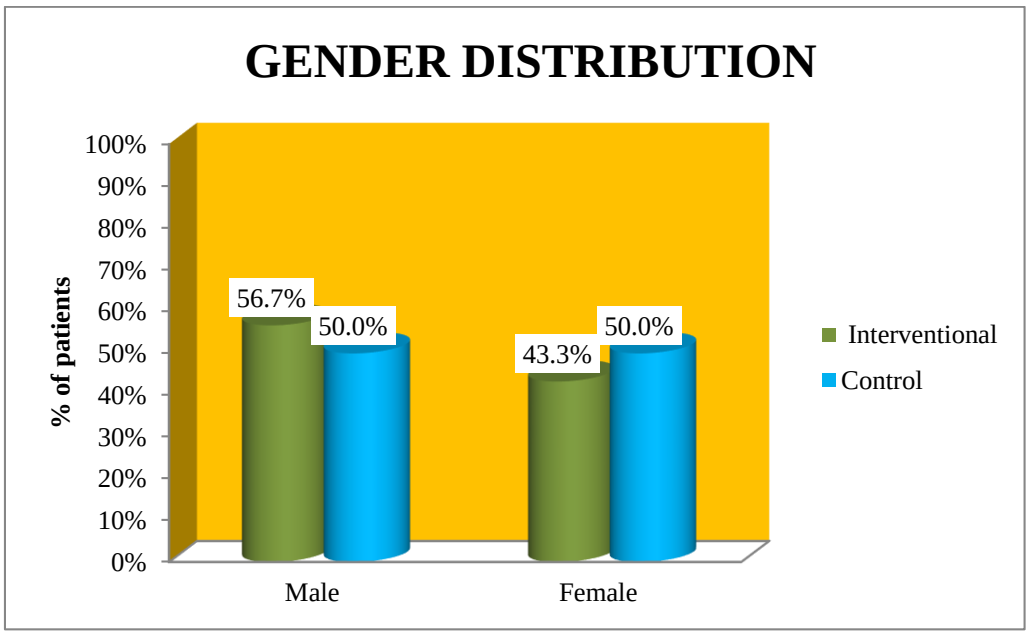


Figure 3 : Percentage distribution of Gender among post operative patients

The above cylindrical diagram portrays that majority of the post operative patients in Intervention group 17 (56.7%) were male and remaining 13 (43.3%) were females, whereas in control group 15 (50.0%) were female and remaining 13 (43.3%) were males.

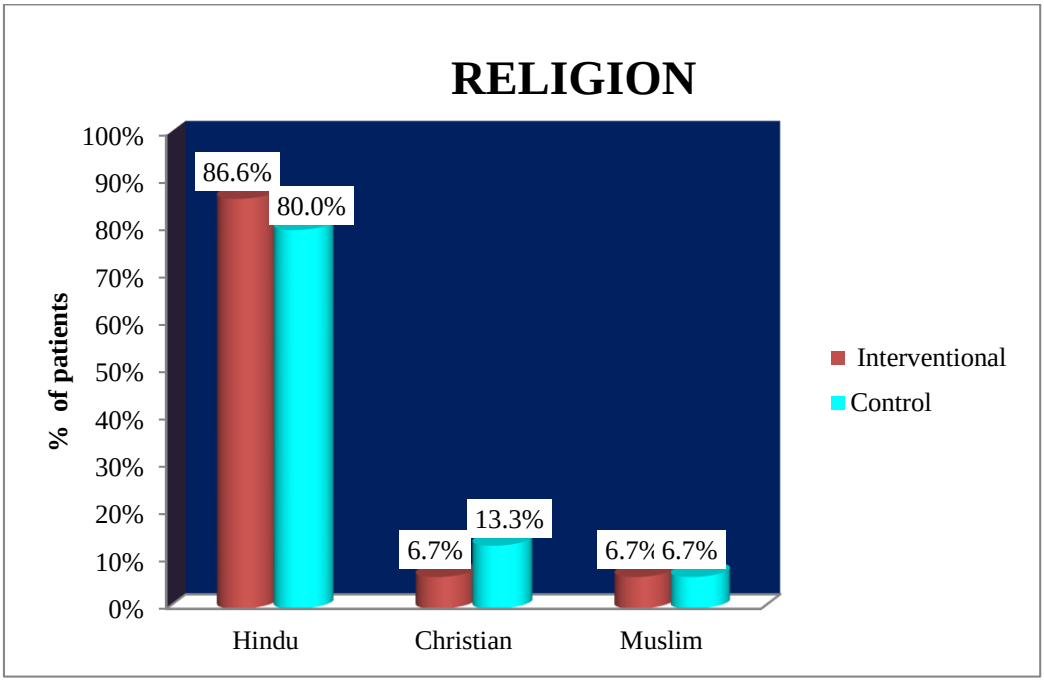


Figure 4 : Percentage distribution of Religion among post operative patients

The above cylindrical diagram shows that majority of the post operative patients in Intervention group 26 (86.6%) were belongs to Hindu religion and least 2(6.7%) were belongs Christian and Muslim. In the control group majority 24 (80.0%) were belongs to Hindu religion and least 2(6.7%) were belongs to Muslim.

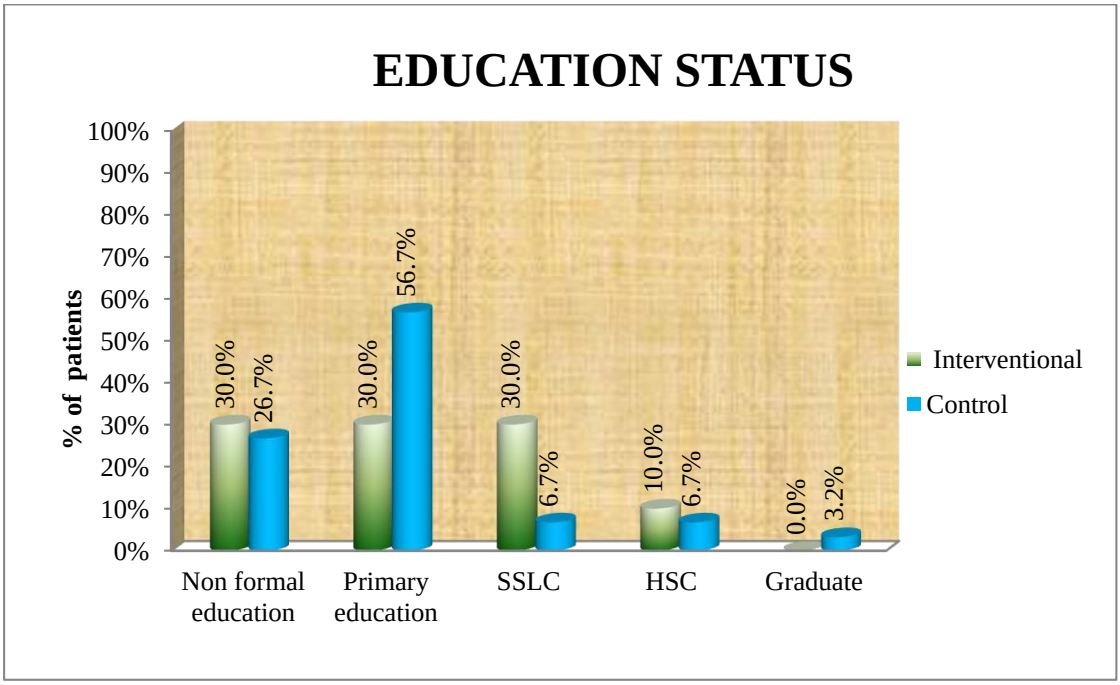


Figure 5: Percentage distribution of Education among post operative patients.

The above multiple cylindrical diagram portrays that majority of the post operative patients in Intervention group 9 (30.0%) had non formal education, 9 (30.0%) were in primary education and least 3(10.0%) were in HSC. In the control group majority 17 (56.7%) were in primary education and least 1 (3.2%) had non formal education.

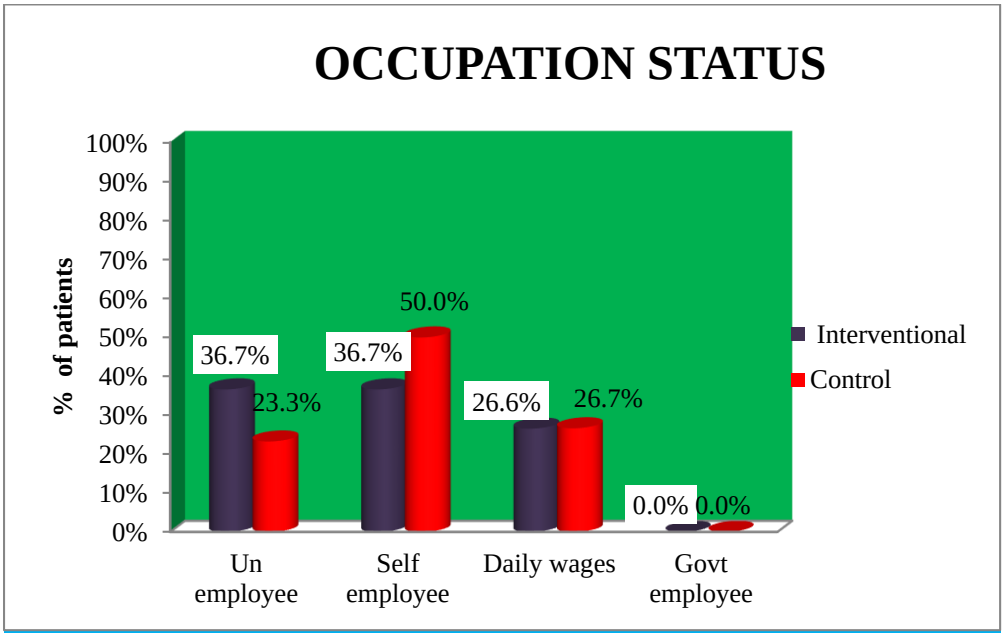


Figure 6 : Percentage distribution of occupation among post operative patients

The above cylindrical diagram states that majority of the post operative patients in Intervention group 11 (36.7%) were unemployed, 11 (36.7%) were self employment, and in the control group majority 15 (50.0%) were self employers and least 7 (23.3%) were daily wages.

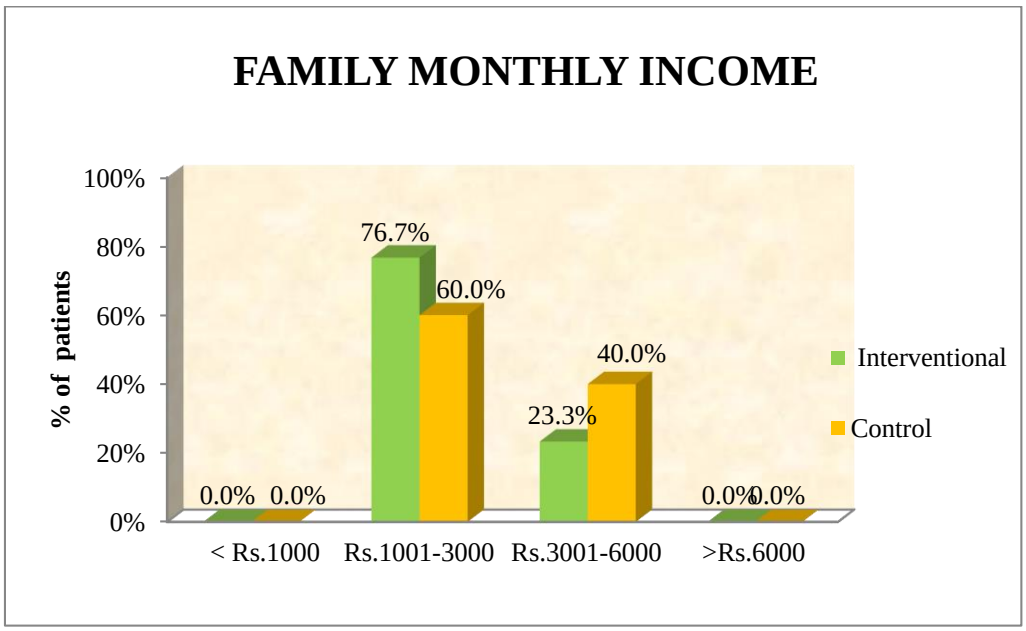


Figure7: Percentage distribution of family monthly income among post operative patients

Above bar diagram illustrates that majority of the patients in Intervention group 23 (76.7%) were earning between Rs 1001- 3000, and least 7(23.3%) were earning between Rs.3001-6000. In the control group, majority 18 (60%) were earning between Rs 1001- 3000 and least 12(40.0%) were earning between Rs.3001-6000.

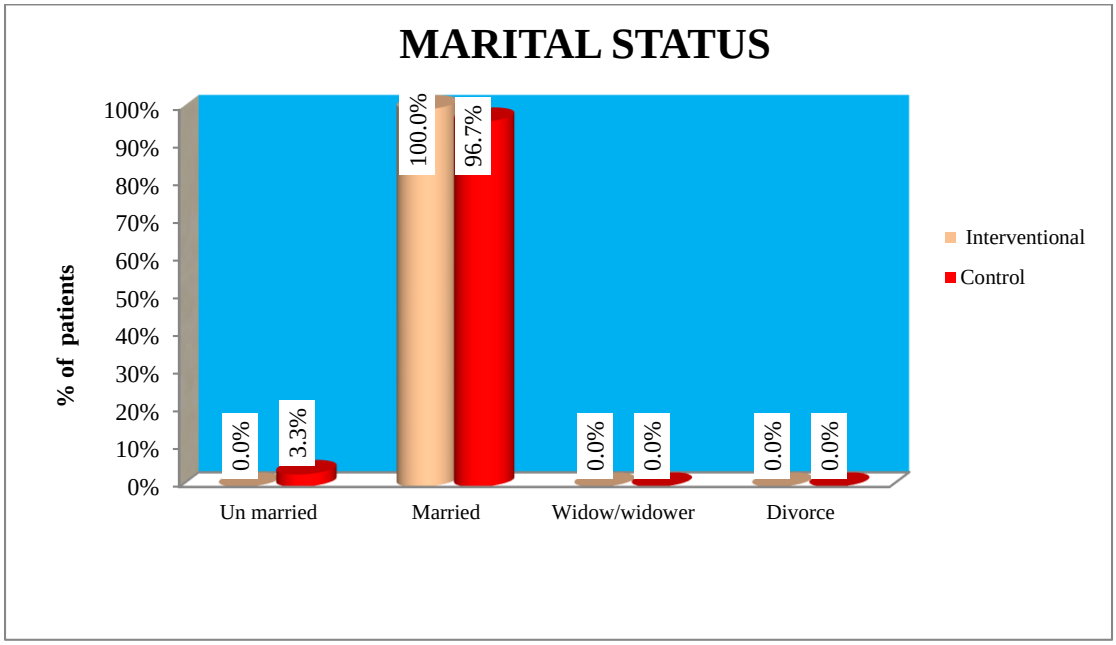


Figure 8: Percentage distribution of Marital status among post operative patients

Above cylindrical diagram represents that all the post operative patients in Intervention group 30 (100%) were married and in the control group majority of the patients 29 (96.7%) were married and 1 (3.3%) was unmarried .

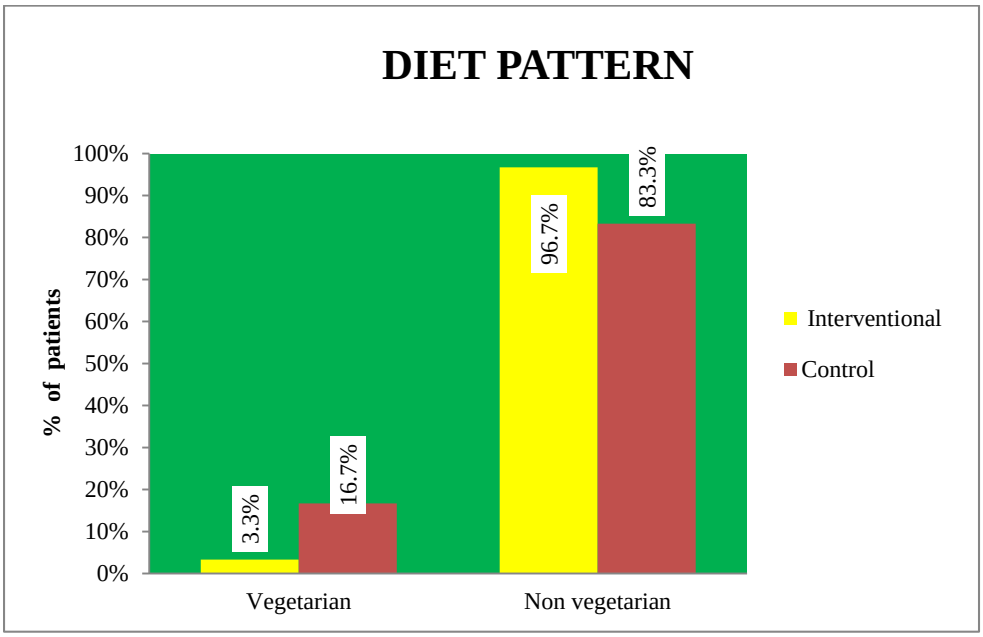


Figure 9 : Percentage distribution of Dietary pattern among post operative patients

Above multiple bar diagrams portrays that majority of the post operative patients in Intervention group 25 (83.3%) were non vegetarian, and remaining 5 (16.7%) were vegetarian and in the control group 25 (83.3%) were non vegetarian, and remaining 5 (16.7%) were vegetarian.

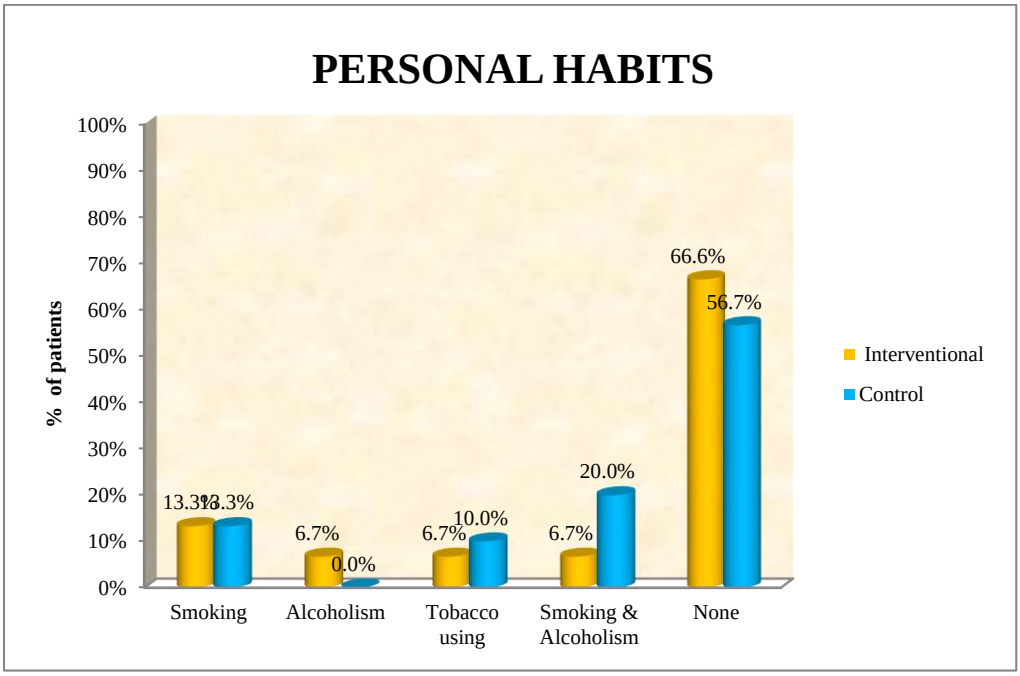


Figure 10: Percentage distribution of Personal habits among post operative patents

Above cylindrical diagram shows that majority of the post operative patients in Intervention group 20(66.7%) had none of any personal habits and minority 2(6.7%) had the habit of alcoholism, tobacco using, and both smoking and alcoholism. In control group majority 17(56.7%) were none and least 3(10.0%) had the habit of tobacco using..

Table 2

Frequency and Percentage distribution of Clinical variables among post operative patients (Intervention and Control group)

n=60

S.No	Clinical variables		Group			
			Intervention (n=30)		Control (n=30)	
			n	%	n	%
1	Waist Hip Ratio	0.95 or below (male)/ 0.80 or below (female	19	63.3%	18	60.0%
		0.96-1.0/ 0.81-0.85	8	26.7%	9	30.0%
		More than 1/ more than 0.85	3	10.0%	3	10.0%
2	Nature of surgery	Elective surgery	24	80.0%	25	83.3%
		Emergency surgery	6	20.0%	5	16.7%
3	Type of Anesthesia	General anesthesia	24	80.0%	25	83.3%
		Spinal anesthesia	6	20.0%	5	16.7%
4	Duration of surgery	2 to 3 hours	12	40.0%	11	36.7%
		3 to 4 hours	9	30.0%	10	33.3%
		4 to 5 hours	5	16.7%	3	10.0%
		5 or more hours	4	13.3%	6	20.0%
5	Malignancy	Yes	8	26.7%	13	43.3%
		No	22	73.3%	17	56.7%
6	Mobility	Completely limited	0	0.0%	0	0.0%
		Very limited	24	80.0%	23	76.7%
		Slightly limited	6	20.0%	7	23.3%
		No	0	0.0%	0	0.0%
7	Co-morbid conditions	Varicose vein	0	0.0%	1	3.3%
		Diabetes mellitus	2	6.7%	4	13.3%
		Hypertension	1	3.3%	2	6.7%
		Heart disease	0	0.0%	1	3.3%
		None of the above	27	90.0%	22	73.3%

8	Perioperative blood transfusion	Yes	14	46.7%	16	53.3%
		No	16	53.3%	14	46.7%
9	Central venous catheter in situ	Yes	3	10.0%	6	20.0%
		No	27	90.0%	24	80.0%
10	Previous documented DVT	Yes	0	0.0%	0	0.0%
		No	30	100.0%	30	100.0%
11	Family History of DVT	Yes	0	0.0%	0	0.0%
		No	30	100.0%	30	100.0%
12	Swollen Leg	Present	7	23.3%	8	26.7%
		Absent	23	76.7%	22	73.3%

The above table reveals the clinical variables such as Waist hip ratio, Nature of surgery, Type of anesthesia, Duration of surgery, Malignancy, Mobility, Co-morbid conditions, Peri-operative blood transfusion, Central venous catheter in situ, Previous documented DVT, Family history of DVT.

Based on the Waist Hip Ratio, majority of the patients in the Intervention group 19 (63.3%) had 0.95 or below (male)/ 0.80 or below (female), 8 (26.7%) of the patients had 0.96-1.0/ 0.81-0.85, 3(10.0%) of the patients had more than 1/ more than 0.85. In the control group majority of the patients18 (60.0%) had 0.95 or below (male)/ 0.80 or below (female 9 (30.0%) had 0.96-1.0/ 0.81-0.85, and 3 (10.0%) had more than 1/ more than 0.85

Regarding Nature of surgery, majority of the patients in the Intervention group 24 (80.0%) had undergone elective surgery, and remaining 6 (20.0%) had undergone emergency surgery. Whereas in the control group 25 (83.3%) had undergone elective surgery, and remaining 5 (16.7%) had undergone emergency surgery.

According to Type of Anesthesia, majority of the patients in the Intervention group 24 (80.0%) had general anesthesia and remaining 6 (20.0%) had spinal

anesthesia. In the control group majority 25 (83.3%) had general anesthesia, and remaining 5 (16.7%) had spinal anesthesia

Regard to Nature of surgery, majority of the patients in the Intervention group 12 (40.0%) had 2-3 hours duration of surgery, 9 (30%) had between 3-4 hours duration of surgery, 5 (16.7%) had between 4-5 hours duration of surgery and 4 (13.3%) had more than five hours duration of surgery. In the control group 11 (36.7%) had between 2-3 hours duration, 10 (33.3%) had between 3-4 hours duration, 6 (20.0%) had more than five hours duration and 3 (10.0%) had 4-5 hours duration of surgery.

Based on Malignancy, majority of the patients in the Intervention group 22 (73.3 %) had no malignancy and remaining 8 (26.7%) had malignancy. In the control group 17 (56.7%) had no malignancy and 13 (43.3%) had malignancy.

Discussing the Mobility. Majority of the patients in the Intervention group 24(80.0%) were very limited mobility, 6 (20.0%) were slightly limited mobility, and none of them were completely limited and no limited mobility. In the control group 23 (76.7%) were very limited mobility, 7 (23.3%) were slightly limited and none of them were completely limited and no limited mobility.

Regarding Co-morbid conditions, majority of patients in the Intervention group 27 (90.0%) had no co-morbid conditions, 2 (6.7%) had Diabetes, 1 (3.3%) had hypertension, and least 0(0.0%) had varicose vein and heart disease. In the control group 22 (73.3%) had no co-morbid conditions, 4 (13.3%) had diabetes, 2 (6.7%) had hypertension, 1 (3.3%) had heart disease and 0 (0.0%) had varicose vein.

Based on Perioperative blood transfusion, majority of the patients in the Intervention group 16(53.3 %) had no perioperative blood transfusion and remaining 14(46.7%) had perioperative blood transfusion. In the control group 16(53.3 %) had

perioperative blood transfusion and 14 (46.7%) had no perioperative blood transfusion.

Regard to Central venous catheter in situ, majority of the patients in the Intervention group 27 (90.0 %) had no central venous catheter and remaining 3 (10.0%) had central venous catheter. In the control group 24 (80.0 %) had no central venous catheter and 6 (20.0%) had central venous catheter.

According to Previous documented DVT, all the patients in the Intervention and control group 30(100.0 %) had no previous documented DVT respectively.

Based on Family history of DVT, all the patients in the Intervention and control group 30(100.0 %) had no family history of DVT respectively.

Discussing the Swollen leg, majority of the patients in the Intervention group 23 (60.0%) had absence of swollen legs, and remaining 7(23.3%) had presence of swollen leg. In the control group 22 (73.3%) had absence of swollen leg and remaining 8(26.7%) had presence of swollen leg.

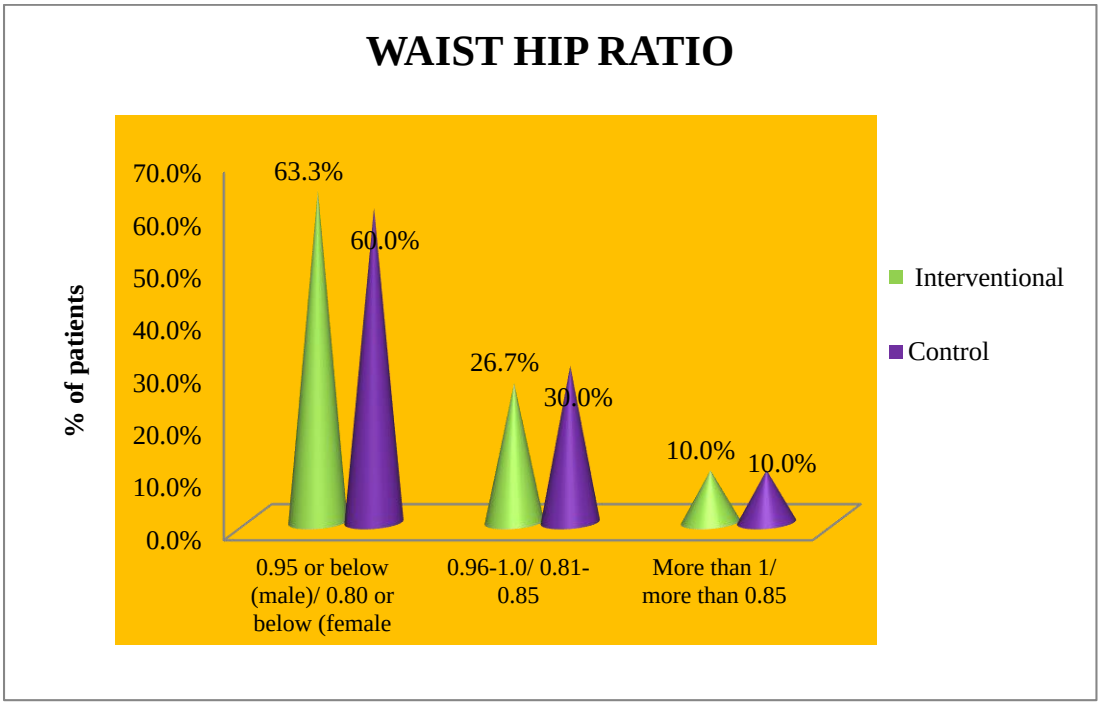


Figure 11: Percentage distribution waist to hip ratio among post operative patients

The above bar diagram depicts that majority of the patients in the intervention group 19(63.3%) had 0.95 or below (male)/ 0.80 or below (female) waist to hip ratio, and least 3(10.0%) of the patients had More than 1/ more than 0.85. In the control group majority of the patients18 (60.0%) had 0.95 or below (male)/ 0.80 or below (female) and least 3(10.0%) of the patients had More than 1/ more than 0.85.

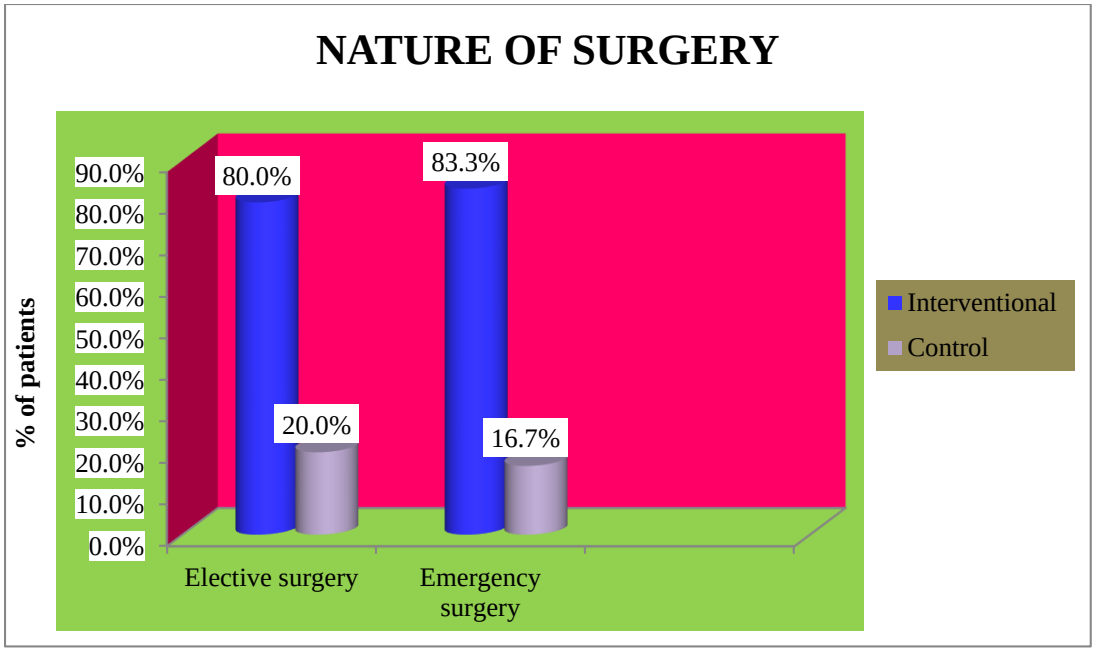


Figure 12: Percentage distribution of Nature of surgery among post operative patients

The above cylindrical diagram shows that majority of the patients in the intervention group 24(80.0%) had undergone elective surgery and remaining 6 (20.0%) had undergone emergency surgery. In the control group 25(83.3%) had undergone elective surgery, and remaining 5(16.7%) had undergone emergency surgery.

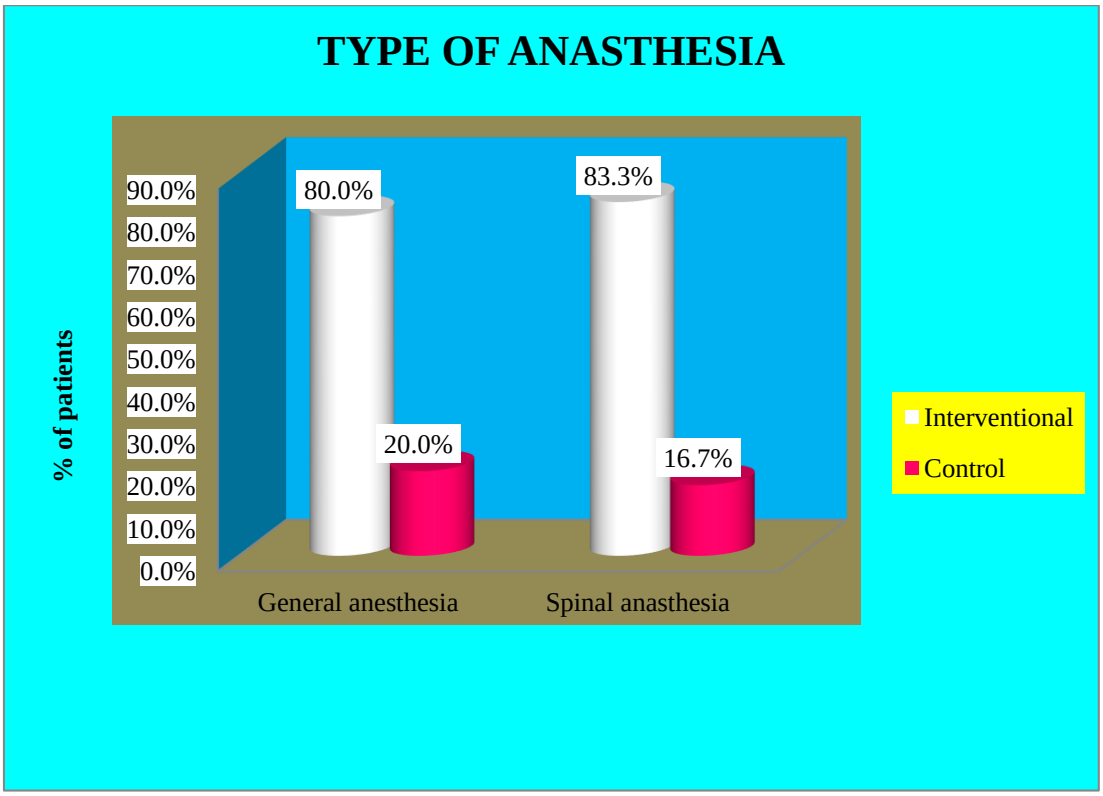


Figure 13: Percentage distribution of Type of anesthesia among post operative patients .

The above cylindrical diagram portrays that majority of the patients in the intervention group 24(80.0%) had general anesthesia and remaining 6(20.0%) had spinal anesthesia. In the control group 25(83.3%) had general anesthesia, and remaining 5(16.7%) had spinal anesthesia

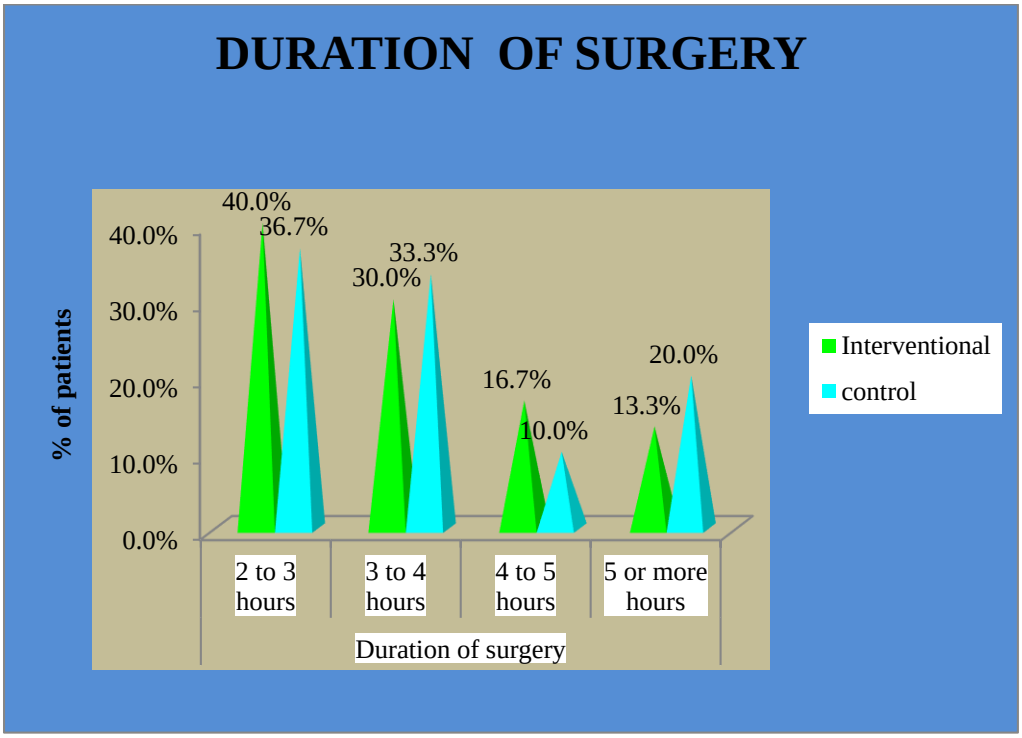


Figure 14: Percentage distribution of Duration of surgery among post operative patients.

The above cylindrical diagram shows that majority of patients in the intervention group 12(40.0%) had between 2-3 hours duration of surgery and least 4(13.3%) had more than five hours duration of surgery. In the control group majority 11 (36.7%) had between 2-3 hours duration, and least 3(10.0%) had between 4-5 hours duration of surgery.

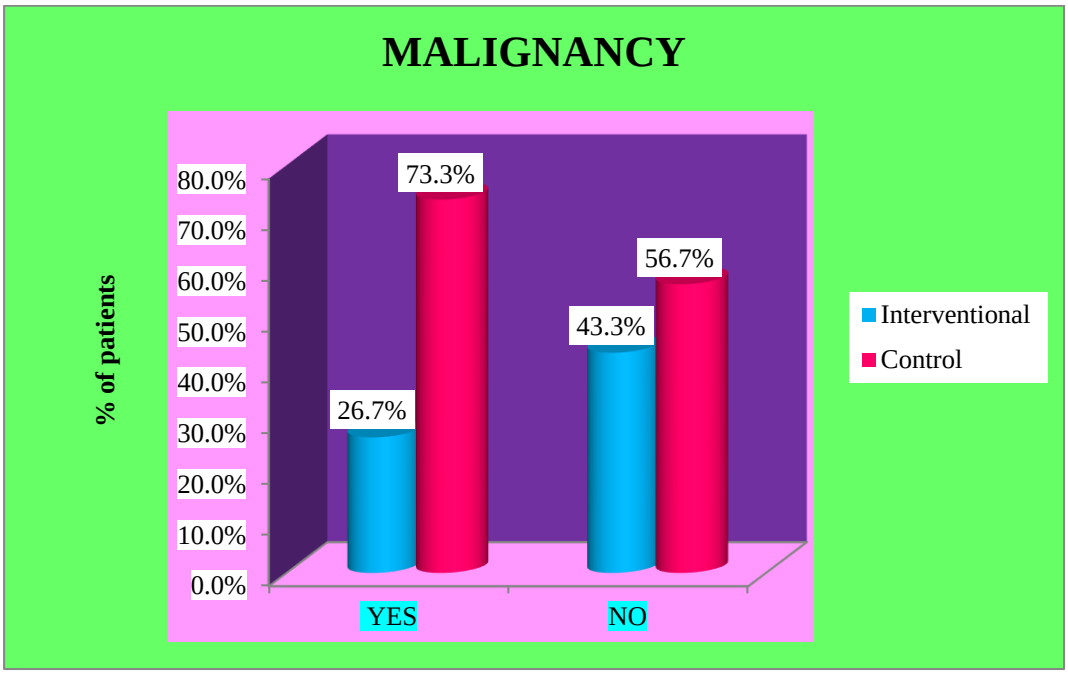


Figure 15 : Percentage distribution of Malignancy among postoperative patients

The above pyramid diagram shows that majority of the patients in the Intervention group 22 (73.3 %) had no malignancy and remaining 8(26.7%) had malignancy. In the control group 17(56.7%) had no malignancy and remaining 13(43.3%) had malignancy.

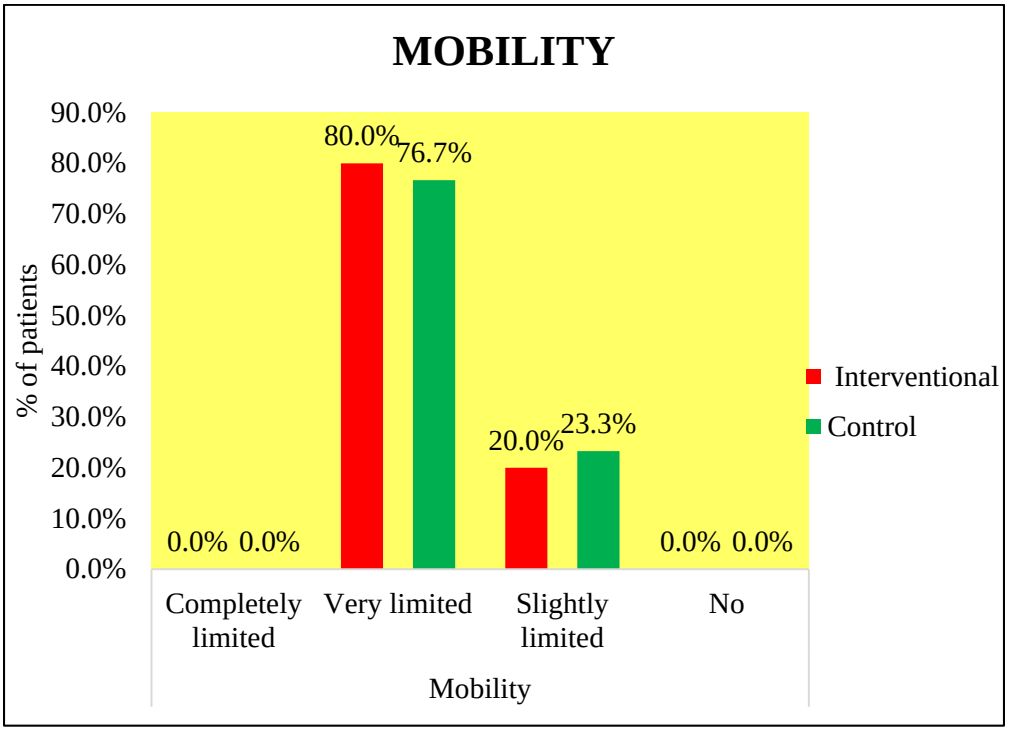


Figure 16 : Percentage distribution of Mobility among post operative patients

The above multiple pyramid diagram shows that majority of the patients in the Intervention group 24(80.0%) had very limited mobility , and none of them were completely limited and no limited mobility. In the control group 23 (76.7%) were very limited mobility .

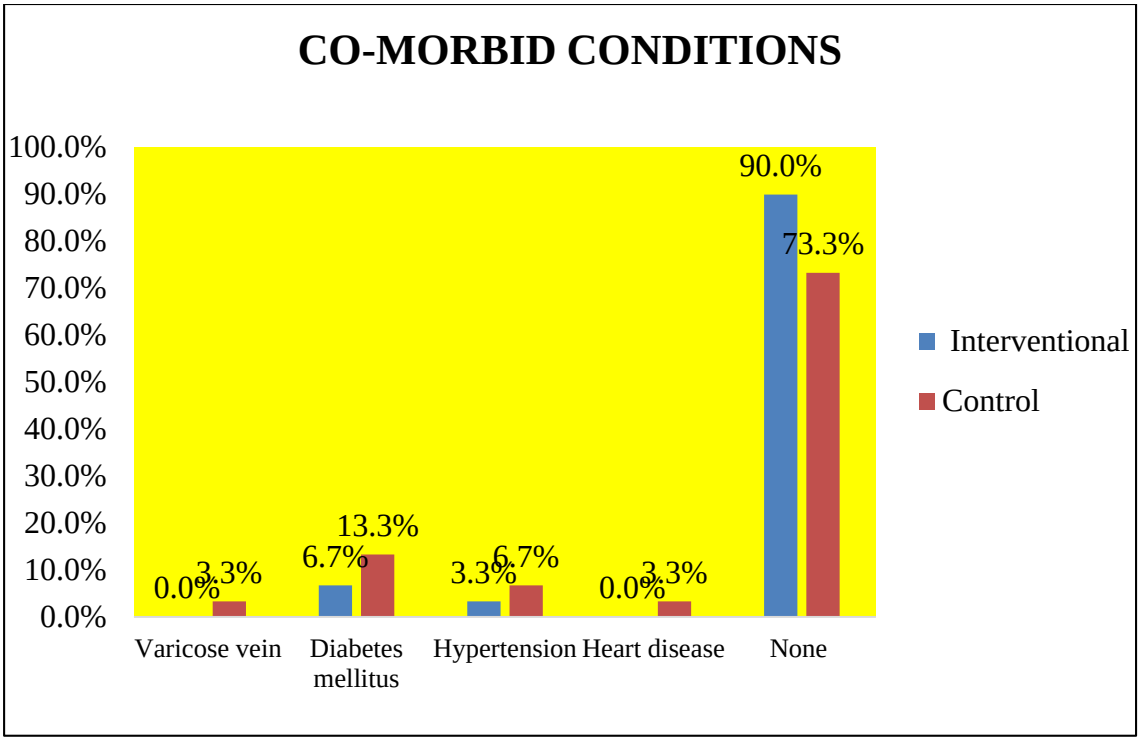


Figure 17: Percentage distribution of Co-morbid conditions among post operative patients.

The above multiple pyramid diagram shows that majority of the patients in intervention group 27 (90.0%) had no co-morbid conditions , and least 0 (0.0%) had varicose vein and heart disease. In the control group 22 (73.3%) had no co-morbid conditions, and least 0 (0.0%) had varicose vein.

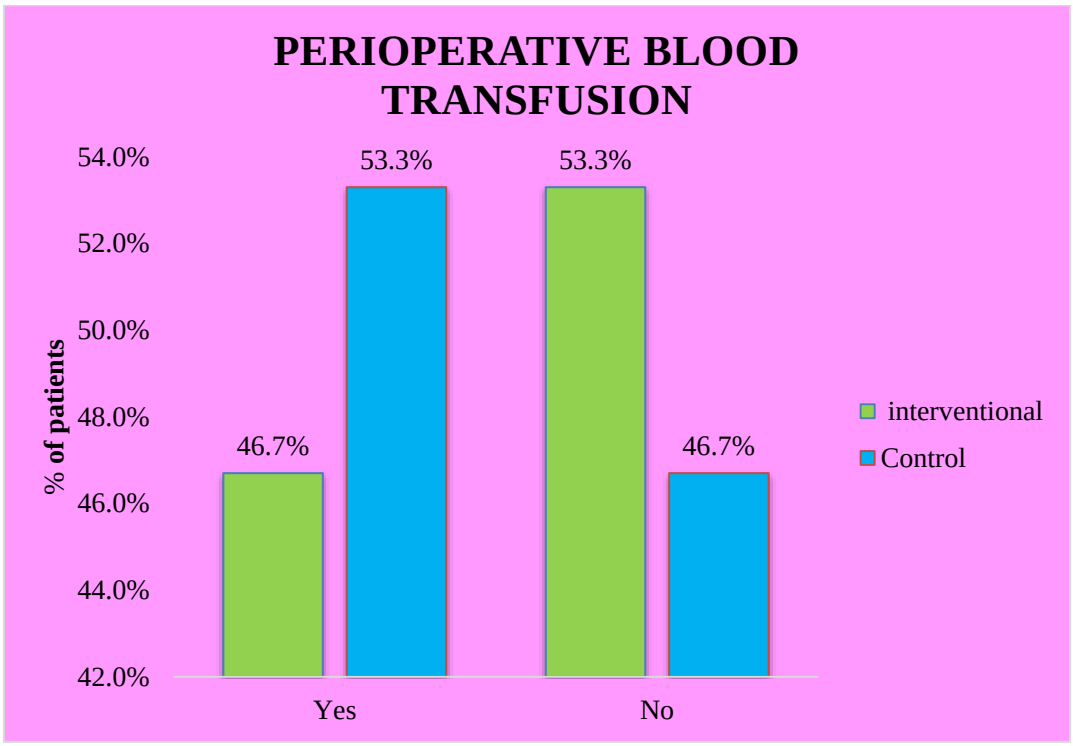


Figure 18 : Percentage distribution of Perioperative blood transfusion among post operative patients .

The above cylindrical diagram portrays that majority of patients in intervention group 16(53.3 %) had no perioperative blood transfusion and remaining 14(46.7%) had perioperative blood transfusion. In the control group 16(53.3 %) had perioperative blood transfusion and remaining 14 (46.7%) had no perioperative blood transfusion .

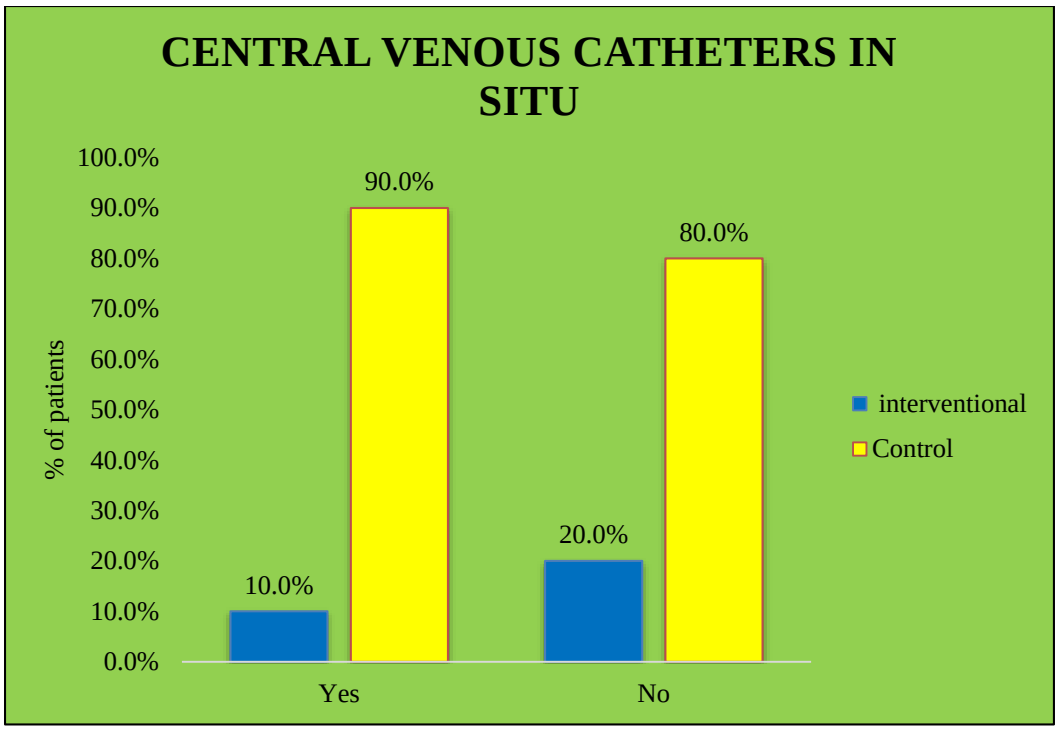


Figure 19: Percentage distribution Central venous catheters in situ among post operative patients

The above pyramid diagram portrays that majority of the patients in intervention group 27(90.0 %) had no central venous catheter and remaining 3(10.0%) had central venous catheter. In the control group 24(80.0 %) had no central venous catheter and remaining 6(20.0%) had central venous catheter.

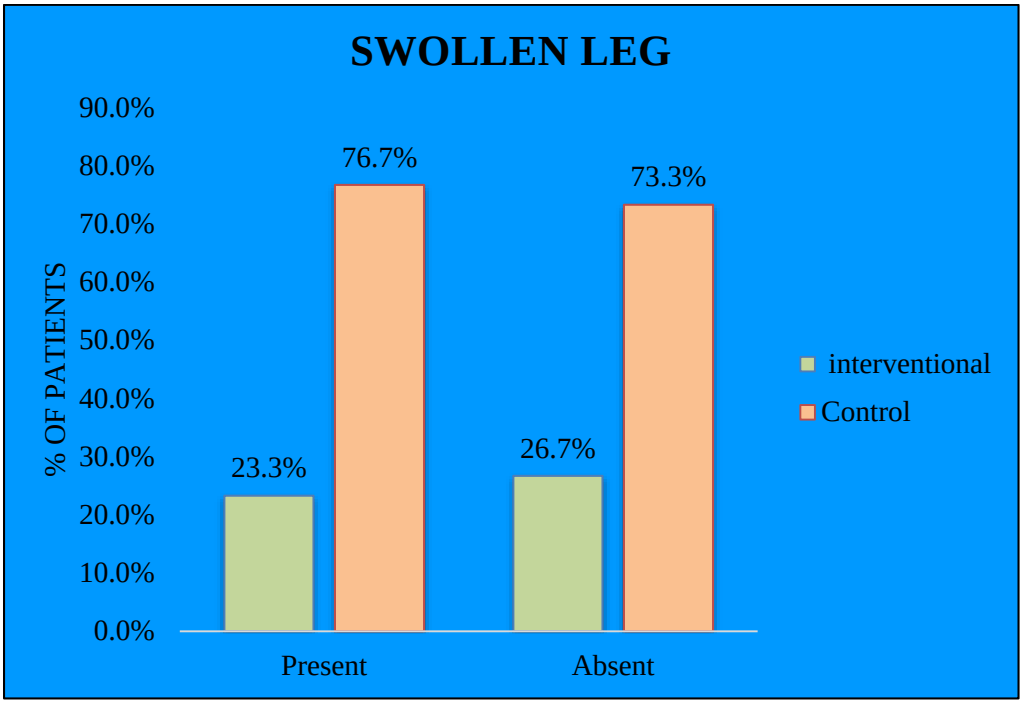


Figure 20 : Percentage distribution of Swollen leg among post operative patients

The above pyramid diagram depicts that majority of the patients in intervention group 23(60.0%) had absence of swollen legs, and remaining 7(23.3%) had presence of swollen leg. In the control group 22(73.3%) had absence of swollen leg and remaining 8(26.7%) had presence of swollen leg.

Table 3

Frequency and Percentage distribution of risk level of deep vein thrombosis among post operative patients in experimental and control group

Risk	Group			
	Intervention		Control	
	N	%	n	%
Low	0	0.0%	0	0.0%
Moderate	14	46.7%	12	40.0%
High	16	53.3%	18	60.0%
Total	30	100.0%	30	100.0%

Above table explains, most of the patients in intervention group 16 (53.3%) are having high risk score, 14(46.7%) are having moderate score, and none of the patients are having low risk score. In control group, 18(60.0%) of the patients are having high risk score, 12(40.0%)of the patients are having moderate score, none of the patients are having low risk score.

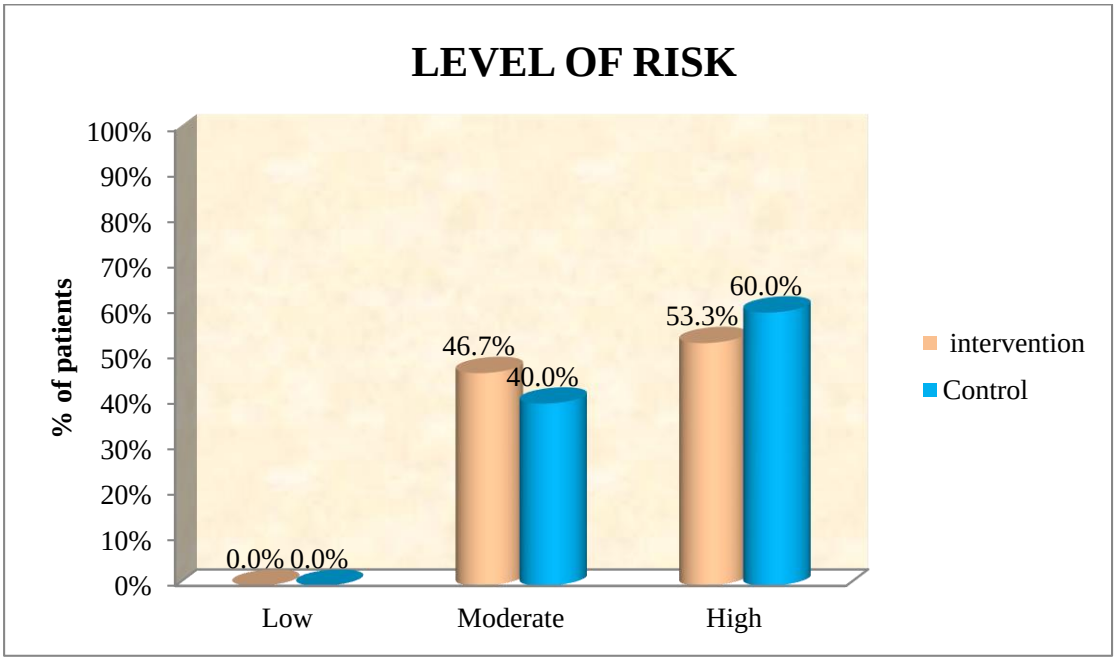


Figure : 21 Percentage distribution of risk level of DVT among post operative patients

The above cone diagram shows that majority of patients in the intervention group 16(53.3%) are having high risk score and none of the patients are having low risk score, In control group, 18(60.0%)are having high risk score and none of the patients are having low risk score.

Section: II

Effectiveness of prophylactic measures on deep vein thrombosis

Table-4

Frequency and percentage distribution of probability level of deep vein thrombosis among post operative patients

probability	Group				Chi square test
	Intervention		Control		
	n	%	n	%	
No	14	46.7%	6	20.0%	$\chi 2=10.21$ P=0.04* DF=4 S
Very low	9	30.0%	6	20.0%	
Low	4	13.3%	7	23.3%	
Moderate	3	10.0%	7	23.3%	
High	0	0.0%	4	13.4%	
Total	30	100.0%	30	100.0%	

The above table shows the posttest percentage probability level of deep vein thrombosis among post operative patients in intervention and control group. In experimental group posttest reveals that 14(46.7%) had no probability level of DVT, 9(30.0%) had very low probability level of DVT, 4(13.3) had low probability level of DVT, 3(10.0) had moderate probability level of DVT and none of them had high probability level of DVT. In the control group 7 (23.3.7%) had low and high probability level of DVT, 6 (20.0%) had no and very low probability level of DVT, 4(13.4) had high probability level of DVT.

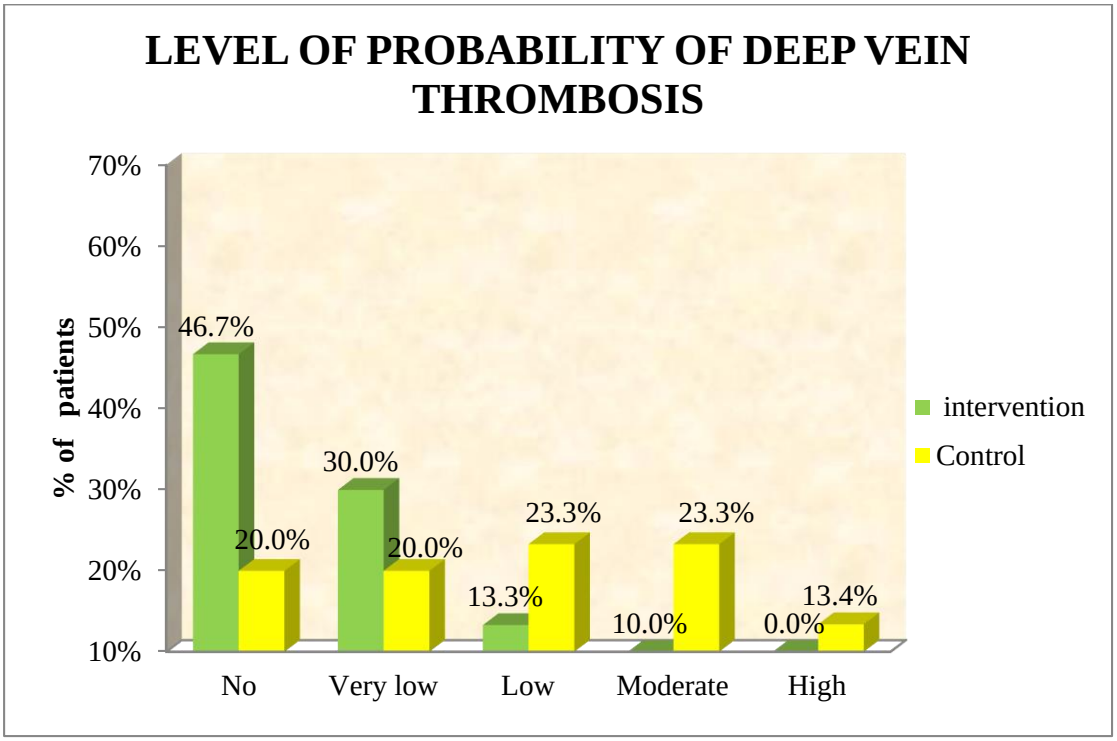


Figure 22 : Posttest Percentage distribution of probability level of deep vein thrombosis among post operative patients

The above multiple bar diagram depicts the posttest percentage probability level of deep vein thrombosis among post operative patient, majority of the patients intervention group 14(46.7%) had no probability level of DVT, and least 3(10.0) had moderate probability level of DVT and none of them had high probability level of DVT. In the control group 7 (23.3.7%) had low and high probability level of DVT, and least 4(13.4) had high probability level of DVT.

Table -5

Mean, Standard Deviation and Mean percentage to evaluate the effectiveness of prophylactic measures on deep vein thrombosis among post operative patients at Govt Rajaji hospital, Madurai

	Max score	Control - Post test scores			Intervention -Post test scores			Difference in mean%
		Mean	SD	Mean%	Mean	SD	Mean%	
Probability level of DVT	**10**	2.97	2.31	29	1.2	1.63	12	17

The above table explains that mean in the control and intervention group was 2.97 and 1.2and standard deviation in the control and experimental group was 2.31 and 1.63 respectively. The mean difference was 17.

Table 6

Comparison of mean post test probability level of deep vein thrombosis among post operative patients in intervention and control group.

	No. of patients	**DVT score Mean ± SD**	**Mean Difference**	**Student's independent t-test**
Experiment	30	1.43±1.69	1.53	t=2.78 P=0.01** significant
Control	30	2.97±2.49		

**** highly significant at P≤0.01**

Above table shows the comparison of mean posttest probability level of DVT score between intervention and control group. The intervention group mean DVT score was 1.43 with the Standard Deviation 1.69 , where as in the control group the mean DVT score was 2.97 with the Standard Deviation 2.49. The mean difference is 1.53. Students independent t-test was done to find out the difference between intervention and control group scores. Calculated t value 2.78 was greater than the table value which was significant at 0.01 level. Hence the above findings statistically proved that prophylactic measures were very effective in preventing the probability level of developing deep vein thrombosis among post operative patients in intervention group.

Table: 7

Mean difference between intervention and control group of DVT score

	DVT score **Mean ± SD**	**Mean Difference in score with** **95% Confidence interval**
Intervention	1.43±1.69	1.53(0.42 – 2.62)
Control	2.97±2.49	

The above table shows the mean difference between intervention and control group DVT score. On an average, Experiment patients are having 1.43 DVT score whereas control group patients are having 2.97 DVT score , Difference between intervention and control group of DVT score shows the effectiveness of Prophylactic measures on deep vein thrombosis among post operative patients at Govt Rajaji Hospital, Madurai. Differences between intervention and control group score was analysed using mean difference with 95% confidence interval.

Section III

Association between posttest probability level of developing DVT score among post operative patients with their selected socio demographic variables and clinical variables

Table 8

Association between posttest probability level of DVT score and selected socio demographic variables(intervention)

n=30

Demographic variables		Level of probability								N	Chi square test
		No		Very low		Low		Moderate			
		n	%	N	%	n	%	n	%		
Age	< 40 years	6	75.0%	2	25.0%	0	0.0%	0	0.0%	8	**χ2=23.74P= 0.02* DF=12 S**
	41 -50 years	5	66.7%	1	16.7%	0	0.0%	0	0.0%	6	
	51 -60 years	2	33.3%	3	50.0%	0	0.0%	1	16.7%	6	
	61 -70 years	1	12.5%	2	25.0%	4	50.0%	1	12.5%	8	
	> 70 years	0	0.0%	1	50.0%	0	0.0%	1	50.0%	2	
Gender	Male	6	35.3%	7	41.2%	2	11.8%	2	11.8%	17	χ2=2.91P=0. 40 DF=3 NS
	Female	8	61.5%	2	15.4%	2	15.4%	1	7.7%	13	
Religion	Hindu	11	42.3%	9	34.6%	3	11.5%	3	11.5%	26	χ2=5.52P=0. 47DF=6NS
	Christian	2	100.0%	0	0.0%	0	0.0%	0	0.0%	2	
	Muslim	1	50.0%	0	0.0%	1	50.0%	0	0.0%	2	
Mother Tongue	Tamil	14	46.7%	9	30.0%	4	13.3%	3	10.0%	30	χ2=0.09P=0. 76 DF=3 NS
Educational Qualification	Non formal education	4	44.4%	2	22.2%	2	22.2%	1	11.1%	9	χ2=9.15P=0. 42 DF=9NS
	Primary education	6	66.7%	3	33.3%	0	0.0%	0	0.0%	9	
	SSLC	2	22.2%	4	44.4%	2	22.2%	1	11.1%	9	
	HSC	2	66.7%	0	0.0%	0	0.0%	1	33.3%	3	
Occupation status	Un employee	6	54.5%	2	18.2%	2	18.2%	1	9.1%	11	χ2=1.51P=0.

	Self employee	5	45.5%	4	36.4%	1	9.1%	1	9.1%	11	95 DF=6NS
	Daily wages	3	37.5%	3	37.5%	1	12.5%	1	12.5%	8	
Family monthly income	Rs.1001-3000	11	47.8%	7	30.4%	4	17.4%	1	4.3%	23	$\chi 2$=4.40P=0.22 DF=3NS
	Rs.3001-6000	3	42.9%	2	28.6%	0	0.0%	2	28.6%	7	
Marital status	Married	14	46.7%	9	30.0%	4	13.3%	3	10.0%	30	$\chi 2$=0.00P=1.00 DF=3 NS
Diettary pattern	Vegetarian	0	0.0%	0	0.0%	1	100.0 %	0	0.0%	1	$\chi 2$=6.72P=0.08 DF=3 NS
	Non vegetarian	14	48.3%	9	31.0%	3	10.3%	3	10.3%	29	
Personal habits	Smoking	2	50.0%	1	25.0%	0	0.0%	1	25.0%	4	$\chi 2$=5.82P=0.92 DF=12 NS
	Alcoholism	1	50.0%	1	50.0%	0	0.0%	0	0.0%	2	
	Tobacco using	1	50.0%	0	0.0%	1	50.0%	0	0.0%	2	
	Smoking & Alcoholism	1	50.0%	1	50.0%	0	0.0%	0	0.0%	2	
	None	9	45.0%	6	30.0%	3	15.0%	2	10.0%	20	

Fig 16 *P< 0.05 significant

The above table explains the association between posttest level of probability of developing deep vein thrombosis among post operative patients in intervention group with their selected socio demographic variables such as age those who are below 40 years(X^2 =23.74 p=0.02) . All other selected socio demographic variables were not significantly associated with the probability level of DVT score.

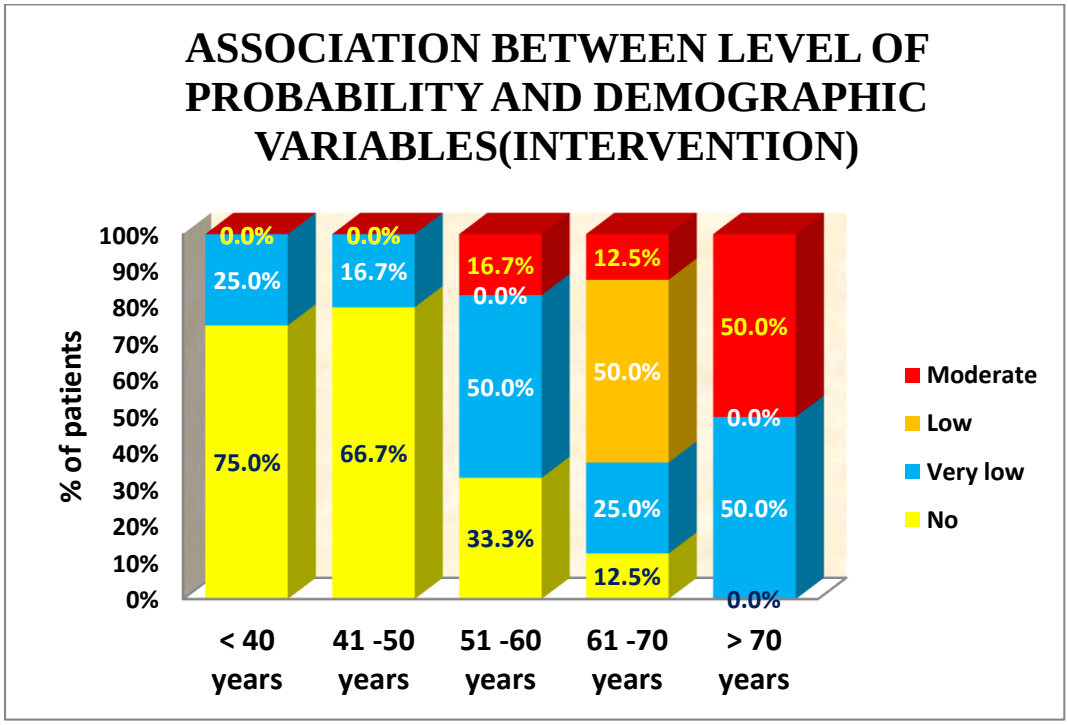


Figure: 23 Percentage distribution of association between the probability level of developing deep vein thrombosis score and patient's age among post operative patients(intervention)

The above bar diagram illustrates that post operative patients in the age group of below 40 years had less probability level of developing deep vein thrombosis than other age groups.

Table 9

Association between posttest Probability level of DVT score and Clinical variables (Intervention)

Clinical variables		Level of probability								n	Chi square test
		No		Very low		Low		Moderate			
		n	%	n	%	n	%	n	%		
Waist Hip Ratio	0.95 or below (male)/ 0.80 or below (female	8	42.1%	8	42.1%	3	15.8%	0	0.0%	19	**χ^2=13.58 P=0.04* DF=6 S**
	0.96-1.0/ 0.81-0.85	6	75.0%	0	0.0%	0	0.0%	2	25.0%	8	
	More than 1/ more than 0.85	0	0.0%	1	33.3%	1	33.3%	1	33.4%	3	
Nature of surgery	Elective surgery	12	50.0%	8	33.3%	2	8.3%	2	8.3%	24	χ^2=3.31P =0.34 DF=3 NS
	Emergency surgery	2	33.3%	1	16.7%	2	33.3%	1	16.7%	6	
Type of Anesthesia	General anesthesia	8	33.3%	9	37.5%	4	16.7%	3	12.5%	24	χ^2=8.53P =0.04 DF=3 NS
	Spinal anesthesia	6	100.0%							6	
Duration of surgery	2 to 3 hours	9	75.0%	3	25.0%	0	0.0%	0	0.0%	12	**χ^2=20.45 P=0.02* DF=9 S**
	3 to 4 hours	5	44.4%	3	33.3%	1	11.2%	0	0.0%	9	
	4 to 5 hours	0	0.0%	2	40.0%	2	40.0%	1	20.0%	5	
	5 or more hours	0	0.0%	1	25.0%	1	25.0%	2	50.0%	4	
Malignancy	Yes	1	12.5%	1	12.5%	3	37.5%	3	37.5%	8	**χ^2=16.87 P=0.001* ** DF=3 S**
	No	13	59.1%	8	36.4%	1	4.5%	0	0.0%	22	
Mobility	Very limited	9	37.5%	8	33.3%	4	16.7%	3	12.5%	24	χ^2=4.35P =0.22 DF=3 NS
	Slightly limited	5	83.3%	1	16.7%					6	
Co-morbid conditions	Diabetes mellitus			1	50.0%			1	50.0%	2	χ^2=11.60 P=0.07 DF=6 NS
	Hypertension					1	100.0%			1	
	None of the above	14	51.9%	8	29.6%	3	11.1%	2	7.4%	27	

Perioperative blood transfusion	Yes	4	28.6%	5	35.7%	3	21.4%	2	14.3%	14	$\chi 2$=3.90P =0.27 DF=3 NS
	No	10	62.5%	4	25.0%	1	6.3%	1	6.3%	16	
Central venous catheter in situ	Yes	1	33.3%	1	33.3%			1	33.3%	3	$\chi 2$=2.39P =0.49 DF=3 NS
	No	13	48.1%	8	29.6%	4	14.8%	2	7.4%	27	
Previous documented DVT	No	14	46.7%	9	30.0%	4	13.3%	3	10.0%	30	$\chi 2$=0.00P =1.00 DF=3 NS
Family History of DVT	No	14	46.7%	9	30.0%	4	13.3%	3	10.0%	30	$\chi 2$=0.00P =1.00 DF=3NS
Swollen Leg	Present	1	14.3%	1	14.3%	3	42.9%	2	28.5%	7	**$\chi 2$=11.92 P=0.01** DF=3 S**
	Absent	13	56.6%	8	34.8%	1	4.3%	1	4.3%	23	

P< 0.05 significant

The above table explains the association between pretest probability level of developing DVT among post operative patients with their selected clinical variables such as Waist Hip Ratio 0.95 or below(male)/0.80 or below(female) (X^2 =13.58 P=0.04), duration of surgery between 2-3 hours(X^2 = 20.45P=0.02), without malignancy (X^2=16.87P=0.001) and absence of swollen leg (X^2=11.92P=0.01) were significantly associated. Other variables were not significant.

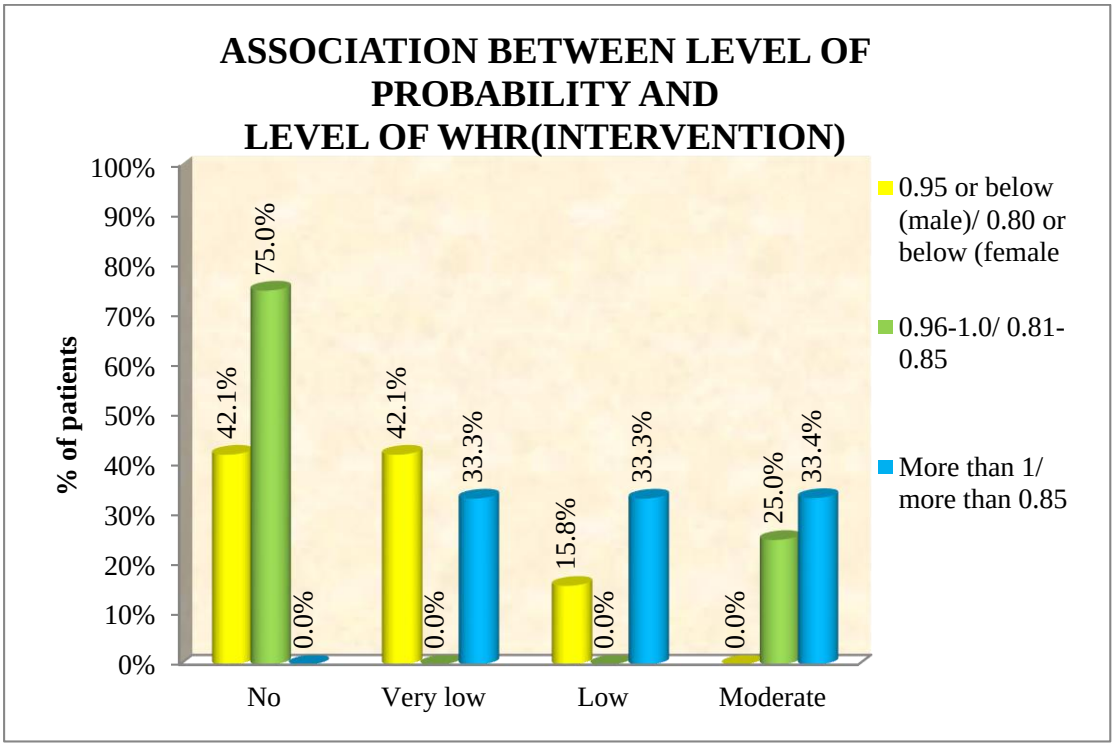


Figure 24: Percentage distribution of association between probability level of developing DVT and the patient's Waist hip ratio

The above cylindrical diagram shows the Ideal Waist Hip Ratio patients are having less probability than others.

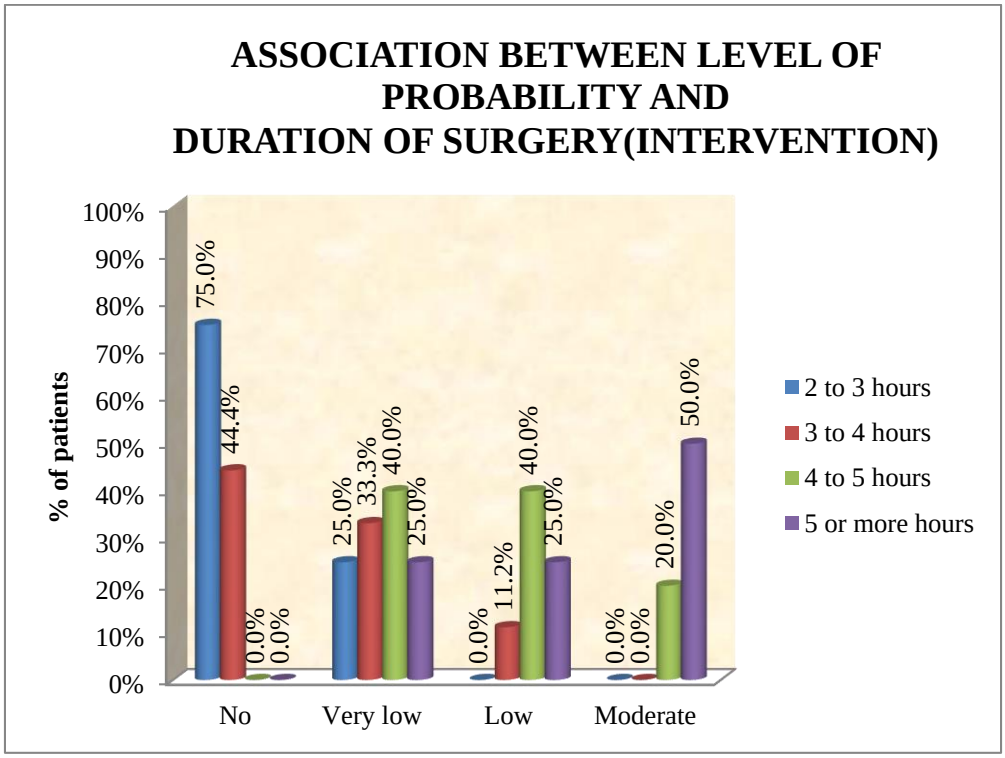


Figure 25 Percentage distribution of association between posttest level of probability and duration of surgery

The above multiple cylindrical diagram depicts that patients with Less duration of surgery in intervention group are having less probability than others.

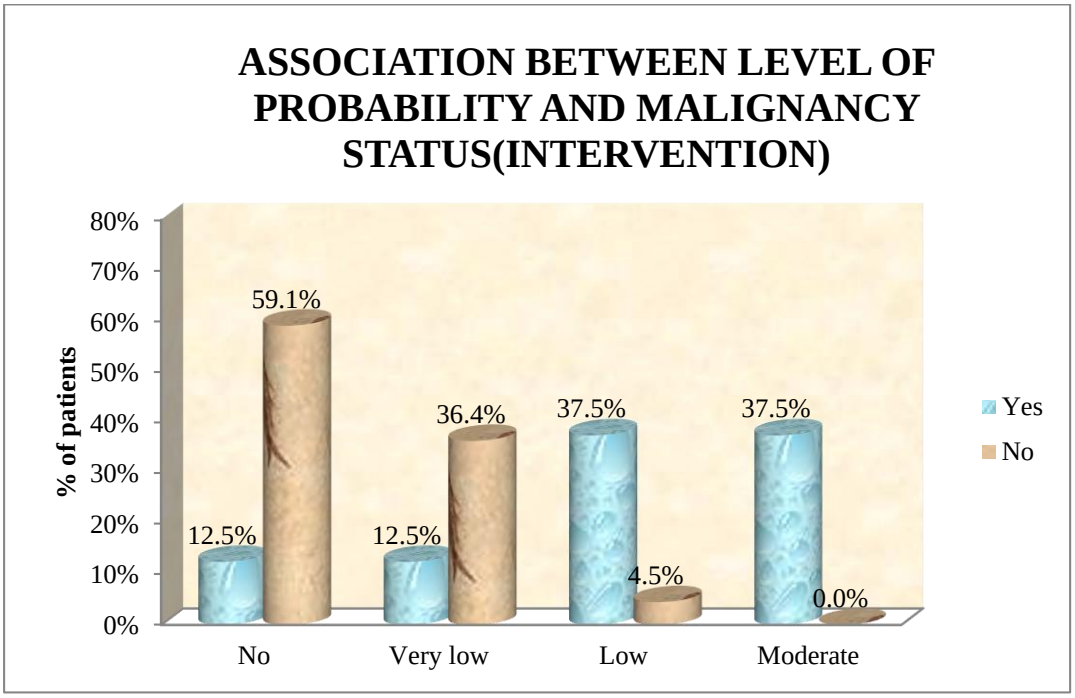


Figure 26 Percentage distribution of association between posttest level of probability in intervention group and malignancy

The above multiple cylindrical diagram portrays that patients without malignancy are having less probability than others.

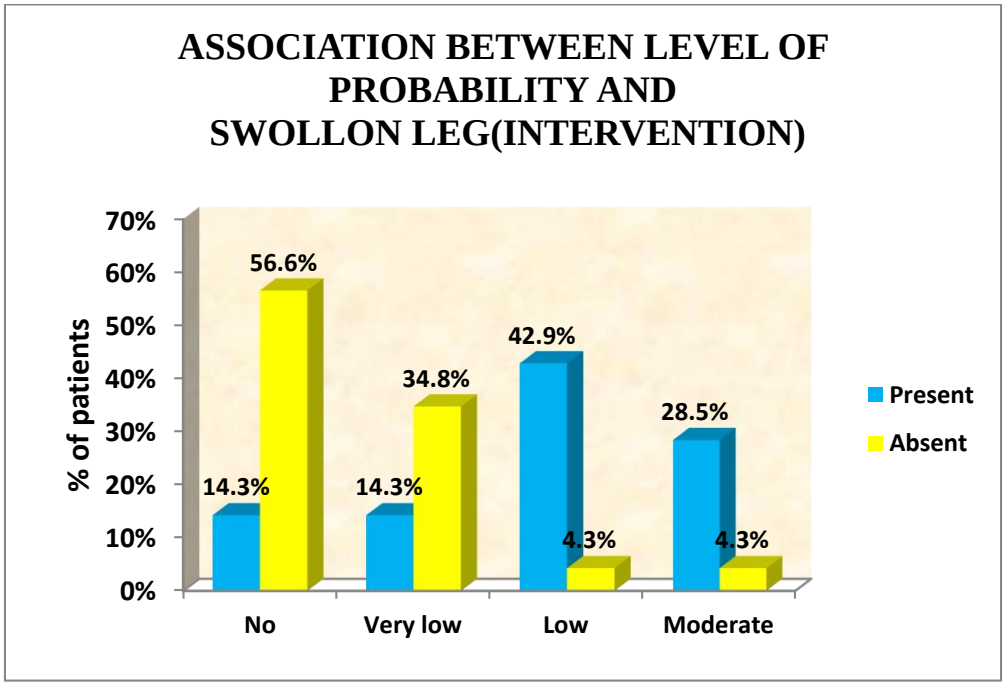


Figure 27 Percentage distribution of association between posttest level of probability and swollen leg

The multiple bar diagram shows that the intervention group patients with absence of swollen leg are having less probability than others.

DISCUSSION

CHAPTER –V

DISCUSSION

This chapter deals with detailed discussion of the data and results interpreted from the statistical, inferential analysis . The present study was focused to evaluate the effectiveness of prophylactic measures on deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai. Post operative patients are at greater risk of developing deep vein thrombosis than other patients due to the immobility , duration of surgery, due to anesthesia, ,invasive lines, prolonged stay ,severity of illness and environment of post operative unit itself .They may undergone all the invasive procedures and keep central venous catheters, urinary catheters etc on them. They are unable to do their self care activities also . these invasive devices and invasive procedures and immobility may contribute to venous stasis will lead to develop deep vein thrombosis. By providing prophylactic measures prevents venous stasis and improves venous circulation and prevents developing deep vein thrombosis.

In this study, Researcher adopted a Quantitative approach, True experimental post test only design and 60 samples were selected by simple random sampling technique. Modified Wiedenbach's Helping Art theory was adopted. After the data collected and risk level assessed by Modified Capirini DVT risk assessment scale , and all the experimental group patients are provided prophylactic measures i.e early mobilization which includes changing of positioning and leg exercises three times a day for four consecutive days and on the fifth day post test was conducted with Modified well's criteria for deep vein thrombosis to assess the probability level of developing deep vein thrombosis.

Discussion of demographic variables

Regarding age majority of the patients in experimental group 8 (26.6%) were belongs to the age below 40 and between 61-70 years ,and the control group 9(30.0%) belongs to the age of 41-50 and between 51-60 years.

With regard to Gender, majority of the patients in experimental group 17(56.7%) were males and 13(43.3%) were females. In control group, 15(50.0%) were females and 13(43.3%) were males.

According to education, majority of the post operative patients in experimental group 9 (30.0%) were non formal education and primary education of patients in experimental group and 17(56.7%) were primary education in control group.

By seeing occupational status Majority of the patients in experimental group 11(60.0%) related to unemployed and self employers, in control group 15(60.0%) were self employers.

While discussing the family monthly income majority of the in the patients in the experimental and control group 23(76.7%) and 18 (60.0%) were earning between Rs.1001-3000 respectively.

Based on marital status, **i**n experimental group 30(100.0%) were married and in control group 29(96.7%) were married.

About food habits, in experimental group maximum patients that are 29(96.7%) were non vegetarian and in control group25(83.3%) were non vegetarian.

In the view of Personal habits, in experimental group 20(66.7%) having none of any personal habits and control group 17(56.7%)were none of having any personal habit.

Discussion of clinical variables

Regarding waist to hip ratio, majority of the patients in the experimental group 19(63.3%) had 0.95 or below (male)/ 0.80 or below (female) and least 3(10.0%) had More than 1/ more than 0.85. In the control group majority of the subjects18 (60.0%) had 0.95 or below (male)/ 0.80 or below (female) and least 3 (10.0%) More than 1/ more than 0.85.

Based on nature of surgery , majority of the patients in the experimental group 24(80.0%) had undergone elective surgery and remaining 6 (20.0%) had undergone emergency surgery. In the control group 25(83.3%) had undergone elective surgery and remaining 5(16.7%) had undergone emergency surgery. .

Regard to the type of anesthesia, majority of the patients in the experimental group 24(80.0%) had undergone general anesthesia and remaining 6(20.0%) had spinal anesthesia. In the control group 25(83.3%) had general anesthesia and remaining 5(16.7%) had spinal anesthesia

According to the duration of surgery, majority of the patients in the experimental group 12(40.0%) had 2-3 hours duration of surgery, and least 4(13.3%) had more than five hours duration of surgery. In the control group 11 (36.7%) had 2-hours duration, and least 3(10.0%) had 4-5 hours duration of surgery.

Based on malignancy, majority in the experimental group 22(73.3 %) had no malignancy and remaining 8(26.7%) had malignancy. In the control group 17(56.7%) had no malignancy and remaining 13(43.3%) had malignancy.

Discussing the mobility, majority in the experimental group 80.0%) were very limited mobility and in the control group 23 (76.7%) were very limited mobility .

Comparing co-morbid conditions, majority in the experimental group 27(90.0%) had no co-morbid conditions and in the control group 22 (73.3%) had no co-morbid conditions.

Regarding perioperative blood transfusion, majority in the experimental group 16(53.3 %) had no perioperative blood transfusion and remaining 14(46.7%) had perioperative blood transfusion. In the control group 16(53.3 %) had perioperative blood transfusion and remaining 14(46.7%) had no perioperative blood transfusion

Based on central venous catheter in situ, majority in the experimental group 27(90.0 %) had no central venous catheter and remaining 3(10.0%) had central venous catheter. In the control group 24(80.0 %) had no central venous catheter and remaining 6(20.0%) had central venous catheter.

Based on previous documented DVT, all the patients in the experimental group and control group 30(100.0 %) had no previous documented DVT

Regarding family history of DVT, all the patients in the experimental group and control group 30(100.0 %) had no family history of DVT

Discussion of risk level of DVT

Regarding risk level, in experimental group, none of the patients are having low risk score, 46.7% of the patients are having moderate score, 53.3% of the patients are having high risk score. In control group, none of the patients are having low risk score, 40.0% of the patients are having moderate score, 60.0% of the patients are having high risk score.

Findings based on the objectives

The first objective was to evaluate the effectiveness of prophylactic measures on probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai.

The mean posttest deep vein thrombosis score in experimental group was1.43 with standard deviation of 1.69 and the mean post test deep vein thrombosis score in control group was 2.97 with standard deviation of 2.49. The mean difference score with 95% confidence interval is 1.53 .Percentage of mean score in the experimental group was 71.3% and in the control group was 40.9%.The student's independent "t" test was used to find out the difference between the probability level of deep vein thrombosis in interventional and control group. The obtained student independent "t" test value was 2.78 which was significant at $p \leq 0.01$ level. This revealed that there was a significant difference in the mean DVT scores between the interventional and control group . The difference was due to the intervention, prophylactic measures . Hence this study proved that the prophylactic measures was very effective in preventing the probability level of developing deep vein thrombosis among post operative patients those who are at risk.

This finding of the study was consistent with a study done by Shawkey S.GAD, Amal A.EL-Shiekh(2013) conducted to evaluate the effectiveness of prophylactic measures i.e leg exercises and positioning on prevention of deep vein thrombosis among post operative patients was carried out in General Surgical Department of Menoufia University Hospital from September 2012 to January 2013. among 120 general surgical patients assigned randomly and divided in to two equal groups, 60 patients for each. Study group exposed to prophylactic measures(turning and positioning , leg exercises like foot and ankle exercises) along with routine

hospital hospital care. Control group exposed only to routine hospital care. This revealed that, the mean age for study group was 42.03±13.58 and for the control group was 41.76±13.72 years. More than half of both groups (53.3%) were male. The majority of study group (83.3%) and control group (80%) were married. According to this study findings, the study group who received intervention did not have DVT when compared to the control group who follow the routine care only, the risk for DVT is prevented this due to giving prophylactic measures to the patient

Hence the hypothesis H_1.There is a significant difference in the post test probability level of developing deep vein thrombosis between intervention and control group among post operative patients at Government Rajaji Hospital Madurai was accepted.

The second objective was to associate the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital, Madurai with their selected socio-demographic and clinical variables .

Chi square analysis was done to find out the association between the post test scores of probability level of developing DVT and selected socio demographic variables and clinical variables. The study revealed a significant association between the probability level of developing DVT and selected socio demographic variables such as age those who are below 40 years (X^2= 23.74 P= 0.02) and the clinical variables such as Waist Hip Ratio(X^2= 13.58,p= 0.04), Duration of surgery (X^2=20.45 P=0.02)malignancy (X^2=16.87P=0.001)and swollen leg (X^2 =11.92P=0.01) among post operative patients in experimental group. There was no significant association between the posttest probability level of developing DVT and the other socio demographic variables such as gender, religion, education, occupational status, family monthly income, marital status , dietary pattern, personal habits and the clinical

variables such as nature of surgery, type of anesthesia, mobility, co-morbid conditions, peri-operative blood transfusions, central venous catheters in situ,

This study findings was consistent with the study findings of Andrew L.Muleledhu ,(2013) to establish the prevalence and developing deep vein thrombosis who underwent major abdominal surgery . This was a perspective study conducted in Mulago Hospital on the general surgical wards between March and June 2011. A total of 82 eligible patients were identified and screened and patient details were collected, duplex scan was performed. This information was recorded on pre coded sheet . Study variables like age, sex, BMI, duration of mobilization, site of surgery, length of surgery were included . The incremental risk associated with increasing age indicates that the Ugandan population would have an increasing risk of DVT as the general population's mean age increases. Malignancy has been and continues to be strongly associated with increasing age . Colorectal and breast cancer have been notable in this regard with the latter occurring in patients 10 to 15 years younger in Uganda as compared to the US . The average age of patients with a diagnosis of malignancy in this study was 47.3 years, which is well below those in other countries. All patients who developed DVT in this study had a malignancy, increasing age . It would thus appear that malignancy is an important risk factor and is independent of other risk factors such as age and obesity. This results that there is significant association between post test score with age, waist hip ratio, duration of surgery and swollen leg.

Hence the hypothesis H_2. There is a significant association between the probability level of developing deep vein thrombosis among post operative patients at Government Rajaji Hospital with their selected socio- demographic and clinical variable was accepted

SUMMARY, CONCLUSION, IMPLIMENTATION, AND RECOMENTATION

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter deals with the summary of the study and conclusions drawn. It also clarifies the limitations of the study, the implications for different areas like nursing education, administration, nursing practice, nursing research and recommendations.

6.1 Summary

The present study was aimed at evaluating the effectiveness of prophylactic measures on deep vein thrombosis among post operative patients, at Government Rajaji Hospital, Madurai.

The objectives of the study were

- To evaluate the effectiveness of prophylactic measures on probability level of developing deep vein thrombosis among post operative patients in experimental group at Government Rajaji Hospital, Madurai.
- To associate the effectiveness of prophylactic measures on probability level of developing deep Vein Thrombosis both intervention and control group among post operative patients with their selected socio-demographic and clinical variables .

The following hypotheses were tested

- H_1.There is a significant difference in post test probability level of developing deep Vein Thrombosis between experimental and control group among post operative patients at Government Rajaji Hospital Madurai.

- H_2. There is a significant association between the probability level of developing Deep Vein Thrombosis among experimental and control group post operative patients at Governmentt Rajaji Hospital with their selected socio- demographic and clinical variables.

The study assumptions were

- Post operative patients may have different level of risk of developing deep vein thrombosis.

The conceptual framework adopted was Modified Wiedenbach's Helping Art theory. Quantitative approach - True-experimental, post test only research design was adopted. The independent variable was prophylactic measures and the dependent variable was deep vein thrombosis. Probability simple random sampling technique was adopted to select 60 samples by picking up the available samples who fulfill the inclusion criteria during the period of data collection. The accessible population for the study was 60 post operative patients admitted in post operative ward at Government Rajaji Hospital, Madurai. Intervention prophylactic measures carried out for prevention of developing deep vein thrombosis.

The tool used in this study consists of two sections.

Section I

- Socio demographic variables
- Clinical Variables

Section II

- Modified Capirini DVT risk assessment scale

Section III

Modified well's criteria for diagnosis of deep vein thrombosis.

Content validity was obtained from four experts in the field of Surgery and Medical -surgical nursing. Pilot study was conducted to find out the feasibility of the study and it did not show any major flaw in the design of the study. On the 1st day, After data collection , level of risk was assessed with Modified Capirini DVT risk assessment scale, followed by prophylactic measures i.e leg exercises and positioning three times daily in the morning, afternoon, and night for 4 consecutive days. Post test was conducted on 5thday using the Modified well's criteria for diagnosis of deep vein thrombosis. Data was collected for six weeks from 15.3.2017.2015 to 30.4.2017 and based on the objectives and hypothesis, data were analyzed using descriptive and inferential statistics.

6.2 Major findings of the study

Based on age , majority of the patients in experimental group 8 (26.6%) were below 40 years and between 61-70 years, Whereas in control group majority of the post operative patients 9 (30.0%) were in the age group of below 40 years and 51- 60 years.

While comparing the gender, majority of the patients in experimental group 17 (56.7%) were male , whereas in control group 15 (50.0%) were female .

Regarding religion, majority of the patients in experimental group 26 (86.6%) were belongs to Hindu religion but in control group 24 (80.0%) were belongs to Hindu religion .

While comparing the educational status, majority of the patients in experimental group 9 (30.0%) had non formal education, but in control group majority 17 (56.7%) were studied up to primary education .

While discussing the occupational status, majority of the patients in experimental group 11 (36.7%) were unemployed and in the control group 15 (50.0%) were self employers .

While comparing the family monthly income, majority of the patients in experimental group 23 (76.7%) were earning between Rs 1001- 3000 , But in the control group 18 (60%) were earning between Rs 1001- 3000.

Regarding the marital status, all the patients in experimental group 30 (100%) were married, whereas in control group majority of the patients 29 (96.7%) were married and remaining 1(13.3%) was unmarried

While discussing the Dietary pattern, majority of the patients in experimental group 29 (96.7%) were non vegetarian and in the control group also 25 (83.3%) were non vegetarian.

In the view of **Personal habits,** In experimental group 20(66.7%) had none of any personal habits 4(13..3%) were smoker, In control group 17(56.7%)were none, 6(20%) were smoker and alcoholic

Based on **Waist to hip ratio** ,majority of the patients in the experimental group 19(63.3%) had 0.95 or below (male)/ 0.80 or below (female. In the control group majority of the patients18 (60.0%) had 0.95 or below (male)/ 0.80 or below (female)

According to the **nature of surgery,** majority of the patients in the experimental group 24(80.0%) had undergone elective surgery and in the control group 25(83.3%) had undergone elective surgery.

Regard to the **type of anesthesia** majority of the patients in the experimental group 24(80.0%) had general anesthesia and in the control group 25(83.3%) had general anesthesia.

Discussing the **duration of surgery** majority of the patients in the experimental group 12(40.0%) had 2-3 hours duration of surgery and in the control group 11 (36.7%) had 2- hours duration.

Comparing the **malignancy** majority of the patients in the experimental group 22(73.3 %) had no malignancy and in the control group 17(56.7%) had no malignancy.

Regarding **mobility** group majority of the patients in the experimental 24(80.0%) were very limited mobility and in the control group 23 (76.7%) were very limited mobility .

Discussing **co morbid conditions** majority of the patients in the experimental group 27(90.0%) had no co-morbid conditions and in the control group 22 (73.3%) had no co-morbid conditions.

Based on **perioperative blood transfusion**, majority of the patients in the experimental group 16(53.3 %) had no perioperative blood transfusion and in the control group 16(53.3 %) had perioperative blood transfusion .

According to **central venous catheter in situ, majority of the patients** in the experimental group 27(90.0 %) had no central venous catheter and in the control group 24(80.0 %) had no central venous catheter

Regarding **previous documented DVT, all the patients** in the experimental group and control group 30(100.0 %) had no previous documented DVT.

Based on **family history of DVT, all the patients** in the experimental group and control group 30(100.0 %) had no previous documented DVT.

Regarding risk level, In experiment group, none of the patients are having low risk score, 46.7% of the patients are having moderate score, 53.3% of the patients are having high risk score. In control group, none of the patients are having low risk

score, 40.0% of the patients are having moderate score, 60.0% of the patients are having high risk score. Statistically there is no significant difference between experiment and control group score. It was confirmed using chi square test

Among 30 patients in experimental group, 1n the posttest,46.7% of the patients are having no probability score,30.0% of the patients are having very low probability score, 13.3% of the patients are having low probability score, 10.0 % of the patients are having moderate probability score and none of them are having high probability score. In the control group 20.0% of the patients are having no probability score, 20.0% of the patients are having very low probability score, 23.3% of the patients are having low and moderate probability score and 13.3% of the patients are having high probability score.

In post test , experimental mean DVT score was 1.43 with the Standard Deviation 1.69 and in the control group mean DVT score was 2.97 with the standard deviation 2.49 . Mean difference is 1.53. The student independent t-test value was 2.78 which was highly significant at $p \leq 0.01$.

The mean difference between experiment and control group is large and it is statistically significant. Differences between experiment and control group score was analyzed using students independent t-test.

The above results proved clearly that the intervention prophylactic measures provided by the researcher was very effective in preventing and the probability level of developing deep vein thrombosis among post operative patients with risk factor for developing deep vein thrombosis in post operative ward.

In the post test , there was significant association between the probability level developing deep vein thrombosis and socio demographic variables in experimental group such as age < 40 years ($X^2 = 23.74$ p=0.02), and the clinical

variables such as Ideal Waist Hip Ratio (X^2 = 13.58 p= 0.04), Less Duration of surgery (X^2 =20.45 p= 0.02), No Malignancy (X^2= 16.87 p= 0.001), and No Swollen leg (X^2 = 11.92 p=0.01) in experimental group. Other variables had no significant association with the probability level of developing deep vein thrombosis.

6.3 Conclusion

The statistical evidence proved that the prophylactic measures along with routine hospital care provided was very effective in preventing probability level of developing deep vein thrombosis in the experimental group than the control group who were not received prophylactic measures . Hence the researcher concluded that the prophylactic measures can be provided for preventing the development of deep vein thrombosis among post operative patients those who are at risk .

6.4 Implications

The investigator had drawn implications from this study for various areas such as nursing practice, nursing education, nursing education, and nursing administration, and nursing research.

Implications for nursing practice

1. Nurse plays a vital role in health care delivery system. She is the one who works in the immediate environment with the patients; hence she has the opportunity to identify the needs and problems of the patients.
2. She can provide the necessary supportive care to the patients , especially in the post operative ward who are immobilized in the immediate post operative period undergone major abdominal surgeries.
3. Today more emphasis is given on patient participation in health care for early recovery and prevention of post operative complications. In order to prevent post operative complication early mobilization of patients in the post operative

period by doing active and passive exercises and turning and positioning of patients.

4. Prophylactic measures are modalities that are non-invasive, readily learned cost effective and can provide a non-pharmacological intervention for reduction of risk of developing deep vein thrombosis. So nurses should educate the clients and their care givers about the benefits of prophylactic measures.
5. Prophylactic measures offers a significant potential for benefitting quality of life, the nurses must know to apply it with proper understanding of the adaptations needed to accommodate the needs and vulnerabilities of post operative patients.

Implications for nursing education

1. Students are intellectually familiar with diseases, surgeries, and post operative complications as deep vein thrombosis but do not receive structured clinical experience with such situations. So as a nurse educator we must enhance the nursing students to acquire knowledge as well as hands on training to reduce and prevent deep vein thrombosis.
2. The nursing curriculum is concerned with the preparation of the future nurses. The present study would help the nurses to understand the probability level of deep vein thrombosis among post operative patients those who are at risk.
3. The study will enable the students to compare prophylactic measures with other non-pharmacological therapies for preventing the probability level of developing of deep vein thrombosis.

4. The procedure which is already present in the nursing foundation can be improved by giving more practical sessions and training the students specially to care of post operative patients those who are prone to develop deep vein thrombosis.

Implications for nursing administration

1. These findings will help the nurse administrators to encourage the nurses to use prophylactic measures for preventing the probability level of deep vein thrombosis among post operative patients.. These findings will be very helpful to the administrators for organizing continuing education programmes for nurses regarding non pharmacological therapies like prophylactic measures.
2. Video assisted teaching programmes can be arranged to motivate the patients care givers, to reduce the risk of developing deep vein thrombosis.

Implications for nursing research

1. Future studies could test varying length of intervention for optimal effect**.**
2. Research can be done regarding the effectiveness of other techniques of prophylactic measures.
3. Similar studies can be done by comparing the prophylactic measures with other non pharmacological therapies.
4. Clinical nurses can conduct further studies prophylactic measures on prevention of deep vein thrombosis like other medical conditions.
5. Study can be done in different settings.

5.5 Recommendations

Based on the findings of the present study recommendations are offered for further research:

1. A similar study can be conducted on a larger sample for wider generalization
2. A similar study can be conducted with true experimental pre test and post test design
3. A similar study can be conducted on patients undergoing orthopedic surgeries and observe the development of DVT.
4. A comparative study with different groups of patients can be conducted.
5. A similar study with video assisted teaching on prevention of DVT can be conducted.
6. A study can be conducted using other techniques breathing exercises, foot elevation.
7. Study can be conducted in a different setting such as orthopaedic, neuro care centre, cardio-thoracic units and home.
8. This non-pharmacological intervention warrants further nursing researches especially in vulnerable populations (such as antenatal and elderly), for whom invasive therapies are problematic.

APPENDICES

APPENDIX – I

From

V.Balasaraswathy,
II year M.Sc (N),
College of Nursing,
Madurai Medical College,
Madurai-20

To

Head Of the Department,
Department of surgery,
Govt.Rajaji Hospital,
Madurai Medical College,
Madurai.

Through: the proper channel

Respected sir,

Sub: Requesting permission to conduct a Dissertation study – regarding.

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.

I have selected a study topic " effectiveness of Prophylactic measures on deep vein thrombosis among post operative patients at GRH Hospitals, Madurai. For my dissertation, I would like to select patients from the post operative ward.

So, kindly I request you to consider my request and allow me to conduct the study in your esteemed institution.

Thanking you.

Date 31.01.2017
Madurai.

Yours sincerely,
V Balasaraswathy

Permitted
31.1.17
PROFESSOR AND HEAD
DEPARTMENT OF GENERAL SURGERY
MADURAI MEDICAL COLLEGE /
GOVT. RAJAJI HOSPITAL
MADURAI

APPENDIX – II

MADURAI MEDICAL COLLEGE
MADURAI, TAMILNADU, INDIA -625 020
(Affiliated to The Tamilnadu Dr.MGR Medical University,
Chennai, Tamil Nadu)

Prof Dr V Nagaraajan MD MNAMS
DM (Neuro) DSc.,(Neurosciences)
DSc (Hons)
Professor Emeritus in Neurosciences,
Tamil Nadu Govt Dr MGR Medical University
Chairman, IEC

Dr.M.Shanthi, MD.,
Member Secretary,
Professor of Pharmacology,
Madurai Medical College, Madurai.

Members

1. Dr.K.Meenakshisundaram, MD (Physiology)Vice Principal, Madurai Medical College

2. Dr.Sheela Mallika rani, M.D., Anaesthesia , Medical Superintendent Govt. Rajaji Hosptial, Maudrai

3.Dr.V.T.Premkumar,MD(General Medicine) Professor & HOD of Medicine, Madurai Medical & Govt. Rajaji Hospital, College, Madurai.

4.Dr.D.Maruthupandian, MS., Professor & H.O.D. Surgery, Madurai Medical College & Govt. Rajaji Hosptial, Madurai.

5.Dr.G.Meenakumari, MD., Professor of Pathology, Madurai Medical College, Madurai

6.Mrs.Mercy Immaculate Rubalatha, M.A., B.Ed., Social worker, Gandhi Nagar, Madurai

7.Thiru.Pala.Ramasamy, B.A.,B.L., Advocate, Palam Station Road, Sellur.

8.Thiru.P.K.M.Chelliah, B.A., Businessman,21, Jawahar Street, Gandhi Nagar, Madurai.

ETHICS COMMITTEE CERTIFICATE

Name of the Candidate	:	V.Balasaraswathy
Course	:	M.Sc., Nursing (Medical and Surgical Nursing)
Period of Study	:	2015 - 2017
College	:	MADURAI MEDICAL COLLEGE
Research Topic	:	Effectiveness of Prophylactic measures on deep vein thrombosis among post operative patients at Govt. Rajaji Hospital, Madurai.
Ethical Committee as on	:	08.02.2017

The Ethics Committee, Madurai Medical College has decided to inform that your Research proposal is accepted.

Member Secretary Chairman Dean / Convenor

Prof Dr V Nagaraajan
M.D., MNAMS, D.M., Dsc.,(Neuro), Dsc (Hon)
CHAIRMAN
IEC - Madurai Medical College
Madurai

DEAN
Madurai Medical College
Madurai-20

APPENDIX – III

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool

SECTION A- Demographic Data

SECTION B- Modified Well's Criteria for Deep Vein Thrombosis.

Prepared for data collection by Mrs.V.Balasaraswathy, II year M.sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis entitled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVT RAJAJI HOSPITAL,MADURAI."** has been validated by me.

13.4.17

SIGNATURE OF THE EXPERT

NAME: **Prof. D. MARUTHUPANDIAN, M.S.,FICS.,FAIS.,**

DESIGNATION: **Professor of General Surgery, Chief Civil Surgeon, Madurai Medical College, Govt. Rajaji Hospital, Madurai-625 020, Reg. No: 40513**

ADDRESS

DATE:

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool

SECTION A- Demographic Data

SECTION B- Modified Well's Criteria for Deep Vein Thrombosis.

Prepared for data collection by Mrs.V.Balasaraswathy, II year M.sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis entitled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVT RAJAJI HOSPITAL,MADURAI."** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: Dr. S. CHANDRAKALA.

DESIGNATION: Principal.

ADDRESS Principal
Velammal College of Nursing
Madurai-625 009

DATE:

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool

SECTION A- Demographic Data

SECTION B- Modified Wells Criteria for Deep Vein Thrombosis.

Prepared for data collection by Mrs.V.Balasaraswathy, II year M.sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis entitled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVT RAJAJI HOSPITAL,MADURAI."** has been validated by me.

SIGNATURE OF THE EXPERT

NAME:

DESIGNATION: ANDAL P
Professor

ADDRESS Sacred Heart Nursing College
Madurai - 20

DATE: 4.3.17

SACRED HEART NURSING COLLEGE
THASILDAR NAGAR
MADURAI-20.
4/285, COLLEGE ROAD

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool

SECTION A- Demographic Data

SECTION B- Modified Wells Criteria for Deep Vein Thrombosis.

Prepared for data collection by Mrs.V.Balasaraswathy, II year M.sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis entitled **"A STUDY TO EVALUATE THE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVT RAJAJI HOSPITAL,MADURAI."** has been validated by me.

SIGNATURE OF THE EXPERT

NAME: N. SAKTHI BHARATHI

DESIGNATION: Assoc Professor

ADDRESS SACRED HEART NURSING COLLEGE MADURAI

DATE: 6/3/17

APPENDIX - IV

CONSENT FORM

ஒப்புதல் அறிக்கை

பெயர் தேதி

எனக்கு இந்த ஆய்வைப் பற்றிய முழு விவரம் விளக்கமாக எடுத்துரைக்கப்பட்டது. இந்த ஆய்வில் பங்கு பெறுவதில் உள்ள நன்மைகள் மற்றும் தீமைகள் பற்றி நான் புரிந்துகொண்டேன். நான் இந்த ஆய்வில் தானாகவே முன் வந்து பங்கு பெறுகிறேன். மேலும் எனக்கு இந்த ஆய்வில் இருந்து எந்த நேரமும் விலகிக் கொள்ள முழு அனுமதி வழங்கப்பட்டுள்ளது. என்னுடைய சிகிச்சை ஆவணங்களைப் பார்வையிட்டு அதில் உள்ள விவரங்களை ஆய்வில் பயன்படுதிக் கொள்ள அனுமதி அளிக்கிறேன். என்னுடைய பெயர் மற்றும் அடையளங்கள் ரகசியமாக வைத்துக் கொள்ளப்படும் என்றும் எனக்கு உறுதியளிக்கப்பட்டுள்ளது.

கையொப்பம்

APPENDIX - V

Part I
A. Socio Demographic Data

1. Age

a) Less than 40yrs ☐
b) 41-50yrs
c) 51-60yrs
d) 61-70yrs
e) More than 70yrs

2. Gender

a) Male ☐
b) Female

3. Religion

a) Hindu ☐
b) Christian
c) Muslim
d) Others

4. Mother Tongue

a) Tamil ☐
b) Malayalam
c) Telugu
d) Others

5. Educational qualification

a) Non formal education ☐
b) Primary education
c) SSLC
d) HSC
e) Graduate

6. Occupation

a) Un employee ☐
b) Self employee
c) Daily wages
d) Govt. employee

7. Family Monthly Income

a) < Rs.1000 ☐

b) Rs.1001-3000

c) Rs.3001-6000

d) > Rs.6000

8. Marital status

a) Un married ☐

b) Married

c) Widow/widower

d) Divorce

9. Dietary pattern

a) Vegetarian ☐

b) Non-vegetarian

10. Habits

a) Smoking ☐

b) Alcoholism

c) Tobacco using

d) Smoking & Alcoholism

e) None

B. CLINICAL VARIABLE

1. Waist to hip ratio

a) 0.95 or below (male)/ 0.80 or below (female) ☐

b) 0.96-1.0/ 0.81-0.85

c) More than 1/ more than 0.85

2. Nature of surgery ☐

a) Elective surgery

b) Emergency surgery

3. Type of anesthesia

a) General anesthesia ☐

b) Spinal anesthesia

4. Duration of surgery

a) 2 to 3 hours ☐

b) 3 to 4 hours

c) 4 to 5 hours

d) 5 or more hours

5. Malignancy

a) Yes ☐

b) No

6. Mobility

a) Completely limited ☐

b) Very limited

c) Slightly limited

d) Not limited

7. Co-morbid conditions

a) Varicose vein ☐

b) Diabetes mellitus

c) Hypertension

d) Heart disease

e) None of the above

8. Previous documented DVT

a) Yes ☐

b) No

9. Family history of deep vein thrombosis

a) Yes ☐

b) No

10. Intra /Postoperative Blood transfusion

a) Yes ☐

b) No

11. Central venous catheter in situ

a) Yes

b) No ☐

12. Swollen leg

a) Present ☐

b) Absent

Part II

Modified Caprini Risk Assessment Tool for Deep Vein Thrombosis

Score 1	Score 2	Score 3	Score 5
❑ Age 41 to 60 years ❑ Minor surgery ❑ Obesity (BMI >30 kg/$m^{2)}$ ❑ Swollen legs ❑ Varicose veins ❑ History of prior major surgery ❑ History of inflammatory bowel disease	❑ Age 61 to 70 years ❑ Major open surgery (1 -2 hours) ❑ Laparoscopic surgery (> 60 minutes) ❑ Morbid obesity(BMI > 40) ❑ Previous Malignancy ❑ Confined to bed (>72 hours) ❑ Central venous access	❑ Age over years 70 ❑ Major surgery lasting 2-3 hours ❑ BMI >50 ❑ History of SVT , DVT/ PE ❑ Family history of DVT/PE ❑ Present cancer or chemotherapy	❑ Stroke (<1 month) ❑ Major surgery lasting over 3 hours

Interpretation

SURGERY RISK CATEGORY	SCORE
LOW RISK	**1 – 2**
MODERATE RISK	**3 - 4**
HIGH RISK	**5 and more**

Part III

Modified Well's Criteria For Deep Vein Thrombosis

S.NO	CLINICAL MANIFESTATION OF DEEP VEIN THROMBOSIS	PRESENT 1	NOT PRESENT 0
1	Pain in the calf muscle		
2	Localized Tenderness along the line of femoral or popliteal veins		
3	Entire leg is swollen		
4	Calf circumference more than 3cm compared with the asymptomatic leg (measured 10 cm below the tibial tuberosity).		
5	Pitting edema (2mm or more) confined to the symptomatic leg.		
6.	Warm skin in the affected distal of proximal leg		
7	Skin discoloration (erythema or cyanosed)		
8	Systemic temperature more than 100.4 ^{o} F		
9	Absence of dorsalis pedis pulse		
10	Dilated superficial veins		

SCORING PROCEDURE

Total items - 10

If symptoms present , score is + 1

If symptoms not present , score is 0

Total score is 10

INTERPRETATION OF CLINICAL PROBABILITY OF DVT

No probability	-	0
Very low probability	-	1-2
Low probability	-	3-4
Moderate probability	-	5 -6
High probability	-	7-8
Very high probability	-	9-10

APPENDIX - VI

தன்னிலை விபரக்குறிப்பு

பிரிவு – அ

1. வயது

    அ. 40 வயது வரை

    ஆ. 41 – 50

    இ. 51 – 60

    ஈ. 61 – 70

    உ. 70 வயதுக்கு மேல்

2. பாலினம்

    அ. ஆண்

    ஆ. பெண்

3. மதம்

    அ. இந்து

    ஆ. கிறிஸ்தவர்

    இ. முஸ்லீம்

    ஈ. பிறமதம்

4. தாய்மொழி

    அ. தமிழ்

    ஆ. மலையாளம்

    இ. தெலுங்கு

    ஈ. பிறமொழி

5. கல்வித்தகுதி

    அ. படிக்காதவர்

    ஆ. ஆரம்பக்கல்வி

    இ. நடுநிலைக்கல்வி

    ஈ. உயர்நிலைக்கல்வி

    உ. பட்டப்படிப்பு

6. பணி விபரம்

அ. வேலையின்மை

ஆ. சுயவேலை

இ. தினக்கூலி

ஈ. அரசு வேலை

7. குடும்ப வருமானம்

அ. ரூ.1000 வரை

ஆ. ரூ.1001 முதல் ரூ.3000 வரை

இ. ரூ.3001 முதல் ரூ.6000 வரை

ஈ. ரூ.6000க்கும் மேல்

.8திருமண விபரம்

அ. திருமணம் ஆகாதவர்

ஆ. திருமணம் ஆனவர்

இ. கணவர் / மனைவியால் கைவிடப்பட்டவர்

ஈ. விதவை

9. உணவு முறை

அ. சைவ உணவு முறை

ஆ. அசைவ உணவு முறை

10. பழக்கம்

அ. புகைபிடித்தல்

ஆ. மது அருந்துதல்

இ. புகையிலை பழக்கம்

ஈ. புகைப்பிடித்தல் மற்றும் மது அருந்துதல்

உ. ஒன்றும் இல்லை

ஆ). மருத்துவ மாறிகள்

1. இடுப்பு இடுப்பு விகிதம்

அ) 0.95 (அ) அதற்கு கீழ் (ஆண்) / 0.80 (அ) அதற்கு கீழ் (பெண்)

ஆ) 0.96 – 1.0 (ஆண்) / 0.81 – 0.85 (பெண்)

இ) 1 க்கு மேல் (ஆண்) / 0.85 க்கு மேல் (பெண்)

2. அறுவை சிகிச்சையின் தன்மை

அ) தேர்வு அறுவை சிகிச்சை

ஆ) அவசர அறுவை சிகிச்சை

3) மயக்க மருந்தின் வகைப்பாடு

அ) பொது மயக்க மருந்து

ஆ) முதுகெலும்பு மயக்க மருந்து

4) அறுவை சிகிச்சையின் கால அளவு

அ) 2 மணி நேரம் முதல் 3 மணி நேரம் வரை

ஆ) 3.01 மணி நேரம் முதல் 4 மணி நேரம் வரை

இ) 4.01 மணி நேரம் முதல் 5 மணி நேரம் வரை

ஈ) 5 மணி நேரத்திற்கும் மேல்

5) புற்றுநோய் தாக்கம்

அ) ஆம்

ஆ) இல்லை

6) நோயாளியின் இயக்க நிலை

அ) முற்றிலும் குறைவாக

ஆ) மிகவும் குறைவாக

இ) சற்று குறைவாக

ஈ) சீரான இயக்க நிலை

7) இணை நோய்கள்

அ) சுருள் சிரை நரம்பு நோய்

ஆ) நீரிழிவு நோய்

இ) இருதய நோய்

ஈ) ஒன்றும் இல்லை

8) முந்தைய ஆவணப்படுத்தப்பட்ட இரத்த குழாய் உறைவு

அ) ஆம்

ஆ) இல்லை

9) பரம்பரை இரத்த குழாய் உறைவு

அ) ஆம்

ஆ) இல்லை

10) உடலில் மத்திய இரத்த வடிகுழாய் உள்ளதா?

அ) ஆம்

ஆ) இல்லை

11) அறுவை சிகிச்சையின் போது இரத்தம் செலுத்துதல்

அ) ஆம்

ஆ) இல்லை

12) கால் வீக்கம்

அ) ஆம்

ஆ) இல்லை

APPENDIX – VII

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to Certify that the dissertation by V.Balasaraswathy II Year M.Sc (N) Student, College of Nursing, Madurai Medical College, Madurai, who has undertaken by study field on Dissertation "A STUDY TO EVALUATE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI". has been edited for English language appropriateness.

SIGNATURE

NAME S. BAGRUDEEN, MA.,BSc.,M.Ed.,

DESIGNATION P/T. Professor of English (I-Year BSc Nursing) Madurai Medical College Madurai - 625020.

INSTITUTION

APPENDIX – VIII

CERTIFICATE OF TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to Certify that the dissertation by V.Balasaraswathy II Year M.Sc (N) Student, College of Nursing, Madurai Medical College, Madurai, who has undertaken by study field on Dissertation "A STUDY TO EVALUATE EFFECTIVENESS OF PROPHYLACTIC MEASURES ON DEEP VEIN THROMBOSIS AMONG POST OPERATIVE PATIENTS AT GOVERNMENT RAJAJI HOSPITAL, MADURAI". has been edited for Tamil language appropriateness.

Name : வி.ரா. கனகவல்லி.

Designation : P. G. Asst.

Date : 12/3/17.

Signature 12/3/17.

R. KANAGAVALLI M.A.M.Phil.,M.Ed (தமிழ்)

P.G. ASST.

GOVT H.R.SEC.SCHOOL

AUNDIPATTI.

THENI. (DT).

AUNDIPATTI.

APPENDIX – IX

Procedure

Prophylactic Measures of Deep Vein Thrombosis

Introduction

In this study Prophylactic measures refers to early mobilization which includes 2nd hourly position changing and leg exercises i.e dorsiflexion (15-20^{o}) and plantar flexion(45-55^{o}), inversion(15-20^{o}) and eversion(20-30^{o}) of the foot and rotation of ankles .

The initiation of mobility by moving out of bed when the patient is unable or minimally able to participate , presents with hemodynamic stability and the patient receives acceptable levels of oxygen

Passive exercise motion imparted to a segment of the body by another individual, machine or outside force or produced by voluntary effort of another segment of the patient's own body.

Purpose

- To stimulate calf muscles to contract and improves venous circulation
- To reduce venous stasis , hypercoagulability of the blood vessel
- To prevent the clotting formation and swelling in the legs
- To stimulate blood circulation

General Guidelines

Passive exercises

- Passive exercises can be done to the point of slight resistance
- It can not be done beyond the capacity of the individual, that is to the point of discomfort.
- Move the body part smoothly, slowly and rhythmically.

Positioning

- Maintain good body mechanics

- ❖ Obtain assistance as required
- ❖ Ensure that mattress is firm and level of bed is at working height
- ❖ Ensure that sheets are clean and dry
- ❖ Avoid placing a body part directly over another to prevent pressure
- ❖ Plan a regular position change schedule for the patient for 24 hrs
- ❖ Ensure patient comfort

Mechanism

Leg exercises

Leg exercises stimulates calf muscle contraction ⟶ increases the pressure outside of the veins ⟶ increases ejection ability of the vein valves ⟶ propels blood back to the heart (calf muscle pump) ⟶ thereby reducing the hydrostatic pressure gradient that is partially responsible for edema formation ⟶ This would tend to reduce venous stasis .

Positioning

Changing of positioning reduces the hydrostatic pressure and improves blood circulation

Articles

- ❖ Bed boards
- ❖ Pillows
- ❖ Foot boards/foot boot
- ❖ Sand bags
- ❖ Hand rolls
- ❖ Trochanter rolls
- ❖ Bed blocks
- ❖ Over bed table
- ❖ Additional sheets
- ❖ Trapeze bar
- ❖ Gloves
- ❖ Mask

Procedure

Nursing action	Rationale
Leg exercises ❖ Explain to the patient for purpose of doing exercises	❖ Ensure cooperation of patient.
❖ Cover the patient with a bath blanket /sheet and assist in assuming a supine position.	❖ Ensure comfort of the patient.
❖ Provide privacy and wash hands.	❖ Reduces patient anxiety and reduces risk of transfer of microorganisms.
❖ Expose only the area that is being exercised.	❖ Reduces embarrassment of patient.
❖ Position the bed to an appropriate height.	❖ Ensures proper body mechanics.
❖ Start providing passive exercises	❖ Improves blood circulation by increasing venous outflow
Ankle and foot exercises -10-15 minutes each leg three times a day. ➢ Dorsiflexion -15-20^{o} ➢ Plantar flexion-45-55^{o} ➢ Inversion -15-20^{o} ➢ Eversion -20-30^{o} ➢ Rotation of the ankle	
Changing of positioning ➢ From supine to side lying every 2 hours ➢ From supine to semi fowler's position -three times a day ❖ Wash hands ❖ Record procedure ❖ Position the patient in a comfortable position	Reduces the hydrostatic pressure and maintains dorsiflexion and improves blood circulation

After Effect

Rhythmic acceleration of venous flow velocity due to muscle pump function, thus preventing venous stasis and clotting formation. exercise suppresses shear-induced platelet activation and subsequent polymorphonuclear leukocyte adhesion to platelets deposited at sites of vascular injury under flow, thus reducing the risk of vascular thrombosis and inflammation. The reduction of platelet and leukocyte functions and the promotion of endothelial fibrinolytic activity reduce the risk of vascular thrombosis.

APPENDIX – X

PHOTOGRAPH