EFFECTIVENESS OF FOOT MASSAGE ON REDUCTION OF PHYSIOLOGICAL LOWER LEG OEDEMA AMONG PRIMIGRAVIDA MOTHERS DURING THIRD TRIMESTER IN ELAYIRAMPANNAI PRIMARY HEALTH CENTRE AT VIRUDHUNAGAR DISTRICT.

DISSERTATION SUBMITTED TO

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

CHENNAI

IN PARTIAL FULFILMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

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BY

MISS. G.RAJESWARI

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SRI.K.RAMACHANDRAN NAIDU COLLEGE OF NURSING

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ABSTRACT

A study to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during third trimester in Elayirampannai primary health centre at Virudhunagar district was conducted by **Miss. G. Rajeswari** in partial fulfillment of the requirement for the degree of Master of Science in Nursing at Sri K.Ramachandran Naidu College of Nursing under The Tamilnadu Dr.M.G.R.Medical University, Chennai in 2012.

Gestational oedema occurs in late pregnancy secondary to increased venous congestion in the legs caused by pressure exerted mechanically by the uterus into the inferior vena cava and iliac veins. Reduced plasma colloid oncotic pressure and obstruction of lymphatic flow may impair the reabsorption of fluid into the intravascular compartments. Foot massage has been found to decrease the level of physiological lower leg oedema. Foot massage means manipulation of superficial and deeper layers of muscle and connective tissues of the limbs by using six techniques includes massaging top and bottom of the feet, ankle rotation, toe massage, toe pull, toe squeeze and foot arch massage over 20 minutes. Foot massaging stimulates lymphatic circulation and decreases swelling. Massaging the feet from toes to calf, exercising gentle pressure with the fingertips may helps to shift water out of the tissue.

The objectives of the study were,

- To assess the pre test level of physiological lower leg oedema among primigravida mothers.
- To find out the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers.

- To associate the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

The hypotheses set for the study were,

H_1 : Mean post test level of physiological lower leg oedema was significantly lower than the mean pretest level of physiological lower leg oedema among primigravida mothers.

H_2 : There was a significant association in the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

All hypotheses were tested at 0.05 level.

The study was based on Modified king's goal attainment model. The quantitative approach was used. The study was conducted in Elayirampannai primary health centre at Virudhunagar district. The design adopted for the study was pre experimental with one group pre & post test design to evaluate the effect of foot massage on reduction of physiological lower leg oedema. Purposive sampling technique was used to select 60 primigravida mothers.

The data collection tools developed for generating the necessary data were, Interview to collect demographic data of the samples which consists of age, educational status, occupation, type of family, family income, religion and area of living and Erin oedema scale was used to assess the level of physiological lower leg oedema.

Investigator has used six techniques of foot massage by reviewing literature and obtaining expert's opinion. Foot massage techniques includes massaging top & bottom of the foot, ankle rotation, toe massage, toe pull, toe squeeze and foot arch massage and consists of twenty (20) minutes duration once in a day for seven days.

The content validity of the tool was established by two medical experts and four nursing experts. Pilot study was conducted to find out the feasibility of the study and to plan for data analysis.

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

The major findings of the study were

- The mean post test level of physiological lower leg oedema was significantly lower than the mean pretest level of physiological lower leg oedema among primigravida mothers $p < 0.05$ level ($t = 7.51$).
- There was no significant association between the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

On the basis of the findings of the study it is recommended that,

1. A comparative study can be conducted to assess the effectiveness of continuous rotary seat pan movement and foot massage on reduction of physiological lower leg oedema among antenatal mothers.
2. A comparative study can be conducted to assess the effectiveness of water aerobics and foot massage on reduction of physiological lower leg oedema among antenatal mothers.
3. A true experimental study also can be conducted to assess the effectiveness of foot massage for reducing the level of physiological lower leg oedema among antenatal mothers.
4. A similar study can also be conducted for the leg oedema of elderly patients.
5. A study can be conducted to assess the effectiveness of water aerobic exercise on reduction of physiological lower leg oedema among antenatal mothers.

6. A further study can be conducted to assess the knowledge, attitude and practice of complementary and alternative therapies on reduction of physiological lower leg oedema among nursing personnel.

Recommendation based on the suggestions of the study subjects,

1. Nurses should have good knowledge regarding the alternative system of medicine.
2. Mothers should have knowledge regarding the available alternative therapies in reducing the level of physiological lower leg oedema.

Conclusion

From this study it was evident that foot massage was effective on reduction of physiological lower leg oedema among primigravida mothers.

CHAPTER I

INTRODUCTION

"A Nurse needs to specialize in several things

But being an expert in massage is a must".

- Hippocrates

BACKGROUND OF THE STUDY

"A mother's joy begins when new life is stirring inside... when a tiny heartbeat is heard for the very first time and a playful kick reminds her that she is never alone" **(Wang MJ, 2010).**

Pregnancy is the Process of human gestation that takes place in the female's body as a fetus develops from fertilization to birth. Pregnancy is the time of greatest change in women's life and it affects every part of the body from hair to toenails **(Dawn C.S, 2003).**

During pregnancy the mother may be affected by the physical growth of the baby and changes in the hormone levels. Pregnancy is associated with the normal physiological changes that assist fetal survival as well as preparation for labour **(Kimberley A Dawson, 2008)**.

Symptoms of early pregnancy include the absence of menstrual periods, breast changes, tiredness, nausea, mood swings or other symptoms. Symptoms of late pregnancy can include heartburn, difficulty in sleeping, swelling of ankles or fingers, haemorrhoids and mild contractions (**Meissa Conrad, 2004)**.

Many women may develop mild swelling in the face, hands or ankles at some points in their pregnancies. Physiological lower leg oedema is most often an issue

during third trimester particularly at the end of the day. The ankles and feet of pregnant women will be swollen due to increased vascularity and fluid retention due to hormone changes. Women experience oedema more around their ankles, ball of the foot and the dorsal end of the foot **(En espanol, 2008).**

Physiological lower leg oedema is one of the cutaneous manifestations of pregnancy. The incidence of dependent oedema in normal healthy pregnant women is reported to be 50 to 80 % in the third trimester (last 12 weeks) and believes that maternal age, parity and height will not have any effect on the incidence of oedema **(Haney Louise, 2000).**

The weight gain during pregnancy and gravity slows down the circulation of blood and body fluids particularly in the lower limbs. As a result, the pregnant woman retains extra cellular fluid and experiences swelling of the legs, hands and even face. **(Shish N, 2005).**

The extra retention of fluid is needed to soften the body and development of the baby. As a result, women may gain weight during pregnancy. Increased circulating angiotensin II encourages water and sodium retention leading to an increased plasma volume (50% by 30 weeks of pregnancy) and predisposing to oedema **(Glinoer D, 2005)**.

Gestational oedema occurs in late pregnancy secondary to increased venous congestion in the legs caused by pressure exerted mechanically by the uterus into the inferior vena cava and iliac veins. Reduced plasma colloid oncotic pressure and obstruction of lymphatic flow impairs the reabsorption of fluid into intravascular compartments **(Dianne Reynold, 2003).**

Swelling may be experienced at any point during pregnancy but it tends to be noticed around the fifth month and can increase in the third trimester. The causes of physiological lower leg oedeme were Standing for long periods of time, Long days of activity, Diet low in potassium, High level of caffeine consumption, High level of sodium intake and Anaemia **(Pakshin, 2008)**.

Oedema is also a common sign of many pathological conditions such as cardiovascular, renal, haematological and nutritional disorders among others. In the absence of these disorders, pregnancy induced oedema is associated with favourable pregnancy outcomes and is functionally regarded as normal. It states as normal or abnormal according to the personal and community perceptions of the condition **(schmutz J.L, 2003)**.

Systemic diseases such as malnutrition, renal or hepatic disease, preeclampsia, diabetes or congestive heart failure may leads to leg swelling. Labial oedema can result from local trauma & infection (genital herpes or other sexually transmitted infections).

Severe or sudden swelling particularly in the hands, face or around the eyes may be the signs of a serious condition called preeclampsia (also called toxaemia) that causes high blood pressure and fluid retention. Women with preeclampsia may experience the symptoms of sudden or severe swelling of the hands and feet, severe headache, blurred vision, dizziness and severe abdominal pain (**Julie A Hayes, 2006).**

Healthy pregnant women presents with severe lower extremity and/or labial oedema, the etiology should be explored by thorough history and physical examination. Physical assessment should evaluate the extent of the oedema. The circumference of the legs should be measured from a defined, predetermined reference point to compare symmetry and course of progression or resolution **(Keturah R. Faurot, 2010).**

Pitting is the term used to describe the indentation level. Indentation will occur when pressure is applied to the skin, forcing fluids into the underlying tissue. It occurs when there is an increased amount of low protein fluid in the interstitial space and is associated with disorders caused by high capillary filtration (DVT, chronic venous insufficiency or venous obstruction) or hypoalbuminaemia. Pitting is a subjective assessment using the grading scale of +1 for mild and upto +4 for deep pitting **(Midwifery women's health, 2006)**.

There is no medical intervention for reducing the level of physiological lower leg oedema. Many of them may feel that, this is abnormal. It may leads to fear, anxiety and depression about the normal delivery and baby wellbeing **(American pregnancy association, 2007)**.

The number of physical and pharmacological measures have been tried to relieve physiological lower leg oedema during pregnancy but none has been consistently found to confer benefits and some are potentially harmful. Leg swelling can be reduced by intermittently lying on the side which moves the uterus off the inferior vena cava by intermittently elevating the lower extremities and by wearing elastic compression stockings **(Geetha K Swamy, 2009).**

Swelling may be reduced by eating foods that are enriched in potassium such as banana, avoiding caffeine and standing for long periods, taking rest with the elevated feet, wearing comfortable shoes, avoiding high heels, using cold compress, minimizing sodium (salt) intake and avoiding tight clothes, swimming in a pool and adding additional salt to meals **(Mayo clinic guide to a healthy pregnancy, 2007)**.

Use the soles of bare feet to roll a rubber ball or tennis ball in circular movements. This will encourage the circulation and strengthen the muscles **(Van Deursen D.L, 2010)**.

Gravity plays a big role in swelling. For that elevate the feet at least three to four times a day. Prop the feet up on pillows when lying on a sofa or in bed and place the feet on a foot stool when sitting in a chair. It may helps to decrease the level of physiological lower leg oedema **(Davinson, 1997)**.

The lymphatic reflexology technique can be used for specific conditions such as leg, foot and generalized oedema as it moves extra vascular fluid without disturbing intravascular fluid. The lymphatic reflexology technique helps in the lymphatic drainage action of the body ie) interstitial fluid moves from the lymphatic capillaries to the lymphatic veins, trunks and returns into the circulatory system at the subclavian vein **(Brown M, 1998)**.

The foot massage originated from china and it dates back to more than three thousand years ago. In ancient period Egypt people used foot massage for the prevention and treatment of various different health ailments **(Gallery, 2005)**.

The meridian network is responsible for the connection of all organs, tissues and cells in the intermediary. A trained person can determine the cause of any illness by applying pressure on meridians, sides of the feet or energy lines on the sole of the foot. Foot massage is also referred to as foot reflexology **(Tae Oksha, 2009)**.

According to Chinese medicine, the sensory nerves of the internal organs that spread throughout the body are mainly gathered around the soles of the feet. Therefore the massage is effective in stimulating the functions of the internal

organs. Another advantage of this therapy is that there is no risk in doing foot massage **(Thaiway magazine, 2002).**

Foot massage includes various techniques such as effleurage, stroking, tapping and kneading. The goal of massage is to stimulate the blood circulation, relax the body muscles or relieve pain. Use the stroking technique for relaxation and effleurage to boost blood circulation. Kneading reduces the pain and stiffness in the joints. Aromatherapy (oils and lotions) will be very useful to obtain the additional benefits from foot massage (**Hand and foot massage, 2001).**

Foot massage is very similar to acupuncture because the different foot areas correspond with some part of the body. Massaging certain part of the foot can positively affect the stomach, colon, liver, kidney or some other organs. Foot massage can be of great help in getting rid of toxic substances in the body, improving the circulation, bodily functions and even memory **(Health benefits of foot massage, 2010)**.

Foot massage is a specific form of massaging and it was found to cause a significant reduction in anxiety and depression with significant increases in the quality of life. Foot massage has physical and psychological benefits for the whole person. By massaging, the researcher can assess the feet, stimulate circulation, decrease oedema and provide a local form of passive exercise. And also the subjects may receive attention and touch. These are vital elements of care that promote comfort and well being **(Priya pannula, 2008)**.

Foot massage has been found to decrease the level of physiological lower leg oedema. Foot massage means manipulation of superficial and deeper layers of

muscle and connective tissues of the limbs by using six techniques. It includes massaging top and bottom of the feet, ankle rotation, toe massage, toe pull, toe squeeze and foot arch massage over 20 minutes **(Wang HL, 2004)**.

NEED FOR THE STUDY

The overall prevalence rate of physiological lower leg oedema during pregnancy is 8.5%. The appearance of physiological lower leg oedema may start at twenty four (24) weeks of pregnancy and 100% of cases disappeared within a week of delivery. Anaemia, malnutrition, excessive body water, kidney diseases, liver diseases, hypertension and preeclampsia was the presumed causes of pathological lower leg oedema during pregnancy **(Nkwo o Peter, 2011)**.

The swelling or oedema is a very common discomfort of pregnancy. It is estimated that about 75% of women will experience this excessive accumulation of fluid around the legs and ankles at some point during pregnancy. Most of the women reported that swelling subsides during night time or several hours of lying down **(Robin Elise Weiss, 2011)**.

Oedema or swelling on the top of the feet and around the ankle is caused by accumulation of fluid in the fatty tissue under the skin. The oedema forms an impression after the application of pressure with fingertips and it may persists for certain period of time **(Sighes, 2007)**.

Kidney disease as well as bacterial toxins, leaky capillary walls and hormonal changes can also result in excessive water retention. Obesity, over exertion, too much salt in the diet and inappropriate footwear are other causes of oedema. Serious disorders, food allergies should be ruled out before choosing from a number of natural

remedies. Among them reflexology, a foot massage technique has been found successful in the treatment of oedema **(Bobbi Jo Houser, 2010)**.

For quick relief, raise your feet higher than the heart for the period of twenty (20) minutes or more every few hours throughout the day and also by sleeping with elevated feet. By immersing the feet alternatively in hot and cold water the pregnant women can improve the blood circulation and reduce the level of physiological lower leg oedema **(Edzard Emst, 2009).**

The mother during second trimester may start developing feet and ankle oedema. Physiological lower leg Oedema is the medical term for swelling and primarily occurs in the lower extremities during pregnancy but sometimes in the fingers and hands as well. Body produces upto fifty percent (50%) of more blood during pregnancy. There is also increased pressure on veins. As the uterus grows bigger it puts pressure on the inferior vena cava which may pump the blood back to the heart from lower extremities. This extra fluid can lead to swelling in the lower extremities **(Wynn, 2011).**

Total body water is increased during pregnancy. Atleast 25% of the fluid will be distributed to the interstitial space, it may leads to physiological lower leg oedema during pregnancy. Oedema has to be expected in most of the pregnant women and should not be used to diagnose preeclampsia. Atypical oedema localization and local unilateral oedema may leads to complications of pregnancy. Diuretics should be restricted to manage the physiological lower leg oedema of pregnancy.

Even though the fluid related swelling will disappear within a few days of delivering the baby and some women find that their size of feets are as much as larger following a pregnancy that is due to the hormone relaxin **(Herz, 2003).**

Cardiovascular alterations during pregnancy are characterized by an increased vascular volume, cardiac output and heart rate. Cardiac output is about 40-50% higher during the third trimester. Many symptoms and findings during pregnancy are caused by the described changes such as dyspnoea on exertion, presyncope due to pressure on the inferior vena cava resulting in a decreased venous return to the heart, prominent jugular venous pulsation, leg oedema and ejection murmurs over the aorta and pulmonary artery. Paroxysmal nocturnal dyspnoea, angina, syncope, anasarca and diastolic heart murmurs require further evaluation **(Ugeskr laeger, 1996).**

Foot massage is a technique by which both the feet of the subjects are held at various positions, stroked gently and rhythmically to attain a relaxation response. Foot massage can be beneficial as it increases the circulation of blood to flow unimpeded. Foot massage Promotes relaxation, Reduces anxiety and depression, Induces sleep, Decreases the need of medications, Maintains immune system, Decreases diastolic pressure and Releases toxins **(Daisy Galindo, 2007)**.

Foot massage stimulates lymphatic circulation and decreases swelling. Massaging the feet from toes to calf, applying gentle pressure with the fingertips may helps to shift water out of the tissue **(Annunziata, 2009)**.

Thus the researcher is interested in studying the effects of foot massage on reduction of physiological lower leg oedema in primigravida mothers. The results of this study may be applied to reduce physiological lower leg oedema for the primigravida mothers during third trimester.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during third trimester in Elayirampannai primary health centre at Virudhunagar district.

OBJECTIVES

1. To assess the pre test level of physiological lower leg oedema among primigravida mothers.
2. To find out the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers.
3. To associate the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

HYPOTHESES

All hypotheses will be tested at 0.05 level.

H_1 : Mean post test level of physiological lower leg oedema among primigravida mothers will be significantly lower than the mean pretest level of physiological lower leg oedema.

H_2 : There will be a significant association in the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

OPERATIONAL DEFINITIONS

Assess

It refers to systematically and continuously collecting, validating and communicating primigravida mother's data regarding reduction of physiological lower leg oedema by using Erin oedema scale.

Effectiveness

It refers to the reduction of physiological lower leg oedema as a result of foot massage which was measured by Erin oedema scale.

Physiological lower leg oedema

It refers to the accumulation of an excessive amount of watery fluid within the cells, tissues or serous cavities of lower limbs which is caused by compression of inferior vena cava by gravid uterus.

Foot massage

It refers to the method of manipulation of superficial and deeper layers of muscle and connective tissues of the lower limbs by using six techniques which includes massaging top and bottom of the feet, ankle rotation, toe massage, toe pull, toe squeeze and foot arch massage. Six techniques of foot massage will be given over the period of 20 minutes once in a day for seven (7) days.

Primigravida mother

The mother who are pregnant for the first time with more than twenty eight weeks of gestation.

Primary health centre

Primary health centre is the structural and functional unit of the public health services situated in Elayirampannai at Virudhunagar district.

ASSUMPTIONS

- The primigravida mothers may have physiological lower leg oedema during third trimester.
- Physiological lower leg oedema can be reduced by giving foot massage.
- Foot massage may improve blood circulation and relieve stress.

- There will be no side effects in giving foot massage for the primigravida mothers.

DELIMITATIONS

- The study is delimited to the third trimester primigravida mothers.
- The study is delimited to primigravida mothers who visited the Elayirampannai primary health centre during antenatal clinics.
- The study is delimited to the period of four weeks.

PROJECTED OUTCOME

1. The findings of the study will help the nurses to plan and use the complementary therapy in reducing the level of physiological lower leg oedema among primigravida mothers.
2. Administration of foot massage will reduce the level of physiological lower leg oedema and prevent the problems due to physiological lower leg oedema.

CONCEPTUAL FRAME WORK

Conceptual framework can be defined as a set of concepts and assumptions that integrate them into meaningful configurations. The conceptual framework serve as a guide (or) map to systematically identify a logical, precisely defined relationship between variables.

The study is mainly focused to find out the effectiveness of foot massage to reduce the level of physiological lower leg oedema among primigravida mothers during third trimester. In order to reduce the level of physiological lower leg oedema, the investigator administered foot massage.

The investigator adopted the King's Goal Attainment theory (1980) as a base for developing the conceptual framework. Imogene King's Goal attainment theory is based on the personnel and interpersonal systems, including perception, judgement, action, reaction, interaction and transaction.

Perception

Refers to person representation of reality. It is highly subjective and unique to each person. Hence the investigator perception was the primigravida mothers having the complaints of physiological lower leg oedema during third trimester.

Judgement

The investigator judged that foot massage reduces the level of physiological lower leg oedema among primigravida mothers. The investigator has judged the need to reduce the level of physiological lower leg oedema.

Action

The investigator administered foot massage to reduce the level of physiological lower leg oedema. The primigravida mothers are willing to accept foot massage and participate in the study.

Reaction

The investigator and primigravida mothers with physiological lower leg oedema mutually setting goals to reduce the level of physiological lower leg oedema.

Interaction

Refers to verbal and non verbal behavior of individual and the environment or two or more individual with a purpose to achieve goal. It includes the goal directed perception and communication. Here the investigator interacts with the primigravida mothers by giving foot massage to reduce the level of physiological lower leg oedema during third trimester.

Transaction

Refers to an observable, purposeful behavior of individual interaction with their environment to achieve the desired goal. At this stage the investigator analysis the level of physiological lower leg oedema among primigravida mothers in order to administer foot massage. The positive outcome in post test is to reduce the level of physiological lower leg oedema which indicates the effectiveness of foot massage.

CHAPTER II

REVIEW OF LITERATURE

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

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

This study examined the effects of foot massage on reduction of physiological lower leg oedema among primigravida mothers during third trimester. From the collected review of various associated literature and research studies, topics can be divided as follows,

Section A: Literature related to incidence of physiological lower leg oedema.

Section B : Literature related to management of physiological lower leg oedema.

Section C: Literature related to effect of foot massage on reduction of physiological lower leg oedema.

SECTION A: Literature Related to Incidence of Physiological Lower Leg Oedema

Nkwo o Peter (2011) conducted a point prevalence survey to determine the perceptions, prevalence and prognosis of physiological lower leg oedema during pregnancy as well as the treatment seeking behaviour for the condition among Nigerian

women. 1000 pregnant women with the age group of seventeen (17) to fourty five (45) years were selected as a sample. The overall prevalence of physiological lower leg oedema during pregnancy was 8.5. All the women believed that physiological lower leg oedema during pregnancy is abnormal and requires treatment. The study report shows that there was no significant association between the development of physiological lower leg oedema during pregnancy and maternal age, parity, education, occupation or weight ($P > 0.05$).

Jeffrey Boberg et al., (2010) conducted a retrospective study on the occurrence of anatomic and physiologic changes and the variety of symptoms affecting the lower extremity during pregnancy. Hundred (n =100) postpartum women were interviewed regarding the lower extremity changes experienced in pregnancy. The interview included dermatologic, vascular, neurologic, and musculoskeletal portions. Results demonstrated that more than fifty percentage (50 %) of women reported swelling of the foot, ankle and leg, unsteady gait, increased foot width and hip pain.

Edzard Emst (2009) conducted a study to assess the incidence of physiological lower leg oedema during third trimester among antenatal mothers. Fifty (50) antenatal mothers were selected as samples. Demographic data was collected by using interview technique and the level of physiological lower leg oedema was assessed by using Erin oedema scale. The results shown that seventy five percentage (75%) of antenatal mothers had physiological lower leg oedema during their third trimester of pregnancy.

Won JS (2009) conducted a study to assess the factors affecting physiological lower leg oedema. Hundred (100) antenatal mothers were selected. Demographic data was collected by interview technique. The level of oedema was measured by using inch tape. The antenatal mothers experienced physiological lower leg oedema due to pressure over the femoral vein at groin region by the gravid uterus. Prolonged sitting and standing may increase the level of physiological lower leg oedema. Age, parity and food pattern had no effect on the development of physiological lower leg oedema.

Tae oksha (2007) conducted a randomized control trial to identify the incidence of dependent oedema in normal healthy pregnant women. Seventy five (N=75) women were selected and interviewed. 61 % (45) women were primigravida mothers. The study was concluded that 50 - 80% of mothers had physiological lower leg oedema in the third trimester. Maternal age, parity and height have no effect on the incidence of oedema.

Andra Creamer Schreier (2005) conducted a descriptive study to assess the nurse midwifery management of physiological lower leg oedema in pregnancy. Oedema occurs in 35 to 80% of normal pregnancies. Etiological factors are reduced colloid osmotic pressure and water retention in the connective tissue ground substance due to oestrogen hormone. The nurse midwife has recommended positions, exercise and appropriate clothing to diminish the level of physiological lower leg oedema. Diuretics and sodium restricted diets are contraindicated.

Winter (2005) surveyed the prevalence and factors affecting physiological lower leg oedema during pregnancy in Newyork. Oedema occurs in 35 to 80% of normal pregnancies. Increased venous pressure in the lower limb was a factor in physiological lower leg oedema. Obesity, oldage, multiparity, hot weather, anaemia,

prolonged standing or sitting and constrictive garments around the legs were the factors which may increase the level of physiological lower leg oedema during pregnancy.

Dianne Reynolds (2003) conducted a descriptive study to assess the incidence of gestational oedema during third trimester in normal pregnant mothers. Sixty (n = 60) subjects were selected. Questionnaire was used to collect the data. The results shown that lower extremity oedema was occurring secondary to increased venous pressure in the legs, obstruction of lymphatic flow and reduced plasma colloid osmotic pressure which may leads to excessive accumulation of fluid in the tissues without coexisting hypertension or proteinuria.

Knudsen A et al., (2002) conducted a descriptive study to assess the level of physiological lower leg oedema, headache and fatigue. One hundred and eighty (180) pregnant women with third trimester were selected as samples. Questionnaire was used to collect the information about fatigue and oedema of the lower limb and it was monitored till the delivery. The prevalence of physiological lower leg oedema is gradually increased significantly from 20% in the thirty first week to 60% in the fortieth (40) gestational week. 35% of women were not experienced headache and twenty two percentage (22%) were not experienced fatigue. The study concluded that oedema, headache and fatigue are common symptoms during third trimester of normal pregnancy.

Carol Cox (1999) conducted a descriptive study to determine the prevalence of physiological lower leg oedema during third trimester among antenatal mothers.100 pregnant mothers were selected as a sample.the overall orevalence of physiological lower leg oedema during pregnancy was approximately 70 – 80%. The study report

shows that there was no significant association between the development of physiological lower leg oedema during pregnancy and maternal age ($P > 0.05$).

SECTION B: Literature related to Management of Physiological Lower Leg Oedema

Snijders C.J, (2008) conducted a study to assess the effects of continuous rotary seat pan movements on physiological oedema of the lower extremities during prolonged sitting. Ten (n = 10) healthy pregnant mothers were selected, five (n = 5) for control group and five (n = 5) for experimental group. Rotary seat pan movements were given for three (3) hours of sitting sessions on eight (8) successive days. The level of lower leg oedema was measured four times at one hour intervals by means of water displacement volumetry scale. Subjects showed a significant reduction in leg swelling ($0.014 < p < 0.129$) and the age of subjects also influence the results.

Cho SH (2007) conducted a quasi experimental study to identify the effect of Elastic compression on reduction of physiological lower leg oedema. Fourty (n = 40) mothers were selected, twenty (n = 20) for experimental and twenty (n = 20) for control group. The data were collected by using inch tape and opening records. Experimental group received elastic compression with one hour duration for two weeks. Data were analysed with percentage, mean, standard deviation, chi square test, unpaired t-test and repeated ANOVA measures. The researcher concluded that elastic compression was effective in reducing the level of physiological lower leg oedema during third trimester.

Katz (2006) conducted a comparative study to assess the effect of static immersion and water aerobics on relieving physiological lower leg oedema. Eighteen (n = 18) healthy pregnant women between 20 and 33 weeks of gestation were studied. Nine (n = 9) were participated in standing on land immersed to the axilla and nine

(n = 9) were participated in a water aerobic class each for 30 minutes. The dilution effect was measured by a decline in urine specific gravity. The researcher concluded that water aerobics had greater significance ($p < 0.01$) in diuretic and oedema relieving effects than static immersion.

Quattrin R (2006) has conducted a study to assess the effect of aerobic exercise in reducing the level of physiological lower leg oedema. Fourty (40) antenatal mothers with physiological lower leg oedema were selected. Leg circumference was checked and the participants were practiced 30 minutes of aerobic exercise for five days. Then the researcher has assessed the level of physiological lower leg oedema. The results showed that there was a significant reduction in the level of physiological lower leg oedema after receiving aerobic exercise.

Kim &Kim (2005) investigated the effect of aerobic exercise on reduction of physiological lower leg oedema. 11 antenatal mothers were selected by using convenient sampling technique. Erin Oedema Scale was used to assess the level of physiological lower leg oedema. There were significant differences in the level of physiological lower leg oedema between pre and post test level of physiological lower leg oedema. The researcher concluded that aerobic exercise may reduce the level of physiological lower leg oedema among antenatal mothers during third trimester.

Song HM (2005) has conducted a study to assess the effect of cold compress in relieving physiological lower leg oedema. Eighty (80) pregnant mothers were selected and divided into two groups randomly. Cold compress was given to the experimental group (40) for 10 minutes. The oedema was measured by checking leg circumference. The researcher concluded that there was a significant reduction in the level of physiological lower leg oedema compared to the control group.

Hosler (2003) conducted a study to find out the effect of water aerobibs on reduction of physiological lower leg oedema during third trimester. Questionnaire was adopted to collect the demographic data and the level of oedema was measured by checking leg circumference with the help of inch tape. Sixty (60) samples were randomly selected, thirty (30) for experimental group and thirty (30) for control group. Data were analyzed with the SPSS program using statistics of repeated measures ANOVA. The report suggests that there was a statistically significant reduction in the level of lower extremity oedema for the experimental group compared to the control group.

SECTION C: Literature related to Effect of Foot Massage on Lower Leg Oedema

Yoon CM (2011) conducted a study to examine the effects of self leg massage for reducing physiologcal lower extremity oedema. The research design was nonequivalent pre and post test design. Study subjects were eighty one third trimester primigravida mothers, fourty (n=40) for experimental group and fourty one (n = 41) for control group. Self leg massage was done for one week. The ankle and calf circumference was measured by using tapeline in centimeter and the pain score was measured by using a subjective numerical rating scale. Data were analyzed with the SPSS program using statistics of repeated measures ANOVA. The report suggests that there was a statistically significant reduction in lower extremity oedema and pain in primigravida mothers during third trimester.

Sarunya Howngsuwannakorn (2010) conducted a quasi experimental study to assess the effect of foot reflexology on reduction of physiological lower leg oedema among primigravida mothers during third trimester. 30 antenatal mothers were selected. The experimental group (15) received 30 minutes of foot reflexology. The paired t-test was used for research analysis. The results demonstrated that foot reflexology has reduced the level of physiological lower level of physiological lower leg oedema with

statistically significant $p < 0.005$. The mean of satisfaction score on foot reflex was 8.39. The researcher concluded that foot reflexology was effective to reduce the level of physiological lower leg oedema and increases the comfort.

Shim Hoon (2010) examined the effects of foot reflexology massage on lower extremity oedema during third trimester. Nonequivalent control group pre and post test design was selected. Thirty one (31) samples were selected by using purposive sampling technique. Mothers were assigned to the experimental group (n=16) and control group (n = 15). Foot reflexology massage was applied for one week to the experimental group. The level of physiological lower leg oedema was measured by checking the circumference of the ankle and calf muscles. It was reported that there was a significant reduction in the level of physiological lower leg oedema after the application of foot massage in the experimental group compared to the control group.

Ahn (2009) examined the effect of foot reflexology on reduction of physiological lower leg oedema during third trimester. The subjects were 41 antenatal mothers resided in Korea. The foot reflexology was applied to the experimental group for one week and twenty (20) minutes of duration for each foot. For the data analysis chi-square test was conducted to verify the homogeneity of general characteristics and t-test was done to verify the homogeneity of physiological lower leg oedema level. To examine the relative efficacy of the intervention, t-test, paired t-test and repeated measures ANOVA were conducted. After foot reflexology the subjects in experimental group showed significant improvement in reduction of physiological lower leg oedema. The results suggested that the foot reflexology is effective in reducing the level of physiological lower leg oedema in late pregnanacy.

Sirin A et al., (2009) conducted a research on effect of foot massage for reducing the level of physiological lower leg oedema during late pregnancy in Manisa

health ministry central primary health care clinic, western Turkey. Eighty pregnant women (n=80) were randomly divided into two groups. Twenty (20) minutes of foot massage was given to the experimental group (n = 40) for seven (7) consecutive days. Compared with the control group, women in the experimental group had a significantly smaller lower leg circumference (right and left, ankle, instep and metatarsal phalanges joint).

Colabatti et al., (2008) founded the effects of foot reflexology on reduction of physiological lower leg oedema during third trimester. The design was an experimental treatment design. Thirty four (34) participants were assigned to either an experimental group (18) or a control group (16). Foot reflexology was administered for one week to participants in the experimental group. The results shown that foot reflexology was an effective nursing intervention to decrease the level of physiological lower leg oedema.

Ko YS (2007) conducted a quasi experimental study to examine the effects of self reflexology on reduction of lower leg oedema in clinical women nurses. The study design was a pre and post test design. Fourty (n = 40) women nurses were assigned to an experimental group (n = 20) and control group (n = 20). Experimental group participated in self foot reflexology for 10 days duration on their right and left feet. Data was analysed using the chi square test and t - test. The findings shown that the level of oedema decreased in the study.

Lance G Dawson et al., (2006) conducted a study to assess the effectiveness of massage therapy on reducing leg swelling following on road running race. Twenty four (24) subjects were selected for experimental (n = 12) and control group (n = 12).Twelve (n = 12) runners (8 male, 4 female) completed a half marathon race. On days 1, 4, and 8, experimental group received 30 minutes of foot massage. The results shown that

there was a significant reduction ($p < 0.05$) in the level of leg swelling for the experimental group compared to the control group.

Lyndall Mollart (2004) conducted a study to assess the effectiveness of foot reflexology technique for ankle/foot oedema in late pregnancy. Twenty ($n = 20$) mothers age ranged between 16 to 39 years with the gestational age of 33 to 39 weeks were selected by convenient sampling. The participants received 15 minutes of lymphatic foot reflexology technique for eight (8) days and circumference measurements of ankles, insteps and foot/toe junctions were recorded. The results shown that there was a significant reduction in the level of physiological lower leg oedema for 16 participants.

Geva Achiron (2003) conducted a randomized controlled trial to evaluate the effect of foot massage on reduction of physiological lower leg oedema.seventy one (71) third trimester antenatal mothers were randomized to receive an one week treatment. Reflexology treatment included manual pressure on specific points in the feet and massage of the calf area. The level of oedema was assessed by using Erin oedema scale. Significant improvement in the mean scores of physiological lower leg oedema ($p = 0.01$) was detected in the reflexology group. They concluded that specific reflexology treatment was beneficial in reducing the level of physiological lower leg oedema among antenatal mothers.

Herold (2003) conducted a comparative study to assess the effect of foot massage and cold compress on reduction of physiological lower leg oedema. Fifty (50) antenatal mothers were divided into two groups. Initially the circumference of the lower leg oedema was measured. Foot massage was given for twenty five antenatal mothers and cold compress was given to the remaining mothers for the period of six (6) days.

The researcher concluded that elevated foot massage was significantly more effective on reduction of physiological lower leg oedema compared to the cold compress.

Diana J Galindo et al., (2002) conducted a study to assess the effects of elevated leg exercise on reducing the level of leg oedema in the elder patients. Two hundred and fourty five (n=245) subjects were selected and fifty seven (n = 57) for control group and one hundred and eighty eight (n=188) for experimental group .The circumference of the leg oedema was measured initially and on the fourth week. The common causes of leg oedema in the elderly population were venous stasis (63.2%) and heart failure (15.1%). The results shown that raised leg exercises were significantly more effective in the management of leg oedema due to venous stasis (p = 0.001) but not significant in other etiologies.

Song HM (2002) conducted a quasi experimental study to assess the effect of foot reflexology education program on nursing staffs with lower leg oedema. The study was pre and post test design on nonequivalent control group. The subjects consisted of sixty one (n = 61) nursing staffs (experimental group:31,control group:30). The period was two (2) weeks composed of one week theory and one week practical skill on the programme. The effect of the programme was measured by using questionnaire method and the level of oedema was measured by using tapeline measures in centimeter. Data were analysed by t-test,chi square test and repeated measures of ANOVA. The results suggested that the foot reflexology education programme has improved the knowledge and reduced the level of lower leg oedema for the nurses.

CHAPTER III

RESEARCH METHODOLOGY

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

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

RESEARCH APPROACH

Quantitative research approach was used to determine the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers.

RESEARCH DESIGN

Research design adopted for this study was pre experimental with one group pre and post test design as the study fulfills the criteria of manipulation. It can be diagrammatically represented as:

Group	Pretest	Intervention	Post test
Experimental group	O_1	X	O_2

Figure- 2: **Schematic representation of Pre Experimental Design**

Key

X - Foot massage.

O_1 - Pretest assessment of physiological lower leg oedema .

O_2 - Post test assessment of physiological lower leg oedema.

VARIABLES

The variables of the study are as follows

Independent variable

Foot massage

Dependent variable

Physiological lower leg oedema.

SETTING OF THE STUDY

The setting of the study refers to the area where the study was conducted. The study samples were selected in Elayirampannai primary health centre at Virudhunagar district. Approximately thirty five (35) primary health centres are there in virudhunagar district. Elayirampannai primary health centre covers 42 villages and the total population covered by the Primary Health Centre is 40,000. Every week Tuesday they are conducting antenatal clinic. Approximately 80-100 antenatal mothers are visiting this Elayirampannai Primary Health Centre every week. Among them approximately twenty five (25) to thirty (30) were third trimester antenatal mothers and fifteen to twenty (15-20) primigravida mothers had physiological lower leg oedema. The researcher has got the address from the primigravida mothers and done a pre test by using Erin oedema scale. The researcher went to the primigravida mothers home and gave brief self introduction. Then the researcher has administered twenty (20) minutes of foot massage by using six (6)

techniques once in a day for seven days. Majority of the people belongs to low socio economic status. Coolie and Agricultural work were the main source of income of these people.

POPULATION

The study population comprised of third trimester primigravida mothers with physiological lower leg oedema.

SAMPLE

Primigravida mothers physiological lower leg oedema during third trimester who visited the Elayirampannai primary health centre.

SAMPLE SIZE

Total sample size was 60 primigravida mothers during third trimester with physiological lower leg oedema.

SAMPLING TECHNIQUE

Purposive sampling technique was adopted for this study. Among the total population the investigator selected sixty (60) samples who met inclusive criteria.

CRITERIA FOR SAMPLE SELECTION

Inclusive Criteria

1. Third trimester primigravida mothers.
2. Primigravida mothers with physiological lower leg oedema.
3. Primigravida mothers who are willing to participate in the study.

Exclusive Criteria

Mothers who had lower leg oedema with other systemic illnesses such as hypertension, varicosities, anaemia and renal disorders.

DEVELOPMENT AND DESCRIPTION OF TOOL

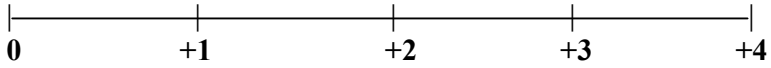
The tool consisted of two sections:

Section : A

It comprised of demographic data of the samples which consists of seven (7) items such as age, educational status, occupation, type of family, family income, religion and area of living.

Section : B

Erin oedema scale was used to assess the level of physiological lower leg oedema. oedema is evaluated on its ability to pit. The investigators finger is pressed into a dependent area of the mothers skin for five (5) seconds. If pitting oedema is present the finger will sink into the tissue and leave an impression after removing the finger. This pitting is graded on a scale of +1 to +4 as follows



Scoring Key

Score	Nature of oedema	Oedema assessment
0	None	No oedema
+1	Trace	Rapid return to normal.
+2	Mild	Rebounds in a few seconds.
+3	Moderate	10-20 seconds to return to normal.
+4	Severe	>30 seconds to return to normal.

ASPECTS OF INTERVENTION

Investigator has used six techniques of foot massage by reviewing literature and obtaining expert's opinion. Foot massage techniques includes massaging top & bottom of the feet, ankle rotation, toe massage, toe pull, toe squeeze & foot arch massage and consists of 20 minutes duration each day for seven days. Each step consists of 1-2 minutes for one foot. The foot massage technique was submitted to experts for establishing content validity. The experts included were two medical experts and four nursing experts in the field of community health nursing. Based on the suggestion of the experts some modification was made in the techniques of foot massage.

CONTENT VALIDITY

Validity refers to the degree to which an instrument measures what it is intended to measure (**Polit and Hungler 1999)**.

The validity of the tool was established after obtaining opinion from 6 experts, consisting of 4 experts from community health nursing speciality and 2 medical experts. Based on the suggestions of the experts some modification was done in objective and hypothesis and demographic data of the tool after consulting with the research guide.

RELIABILITY OF THE TOOL

The standardized tool was adopted.

PILOT STUDY

It is a rehearsal for the main study. The researcher has got the permission from Principal and Research ethical committee of Sri. K. Ramachandran Naidu

College of nursing and Head of the Department of community health nursing. A formal permission was obtained from the Medical officer, Primary health centre, Vupathoor. The pilot study was conducted in Vupathoor primary health centre areas for the period of one week (22/03/2011 to 29/03/2011) from 9 am - 6 pm. The sample size was six (6) primigravida mothers with physiological lower leg oedema. Samples were selected from Vupathoor primary health centre during antenatal visit on Tuesday.

Rapport was established with the primigravida mothers and a brief introduction about the study was given. Written consent was obtained from each primigravida mother and reassurance was provided that the collected data would be kept confidential. The data related to demographic variables were collected from the primigravida mother by Interview method. Pre and post test assessment of physiological lower leg oedema was done by using Erin oedema scale. After the assessment of pre test level of physiological lower leg oedema among primigravida mothers, six techniques of foot massage which includes massaging top and bottom of the foot, ankle rotation, toe massage, toe pull, toe squeeze and foot arch massage was given over 20 minutes for each day. Each step has to be administered for 1-2 times.

During the seven (7) days of intervention period, the researcher gave adequate orientation and explanation regarding six techniques of foot massage by using pamphlet to the primigravida mother and their family members. Post test assessment was done for the primigravida mothers after seven (7) days of intervention. The results of the pilot study showed that the primigravida mothers has got decreased level of physiological lower leg oedema as compared to the pretest level. The study was found to be feasible and hence the same procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study. The samples selected for the pilot study were not included for the main study.

PROCEDURE FOR DATA COLLECTION

The researcher has got permission from the Principal and research ethical committee and Head of the Department of Community Health Nursing Department, Sri K. Ramachandran Naidu College of Nursing. Before collecting the data the researcher obtained the formal permission from Medical officer, primary health centre, Elayirampannai for conducting the main study. The data were collected from 05/04/2011 to 03/05/2011 during 8 am to 5 pm.

Samples were selected from the Elayirampannai primary health centre on every Tuesday by using purposive sampling technique according to the inclusive criteria after obtaining the written consent from the primigravida mothers. The researcher went to the sample mother's home and collected the demographic data from the primigravida mothers by interview method and pre test was done. The researcher gave psychological support to the primigravida mother and explained about the techniques, its effect on reducing the level of physiological lower leg oedema. Foot massage was given over twenty (20) minutes. During the seven (7) days of intervention period the researcher gave adequate orientation and explanation regarding six techniques of foot massage by using pamphlet to the primigravida mothers and their family members. Post test was done after seven (7) days of intervention foot massage. The data were collected approximately 15 to 18 study subjects per week.

PLAN FOR DATA ANALYSIS

After data collection the collected data was organized, tabulated, summarized and analyzed according to the objectives of the study by using both descriptive and inferential statistics.

Descriptive statistics

1. Frequency and percentage distribution were used to analyze the demographic data.
2. Mean and Standard deviation were used to assess the effectiveness of foot massage on reduction of physiological lower leg oedema.

Inferential statistics

1. Paired ‘t’ test was used to compare the pre and post test level of physiological lower leg oedema.
2. Chi-Square test was used to find out the association of the effectiveness of physiological lower leg oedema with selected demographic variables.

PROTECTION OF HUMAN RIGHTS

The proposed study was conducted after the approval of research committee of the college. Permission was sought from the Medical Officer of Elayirampannai Primary Health Centre. The written consent of each individual was obtained before data collection. Assurance was given to the study participants regarding the confidentiality of the data collection.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

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

This chapter deals with analysis and interpretation of data collected from sixty (60) samples with physiological lower leg oedema during third trimester among primigravida mothers in Elayirampannai primary health centre at Virudhunagar district. The data has been tabulated and analyzed according to the objectives.

The purpose of analysis is to reduce the collected data to an intelligible form. So the relation of the problem can be tested.

Analysis is the method of organizing, shorting and scrutinizing data in such a way that research question can be answered **(Polit, 2005).**

ORGANIZATION OF DATA

The organization of data is presented under the following sections.

Section A: **Assessment of demographic variables of sample**.

- Frequency and percentage distribution of demographic variables of Primigravida Mothers.

Section B: **Assessment of the pre interventional level of physiological lower leg oedema among primigravida mothers**.

- Mean value of pre and post interventional level of physiological lower leg oedema among primigravida mothers
- Frequency and percentage distribution of pre intervention level of physiological lower leg oedema.

Section C: **Assessment of the post interventional level of physiological lower leg oedema among primigravida mothers**

- ❖ Frequency and percentage distribution of post intervention level of physiological lower leg oedema.

Section D: **Comparison of pre and post test level of physiological lower leg oedema among primigravida mothers**

- ❖ Mean and standard deviation of pre and post test level of physiological lower leg oedema among primigravida mothers.

Section E: **Association of post test level of physiological lower leg oedema with selected demographic variables.**

- ❖ Association of post test level of physiological lower leg oedema with selected demographic variables of primigravida mothers.

SECTION A: ASSESSMENT OF DEMOGRAPHIC VARIABLES OF SAMPLE.

Table 1: Frequency and percentage distribution of demographic variables of Primigravida Mothers.

(N=60)

S.NO	DEMOGRAPHIC VARIABLES	COMPONENTS OF VARIABLE	SAMPLES	
			FREQUENCY (f)	PERCENTAGE (%)
1.	Age (years)	a) 15-22	21	35.0
		b) 23-30	29	48.3
		c) 31-38	10	16.7
2.	Educational status	a) Illiterate	7	11.7
		b) Primary school	22	36.7
		c) Secondary school	24	40.0
		d) Higher secondary school	5	8.3
		e) Graduate	2	3.3
		f) Post graduate	0	0
3.	occupation	a) Sedentary worker	23	38.3
		b) Moderate worker	26	43.3
		c) Heavy worker	11	18.4
4.	Type of family	a) Nuclear	41	68.3
		b) Joint	18	30.0
		c) Extended	1	1.7
5.	Family income	a) Less than Rs.3000	4	6.7
		b) Rs.3001-5000	27	45.0
		c) Above Rs.5001	29	48.3
6.	Religion	a) Hindu	36	6.7
		b) Christian	12	20.0
		c) Muslim	12	20.0
		d) Others	0	0
7.	Area of living	a) Urban	0	0
		b) Semi Urban	13	21.7
		c) Rural	47	78.3

It shows out of 60 samples, 21 (35%) samples were between the age group of 15-22 years, 29(48.3%) samples were between the age group of 23-30 years and remaining 10 (16.7%) samples were between the age group of 31-38 years.

With regard of educational status, 7(11.7%) samples were illiterate, 22(36.7%) samples had primary school, 24(40%) samples had secondary school, 5(8.3%) samples had higher secondary school education, 2(3.3%) samples were graduates and none of them were post graduates.

According to the occupation, 23(38.3%) samples were sedentary worker, 26(43.3%) samples were moderate worker and remaining 11(18.4%) samples were heavy worker.

Based on the type of family, 41 (68.3%) samples belongs to nuclear family, 18 (30.0%) samples belongs to joint family and remaining 1 (1.7%) sample belongs to extended family.

Based on family income, 4 (6.7%) samples were getting less than Rs.3000, 27 (45%) samples were getting Rs.3001-5000 and remaining 29 (48.3%) samples were earning above Rs.5001.

With regard of religion, 36(60%) samples were Hindu, 12(20%) samples were Christian and 12(20%) were Muslims.

In relation with area of living, none of the samples were living in urban area, 13 (21.7%) were living in semiurban area and 47(78.3%) were living in rural area.

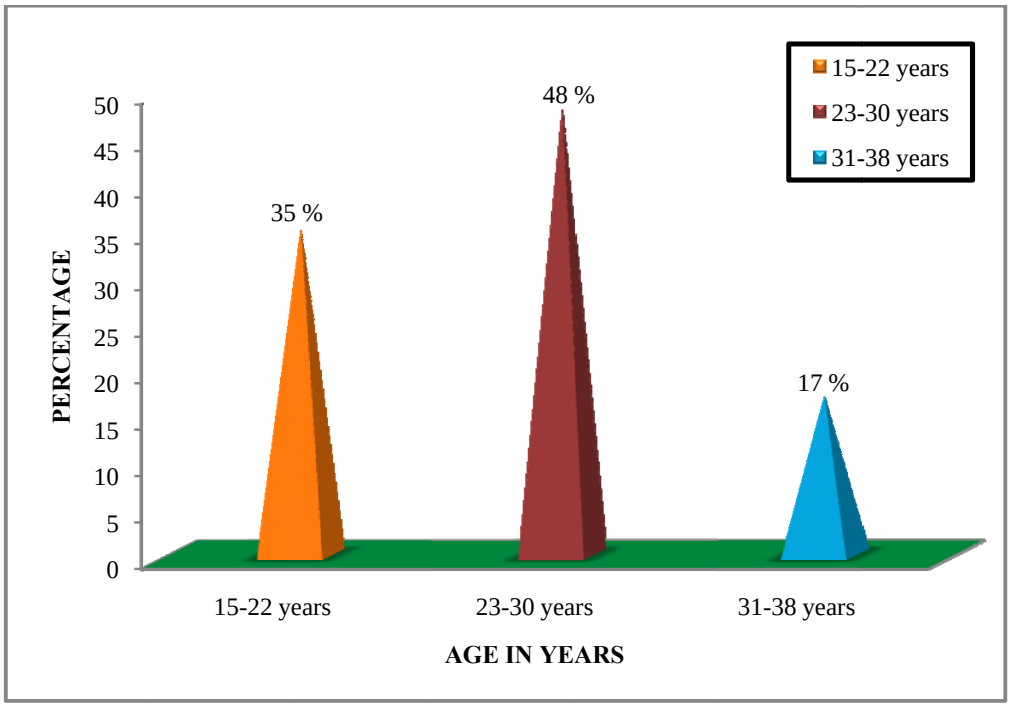


Figure 4: Percentage distribution in age of primigravida mothers

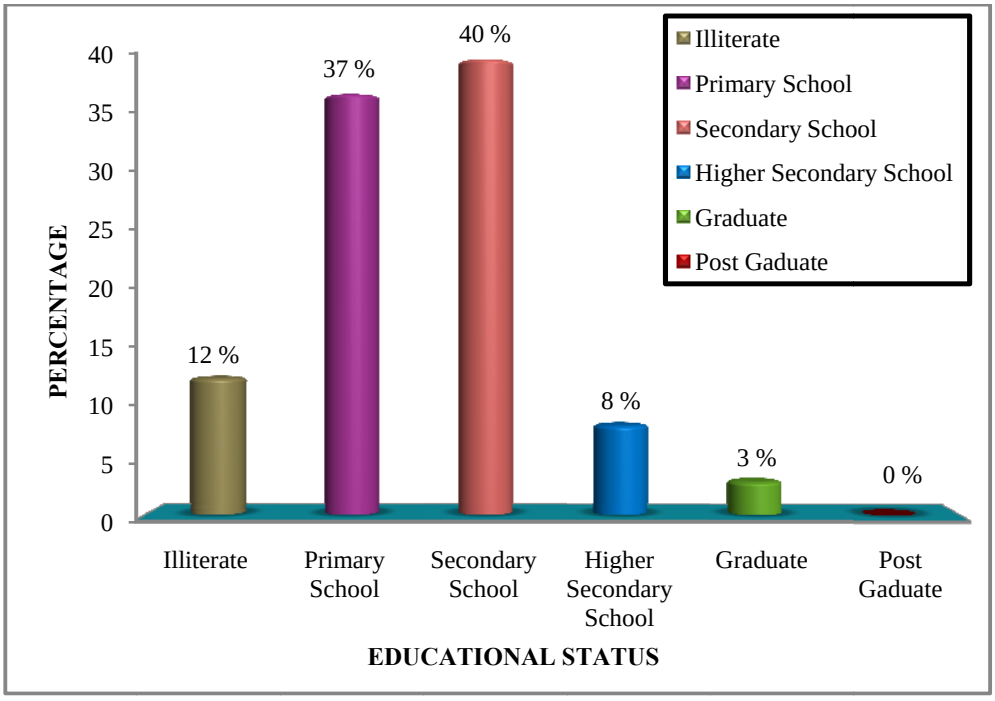


Figure 5: Percentage distribution of educational status among primigravida mothers

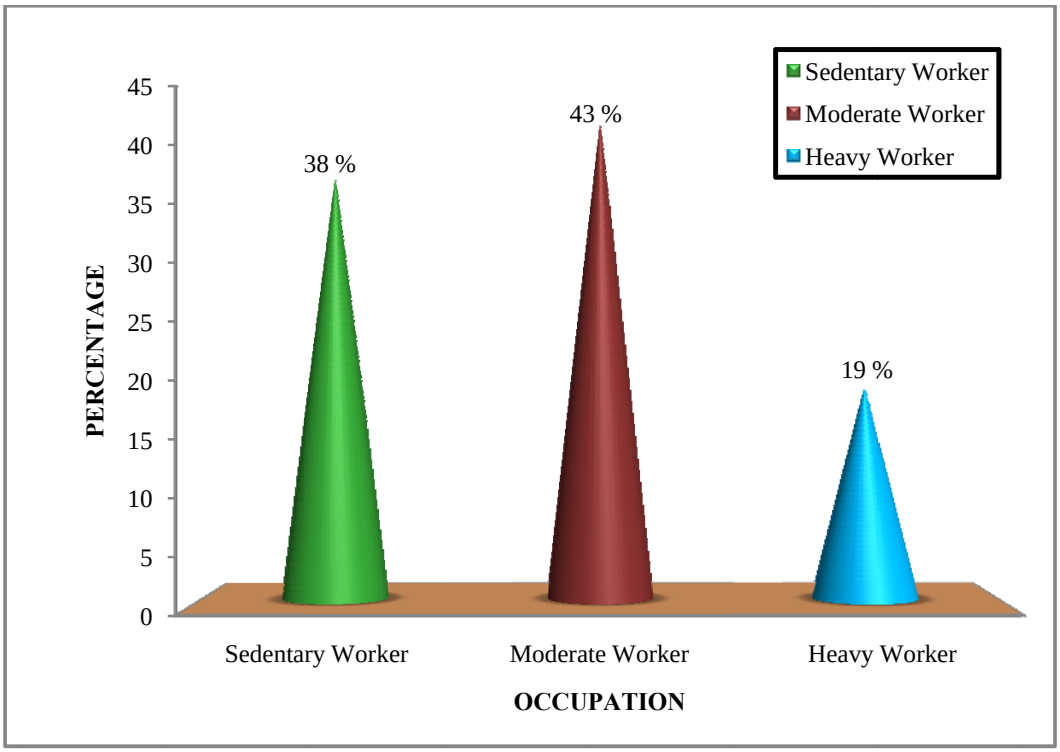


Figure 6: Occupation of primigravida mothers

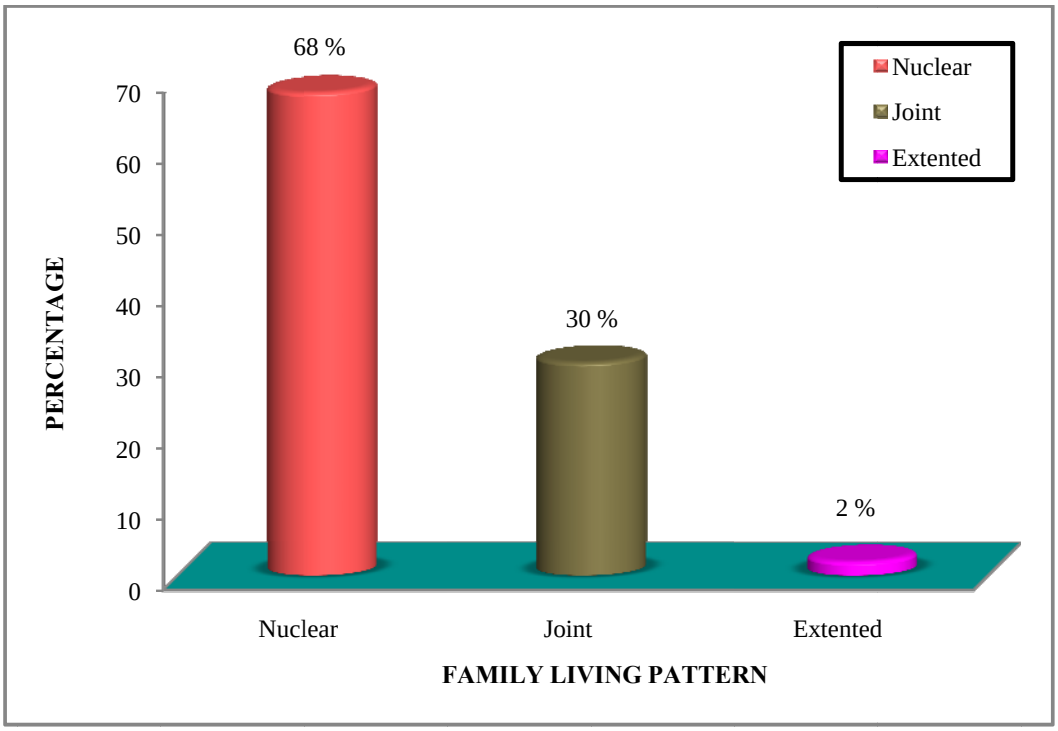


Figure 7: Family living pattern of primigravida mothers

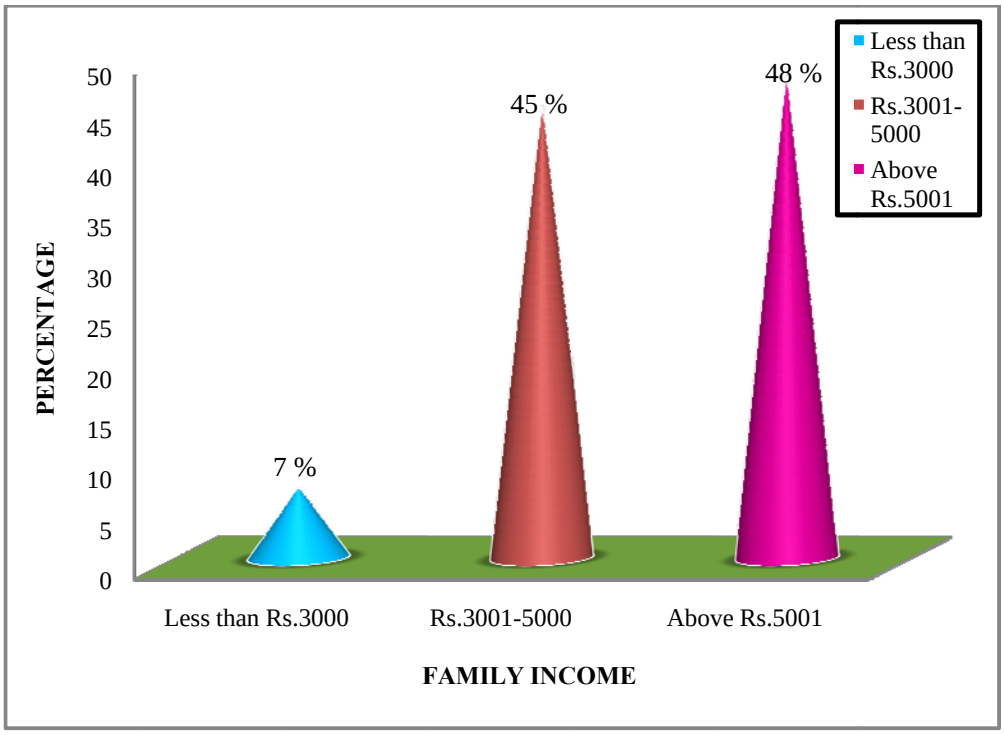


Figure 8: Family income of primigravida mothers

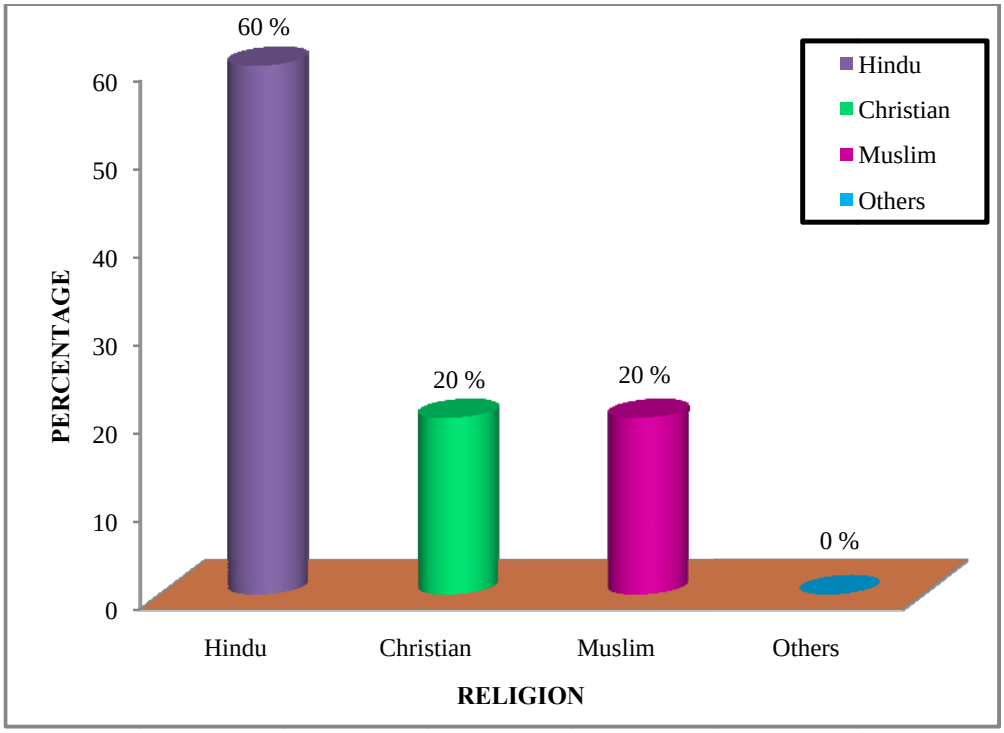


Figure 9: Religion of primigravida mothers

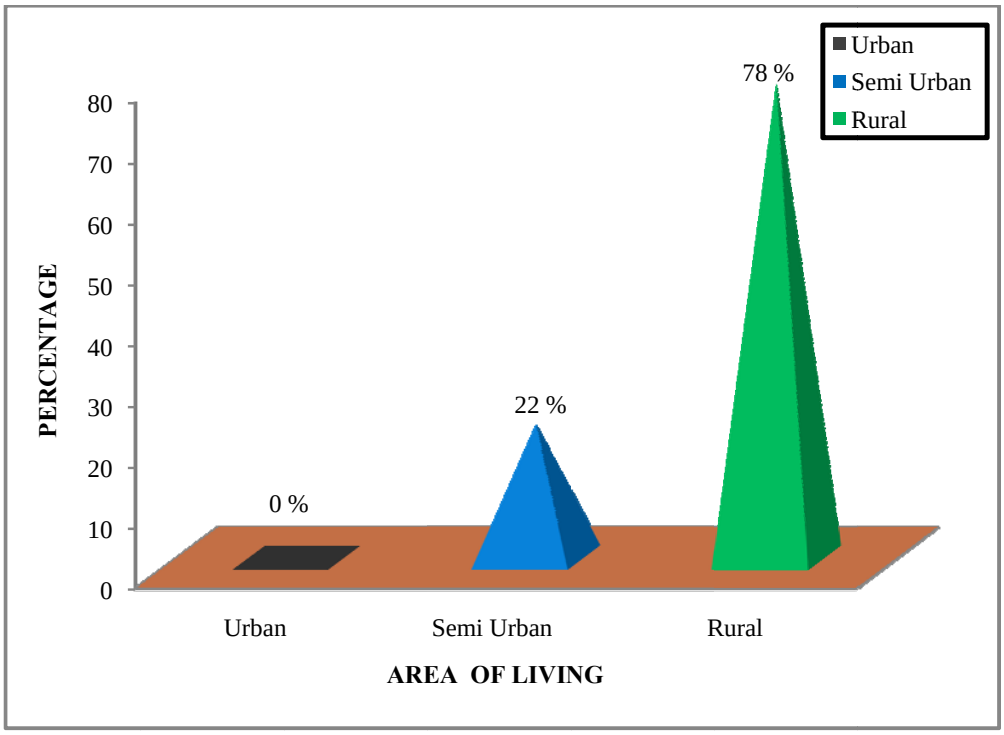


Figure 10: Primigravida mothers area of living

SECTION B : ASSESSMENT OF THE PRE INTERVENTIONAL LEVEL OF PHYSIOLOGICAL LOWER LEG OEDEMA AMONG PRIMIGRAVIDA MOTHERS.

Table 2: Mean value of pre and post interventional level of physiological lower leg oedema among primigravida mothers.

(N=60)

S.NO	Level of physiological lower leg oedema	Mean
1.	Pre intervention level	2.38
2.	Post intervention level	0.58

It shows the mean value of pre and post interventional level of physiological lower leg oedema. With regard to mean of pre interventional level was 2.38 and mean of post interventional level of physiological lower leg oedema was 0.58.

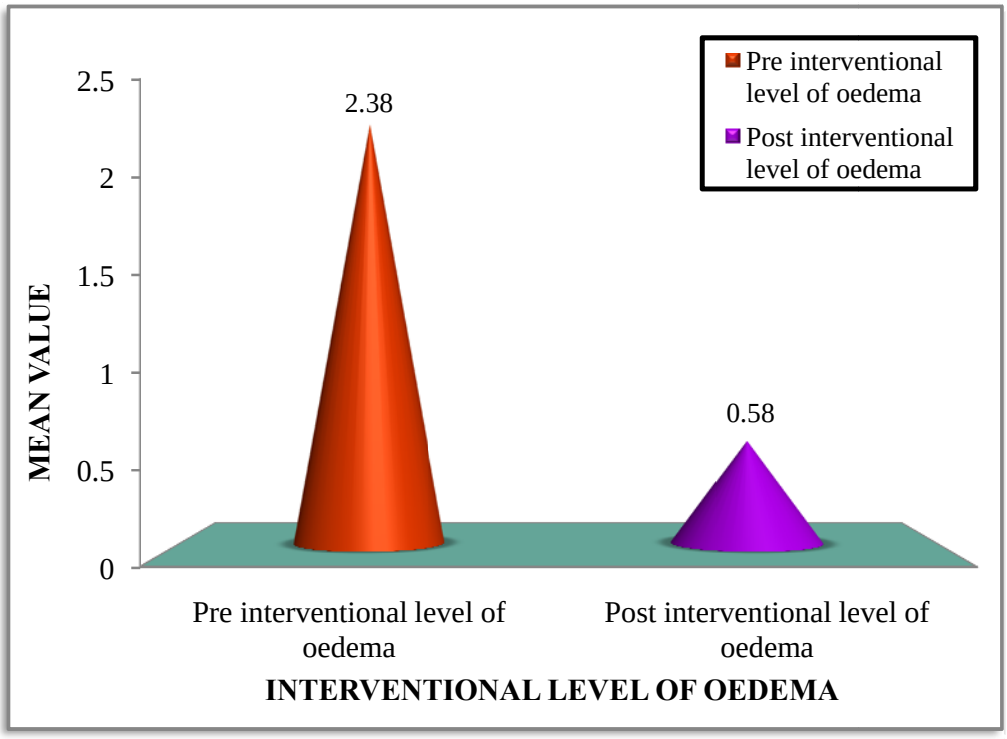


Figure 11: Mean value of pre and post interventional level of physiological lower leg oedema.

Table 3 : Frequency, percentage distribution of pre intervention level of physiological lower leg oedema.

(N=60)

S.NO	Level of physiological lower leg oedema	Frequency (f)	Percentage (%)
1.	0	0	0
2.	+1	11	18.33
3.	+2	20	33.33
4.	+3	24	40.00
5.	+4	5	8.33

It shows the frequency, percentage distribution of pre interventional level of physiological lower leg oedema. It is witnessed that 11(18.33%) samples had +1 level, 20(33.33%) had +2 level, 24(40%) samples had +3 level and remaining 5(8.33) samples had +4 level of physiological lower leg oedema.

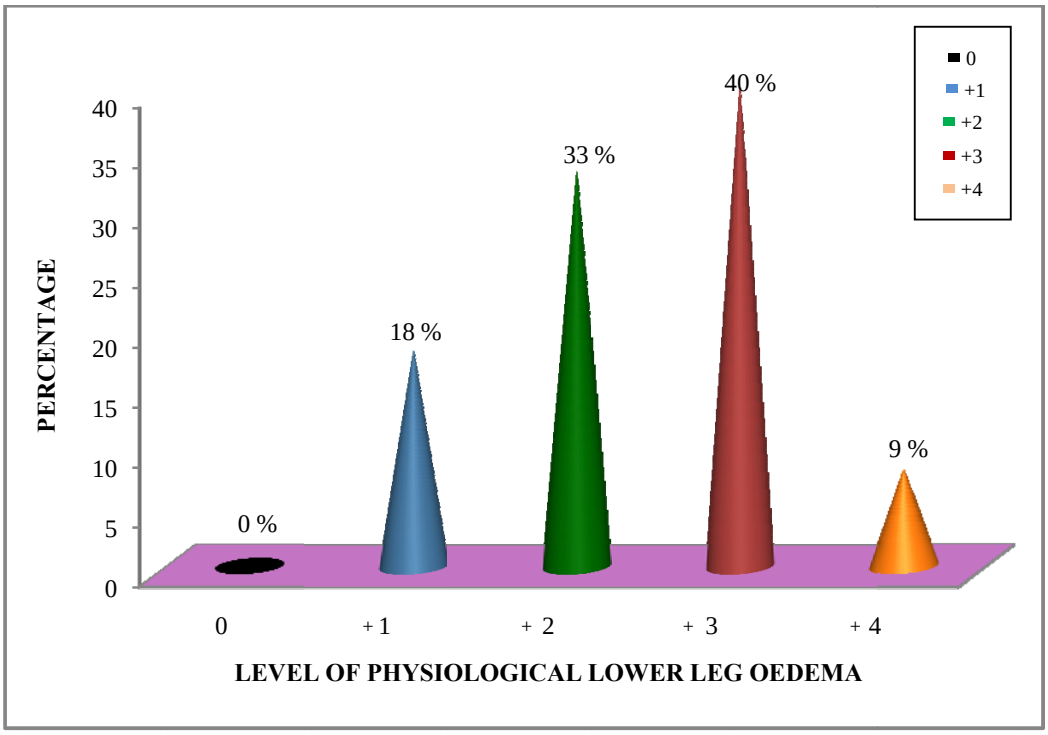


Figure 12: Frequency and percentage distribution of pretest level of physiological lower leg oedema

SECTION C: ASSESSMENT OF THE POST INTERVENTIONAL LEVEL OF PHYSIOLOGICAL LOWER LEG OEDEMA AMONG PRIMIGRAVIDA MOTHERS.

Table 4 : Frequency and percentage distribution of post intervention level of physiological lower leg oedema.

(N=60)

S.NO	Post interventional level of physiological lower leg oedema	Frequency (f)	Percentage (%)
1.	0	32	53.33
2.	+1	21	35.00
3.	+2	7	11.67
4.	+3	0	0
5.	+4	0	0

It is witnessed that 32(53.33%) samples had 0(no oedema) level, 21(35%) samples had +1 level and remaining 7(11.67%) samples had +2 level of lower leg oedema. And none of them had +3 and +4 level of physiological lower leg odema.

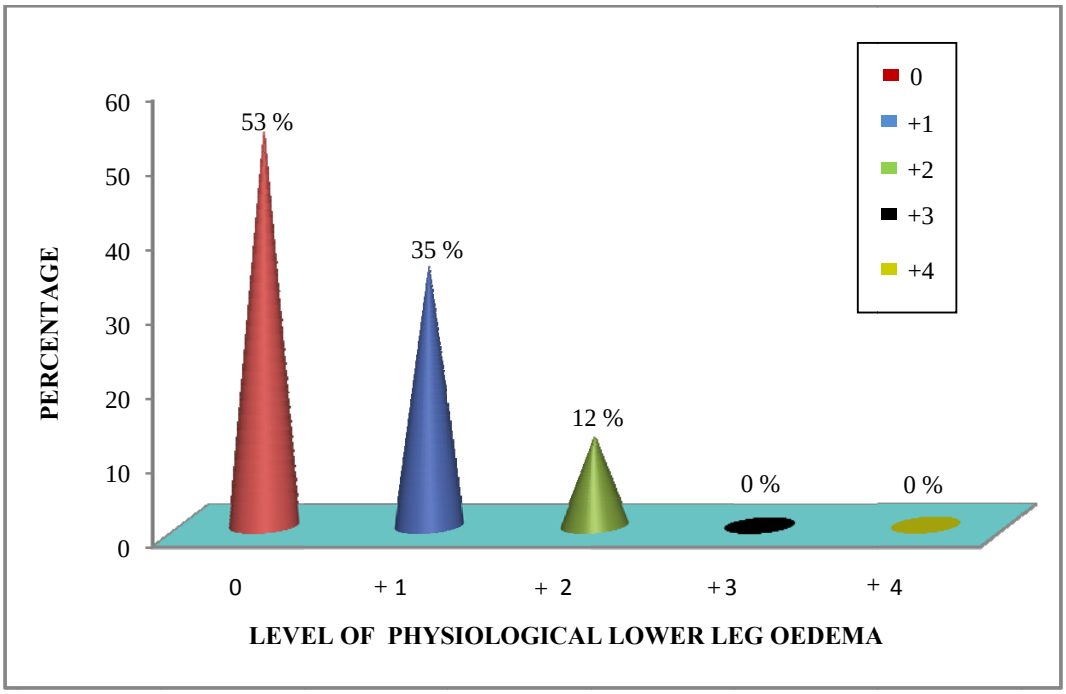


Figure 13: Frequency and percentage distribution of post test level of physiological lower leg oedema

SECTION D: COMPARISON OF PRE AND POST TEST LEVEL OF PHYSIOLOGICAL LOWER LEG OEDEMA AMONG PRIMIGRAVIDA MOTHERS

Table 5: Mean and standard deviation of pre and post test level of physiological lower leg oedema among primigravida mothers.

(N=60)

S.NO	GROUP	LEVEL OF OEDEMA SCORE			T-VALUE
		MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	
1.	PRE TEST	2.38	0.87	1.8	7.51 S
2.	POST TEST	0.58	0.69		

S - Significant

The mean value of post test level of physiological lower leg oedema after receiving foot massage was 2.38 and it was lower than the pretest mean value 0.58. It was indicated that mean difference between the mean 1.8 was a true difference and has not occurred by chance. The difference between the two means could be due to the effect of foot massage. The calculated value was 7.51 showed that there was a significant difference in the effectiveness of foot massage at $p < 0.05$ level. The difference between the pre and post test response showed that foot massage was effective in the reduction of physiological lower leg oedema. Hence the research hypothesis states that, “There is a significant difference between the pre and post test level of physiological lower leg oedema among primigravida mothe

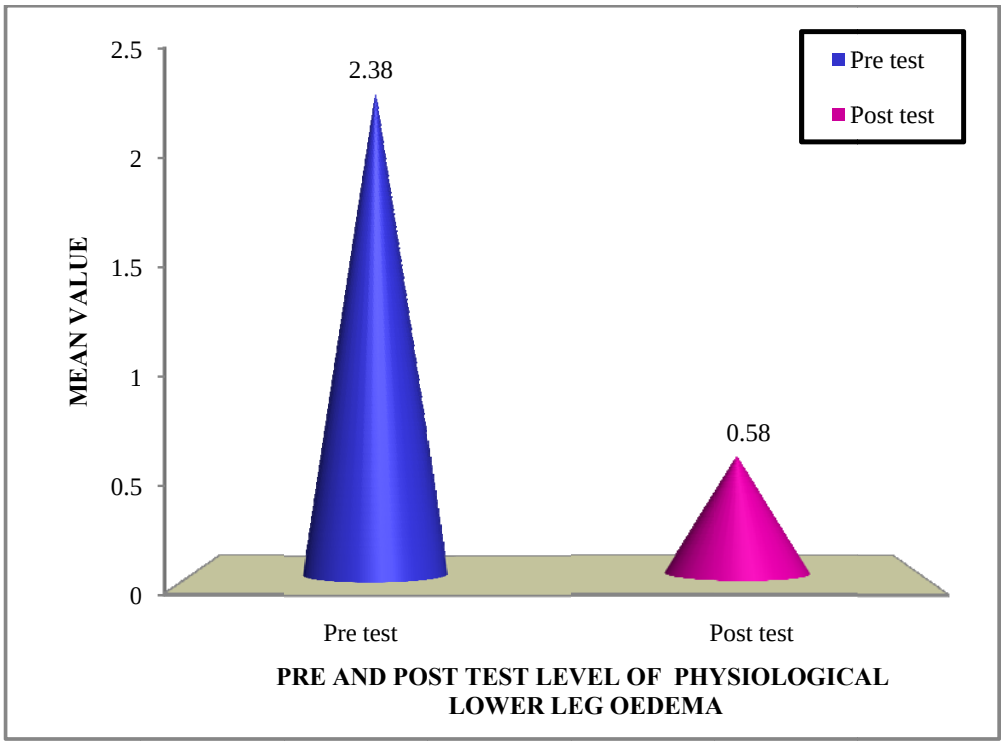


Figure 14 : Mean value of pre and post test level of physiological lower leg oedema

SECTION E: ASSOCIATION OF POST TEST LEVEL OF PHYSIOLOGICAL LOWER LEG OEDEMA WITH SELECTED DEMOGRAPHIC VARIABLES.

Table 6: Association of post test level of physiological lower leg oedema with selected demographic variables of primigravida mothers.

(N=60)

S.NO	DEMOGRAPHIC VARIABLES	POST TEST LEVEL OF PHYSIOLOGICAL LOWER OF LOWER LEG OEDEMA										χ^2 VALUE
		0		1		2		3		4		
		f	%	f	%	f	%	f	%	f	%	
1.	**Age (years)**											
	a) 15-22	12	20.0	7	11.7	2	3.3	0	0	0	0	1.05
	b) 23-30	13	21.6	12	20.0	4	6.7	0	0	0	0	DF=8
	c) 31-38	7	11.7	3	5.0	0	0	0	0	0	0	**NS**
2.	**Educational status**											
	a) Illiterate	5	8.3	1	1.7	1	0	0	0	0	0	
	b)Primary school	10	18.3	7	6.7	4	0	0	0	0	0	
	c)Secondary school	12	20	12	20	0	0	0	0	0	0	4.39 DF=20
	d)Higher secondary school	2	3.3	2	3.3	1	0	0	0	0	0	**NS**
	e) Graduate	1	1.65	1	1.65	0	0	0	0	0	0	
	f)Post graduate	0	0	0	0	0	0	0	0	0	0	
3.	**Occupation**											
	a)Sedentary worker	13	21.6	10	16.7	0	0	0	0	0	0	4.34 DF=8
	b)Moderate worker	14	3.3	10	16.7	2	3.3	0	0	0	0	**NS**
	c)Heavy worker	5	8.3	3	5.0	3	5.0	0	0	0	0	
4.	**Type of family**											
	a) Nuclear	22	36.7	14	23.3	5	8.3	0	0	0	0	0.32
	b) Joint	11	18.3	6	10.0	1	1.7	0	0	0	0	DF=8
	c) Extended	1	1.7	0	0	0	0	0	0	0	0	**NS**
5.	**Family income**											
	a)Less than Rs.3000	2	3.35	2	3.35	0	0	0	0	0	0	5.51 DF=8
	b)Rs.3001-5000	12	20.00	9	15.00	6	10.00	0	0	0	0	**NS**
	c)Above Rs.5001	18	30.00	11	18.30	0	0	0	0	0	0	
6.	**Religion**											
	a) Hindu	17	26.7	15	25.0	5	8.3	0	0	0	0	19.98
	b) Christian	7	11.7	4	6.6	1	1.7	0	0	0	0	DF=12
	c) Muslim	8	13.4	4	6.6	0	0	0	0	0	0	**NS**
	d) others	0	0	0	0	0	0	0	0	0	0	
7.	**Area of living**											
	a) urban	0	0	0	0	0	0	0	0	0	0	1.112
	b) semi urban	9	15.1	4	6.6	0	0	0	0	0	0	DF=8
	c) rural	23	38.3	18	30	6	10	0	0	0	0	**NS**

NS - Non Significant

Chi-square test was carried out to find out the association between age, educational status, occupation type of family, family income, religion and area of living with post test level of physiological lower leg oedema. The results showed that there was no association between post test level of physiological lower leg oedema with selected demographic variables.

CHAPTER-V

DISCUSSION

This chapter deals with the discussion of the results of data analysis based on the objectives and hypothesis of the study. The problem stated was "A study to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during third trimester in Elayirampannai primary health centre at Virudhunagar district".

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

MAJOR FINDINGS OF THE STUDY

- Majority of primigravida mothers 29 (48.3%) were between the age group of 23-30 years.
- Majority of primigravida mothers 24 (40%) were completed secondary education.
- Majority of primigravida mothers 26 (43.3%) were moderate worker.
- Majority of primigravida mothers 41 (68.3%) were living in nuclear family.
- Majority of primigravida mothers 29 (48.3%) were getting the income of Rs.3001-5000 per month.
- Majority of primigravida mothers 36 (60%) were Hindu.
- Majority of primigravida mothers 47 (78.3%) were living in rural area.
- With regard to mean value, the pre test mean value was 2.38 and post test mean value was 0.58. The mean difference was 1.8. The calculated 't' value was 7.51.

- With respect to association there was no significant association between the post test level of physiological lower leg oedema with selected demographic variables.

The result of the study has been discussed based on the objectives stated for the study.

The first objective was to assess the pre test level of physiological lower leg oedema among primigravida mothers

The assessment of physiological lower leg oedema among primigravida mother was done by using Erin oedema scale.

Regarding the level of physiological lower leg oedema among primigravida mothers on the pre assessment mean value was 2.38.

Based on frequency and percentage distribution of pretest level of physiological lower leg oedema 11(18.33%) samples had +1 level of oedema, 20 (33.33%) samples had +2 level of physiological lower leg oedema, 24(40%) samples had +3 level of oedema and remaining 5(8.33%) had +4 level of physiological lower leg oedema oedema.

The second objective was to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers

Regarding the level of physiological lower leg oedema among primigravida mothers on the post assessment mean value was 0.58.

Based on frequency and percentage distribution of post test level of physiological lower leg oedema, 32(53.33%) samples had no oedema, 21(35%) samples had +1 level of physiological lower leg oedema, 7(11.67%) samples had +2

level of oedema and none of them had +3 and +4 level of physiological lower leg oedema.

Regard to physiological lower leg odema by using Erin oedema scale. The preassessment mean value was 2.38 and the standard deviation was 0.87. Post assessment mean was 0.58 and standard deviation was 0.69. Mean difference between the pre and post test level of physiological lower leg oedema was 1.8. Calculating physiological lower leg oedema t' value was 7.51 shows high statistical significant difference at $p < 0.05$ level of significant.

Hence the research hypothesis stated that, mean post test level of physiological lower leg oedema will be significantly lower than the mean pretest level of physiological lower leg oedema among primigravida mothers were retained at $p< 0.05$ level.

The study was supported by **Creamer Schreier (2005)** who has conducted a research study on effect of foot massage in reducing the level of physiological lower leg oedema during late pregnancy. Fifty pregnant women (n=50) were randomly divided into two groups. 20 minutes of foot massage was given to the experimental group (n=25) for seven days. The researcher measured the level of physiological lower leg oedema by using Erin oedema scale. Compared with the control group, women in the experimental group had a significantly smaller lower leg circumference (right and left, ankle, instep and metatarsal phalanges joint).

The third objective was to associate the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables

Association of post assessment level of physiological lower leg oedema for a change with their demographic variables were done by using chi-square test.

The findings revealed that there was no statistical significant association between the post test level of physiological lower leg oedema with selected demographic variables such as age, educational status, occupation, type of family, family income, religion and area of living.

Hence the research hypothesis H_2 stated that “There will be a significant association in the post test level of lower leg oedema among primigravida mothers with selected demographic variables was rejected at $p < 0.05$ level.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter deals with the summary, conclusion, implications, recommendations and limitations.

SUMMARY

This study was undertaken to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during third trimester in Elayirampannai primary health centre at Virudhunagar district.

Physiological lower leg oedema occurs in late pregnancy secondary to increased venous congestion in the legs caused by pressure exerted mechanically by the uterus on inferior vena cava and iliac veins. The mothers with physiological oedema may have the complaints of fear and anxiety about the outcome of delivery, labour progressiveness, walking difficulties and psychological disturbances.

Interventions are needed to reduce the level of physiological lower leg oedema. Special efforts are needed for promoting the health of primigravida mothers and also needs to focus on alternative medicine. The researchers are introducing alternative medicine with foot reflexology for reducing the level of physiological lower leg oedema. Evidence suggests that physiological lower leg oedema can be reduced without medicine intake. Foot massage was very helpful to reduce pain,

stimulates blood circulation, reduces oedema, warm up and relax the body muscles. And also there is no complications for foot massage.

The objectives of the study were

- ❖ To assess the pre test level of physiological lower leg oedema among primigravida mothers.
- ❖ To assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers.
- ❖ To associate the post test level of physiological lower leg oedema among primigravida mothers with selected demographic variables.

Research hypothesis of the study were

H_1 : Mean post test level of physiological lower leg oedema among primigravida mother was significantly lower than the mean pretest level of physiological lower leg oedema.

H_2 : There was no significant association in the post test level physiological of lower leg oedema among primigravida mothers with selected demographic variables.

Assumptions of the study were

1. The primigravida mothers may have physiological lower leg oedema during third trimester.
2. Physiological lower leg oedema can be reduced by giving foot massage.
3. Foot massage will improve blood circulation and relieve stress.
4. There will be no side effects in giving foot massage for the primigravida mothers.

The review of literature collected for the study was related to four headings. They are literature related to incidence of physiological lower leg oedema, literature related to management of physiological lower leg oedema and literature related to effect of foot massage on reduction of physiological lower leg oedema.

The conceptual framework obtained for the study was based on the King's Goal Attainment theory (1980) and it provided a complete framework in order to achieve the objectives of the study.

The research design used in this study was one group pre and post test pre experimental design in Elayirampannai primary health centre at Virudhunagar district. The tool consisted of demographic variables which had general information and Erin oedema scale. The tool was validated by 4 nursing experts and 2 medical experts. The researcher has used the standardized tool.

The pilot study was conducted at Vupathoor Primary Health Centre in last week of March (22/03/2011 to 29/03/2011). Six samples were selected by using purposive sampling technique. Oral consent was obtained from the subjects. The main study was conducted in Elayirampannai primary health centre at Virudhunagar district.

Pretest level of physiological lower leg oedema was checked by using Erin oedema scale. The investigator administered twenty (20) minutes of foot massage for the mothers who fulfilled the inclusive criteria. After seven days of intervention post test was done for checking the reduction of physiological lower leg oedema.

Regard to physiological lower leg odema by using Erin oedema scale, the mean value of preassessment was 2.38 and post assessment mean value was 0.58. Mean difference between the pre and post test level of physiological lower leg oedema was 1.8. Calculating physiological lower leg oedema 't' value was 7.51 which shows high statistical significant difference at $p < 0.05$ level of significant. Hence the research hypothesis H_1 is accepted at 0.05 level of significance.

CONCLUSION

The present study assessed the effectiveness of foot massage on reducing the level of physiological lower leg oedema. The result showed that there was a significant association between the foot massage on reducing the level of physiological lower leg oedema among primigravida mothers. On the basis of this study the investigator were concluded that foot massage reduces the level of physiological lower leg oedema and the reflexology technique is the best method to reduce the level of physiological lower leg oedema. It can be done by family members, no need to spend money and less skilled procedure.

IMPLICATIONS

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

Nursing practice

The nurses who all are working in the community has a key role to play in providing effective nursing care to the community includes improving the health status of antenatal mothers and reducing the level of physiological lower leg oedema, providing continuous nursing intervention and health education.

1. The nurse educates the community regarding the techniques of foot massage for antenatal mothers.
2. The nursing person must have an indepth knowledge about the techniques of foot massage and its effect of physiological lower leg oedema.
3. The nurse should educate the community about non pharmacological management for physiological lower leg oedema.
4. The nurse should explain regarding the difference physiological and pathological lower leg oedema.

Nursing Education

1. Incorporate indigenous system of medicine in the B.Sc (N) students with clinical experience.
2. To motivate the students to follow the non-pharmacological treatment modalities in community setup.

Nursing Administration

1. Collaborative with governing bodies to formulate standard policies and protocols to emphasize nursing care for antenatal mothers for reducing physiological lower leg oedema.
2. Conduct inservice education program and continuing education program for effective management among antenatal mothers in reducing the level of physiological lower leg oedema.
3. Ensure and conduct workshops, conferences, seminars on non-pharmacological methods to reduce the level of physiological lower leg oedema among antenatal mothers during third trimester.

Nursing Research

1. The research findings need to be publishing through conferences, seminars and publishing in nursing journal to the nursing staff.
2. The research findings help to build and strengthen the knowledge about the effects of foot massage to reduce the level of physiological lower leg oedema.

LIMITATIONS

1. Only limited literatures and studies were obtained from the Indian context.
2. The study is limited for 60 samples residing at Elayirampannai Primary health centre area. So generalization should be done with caution.

RECOMMENDATIONS FOR THE FURTHER RESEARCH

The study recommended the following for future research

1. A comparative study can be conducted to assess the effectiveness of continuous rotary seat pan movement and foot massage on reduction of physiological lower leg oedema among antenatal mothers.
2. A comparative study can be conducted to assess the effectiveness of water aerobics and foot massage on reduction of physiological lower leg oedema among antenatal mothers.
3. A true experimental study also can be conducted to assess the effectiveness of foot massage for reducing the level of physiological lower leg oedema among antenatal mothers.
4. A similar study can also be conducted for the leg oedema of elderly patients.
5. A study can be conducted to assess the effectiveness of water aerobic exercise on reduction of physiological lower leg oedema among antenatal mothers.
6. A further study can be conducted to assess the knowledge, attitude and practice of complementary and alternative therapies among nursing personnel.

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APPENDIX- A

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE STUDY

SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

Approved by Govt. of Tamilnadu and Indian Nursing Council / T.N.C
Affiliated to the Tamilnadu Dr. M.G.R. Medical University

K.R. Naidu Nagar - 627 753, Paruvakudi Village, Post Bag No.1, Karivalam (via)
Sankarankovil (Tk), Tirunelveli (Dt), Ph. : 04636 - 260950, Fax : 04636 - 260377. E - Mail : srikrncon@yahoo.com

31.03.2011

To

The Medical Officer,
Primary Health Centre,
Elayirampannai, Sattur (Tk)
Virudhunagar District-626201.

Ms. G.Rajeswari is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirement for the award of M.Sc (N) degree, She needs to conduct research project.

Her chosen research project is as follows **"A study to assess the effectiveness of foot massage on reduction of physiological lowering oedema among antenatal mothers during third trimester in Elayirampannai Primary Health Centre areas at Virudhunagar District, April 2011."**

She will abide by the rules and regulations of the Primary Health Centre and adhere to Primary Health Centre policies during her period of data collection. Permission may kindly be granted to her for conduction of the study at your Primary Health Centre.

Further details of the proposal project will be furnished by the student personally, Confidentiality will be ensured in the research project.

Thanking you

Yours faithfully

31/3/11

Principal
Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753. Karivalam (Via)
Sankarankovil (T.K.) Tirunelveli Dt.,

மருத்துவ அலுவலர்
அரசு ஆரம்ப சுகாதார நிலையம்
ஏழாயிரம்பண்ணை

APPENDIX- B

LETTER SEEKING EXPERTS OPINION FOR CONTENT VALIDITY OF THE TOOL

From

Miss.G.Rajeswari,
M.sc (N) II year,
Sri. K. Ramachandran Naidu College of Nursing,
K.R Naidu Nagar, Karivalam (via),
Sankarankovil (Taluk), Tirunelveli District-627753.

To

Subject: Requisition for expert opinion on suggestion for Content validity of the tool.

Respected Madam,

I am M.sc.Nursing student of Sri.K. Ramachandran Naidu College of Nursing, Sankarankovil. As a part of my course, I am doing the study of the topic mentioned below.

"A study to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during Third trimester in Elayirampannai Primary health centre at Virudhunagar district."

The research project is to be submitted to The Tamil Nadu Dr. MGR Medical university as a partial fulfillment for the requirement of M.sc (N) Programme.

I request you to kindly evaluate the tool item and give your valuable opinion and suggestion for improvement of the tool.

I would be highly obliged and thankful to hear from you.

Thanking you in anticipation,

Signature and seal of validation

Yours Sincerely,

(G.RAJESWARI)

Enclosures:

- Statement of the problem.
- Research tool.
- Scoring key.
- Self addressed envelope.

APPENDIX-C

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS

1. **Dr. Karunagara prabhu, MBBS,**
   Medical officer,
   Zaminkollankondan PHC,
   Rajapalayam.
2. **Dr.Vijay, M.B.B.S,**
   Medical officer,
   Elayirampannai PHC,
   Virudhunagar district.

NURSING EXPERTS

1. **Mrs.Padmavathy**, **M.Sc (N),**
   Principal,
   RAK College of nursing, Chennai,
   Tirupathi high way,
   Thiruvallur diistrict, Tiruthani-631209.
2. **Mrs.Diana**, **M.Sc (N),**
   Vice Principal,
   Christian College of nursing,
   Neyyoor, Kanyakumari District
3. **Mrs.Gandhimathi**, **M.Sc (N),**
   Reader,
   P.S.G College of Nursing,
   Peelamedu,
   Avinasi Road, Coimbatore District.
4. **Mrs. Margret**, **M.Sc (N),**
   Principal,
   Nehru college of nursing,
   Post box no.3, Nehru nagar,
   Tiruchendur road, Vallioor,
   Tirunelveli district, pin - 627117.

APPENDIX- D

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This to certify that **Miss.G. Rajeswari,** II year, M.Sc. Nursing student of Sri.K.Ramachandran Naidu College of Nursing, Sankarankovil, Thirunelveli has done a dissertation study on **"A study to assess the effectiveness of foot massage on reduction of physiological lower leg oedema among primigravida mothers during Third trimester in Elayirampannai Primary health centre at Virudhunagar district".** This study was edited for English Language appropriateness.

Signature

(Mr. Senthil kumar, MA. M.Ed)

APPENDIX-E

INFORMED CONSENT

Dear mothers,

Good morning. I am **Miss. G. Rajeswari**, II year M.Sc. (N) student from Sri.K.Ramachandran Naidu college of Nursing, Tirunelveli. I would like to assess the effectiveness of foot massage on reducing physiological lower leg oedema among primigravida mothers. I assure that the responses given by you will be used only for my study purpose. So please feel free to answer my questions and cooperate with my intervention (administration of foot massage) to follow. This will promote your welfare. Henceforth I request you to kindly give your full support and willingness.

Thanking you,

Signature of primigravida mothers

(Name of the Mother)

APPENDIX-F

COPY OF THE TOOL FOR DATA COLLECTION

SECTION A

DEMOGRAPHIC VARIABLES

1. Age

a. 15 -22 yrs

b. 23 -30 yrs

c. 31 -38 yrs

2. Educational status

a. Illiterate

b. Primary education

c. Secondary education

d. Higher education

e. Graduate

f. Post Graduate

3. Occupation

a. Sedentary worker

b. Moderate worker

c. Heavy worker

4. Type of family

a. Nuclear family

b. Joint family

c. Extended family

5. Family Income

a. Less than Rs.3000

b. Rs.3001-5000

c. Above Rs.5001

6. Religion

a. Hindu

b. Christian

c. Muslim

d. Others

7. Area of living

a. Urban

b. Semi Urban

c. Rural

SECTION-B

ERIN OEDEMA SCALE

Assessment of level of physiological lower leg oedema among primigravida mothers.

PRE ASSESSMENT

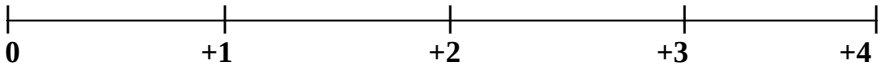
Assessment of level of physiological lower leg oedema.

POST ASSESSMENT

Assessment of level of physiological lower leg oedema after seven (7) days of intervention.

TOOL

Erin oedema scale was used to assess the level of physiological lower leg oedema. Oedema is evaluated on its ability to pit. The investigators finger is pressed into a dependent area of the mothers skin for 5 seconds. If pitting oedema is present, the finger will sink into the tissue and leave an impression after removing the finger. This pitting is graded on a scale of +1 to +4 as follows.



APPENDIX-G

SCORING KEY

Scoring key 0 to +4 was used for assessing the level of physiological lower leg oedema.

Score	Nature of oedema	Oedema assessment
0	None	No oedema.
+1	Trace	Rapid return to normal.
+2	Mild	Rebounds in a few seconds.
+3	Moderate	10-20 seconds to return to normal.
+4	Severe	>30 seconds to return to normal.

APPENDIX-H

TECHNIQUES OF FOOT MASSAGE

1. MASSAGING TOP & BOTTOM OF THE FEET

2. ANKLE ROTATION

3. TOE MASSAGE

4. TOE PULL

5. TOE SQUEEZE

6. FOOT ARCH MASSAGE

APPENDIX-I

INTERVENTION GUIDE FOR PHYSIOLOGICAL LOWER LEG OEDEMA AMONG PRIMIGRAVIDA MOTHERS

INTRODUCTION

As part of research study intervention choosen for the study was foot massage to primigravida mothers with physiological lower leg oedema.

INTERVENTION

6 techniques of foot massage was given with the help of fingertips.

PROCEDURE

Preliminaries

- Explained the procedure and its effect to the mother.
- Mother was made in supine position.
- Privacy was maintained. Assessed the pre test level of physiological lower leg oedema by using Erin oedema scale.

Intervention

- Place the mother in supine position comfortably.
- Raise the leg at 45^0 degrees.
- Six techniques of foot massage were given on the right foot for 10 minutes.
- Subsequently foot massage was applied on the left foot for 10 minutes.
- Foot massage will be given over the period of 20 minutes once in a day for seven days.

Post test

After the application of foot massage post test level of physiological lower leg oedema was assessed by using Erin oedema scale.