IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

"A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF LEG MASSAGE IN REDUCING DISCOMFORT DUE TO PHYSIOLOGICAL LOWER LEG EDEMA AMONG ANTENATAL MOTHERS ATTENDING ANTENATAL CARE (ANC) OUT PATIENT DEPARTMENT (OPD) IN SELECTED HOSPITALS AT DURG, DISTRICT (C.G.)."

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ABSTRACT

"Act like you expect to get into the end zone"

Philippians 4:13

A quasi- experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital Durg District C.G."

Background of the study: Pregnancy is presumed to be a major contributory factor in the increased incidence of varicose veins in women, which in turn lead to venous insufficiency and leg edema. Edema occurs when body fluids increase to nurture both mother and her baby and accumulate in the tissues as a result of increased blood flow and pressure of the growing uterus on the pelvic veins and the vena cava. In recent years, there has been an increased acceptance of the use of complementary therapies within the healthcare system.

Objective:

- To assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital Durg District.
- To find out the association between the level of discomfort due to physiological lower leg edema in antenatal mothers attending ANC OPD with selected socio demographic variable.

Methods: The research design adopted was Pre experimental one group pretest post-test design. The sample size was 60 antenatal mothers with physiological lower leg edema in Durg District Hospitals. Non probability purposive sampling technique was used in this study. Those who fulfilled the inclusion criteria were selected for this study. The risk factors of physiological lower leg edema were assessed by questionnaire. Pretest was done using self-structured discomfort measuring tools. Intervention of leg massage was given for 10 minutes in each leg and post-test assessment was done after 1 week of intervention.

Result of the study: The post-test day1 mean value (8.65), post-test day 2 mean value (6.15) and post-test day3 mean value (4.60) were lower than the pre-test means value (10.7) and post-test day 3 and day2 values were lower than post-test day1 mean value. The obtained paired' test values (19.69) are higher than the tabulated value (1.68) ($P<0.05$) was highly significant. Post test day1 revealed that among 40 antenatal mothers, 2 mothers (5%) had mild edema, 36mothers (90%) had moderate edema, 2mothers (5%) had severe edema. Post test day2 revealed that 27mothers (67.5%) had mild edema, 13mothers (32.5%) had moderate edema. Post test day3 revealed that 4mothers (10%) had no edema and 36mothers (90%) had mild edema. There was no significant association between the degree of physiological lower leg edema and selected demographic variables like age, education, occupation, area of living, type of family, height, BMI, obstetrical score, gestational weeks except weight. Biophysical and biochemical parameters and the risk factors of physiological lower leg edema except intake of water.

Conclusion: Physiological lower leg edema is a very common problem among antenatal mothers and they are some risk factors associated with it. Leg massage is an effective and inexpensive measure to reduce the degree of physiological lower leg edema among antenatal mothers. The study concluding that leg massage is significant in reducing the risk factors of physiological lower leg edema during pregnancy among antenatal mothers.

Key words: Leg massage, Antenatal mothers, Physiological lower leg edema.

CHAPTER – 1

INTRODUCTION

1.1 Background of study

"A baby is something you carry inside you for nine months, in your arms for three years, and in your heart until the day you die"

Mary Mason

Pregnancy and the associated changes are a normal physiological process in response to the development of the fetus. These changes happen in response to many factors; hormonal changes, increase in the total blood volume, weight gain, and increase in fetus size as the pregnancy progresses. All these factors have a physiological impact on the pregnant woman: the musculoskeletal, endocrine, reproductive, cardiovascular, respiratory, nervous, urinary, gastrointestinal and immune systems are affected, along with changes to the skin and breasts. The full gestation period is 39-40 weeks, and a pre-term birth is classed as delivery before 37 weeks gestation, although there is variation internationally and it is thought that the length of human pregnancies also varies naturally. **(Gloria Noble khan2023)**

Pregnancy is a natural process of approximately forty weeks that begins with fertilization and ends with the birth of the fetus. Physiological, anatomical, and hormonal changes occur throughout the body to maintain physical and metabolic balance during pregnancy. These adaptive changes appear as pain due to the change in the center of gravity, musculoskeletal disorders, and soft tissue edema. Pain during pregnancy is mostly seen in the waist, pelvic, and leg regions. Lumbar lordosis and increased anterior pelvic tilt of the pelvis cause knee and ankle extension. Knee problems manifest as ligament laxity in the knee increases in the second trimester of pregnancy. In a study, it is stated that the risk of musculoskeletal problems during pregnancy is increased by changes in hormones and physiological changes during pregnancy. While this pain causes pain in all lower extremity muscle groups, the gastrocnemius muscle is often affected. Studies indicate that pregnant women experiencing pain in their lower extremities and lower back who receive education and physical therapy during their pregnancy experience reduced pain and impairment. Stretching, self-mobilization techniques, back strengthening, and postural changes are all included in physical therapy. By stimulating certain body areas, soft tissue massage is a type of physiotherapy that helps relieve a variety of aches and pains, as well as tension, exhaustion, and illnesses, intending to revive the body's vital energy circulation Another important condition frequently encountered during pregnancy is edema. During pregnancy, the body physiologically retains water and sodium due to the increase in circulating plasma volume, decrease in osmolarity, and changes in hormones. The resulting increase in extracellular fluid causes pathological edema. In addition, as the uterus grows, it puts pressure on the inferior vena cava, causing edema in the lower extremities. One-third of the edema is in the lower extremities and they encounter this complaint more in the last trimester **(Gimunová *et al*.2020**)

During pregnancy it is reported that 95.5% of 140 pregnant women had foot edema. Also, an increase in lower extremity and ankle circumference due to edema was observed in 83% of pregnant women. In pregnant women, the severity of symptoms such as night cramps, bloating, pain, and fatigue may increase due to edema in the lower extremities. Women with leg and foot edema can be treated non-pharmacologically using leg elevation, relaxing, immersion in water, bandaging, compression stockings, foot massage, intermittent pneumatic compression, reflexology, and interstitial fluid movement monitoring. Foot massage is a typical non-pharmacological technique used by medical professionals**. (Merve Yilmaz Menek 2024)**

Lower limb edema is a common and challenging diagnostic problem often with a significant impact. It is defined as swelling caused by an increase in interstitial fluid that exceeds the capacity of physiologic lymphatic drainage. In most cases it occurs when fluid accumulates in subcutaneous tissues leading to volume expansion, although congenital etiologies and lipedema may result in excessive soft tissue in the lower

extremities. Fluid collection can be a result of many etiologies including a range of local or systemic disorders, including infra-inguinal superficial and deep venous reflux, supra and infra inguinal deep vein obstruction, and primary and secondary lymphatic diseases. Although the most likely singular cause of unilateral lower limb edema in individuals over 50 years old is venous disease, the etiology is often multifactorial. Symptoms can be debilitating and subsequently impact quality of life with significant costs to society. Recent work has demonstrated that chronic edema negatively impacts physical and psychological health and reduces quality of life. As such, in this opinion article, we propose a practical diagnostic approach to accurately and efficiently identify the causes of chronic edema in affected patients and to institute appropriate therapy. **(Antonios P Gasparis 2020)**

Pregnancy brings a new meaning to the concept of beauty. It is a period of immense joy coupled with excitement. The feeling of carrying a little soul within is magnificent. It can be a single soul or more than that. **(Ayeesha., 2016)**

Edema occurs when body fluids increase to nurture both mother and her baby and accumulate in the tissues as a result of increased blood flow and pressure of the growing uterus on the pelvic veins and the vena cava which are the large vein on the right side of the body that returns blood from the lower limbs to the heart. This causes the mother to experience this increase in swelling particularly swollen ankles and feet. At times there may be more swelling in the feet if the weight gain of the mother has been on the faster side**. (Penny., 2017)**

Edema can be caused by a problem with the circulatory system, the lymphatic system or the kidneys. It is not always a sign of a heart or circulation problem. There can be an experience of swelling due to fluid buildup from being overweight, being inactive, after sitting or standing for a long time, or wearing tight stockings. It can also be caused by inflammation in leg tissues. Inflammation may be a normal response to injury or disease, or it may be due to rheumatoid arthritis or another inflammatory disorder. There will be a feeling of pain with inflammation**. (Kelly., 2016)**

Pregnancy causes anatomic and physiologic changes in the lower extremity, resulting in a variety of symptoms. Edema is the accumulation of fluid in intercellular tissue. The interstitial and intravascular fluid are controlled by hydrostatic and the colloid oncotic pressure (COP). Fluid accumulation occurs when local or systemic conditions disrupt the balance The pressure on the pelvic vein and the inferior vena increases as the uterus grows in size. This causes venous insufficiency and leg edema by raising blood pressure in leg veins. Lower extremity edema occurs as a result of increased venous pressure in the legs, lymphatic blockage, and decreased plasma COP. Varney defines gestational edema as the buildup of extra fluid in the tissues without the presence of hypertension or proteinuria. The mechanical pressure of gravid uterus on the inferior vena cava and iliac veins might create physiological lower leg edema, which inhibits venous return and also increased body fluids to accumulate in the tissues. Prostaglandin in also induces vascular relaxation and reduces plasma COP, that endorses fluid movement from the vascular to extravascular space. Leg edema is a common condition during pregnancy, limiting pregnant women's activities. It can impact about 80% of pregnant women and should not be misinterpreted as an indication of pregnancy-related hypertension or preeclampsia. Swelling of lower extremities occurs in 35 to 80% of all normal pregnancies in late pregnancy. The study in Lahore, Pakistan (2015) reported a 67% prevalence of edema in pregnant women, with49% of legswelling,33% of sacral edema, and14% of edema in both areas. After long durations of standing and with each subsequent pregnancy, symptoms tend to intensify**. (Fatemeh Mollaelahi et al., 2022)**

Leg massage, specifically foot massage, has been shown to be an effective and safe methods for reducing physiological lower leg edema in pregnant women during the third trimester. The type of massage helps to improve circulation and lymphatic drainage, which can alleviate the swelling caused by fluid retention in the lower limbs.

Pregnancy is presumed to be a major contributing factor in the increased incidence of varicose vein in women, which in turn leads to venous insufficiency and leg oedema. Oedema occurs when body fluids increase to nurtured both mother and her baby and accumulation in the tissues as a result of increased blood flow and pressure of the growing uterus on the pelvic vein and the vena cava. In recent years, there has been an increased acceptance of complementary therapies within the healthcare system. Massage has been a vital part of prenatal and postnatal care across different cultures in countries. Leg massage is an effective and inexpensive measure to reduce the level of physiological lower leg oedema. Leg massage should become a routine activity among antenatal mothers with physiological lower leg oedema. There are many benefits of massage therapy, such as relaxing and relieving muscle spasms and improve circulation. It also helps a healthier lifestyle free from discomfort and pain associated with swelling**. (Ms. Kalyani Ambre 8 August 2023)**

1.2 Need of the study

The swollen ankles are a normal, though frustrating, for many expectant women. During pregnancy, the extra fluid in the body and the pressure from the growing uterus can cause swelling or edema in the ankles and feet. The swelling tends to get worse as a woman's due date nears, particularly near the end of the day and during hotter weather. For annoying swollen ankles, simple steps like avoid standing for long periods, stretching often when sitting for long periods, lying on left side when sleeping, wearing maternity support stockings helps in the reduction of edema. **(Schroth., et al. 2018)**

Physiological lower leg edema is found in about 80% of all pregnancies, occurring in late pregnancy. It occurs as a result of the pressure of the gravid uterus, which impedes venous return; prostaglandin-induced vascular relaxation; and reduced plasma colloid osmotic pressure. Dependent physiological lower leg edema (water retention in the interstitial space of the lower limbs) is a frequent and unpleasant accompaniment to pregnancy, causing discomfort, a feeling of heaviness, night cramps and painful paresthesia**. (Ayden., 2020)**

In recent years, there has been an increased acceptance of the use of complementary therapies within the healthcare system. The use of non-pharmacological interventions to complement modern technological medicine is proving popular among nurses and midwives in clinical practice. Leg massage is an example of an intervention that can be used for specific conditions such as leg and foot edema as it moves extravascular fluid without disturbing intravascular fluid. **(Tuna N., 2019)**

Pregnancy is a physiological condition that brings numerous anatomical and physiological changes in the body. One of the common discomforts experienced by antenatal mothers, especially in the second and third trimesters, is **physiological lower leg edema**, resulting from increased blood volume, hormonal influences, and pressure exerted by the growing uterus on the venous system **(Dutta, 2018; Fraser & Cooper, 2015).**

Studies conducted internationally and in India have reported that regular lower leg massage during pregnancy significantly reduces edema and discomfort levels**. Chang et al**. (**2012)** demonstrated that daily 20-minute leg massage for pregnant women effectively decreased lower leg swelling and improved sleep quality. Similarly, **Kavitha and Jayanthi (2018)** found that leg massage was effective in reducing lower limb edema among antenatal mothers in Indian hospital settings.

Pregnancy is a physiological condition associated with numerous anatomical and physiological changes. One common issue experience by antenatal mothers, particularly in the second and third trimesters, is physiological lower leg edema. This condition result from hormonal changes, increased blood volume, and pressure exerted by the growing uterus on the venous system, which impairs blood return from the lower limbs.

Lower leg edema can cause significant discomfort, including heaviness, pain tightness and reduce mobility. Although it is generally non pathological, if unmanaged, it can severely affect a pregnant woman’s quality of life and day to day functioning.

Leg massage is a non -pharmacological, low cost, and easily administered intervention that may help improve venous and lymphatic return, reduce swelling, and relieve discomfort. Despite its potential benefits, leg massage is often underutilized or not integrated into routine antenatal care, especially in certain districts in India, including Durg.

Limited empirical evidence is available in the Indian context regarding the effectiveness of leg massage in reducing edema related discomfort during pregnancy.

Therefore, this study is essential to:

- **Generate evidence** on the effectiveness of leg massage as a supportive care method.
- **Encourage non -invasive nursing intervention** in ANC practices.
- **Empower antenatal mothers and healthcare providers** with simple, practical solution to improve maternal comfort.
- Potentially **reduce the dependence on pharmacological intervention** or referrals especially in primary healthcare settings.
- Leg massage therapy can also bring relief in physiological lower leg edema as a part of treatment. Several studies were done on foot and lower leg massage in reducing lower leg edema physiologically, reported antenatal mothers experienced no pain and better grip strength, they also had less anxiety, sleep problems.
- There are many benefits of massage therapy, such as increasing blood circulation, reducing swelling, relaxing muscles, and relieving muscle spasms. Massage therapy focuses on the specific parts of the body where the swelling occurs, such as feet, ankles, or legs. It helps you experience a healthier lifestyle free from discomfort and pain associated with swelling. Studies indicate that massage therapy performed during pregnancy may reduce symptoms of depression, ease muscle aches and joint pains, and improve labor outcomes and newborn health.

1.3 Problem statement

"A quasi – experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending Antenatal care (ANC) Outpatient Department (OPD) in selected hospital at Durg district C.G."

1.4 Objectives of the study

- To assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital Durg District.
- To find out the association between the level of discomfort due to physiological lower leg edema in antenatal mothers attending ANC OPD with selected socio demographic variable.

Hypothesis

- **Null hypothesis H0 –** There will be no significant difference in the level of discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD before and after Intervention in the selected hospital Durg District.

- **H1 –** There will be significant difference in the level of discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD before and after Intervention in the selected hospital Durg District.

- **H2 –** There will be a significant association between post -test level of discomfort and selected demographic variables such as age, gravida, occupation among antenatal mothers.

1.4 Operational definitions

Leg massage – Massaging in circular motion the foot and lower leg to reduce physiological lower leg edema among antenatal mothers from 3rd trimester.

Effectiveness: It refers to the outcome of leg massage on physiological lower leg edema among antenatal mothers.

Physiological lower leg edema: Fluid collection in the lower leg during the third trimester due to increased retention of fluid in the interstitial. Also, the enlarging uterus causes mechanical obstruction to the IVC and pelvic veins causing reduced venous return.

Antenatal mother: All pregnant mothers in the 3rd trimester admitted in the antenatal ward in Durg district hospital.

1.6 Assumptions

- Antenatal mothers in the third trimester may have physiological lower leg edema due to certain risk factors.

- Leg massage may have some effect on physiological lower leg edema among antenatal mothers.

DELIMITATION OF THE STUDY

1. The study is delimited to antenatal mothers only, specifically those in the third trimester, experiencing physiological lower-leg edema.
2. The setting is restricted to the Antenatal Care (ANC) Outpatient Department (OPD) of a selected hospital in Durg district, Chhattisgarh, therefore findings cannot be generalized to other settings.
3. Only mothers with physiological (normal pregnancy-related) edema are included; those with pathological or medically complicated edema (e.g., pre-eclampsia, cardiac or renal disorders) are excluded.
4. The study is limited to a quasi-experimental one-group pre-test post-test design; no control group is used for comparison.
5. The intervention is limited to lower-leg massage only, excluding any other therapeutic approaches (compression therapy, foot elevation protocol, medications, etc.).
6. The duration of intervention and data collection is limited to 6 days, and results may not reflect long-term effectiveness.
7. The sample size is restricted to 60 antenatal mothers, which may limit the generalizability of the findings.

8. The study tools are restricted to a discomfort assessment scale and measurement of leg circumference, using only those variables considered relevant by the researcher.
9. The study is delimited to specific sociodemographic variables chosen by the researcher (e.g., age, parity, gestational age, etc.).

1.7 Conceptual Framework

Conceptualization is the process of forming ideas, designs and plans. A conceptual framework deals with the concepts assembled together by virtue of relevance to the research problem, which provides a certain frame of reference for clinical practice, research and education.

The conceptual frame work of the present study is based on the Dorothea Orem theory. This study was based on the concept that leg massage helps to reduce degree of physiological lower leg edema among antenatal mothers of third trimester. Dorothea Oram was a prominent American nursing theorist best known for developing the Self – Care Deficit nursing Theory, which has had a profound impact on nursing education and practice.

Main concept of Orem's theory:

- **S**

  elf- Care – The practice of activities that individuals initiate and perform on their own behalf to maintain life, heath, and well-being.

- **S**

  elf-care Deficit – Occurs when a person is unable to meet their own self care needs.

- **N**

  ursing system – How nursing helps the patient, based on their level of ability.

  - W

    holly compensatory- Nurse does everything for the patient.

  - P

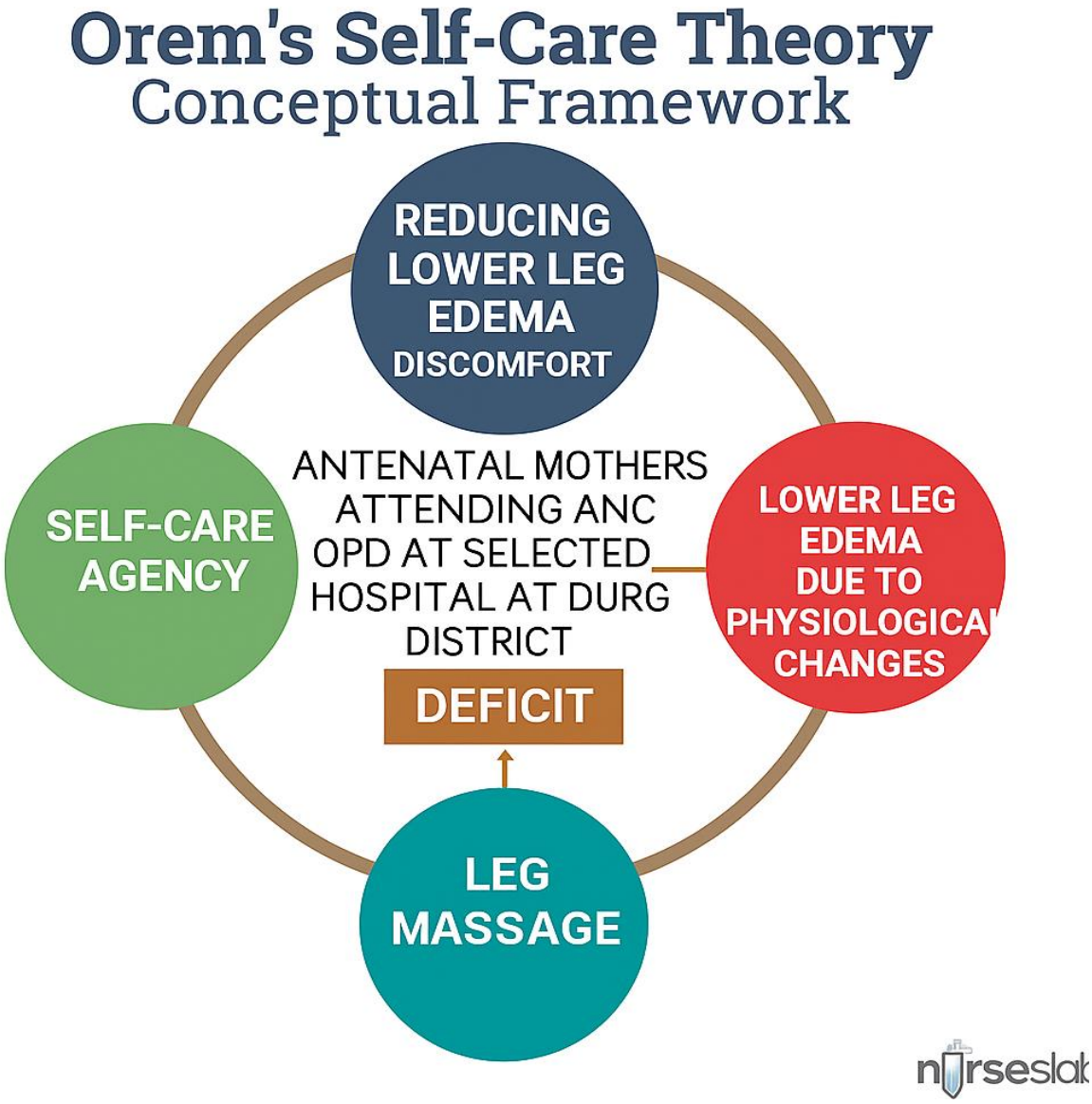
    artially compensatory – Nurse and patient share care activities.

  - S

    upportive education – Patient can care for themselves but needs

Orem's concept	Application in present study
Self-care	Antenatal mothers should maintain comfort and prevent swelling in the legs.
Self-care deficit	Due to pregnancy changes, mothers experience lower leg edema and discomfort.
Nursing system (Supportive	Nurse provides leg massage and educates mothers about its importance in

educative)	reducing edema.
Nursing intervention	Leg massage helps improve blood circulation and comfort.
Expected outcome	Reducing in discomfort and edema, improvement in self-care ability and well-being.



SUMMARY OF CONCEPTUAL FRAMEWORK

- The study is based on Orem's self-care Deficit theory.
- Antenatal mothers have a self-care deficit due to physiological edema.
- The nurse uses a supportive educative system (leg massage) to help meet the self-care need.
- The outcome is reduction and improve maternal comfort.

CHAPTER-II

REVIEW OF LITERATURE

A literature review is the critical analysis of segment of published research studies, reviews of literature, and theoretical articles. A literature review is an evaluation report of studies found in literatures related to selected areas. The review should describe, summarize, evaluate and clarify the literature. It should give a theoretical basis for the research and help to determine the nature of research. A literature review goes beyond the search for information and includes the identification and articulation of relationships between the literatures and field of research.

This chapter consists of literature and research studies related to:

2.1 Studies related to risk factors of physiological lower leg edema

2.2 Studies related to the effect of leg massage on physiological lower leg edema

2.1 Study related to risk factors of physiological lower leg edema.

Lower leg edema is common in the afternoon even in healthy individuals and could involve venous blood flows. Women appear more likely to develop lower leg edema. Possibly due to menstrual cycle however, this phenomenon has not been quantitatively investigated using imaging. This study therefore used sonography to investigate sex dependent impact on physiological lower leg edema in relation to venous blood flow in the legs and the menstrual cycle.

(Yoriko, Tomonori kishino et al., May12, 2025)

The objective of this study was to determine the occurrence of edema in the natal and post-natal period, risk factors, and their association with edema. An observational study was conducted. Out of405 females, 18 – 35 years of age and 3rd trimester of gestational or post-natal period and women with previous venous disease or high-risk gestations were included. women with edema in other body parts and those after puerperium were excluded. The data was collected by self-structed questionnaire, edema grading scale, and limb measurement. Data was analyzed by SPSS 23(Statistical package for the social sciences). the frequency of leg edema was 65.9%and higher in the third trimester, especially during the eighth and nine months of pregnancy.it could lead to several other symptoms like pain and cramps that could be intensified by prolonged standing and comforted through rest. At the same time, a few other factors that affect edema include less water intake and lack of exercise. There is significant association between edema and its related risk factors including months of pregnancy, exercise during pregnancy, and activity level($p<0.001$). **(RafiqueA, Afzal K et al.,2023 October)**

Older people are at risk of chronic edema that increases morbidity and reduces quality of life. this retrospective study aimed to explore the prevalence, characteristics, and risk factors of chronic edema in older community dwelling people. non health professionals completed routine screening of older people receiving community age care between 2020 and 2022, including a 10 second pitting test to detect foot and ankle edema, age, gender, comorbidities, mobility and care levels. participant characteristics was described and unadjusted analysis and logistic regression were completed to explore factors associated with edema.

there were 459 older adult receiving community care with a mean age of 80.3 years and 68.6 where female prevalence of chronic edema was 38.1% (n= 175) and 85.4% (n=147) had bilateral edema. An increased risk of edema was associated with having chronic heart failure and using a mobility aid.

Older people are at risk of chronic edema and early detection may prevent complications. non health professionals can perform screening boosting workforce capacity. **(O'ConnorMA et al. 11 December 2024)**

A descriptive study was conducted to assess risk factors and to analyze methods applied in the prevention and treatment of lower limb edema in pregnant women with a particular focus on compression therapy and exercise among 54 women. Women were assigned in 2 groups either to a group with swellings of lower limbs during pregnancy, located mostly in the region of feet and lower legs and to a group without edema. The analysis has led to a conclusion that there is a link between the occurrence of edema during pregnancy on the one hand and the pre gravidity episodes of venous conditions (vascular insufficiency and thrombosis, $p<0.05$) and the lack of physical exercise during pregnancy ($p=0.01$) on the other hand. Only 33% of the analyzed women applied compression therapy during pregnancy; a half of them continued to apply compression during the postpartum period. Compression therapy in combination with proper physical exercises appears to be an effective means to prevent and treat venous thrombosis and lower limb edema in pregnant women**. (Katarzyna Ochalek K, et al., 2017).**

Patients with limb edema are frequently referred to vascular specialists for evaluation multiple etiology must be considered and often more than one cause may be present. The role of lymphatic system regardless of the underlying pathology has been underestimated. A thorough history and physical examination and a carefully considered laboratory and imaging evaluation are critical in differentiating causes. In this opinion article, we propose a diagnostic algorithm that incorporates a systematic approach to the patient with leg swelling and provide an efficient pathway for the differential diagnosis for this problem.

A complete physical examination is as essential to the clinical history in establishing the etiology of swelling. Although the main complaint is in the lower limbs, evaluation of the heart, lungs, and abdomen are important to assess for systematic etiologies or contributing factors. Increase jugular venous distention or crackles in the lungs may be due to heart failure, a distended abdomen with ascites or scleral icterus suggests hepatic disease, and abdominal incision can reveal past surgeries. Extensive prominent vein in the lower abdomen may be a sign of inferior vena cava occlusion. obesity with a large abdomen also may contribute to bilateral lower limb edema. **(Antonios P Gasparis 6 July 2020)**

The main risk factors for the development of lower extremity lymphedema after cervical cancer treatment are controversial. Our aim was to evaluate the main risk factors of lower extremity lymphedema after cervical cancer treatment.

Early-stage cervical cancer is mainly treated by surgery, often accompanied by pelvic lymphadenectomy. The standard treatment for advanced cervical cancer is radiotherapy and chemotherapy which although having a good therapeutic effect, can affect lymphatic drainage and result in lower extremity lymphedema. Lymphedema is defined as dysfunction of the lymphatic system and is diagnosed by subjective or objective methods when the body tissue contains excessive protein rich interstitial fluid, it led to increased limb Volume. Lower limb lymphedema is characterized by swelling, unilateral or bilateral heaviness, pain, purities, numbness, skin changes, infection ect. The condition affects the patient's activities of daily life, and seriously affects quality of life. **(Hongyuan Hu, Mingru Fu 11 July 2022)**

The most common causes of edema in pregnancy are physiologic edema results from hormones induced sodium retention. Edema may also occur when the enlarged uterus intermittently compresses the inferior Vena cava during recumbency, obstructing outflow from both femoral veins. Pathologic Causes of edema are less common but often dangerous. They include preeclampsia deep venous thrombosis (DVT), peripartum cardiomyopathy. DVT is more common during pregnancy because pregnancy is a hypercoagulable state, and women may be less mobile. preeclampsia is a type of pregnancy induced hypertension. Not all women with preeclampsia develop upper extremity or facial edema. peripartum cardiomyopathy is a rare but serious condition. it can cause other nonspecific symptoms of pregnancy, including dyspnea and fatigue when extensive Cellulitis which usually causes focal erythema may resemble general edema. **(Emily E. Bunce, Robert P. Heine July 2023)**

A cross-sectional assessment study was conducted to analyze the stress scores among the outpatients of a tertiary care hospital who come for regular antenatal checkup. The women at the gestation weeks between 28 to 34 weeks agreed to participate in the study. They were interviewed to assess the perceived stress score. Among the total patients 57.7% were primigravida and the mean score on perceived stress scale was 13.5±5.02. The majority of the group (102; 65.4%) scored higher than the mean value of total score on the perceived stress scale. Unplanned pregnancy and husband's employment status were associated with high levels of perceived stress in multivariate analysis in this set of women**. (Anuja Abraham, 2015)**

Non-pharmacological methods are primarily recommended for the treatment and care of pregnant women with restless legs syndrome. This study aimed to determine the effectiveness of non-pharmacological methods in reducing the severity of restless legs syndrome and improving sleep quality in pregnant women, based on the results of previous studies. **Method -** A systematic review and meta-analysis of randomized controlled trials and quasi-experimental studies was conducted. Studies published between 14 February 2022 and 22 March 2023 in Digipak, Turkish Clinics, ULAKBIM, Higher Education Council National Thesis Center, ProQuest Dissertations, EBSCOhost (Medline, CINAHL), OVID-LWW, Web of Science, PubMed, Scopus, and ClinicalStudys.gov databases were identified by keywords. **Results:** Six articles with a total sample size of 359 (intervention group: 312; control group: 107) were included in the meta-analysis. The combined results of these studies showed that non-pharmacological methods significantly reduced the severity of restless legs syndrome (MD: -13.00, Z = 7.29, P < .0001). In the subgroup analysis performed based on the type of intervention methods used, relaxing background music, progressive muscle relaxation exercises, sleep hygiene training, and hot and cold-water applications were found to be effective. In addition, this meta-analysis showed that non-pharmacological methods significantly improved sleep quality (MD: -3.73, Z = 12.49, P < .00001). **Conclusion:** By using a non-pharmacological method with proven effectiveness, it is possible to reduce the discomfort associated with pregnancy-related restless legs syndrome and improve sleep. **(Ozlem Kaplan, Muruvvet Baser et al.,2024)**

Pregnant women experience restless legs syndrome and intervention studies are needed to prevent this. This study evaluated the effect of hot and cold-water applications on the severity of restless leg syndrome and sleep quality in pregnant women. **Methods:** It is a randomized controlled trial. The subjects comprised 80 (hot water group = 26, cold water group = 27, control group = 27) pregnant women. Pregnant women in intervention groups applied hot or cold water to their legs before going to bed for seven days. The control group did not do any application other than routine care. The data were collected with the Restless Legs Syndrome Diagnostic Form, Personal Information Form, Restless Leg Syndrome Severity Grading Scale, The Pittsburgh Sleep Quality Index, Application Satisfaction Form, and Post-Application Follow-up Chart. **Results:** While the Restless Legs Syndrome Severity Grading Scale and Pittsburgh Sleep Quality Index pre-test scores of the groups were similar (P > .05), the post-test scores were lower in the intervention groups than in the control group (P < .001). The effect of the applications started on the second day and the level of satisfaction with the application was similarly high in both groups (P < .05). During the follow-up, the syndrome severity scores of both the intervention groups were similar (P > .05), while the sleep quality of the cold group was better (P < .05) and most of the pregnant women did not need reapplication and they were satisfied with the application (P < .05). **Conclusion:** These safe interventions reduced the severity of restless legs syndrome in pregnant women and improved the quality of their sleep. Nurses can use these applications in pregnancy care, which begin to show effect in as little as two days.

Lower limb edema with its accompanying subjective ailments has been increasingly frequent in gravid women and in the postpartum period. The management is essentially non-interventional based on compression therapy (CT) with physical exercise adapted to the severity of venous disease and edema. A case of lower limb edema in a woman in the thirty third week of pregnancy was described. CT including compressive bandaging (CB) by short-stretch bandage and compression garments (CG) with physical activity was applied. Edema

volume reduction, changes in consistency from hard to mild in palpation and reduction of accompanying ailments by use of CB after two weeks were observed. Further improvement by use of CG before and after delivery, and 3 years later was confirmed. Compression and physical exercise have a positive impact on edema reduction and leg symptoms intensity during pregnancy and should be recommented. **(Katarzynz Ocholek Journal of vascular nursing volume 39 Issue 2, June 2021**

Leg -edema from venous insufficient is not dangerous but it can cause women symptoms such as pain, feelings of heaviness, night cramps and paranesthesia. Leg edema can be a sign of pre-eclampsia when associated with raised blood pressure or proteinuria The objective of this review was to assess the effects of treatment to relieve the symptoms associated with varicosity in pregnancy and to reduce leg oedema. We searched the Cochrane Pregnancy and childbirth Group trials register in October 2004 for randomized trials of any form of treatment for varicosity and or leg oedema in pregnancy. Trial quality was assessed and data were extracted. Four trials of three different treatments were included. In one trial, women given rut side capsules in the last 3 months of pregnancy noted an improvement in symptoms compared with placebo (relative risk 0.54 95% CI 0.32, 0.89). They had a decrease in ankle circumference at 36 weeks' gestation after 8 weeks of treatment, while women given placebo had a small increase. In one trial, women with ankle edema had a small non-significant reduction in lower leg volume when treated with external pneumatic intermittent compression for 30 min. In another trial compression stocking prophylactically reduced the emergence of leg symptoms but not venous varicosities (relative risk 0.74 95% CI 0.59, 0.93). Lymphatic reflexology was studied in too few women to draw conclusions. In conclusions, rut sides appear to relieve symptoms of venous insufficiency in late pregnancy. However, it is not known if the drug is safe in pregnancy. External pneumatic compression appears to reduce ankle swelling and compression stockings reduce leg symptoms but not varicose veins**. (Anthony Akinloye Bamigboye volume 129 issue 1 November 2020)**

Lower limb edema associated with venous disorder is an increasingly common problem in pregnant women. The study aimed to assess the use of compression class 1 in lower limb edema and chronic venous disease (CVD) prevention in pregnant and postpartum women. pregnant women (second trimester) were randomly recruited into either a study group CG with compression or control group both with physical activity recommendation. The assessment concerned venous system condition, limb size and compression comfort. Edema was diagnosed as > 10% measurement increase. **(Aleksandra Frydrych Szymonik, International Angiology 2024 October)**

Edema in pregnancy often occurs. Nearly 80% of all pregnancies can occur in leg edema which is a small problem that can provide initial symptoms for various diseases and pathological conditions and can be an indicator of serious chronic disease. Various methods of management to prevent and treat edema in pregnancy are by compression stocking and foot massage. The purpose of this study was to analyze the effect of foot massage and compression stocking on pain intensity and the degree of edema in pregnant women Trimester III. The type of research is quasi experiment and using a pretest-posttest control group design with 3 treatment groups, namely foot massage, compression stocking and a combination of foot massage and compression stocking. The population of this study was all Trimester III pregnant women with edema in Pekanbaru City. The sampling technique used purposive sampling with inclusion criteria. This research was conducted on April 9 to September 15, 2018 in Pekanbaru City Health Center namely Rumbai Health Center, Umbansari Health Center and Melur Health Center. Data analysis using Annova Test. The results showed that in the combination group of foot massage and compression stocking the decrease in the average pain intensity was 1.8 and the decrease in the average degree of edema was 1.6 mm. There is the effect of foot massage, compression stocking and a combination of foot massage and compression stocking on pain intensity and degree of edema (p -value = 0.00. The group that most significantly reduces pain intensity and the degree of edema is a combination of foot massage and compression stocking. Recommended for health workers in order to use the method of foot

massage, compression stocking and a combination of foot massage and compression stocking in preventing and reducing edema in pregnant women. **(Hevrialni R Published 15 September 2022)**

2.2 Studies related to the effect of leg massage on physiological lower leg edema.

Venous insufficiency leads to bilateral lower extremity edema in advance healthy pregnancies affecting women's quality of life by generating variety of discomfort, the most of which are pain. Cramps and heaviness. the goal of study was to collect evidence of how well therapeutic massage reduce the typical physiological edema of the ankle and foot that develop in late pregnancy. The study aimed to assess the effectiveness of therapeutic massage in reducing physiological ankle and foot edema during late pregnancy. Methods: A two -group randomized control trial was performed on 264 pregnant women between 28-38 weeks gestation devoid of any complication in outpatient clinic of a tertiary care hospital. In each group 132 participant were assigned to routine care and therapeutic massage groups through simple randomization. Result: The response rate was 90.2%. both treatments were found significantly effective in reducing ankle and foot edema ($p<0.0001$) in late pregnancy. However, all bilateral mean measurement of the massage group confirmed greater decrease in edema as compared to the routine care group Conclusion: therapeutic massage was found to be a more effective and superior alternative to routine care to combat physiological lower extremity edema during late pregnancy**. (Gloria Noble Khan, Shehla Naeem Zafar et al.,5 November 2023)**

Pregnancy brings a new meaning to the concept of beauty. It is a period of immense joy coupled with excitement. The physiological transition from being pregnant women to becoming a mother means an enormous change for each woman both physically and psychologically. It is a time when each and every system in the body is affected and the experience, though unfortunately not joyous for all. The overall prevalence rate of physiological lower leg oedema during pregnancy is 8.5%. Leg massage is an example of an intervention that can be used for specific conditions such as leg and foot oedema as it moves extravascular fluid without disturbing intravascular fluid. Materials and methods used: The quantitative research approach was used; the study was conducted at selected hospitals. The research design adopted for study was experimental two group pre-test post-test design to assess the effect of leg massage on physiological lower leg oedema among antenatal mothers admitted in antenatal ward of selected hospitals. Purposive sampling technique was used to select 60 antenatal mothers among that 30 samples were for control group, 30 samples for experimental group pre- test given to both group and intervention was given to experimental group, for 4 days on 5th day post -test was taken. Erin Oedema scale was used to assess the level of physiological lower leg oedema. Data was analysis by using descriptive and inferential statistical. Result: The mean post test score of control and experimental group shows that reduction in physiological lower leg oedema score, this is statistically significant as evidence from m $p= <0.0001$ at 0.0005 level Conclusion: The finding of this study leg massage was effective in reducing physiological lower leg edema among antenatal mothers**. (Ms. Kalyani Ambre, Ms. Jessey Jacob et al.,8 August 2023)**

A quasi-experimental study was conducted to determine the effect of leg massage on physiological lower leg edema level among antenatal mothers. The study was conducted at OBG Department in Menoufia University Hospital. A purposive sample of sixty-four mothers who were under third trimester was assigned alternatively & randomly into two equal groups. Thirty-two patients for each group (study &control). An interviewing questionnaire to assess socio demographic data. The results showed that there was statistically significant reduction in the degree of physiological lower leg edema among study group rather than control group after leg massage. There was no significant relation between edema degree and gender, education and marital status. So, leg massage has a positive effect on reducing degree of physiological lower leg edema among antenatal mothers**. (Amal El. Shehata, et al., 2016).**

An experimental study was conducted to test the impact of leg massage on the level of physiological lower leg edema among antenatal mothers. Sample comprised 30 antenatal mothers selected by purposive sampling method. Pre-assessment edema degree, heart rate, and blood pressure were recorded. Leg massage with low stroke manipulations was applied on each leg of the subject for 15 minutes. The result showed that there was a significant difference between pre- and post-leg massage lower leg edema score, heart rate, and blood pressure ($P<0.05$). The study concluded that leg massage is an effective non pharmacologic measure in reducing physiological lower leg edema. **(Muller, 2016).**

Leg edema is a prevalent problem in pregnancy causing activity restrictions for pregnant women. This study was performed to compare the effect of foot massage using grape seed oil and sweet almond oil on physiological leg edema. Methods: A randomized clinical trial was conducted on 90 primigravidae referred to public health centers of Zahedan, Iran. The participants' gestational age was 30–40 weeks. The study was conducted from August 2016 to November 2017. The participants were randomly assigned to three groups (massage with grape seed oil, massage with sweet almond oil, and without intervention). After determining the extent of leg edema, foot massages were done for 20 minutes within 5 days in the two intervention groups. Then, foot circumferences were measured on day 5 after the intervention. Foot circumferences for the control group were measured on days 1 and 5. A nonelastic tape measure was used to measure the circumferences. To analyses the data, SPSS 21 software and statistical tests including one-way ANOVA, Tukey's test, and paired *t*-test were used.

The results from this study showed a significant difference in the mean score change of foot circumferences between groups (P=0.001). According to the results of Tukey's test, mean score changes of foot circumferences of both intervention groups were significantly different those of the control group. However, this difference was not significant between the two intervention groups (P=0.865**). (Maryam Navaee, Marzieh Rarzieh Rakhshkhorshid 13 January 2020)**

Physiological lower leg oedema is one of the cutaneous manifestations of pregnancy. The weight gain during pregnancy and gravity slows down the circulation of blood and body fluids particularly in the lower limbs. 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 during pregnancy. 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 and exercising gentle pressure with the fingertips may help to shift water out of the tissue. **(International journal of creative research thoughts 2 February 2020)**

Pain and edema in the legs are the most common problems in pregnancy. This study examined the effect of percussion massage therapy applied to the lower extremities on pain, edema, and quality of life in pregnant women. Methods: Sixty pregnant women between 24 and 36 weeks of pregnancy were included in the study. Pregnant women were randomly divided into two groups: the percussion massage treatment (PMT) group (n = 30) and the control group (n = 30). Twelve sessions of percussive massage therapy were administered to the bilateral medial gastrocnemius, lateral gastrocnemius, peroneus longus, and tibialis anterior muscles of pregnant women included in the PMT group, three times a week for four weeks. The lower extremities of the pregnant women in the control group did not get any massage therapy. A Visual Analog Scale (VAS) was used to assess pain. A tape measure was used to measure the ankle, knee, and thigh circumference. The Fatigue Severity Scale (FSS) was used to evaluate fatigue, and the Short Form-36 (SF-36) was used to assess quality of life. When comparing pre-treatment and post-treatment results within each group, statistically significant differences were found in both groups in terms of right/left ankle, knee, and thigh circumference measurements, and SF-36

physical function (PF) measurements ($p < 0.05$). When the difference measurements between the groups were compared, a statistically significant improvement in the PMT group was detected in VAS ($p = 0.000$), right/left ankle ($p = 0.002$/$p = 0.006$) and right/left hip circumference measurements ($p = 0.006$/$p = 0.008$), FSS ($p = 0.009$), and SF-36-role emotional (RE) ($p = 0.000$), mental health (MH) ($p = 0.005$), social function (SF) ($p = 0.005$), and body pain (BP) ($p = 0.003$) measurements.

Conclusions**:** PMT was more effective than the control group in parameters such as pain, ankle and thigh circumference measurements, fatigue, and some sub-parameters of quality of life. PMT could be preferred to enhance the quality of life of pregnant women by improving parameters like pain, edema, and fatigue.
(Merve Yilmaz Menek et al.,5 August 2024)

A cross-sectional study was conducted 1000 consecutive eligible pregnant Igbo women who presented at the antenatal clinic of the Park Lane Specialist Hospital Enugu over a 10-month period. The data were collated and analyzed with the computer statistical software SPSS version.

15 for descriptive and inferential statistics. Level of significance was set at p<0.05 (95% confidence interval). The overall prevalence of leg oedema during pregnancy was 8.5%. All the women (100%) however believed that leg oedema during pregnancy is abnormal and requires treatment. All the 85 respondents (100%) of those who had leg oedema were offered only reassurance without drug in the hospital. However, 62(73%) of those who had leg oedema admitted receiving some forms of drug treatment. **(Ohang., 2015)**

A randomized controlled study was conducted to evaluate the effects of leg massage on physiological lower leg edema among sixty-two Taiwan mothers who are under third trimester of pregnancy. Mothers were given 20 minutes of leg massage. Mothers in the control group received usual edema management. Results indicated that less edema (P<0.05) over time were reported by the intervention group compared with the control group. The study concluded that leg massage is an effective intervention in reducing physiological lower leg edema among antenatal mothers. **(Piner, 2015).**

A non-randomized clinical trial was conducted to evaluate of the effect of leg massage and foot elevation on physiological lower leg edema during pregnancy among 180 healthy pregnant women assigned to three groups. In the first group, massage was performed for 20 minutes. In the second group, foot elevation was performed for 20 minutes. The third was the control group where no manipulation was done. The intervention was performed during 5 days, and lower leg edema measured. After the intervention there is a significant difference between the 3 groups in terms of the mean rate of change of the circumferences (P<0.001). The results indicated that the greater effect of massage compared with foot environment was measured in feet (P<0.001). The results of this study showed that massage therapy is effective in reducing physiological lower leg edema during pregnancy. Therefore, the leg massage can be performed by midwives and as a useful intervention. **(Fatemeh., 2015)**

This study aims to evaluate the effect of foot massage for decreasing physiological lower leg edema in late pregnancy. Eighty pregnant women were randomly divided into two groups study group had a 20-minute foot massage daily for five days whereas the control group did not receive any intervention beyond standard prenatal care. the research was conducted between March and August in Manisha province health Ministry Central Primary Health Care Clinic in Manisa western Turkey. compared with the control group, women in the experimental group had a significantly smaller lower lag circumference after five days of massage. The results obtained from our research show that foot massage was found to have a positive effect on decreasing normal physiological lower leg edema in late pregnancy. **(Ayden Coban 2019)**

To evaluate the effect of foot exercise and Epsom salt water on reduction of foot oedema among the antenatal mothers at selected hospitals of Kheda district. **Materials and methods** This was a Quasi experimental study, conducted from January 17, 2020 to March 18, 2020 at Dr ND Desai Hospital and Medical College, Nadiad, Gujarat, on 40 antenatal mothers having foot oedema, from selected hospitals of Kheda district by purposive non probability sampling techniques. The total sample of 40 mothers was randomly allocated to group 1 (n=20 of foot exercise) and group 2 (n=20 of Epsom salt water). Foot oedema level assessment was done using tools of data collection for both groups which included the Performa of demographic variables and Modified Standardized Erin oedema scale. **Data collection procedure:** The data collection procedure was started on 17th January, 2020. During the first visit, the researcher introduced herself and explained the aim of the study and confirmed the willingness of the antenatal mothers to take part in the study by getting consent from them as per the inclusion criteria. The time taken for each client is 20 minutes. On the first day of sample selection, the demographic data and pre assessment of foot oedema level measured of the subjects were assessed. In group 1, foot exercise was given to the antenatal mothers. It applying for 20 minutes for three days once a day. Foot exercise consists of ankle pump exercise and circumduction of foot. In group 2, Epsom salt water application prepared by adding one cup (30 grams) of Epsom salts to one liter of Lukewarm water and applying for 20 minutes over the feet, for three days once a day would relieve the foot oedema level. **Result** Amongst the total study subjects, 11 (55%) of those in group 2 were from 18-24 years of age. Oedema score analysis preintervention ally, showed moderate score in 18 (90%) of subjects in group 1 and 9 (45%) subjects in group 2. Severe score presented by 2 (10%) subjects in group 1 and 11 (55%) subjects in group 2. Postintervention ally, none of the subjects in group 1 and group 2 showed moderate and severe oedema. All gave the score of 0, trace or mild oedema. There was statistically significant difference found in level of foot oedema in group 1 and group 2 with mean difference of group 1 as 2.2 and Standard Deviation (SD) 0.51 and for group 2 mean difference was 2.95 and SD 0.68. The calculated value of Mann-Whitney test was group 1 (3) and group 2 (1.49). Among them the level of foot oedema reduced to 55% in group 1 (foot exercise) whereas in group 2 (Epsom salt water) it reduced to 73.75%. **Conclusion** Epsom salt water is more effective than foot exercise on reduction of foot oedema among the antenatal mothers**. (khevna Rameshbhai Macwan et al., May 2021)**

CHAPTER – III

METHODOLOGY

Research methodology is a way systematically solves the research problem. It may be understood as a science of studying how research is done scientifically. It includes the various steps that are adopted by a researcher in studying his research problem along with the logic behind them. In order to achieve the stated objectives and test hypothesis, the following research design and methods were used. It includes research approach, research design, population study, setting sample and sampling technique, inclusion criteria and exclusion criteria, data collection method, development of tools and plan for data analysis. This chapter gives a brief description of method adopted by the investigator for the study.

According to **Polit and Beck (2004)** "Methodology refers to way of obtaining, systematizing and analyzing data."

John W. Creswell (2014) portrays methodology as a coherent group of methods that harmonize one another and that have the capability to fit to deliver data and findings that will reflect the research question and suits the researcher's purpose.

This chapter deals with the methodology of "A quasi- experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema antenatal mothers in the third trimester attending ANC OPD in selected hospital at Durg district CG."

1.1 Research approach and design

Pre experimental one group pretest – posttest design was used in this study. This design measures the effect on the experimental group, based on their state before the beginning of the experiment (pretest) and the difference achieved at the end of the experiment (posttest). There is no control group in this design.
According to Burns, N., & Grove, S. K. (2011) research approach indicates the procedure for conducting the study in order to accomplish the objective of the study was adopted.

The research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in a research study. **(Suresh K. Sharma 2018 4th ed)**

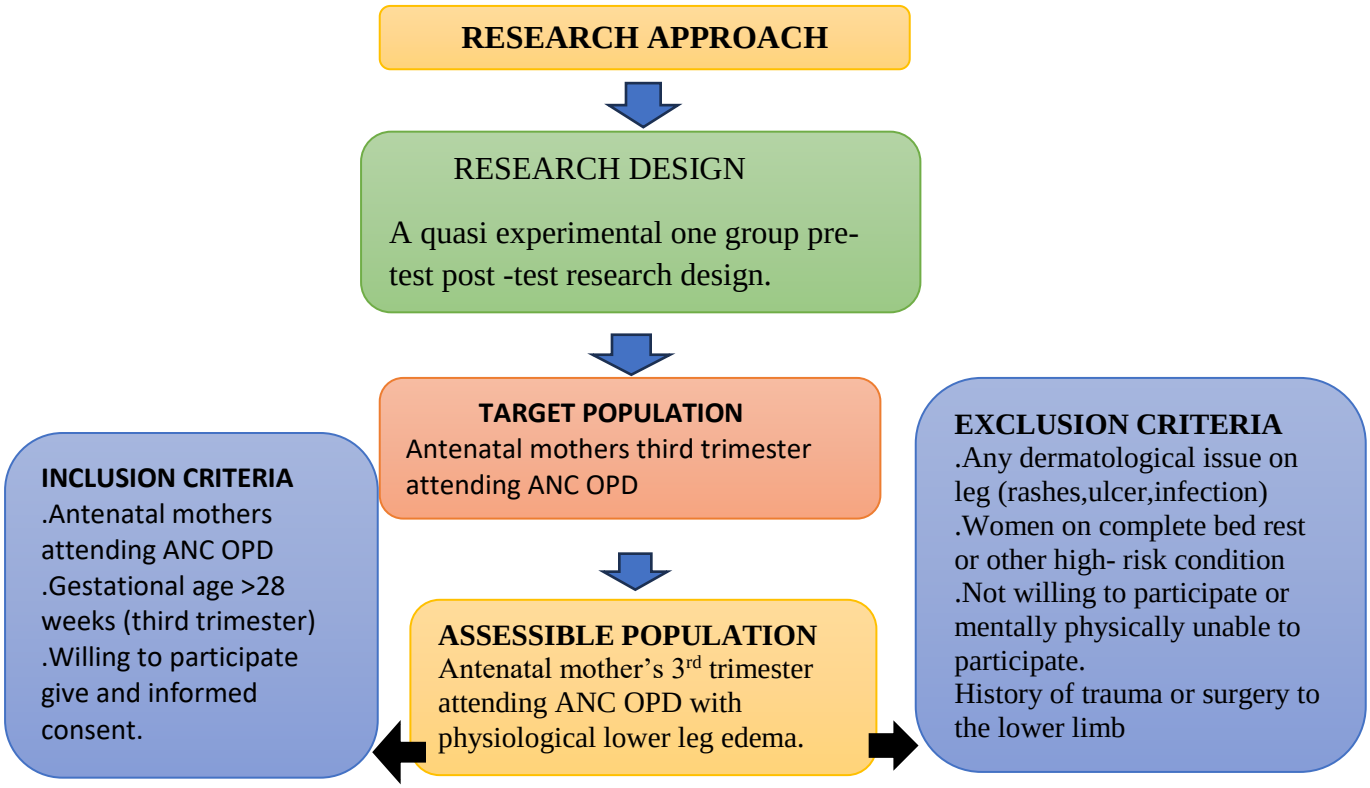
Research design is a planned structure and strategy of investigation of answering the research questions is the overall plan or blue print of research select to carry out this study.

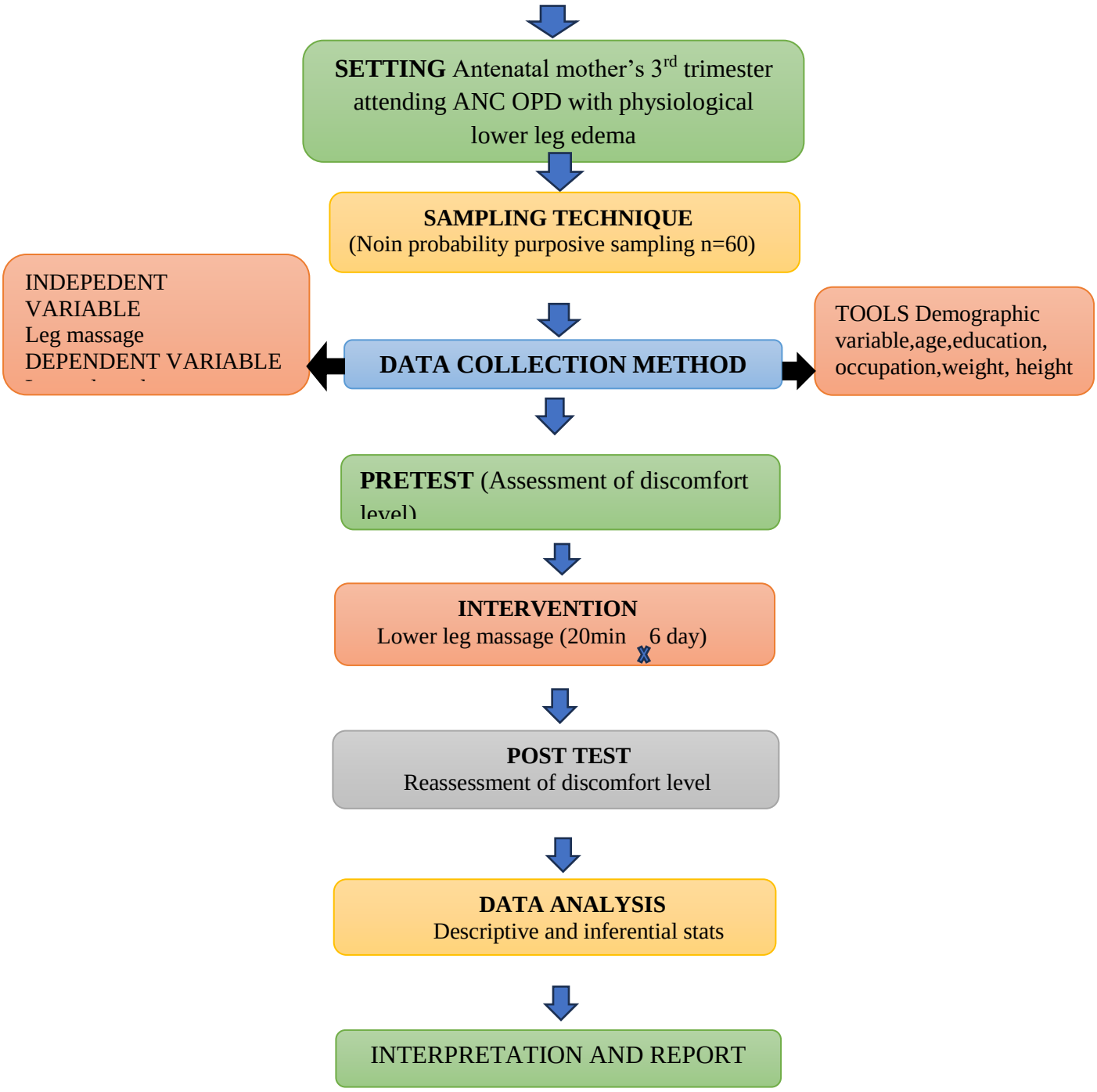
(BT Basavanthappa 2019)

O1-Observation (pre-test)

X-Intervention (Leg massage)

O_2-Observation (posttest)





POPULATION

Polit and Hungler (1999) define population as the totality of all subjects that conform to a set of specifications, compromising the entire group of persons that is of interest to the researcher and whom the research results can be generalized.

TARGET POPULATION

Target population define as the entire group of individuals or object to which researchers want to generalize the results of a study**.** **(Crewell, 2014)**

The target population composed of antenatal mothers of third trimester with physiological lower leg edema attending ANC OPD in selected hospital at Durg district.

ACCESSIBLE POPULATION

The accessible population also known as the study population is the group of individuals from the target population who meet the inclusion criteria and are available to be recruited for a specific research study**. (Polit &Beck, 2017)**

The aggregate of cases that conform to designated inclusion or exclusion criteria and that are accessible as subjects of the study. In the present study, Accessible population for the study will consist of all antenatal mothers diagnosed with physiological lower leg edema who are attending the ANC OPD at the selected hospital in Durg district, and available and willing to participate in the study during the data collection period.

SETTING OF STUDY

The study was conducted in the Antenatal department (ANC OPD) of a Pandurang Ramarao Dongaonkar District Hospital Durg, Chhattisgarh. This hospital was chosen due to its accessibility, available of a large number of antenatal mothers with physiological lower leg edema and the feasibility of implementing the intervention (leg massage) within the routine ANC schedule. The ANC OPD function on all working days and caters to pregnant women from both rural and urban areas of the district.

SAMPLE AND SAMPLING TECHNIQUE

SAMPLE

Sample may be defined as the representative unit of a target population which is to be worked upon by the researchers during the study. **(Suresh K Sharma 4th edition)**

The samples for this study were the antenatal mothers third trimester with physiological lower leg edema who were selected on the basis of purposive sampling technique who met the inclusion criteria. Total sample size is N= 60 Antenatal mothers with third trimester.

SAMPLING TECHNIQUE

Suresh K. Sharma 4th edition stated “Sampling is the process of selecting a representative segment of the population under study”

In this study a non-probability purposive sampling technique will be used to select the participants based on the following inclusion and exclusion criteria.

SAMPLING SIZE

A total N=60 samples who are present at the time of study and who satisfy the required criteria.

SAMPLING CRITERIA

In sampling criteria, the researcher specific the characteristics of the population under study by detailing the inclusion and exclusion criteria. Inclusion criteria are defined as the key features of the target population that the investigators will use to answer their research questions.

The samples were selected with the following criteria: -

INCLUSION CRITERIA

- Antenatal mothers attending ANC OPD.
- Gestational age ≥ 28 weeks (third trimester)
- Diagnosed by doctor as physiological edema.
- Willing to participate and provide informed consent

EXCLUSION CRITERIA

- Any dermatological issue on legs (rashes, ulcers, infection)
- Antenatal mothers on complete bed rest or other high-risk conditions
- Not willing to participate or mentally/physically unable to co operate
- History of trauma or surgery to the lower limbs

VARIABLES UNDER STUDY

Variables are qualities, properties or characteristics of person, things or situation that can change or vary.

Chinn and Kramer 2018 stated that variables are concepts at different level of abstraction that are concisely defined to promote their measurement or manipulation within study.
They are independent and dependent variable.

Independent variable:

The independent variable of the study is leg massage.

Dependent variable:

The dependent variable is physiological lower leg edema.

Socio demographic variables – The characteristics and attributes of the study subject is considered as demographic variable**.**

- Age
- Gestational age
- Parity (primigravida/multigravida)
- Education level
- Occupation
- Socioeconomic status
- Type of family (nuclear/joint)
- Area of residence (urban/rural)

SELECTION AND DEVELOPMENT OF RESEARCH TOOL

The research tool are the devices used to collect the data, or information necessary to answer specific research question. (**Sukhpal Kaur2020)**

A research instrument is a device used to measure the concept of interest in a research project that a researcher uses to collect data. **(Suresh K Sharma 4th edition)**

SELECTION OF THE TOOL

To assess the effectiveness of leg massage in reducing physiological lower leg edema among antenatal mothers attending ANC OPD a self- structured discomfort measuring tools was developed. The tools were selected based on the nature of the study, population characteristics, and the specific research objectives.

The tool was designed in simple language to ensure clarity and ease of understanding by antenatal mothers in the Indian context, especially those attending clinics and hospitals in Durg District, Chhattisgarh.

DEVELOPMENT OF THE TOOL

The development process of the tool involved the following steps:

1. Review of Literature:
An extensive review of national and international research studies, textbooks, journals, and WHO guidelines.

2. Tool Construction:
Based on the findings from the literature and expert advice, the tool was developed in two parts:

Part 1: Section A

Demographic Profile

Includes age, gestational age, parity, weight, education, occupation, income, type of family, and area of residence, previous knowledge about massage.

Section B: Obstetrical history

Obstetric score G P A L, Gestational age,

Section C: Assessment of risk factors of physiological lower leg edema.

Family history, presence of lower leg edema in previous pregnancy, sitting for a prolong period, standing for a prolong period, types of foot were, hours of rest taken in the afternoon, position assumed during sleep, timing of severity of edema, travel history, dietary habit, coffee consumption, intake of water, and other measures followed to reduce edema.

PART 2

Self -structured discomfort measuring tools total score 20.

CLINICAL DECISION

- 0 – 4 Mild discomforts reassure and advise rest and leg elevation.
- 5 – 10 Moderate discomforts recommend support stocking, monitor for progression.

- 11 – 20 Severe discomfort evaluation further to rule out pathological causes (e.g. DVT, preeclampsia)

DESCRIPTION OF THE TOOLS

The tool used for the present study is a self -structured discomfort measuring tools developed by the researcher to assess discomfort level among antenatal mothers third trimester who have physiological lower leg edema. The tool was designed based on an extensive review of literature, consultation with subject experts, and validation through a pilot study.
The tool consists

Part I: Demographic Data Sheet

Section A
This section collects background information about the participants. It includes variables that may influence discomfort levels, such as:

- Age
- Education status
- Occupation
- Type of family
- Area of living
- Weight

OBSTETRICAL HISTORY

- Obstetric history
- G P A L
- Gestational age

Section B:
Questionnaire to assess the risk factors of physiological lower leg edema among antenatal mothers. The risk factors for the assessment of physiological lower leg edema are,

- Family history
- Presence of lower leg edema in previous pregnancy
- Sitting for a prolong period
- Standing for prolong period
- Type of footwear
- Hours of taken rest in the afternoon
- Position assumed during sleep
- Timing of severity of edema
- travel history
- Dietary habit
- Coffee consumption
- Intake of water
- Any other measure followed to reduce edema

Section C

Self -structured discomfort measuring tools to assess the degree of physiological lower leg edema. The constituents necessary to assess the degree of physiological lower leg edema are assessment using the edema discomfort scale (EDS). (Discomfort reported, mild discomfort, moderate discomfort, severe discomfort, very severe discomfort and interfering with daily life.)
Ask the patient about discomfort in the following domain related to edema (heaviness in leg, tightness or skin stretching, difficulty in wearing shoes or cloths, night time discomfort or sleep disturbance.

CLINICAL DECISION

- 0 – 4 Mild discomforts reassure and advise rest and leg elevation.
- 5 – 10 Moderate discomforts recommend support stocking, monitor for progression.
- 11 – 20 Severe discomfort evaluation further to rule out pathological causes (e.g. DVT, preeclampsia)

Language and Format:

The tool was developed in **English** and later translated into **Hindi** to ensure comprehension among all participants.
Simple and culturally appropriate language was used to suit the literacy level of antenatal mothers in the selected region.

CONTENT VALIDITY OF TOOL

Validity refers to the appropriateness, completeness and usefulness of an attribute measuring research instrument.

According to Polit and Hungler 1999"Validity refers to the degree to which an instrument measures what is supposed to be measuring".

Validity of the tool was determined by obtaining opinion from the expert of the specialized fields in obstetric and gynecological nursing and medical department. The tool was modified based on the suggestions of the experts.

RELIABILITY OF THE TOOL

Reliability refers to the consistency and stability of a research instrument in measuring what it is intended to measure**. (Suresh K. Sharma 4th edition)**

In the present study, reliability testing was conducted to ensure that the self- structured discomfort measuring tools used for assessing physiological lower leg oedema among antenatal mothers third trimester who attending the ANC OPD, provides consistent and dependable results.

Techniques of Data collection:

Demographic data (age, education, occupation, type of family, area of living, height, weight), Obstetrical variables (obstetric score G,P,A,L, gestational weeks), and questionnaire was collected through interview method and retrieved from the antenatal mothers third trimester and medical records. Physiological lower leg edema among antenatal mothers third trimester were assessed using Self- structured discomfort measuring tool.

INTERVENTION: LOWER LEG MASSAGE

The intervention in this study involved the administration of lower leg massage to antenatal mothers third trimester experiencing physiological lower leg edema. The massage was performed as a therapeutic nursing measure to enhance venous return, reduce fluid accumulation, and relieve discomfort.

PROCEDURE:

- The leg massage was given to the experimental group only.
- Each participant received 10 minutes of massage per leg (20 minutes total).
- The massage was administered using firm but gentle upward strokes, starting from the ankles and moving towards the knees.
- Coconut oil or any suitable emollient was used to reduce friction and enhance comfort.
- The massage technique focused on the calf muscles, and ankles, avoiding deep pressure on bony areas.
- The intervention was given once a day for a total of 5 consecutive days.
- the massage was administered by the researcher (or trained personnel) in a quiet**,** private area to ensure comfort and privacy.

PRECAUTIONS TAKEN:

- Participants were positioned comfortably in semi-Fowler's position.
- The leg was assessed for redness, varicose veins, or signs of thrombosis before each session.
- The procedure was immediately discontinued in case of any pain, discomfort, or contraindicated symptoms.

STEPS OF LOWER LEG MASSAGE

1. **Preparation**
   - Wash hands thoroughly.
   - Position the mother comfortably (semi-fowlers position).
   - Apply suitable massage oil (e.g., coconut oil) to reduce friction.
2. **Effleurage (Light Stroking)**
   - Begin with gentle, long strokes from ankle to knee using both palms.
   - Promotes relaxation and warms the tissues.
   - Duration: 1–2 minutes.
3. **Petrissage (Kneading)**
   - Use the fingers and thumbs to gently knead the calf muscles.
   - Helps stimulate blood flow and reduce muscle tension.
   - Duration: 2–3 minutes.

4. **Thumb Circling (Circular Friction)**
    - Apply small, circular movements with the thumbs around the ankle area and shin.
    - Focus on soft tissues, avoiding bony prominences.
    - Duration: 1 minutes.
5. **Tapotement (Rhythmic Tapping - Optional)**
    - Light tapping or hacking movement using the side of the hands.
    - Used for stimulation and muscle tone (optional in pregnancy).
    - Duration: 30 seconds – 1 minute (if tolerated).
6. **Effleurage (Closing Strokes)**
    - Finish with gentle upward strokes from ankle to knee to calm and relax.
    - Helps drain any mobilized fluid toward lymphatic areas.
    - Duration: 2 minutes.
7. **Rest and Observation**
    - Allow the mother to rest for a few minutes after the massage.
    - Observe for signs of discomfort, dizziness, or skin reaction.

TOTAL DURATION:

10 minutes per leg, preferably in the **evening** when edema is more noticeable.

Ethical approval:

Ethical approval was obtained from the appropriate Institutional Ethics Committee**,** prior permission was obtained from our Principal, Government College of Nursing, Durg (C.G). Confidentiality and anonymity of the participants were maintained. Ethical committee approved the study to conduct. After getting clearance from Ethics Committee data collection was done.

Data collection procedure

Formal written permission was sought from the Principal, Chief medical officer and Head of the department of obstetrics and gynecology, The data collection procedure was carried out from 23.6.2025 to 28.6.2025. The samples were selected using non probability purposive sampling technique and the screening was done among the antenatal mothers of third trimester with physiological lower leg edema. The written consent was obtained from the all the selected antenatal mothers as there is no control group. The sample size is 60. The pre assessment was done by using self- structured discomfort measuring tool and pre -test was done by using the questionnaire. The intervention of leg massage was given for 10 minutes in each leg. The post -test level of edema was assessed after one week of the intervention given by using tool.

REPORT OF THE PILOT STUDY

- Pilot study was a trial run done in preparation for the main study to test the reliability, practicability, appropriateness and flexibility of the study and tool.
    - After obtaining permission from the authorities and ethical committee the researcher conducted pilot study with 6 samples for a period of 1 week from 23-6-2025 to 28-6- 2025 in antenatal ward Durg district Hospital.

- Based on the inclusion criteria, samples were selected by using non probability purposive sampling technique.

ETHICAL CONSIDERATION

1) **Informed consent** – Ensuring that antenatal mothers understand the study's purpose, risk, benefit, and provide voluntary informed consent.
2) **Participant safety** – Ensuring that the leg massage intervention does not poise any significant risk to the antenatal mothers or their fetuses.
3) **Confidentiality** – protecting the antenatal mothers personal and medical information.
4) **Vulnerability** – Considering the vulnerability of antenatal mothers and ensuring that they are not coerced or exploited.
5) **Potential biases** – Ensuring that the study design and implementation do not introduce biases that could impact the result or participant experiences.

SUMMARY

This chapter deals with the research approach, research design, variables under the study, setting, population, sample and sampling technique, development of data collection instrument, pilot study, data collection procedure and plan for data analysis.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Analysis is a process of organizing the data in such a way that research question can be answered. This chapter deals with the analysis and interpretation of the data collected from the antenatal mothers to assess the effectiveness of the leg massage in reducing degree of physiological lower leg edema among antenatal mothers at Durg District hospital.

Objectives of the study

- To assess the effectiveness of leg massage in reducing discomfort level due to physiological lower leg edema among antenatal mothers attending ANC OPD in experimental group.
- To compare the pre and post intervention levels of discomfort in the experimental group.
- To assess the association between the level of lower leg discomfort caused by edema in antenatal mothers with selected socio demographic variable.
- To identify the risk factors associated with physiological lower leg edema among antenatal mothers attending ANC OPD.

ORGANIZATION OF DATA

The data was organized under following section.

- **Section** I: Distribution of Antenatal Mothers According to Demographic Variables
- **Section II**: Assessment of Pre-Test and Post-Test Levels of Discomfort due to Physiological Lower Leg Edema among Antenatal Mothers in Experimental Group
- **Section III**: Comparison of Pre-Test and Post-Test Levels of Discomfort in Experimental Group.
- **Section IV**: Association between Post-Test Level of Discomfort and Selected Sociodemographic Variables.
- **Section V**: Identification of Risk Factors Associated with Physiological Lower Leg Edema.

Section I Distribution of antenatal mothers according to demographic variables.

4.1) frequency and percentage distribution of subjects with physiological lower leg edema according to demographic variable.

DEMOGRAPHIC PRESENTATION

1 AGE GROUP	N	%
18 – 25 years	18	30
26 – 30 years	35	58.33
31 – 35 years	6	10
≥36 years	1	1.67
TOTAL	60	100

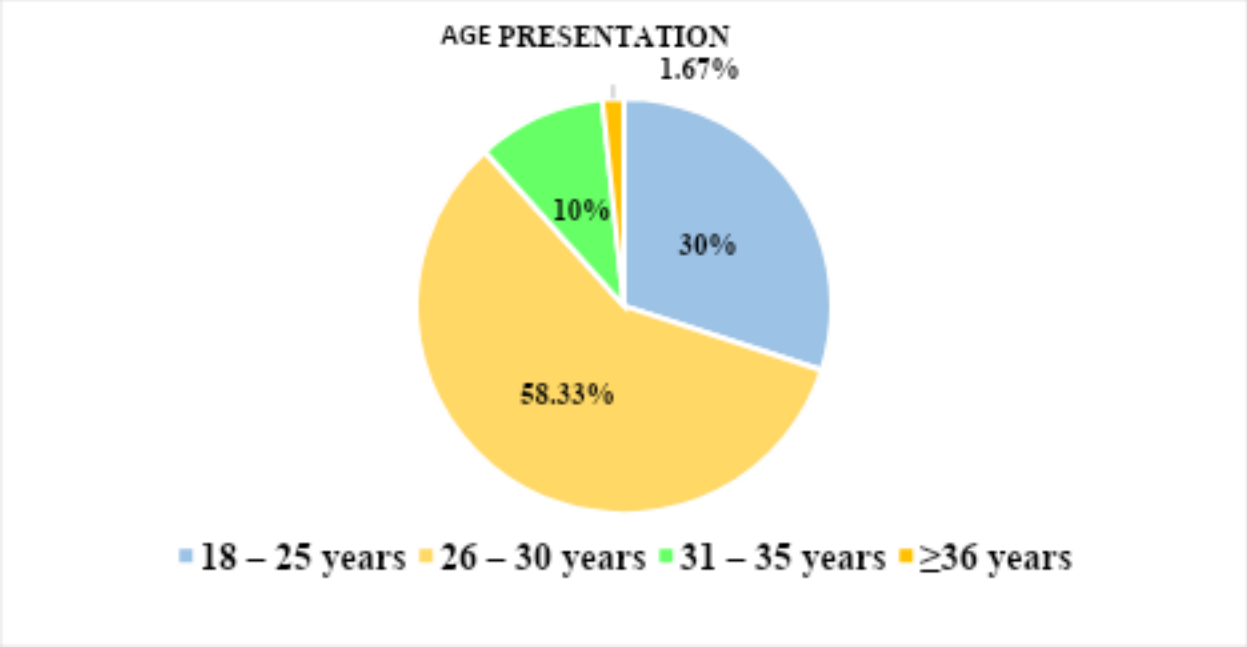


Figure 1: Pie Chart Showing the Distribution of Antenatal Mothers According to Age Group

The pie chart illustrates the distribution of antenatal mothers by age. The highest proportion, **58.33%**, belonged to the **26–30 years** age group, indicating that most participants were in the prime reproductive age. This is followed by **30%** in the **18–25 years** category. Only **10%** were between **31–35 years**, and **1.67%** were **≥36 years**, showing that very few participants conceived at advanced maternal age. The chart clearly highlights that the younger reproductive age groups formed the majority of the study population.

2 EDUCATION STATUS	N	%
Illiterate	**1**	**1.67**
Primary education	**0**	**0**
Secondary education	**48**	**80**
Graduate & above	**11**	**18.33**
TOTAL	**60**	**100**

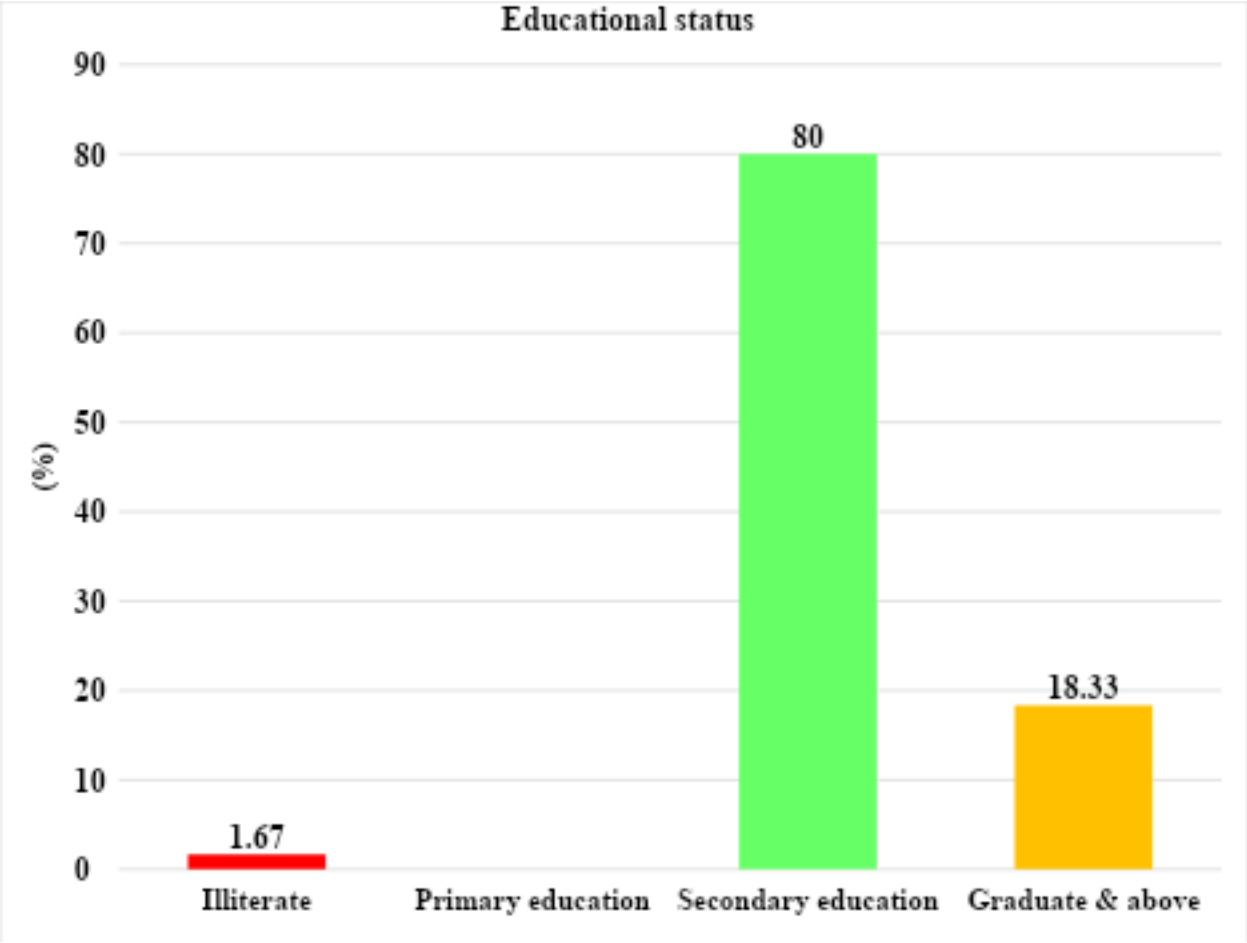


Figure 2: Clustered Column diagram Showing Distribution of subjects on the basis of Education Status.

The pie chart reveals that a significant majority (**80%**) of antenatal mothers had **secondary education**, reflecting a moderately educated population. Women with **graduate and above** qualification constituted **18.33%**, while **1.67%** were **illiterate**. No participants reported only primary education. The chart shows that most participants had basic to intermediate educational background.

3 OCCUPATIONS	N	%
Homemaker.	60	100
Service		0
Business		
Part time employed		
TOTAL	60	100

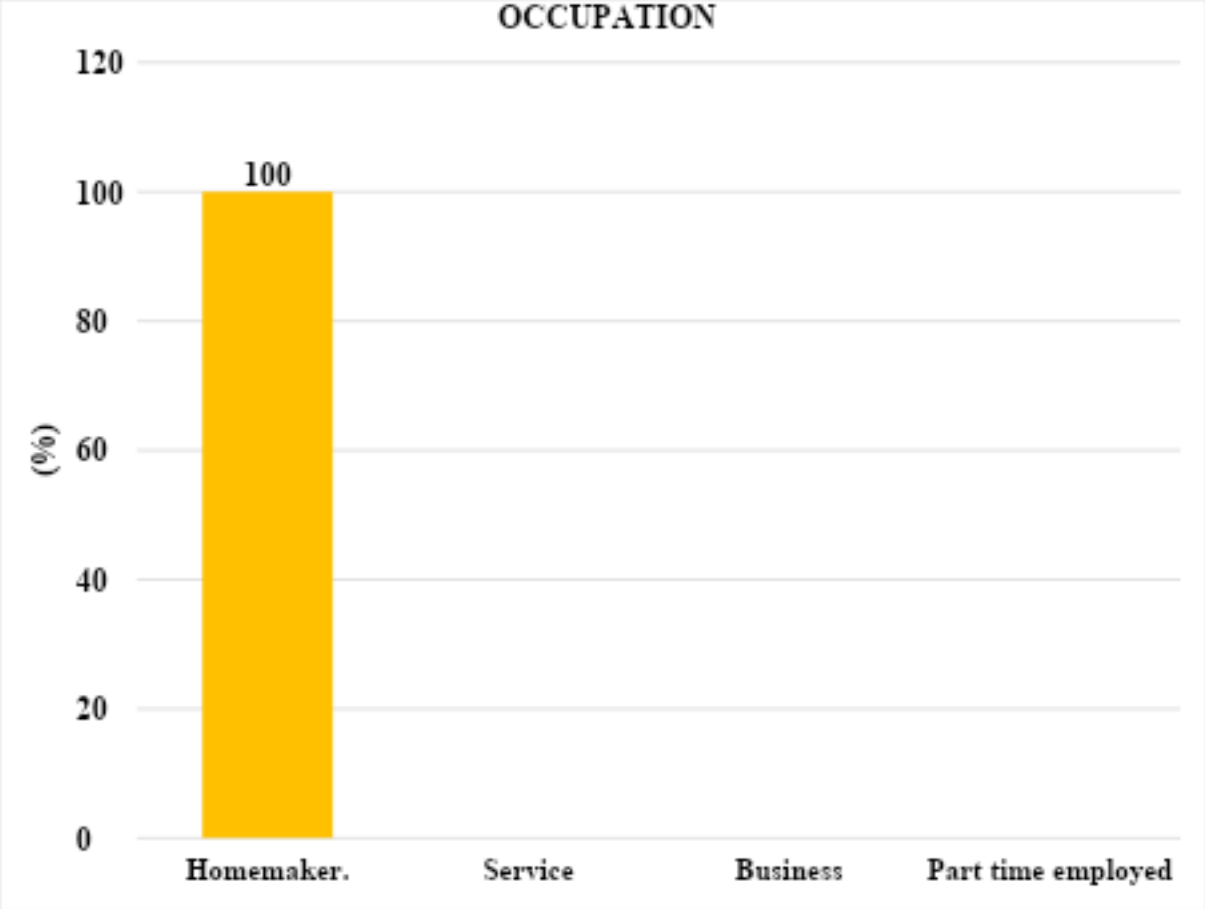


Figure 3: Clustered Column diagram Showing the Distribution of subjects on the basis of Occupation.

The pie chart shows that **100%** of antenatal mothers were **homemakers**. No participant was engaged in service, business, or part-time employment. This clearly indicates that the majority of women in the study population were non-working and stayed at home, which may influence lifestyle and activity levels that can affect lower leg edema.

4 TYPES OF FAMILY	N	%
Nuclear family	15	25
Joint family	45	75
Extended family		
TOTAL	60	100

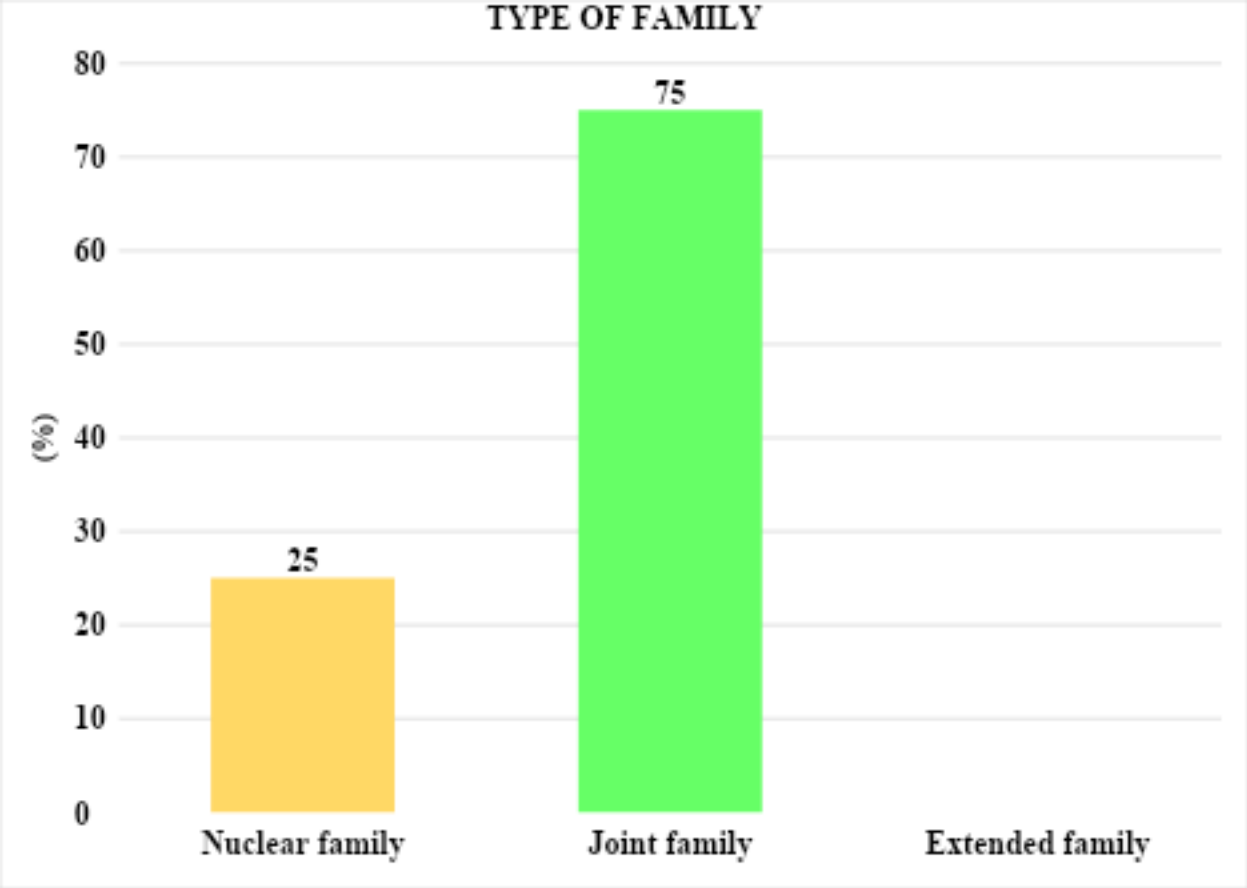


Figure 4: Bar Diagram Showing the Distribution of subjects on the basis of type of Family

The diagram depicts that **75%** of antenatal mothers belonged to **joint families**, while **25%** belonged to **nuclear families**. No participants were from extended families. This suggests that the majority have a traditional joint family setup, which may impact support systems during pregnancy.

5 AREA OF LIVING	N	%
Urban area	45	75
Rural area	15	25
TOTAL	60	100

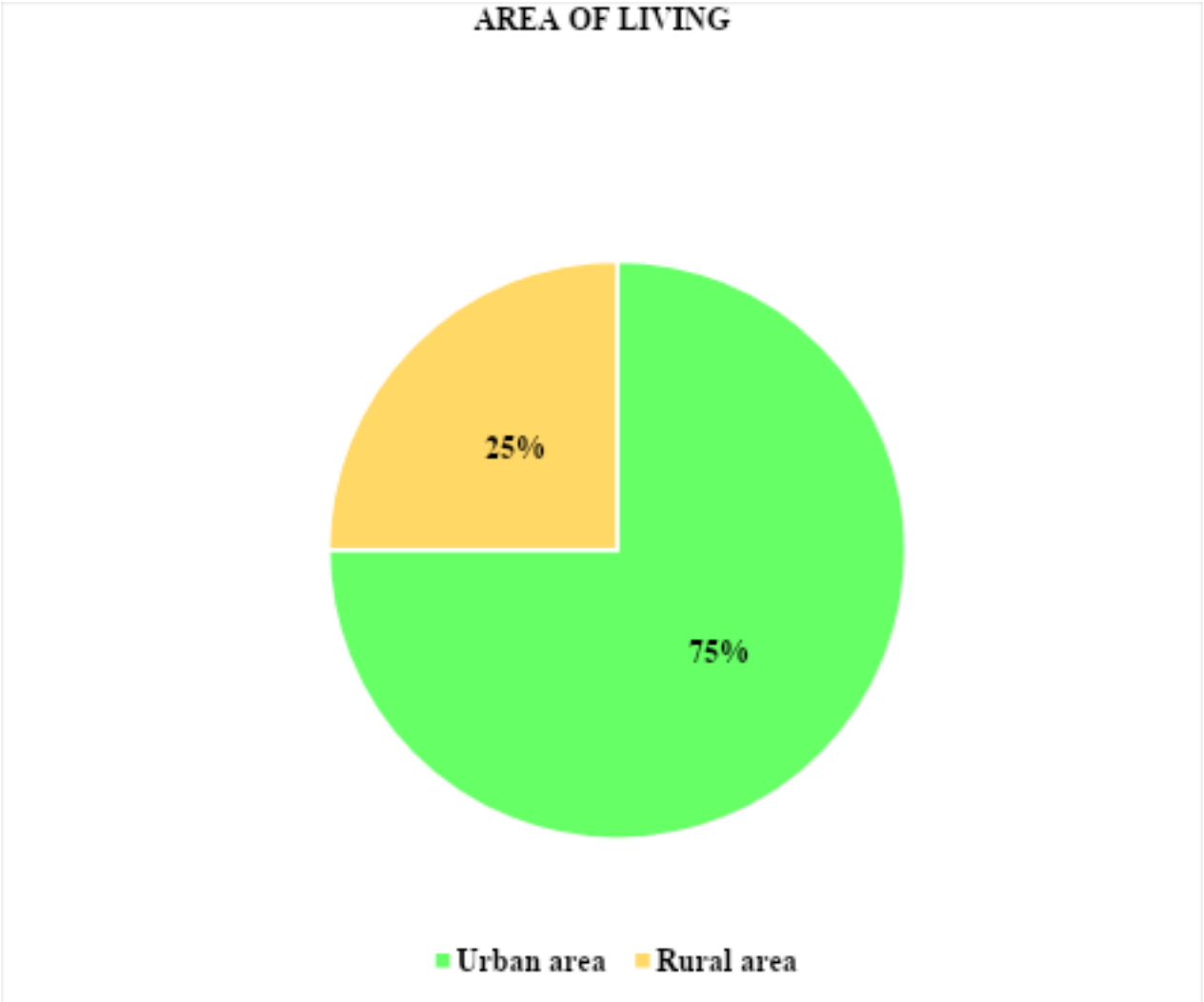


Figure 5: Pie Chart Showing the distribution of subjects on the basis of Area of Living

The pia chart indicates that **75%** of antenatal mothers resided in **urban areas**, whereas **25%** were from **rural areas**. This reflects that most of the study population belongs to urban settings, possibly due to easier access to ANC clinics and hospitals.

6 HEIGHT	N	%
4 Feet to 4 feet 5 inch	30	50
5 feet to 5 feet 5 inch	36	60
6 feet to 6 feet 5 inch	24	40
TOTAL	60	100

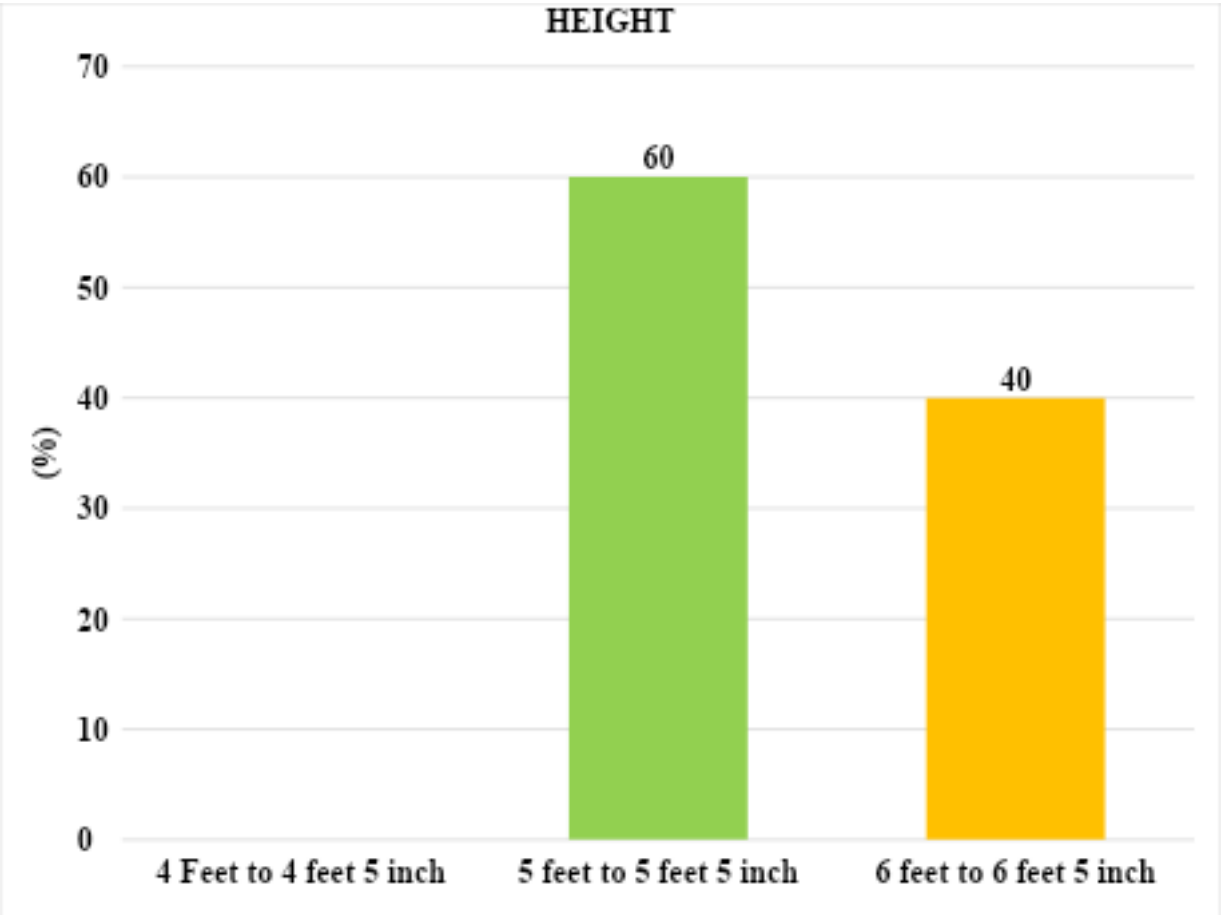


Figure 6: Bar Diagram Showing the distribution of subjects on the basis of Height

The bar chart represents distribution by height. Most participants fall in mid-height categories, showing normal physical build among antenatal mothers. Taller or much shorter categories were fewer in number.

7 WEIGHT	N	%
40 to 50kg	9	15
51 to 60 kg	26	43.33
61 to 70 kg	20	33.33
> 70 kg	5	8.33
TOTAL	60	100

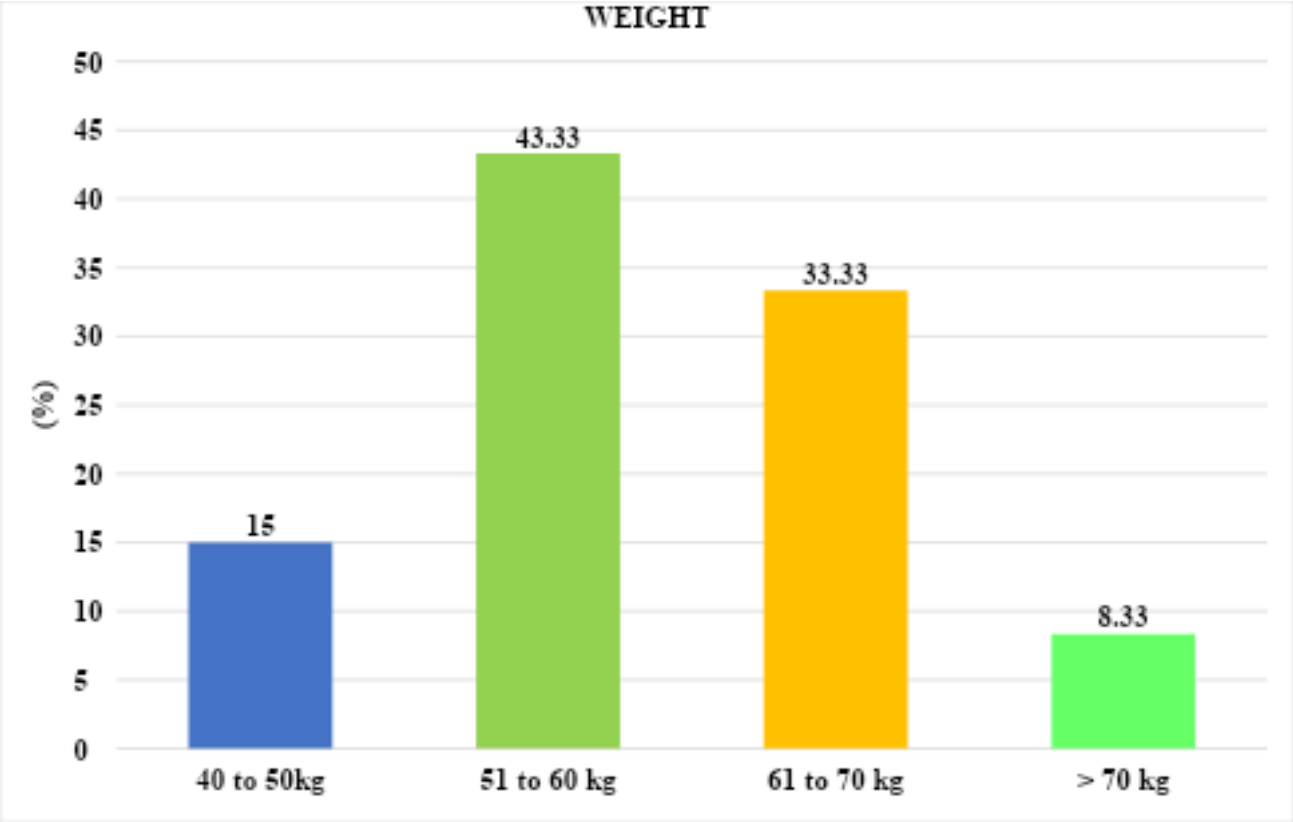


Figure 7: Bar Diagram Showing the Weight variation among subjects with physiological lower leg edema

The bar diagram displays that the majority (**43.33%**) of antenatal mothers weighed **51–60 kg**, followed by **33.33%** in the **61–70 kg** category. Only **15%** weighed **40–50 kg**, and **8.33%** were above **70 kg**. The chart indicates that most participants had weight within the normal to slightly higher range for pregnancy

GRAVIDA	N	%
G1	28	46.67
G2	20	33.33
G3	9	15
G4	3	5
TOTAL	60	100

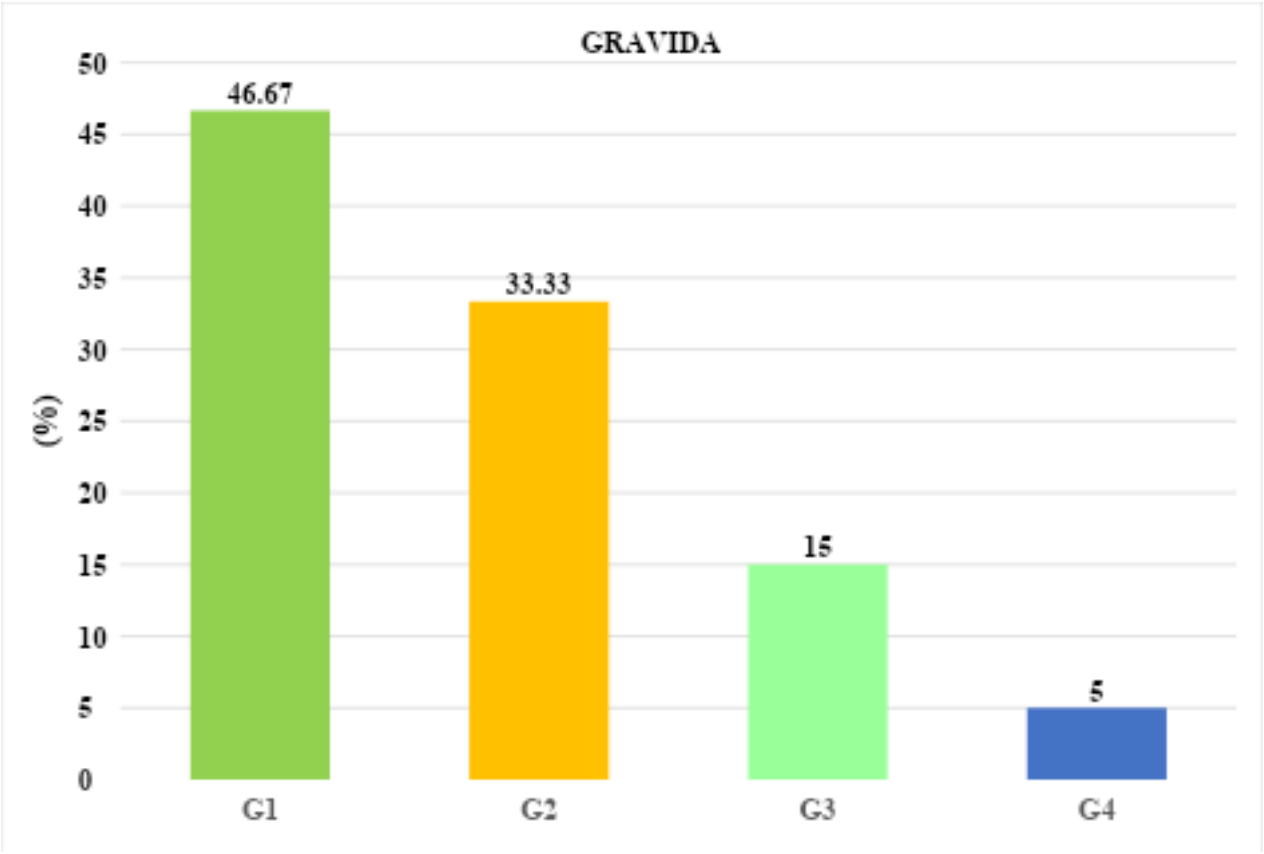


Figure 8: Clustered Pyramid diagram Showing the distribution of subjects Gravida Status

The pie chart indicates that nearly half (**46.67%**) of the antenatal mothers were **primigravida (G1)**. About **33.33%** were **G2**, **15%** were **G3**, and **5%** were **G4**. The majority being primigravida may influence edema patterns due to first-time physiological adaptation to pregnancy.

4.2) Frequency and percentage distribution of risk factors of physiological lower leg edema.

9 FAMILY HISTORY	N	%
Yes	27	45
No	33	55
TOTAL	60	100

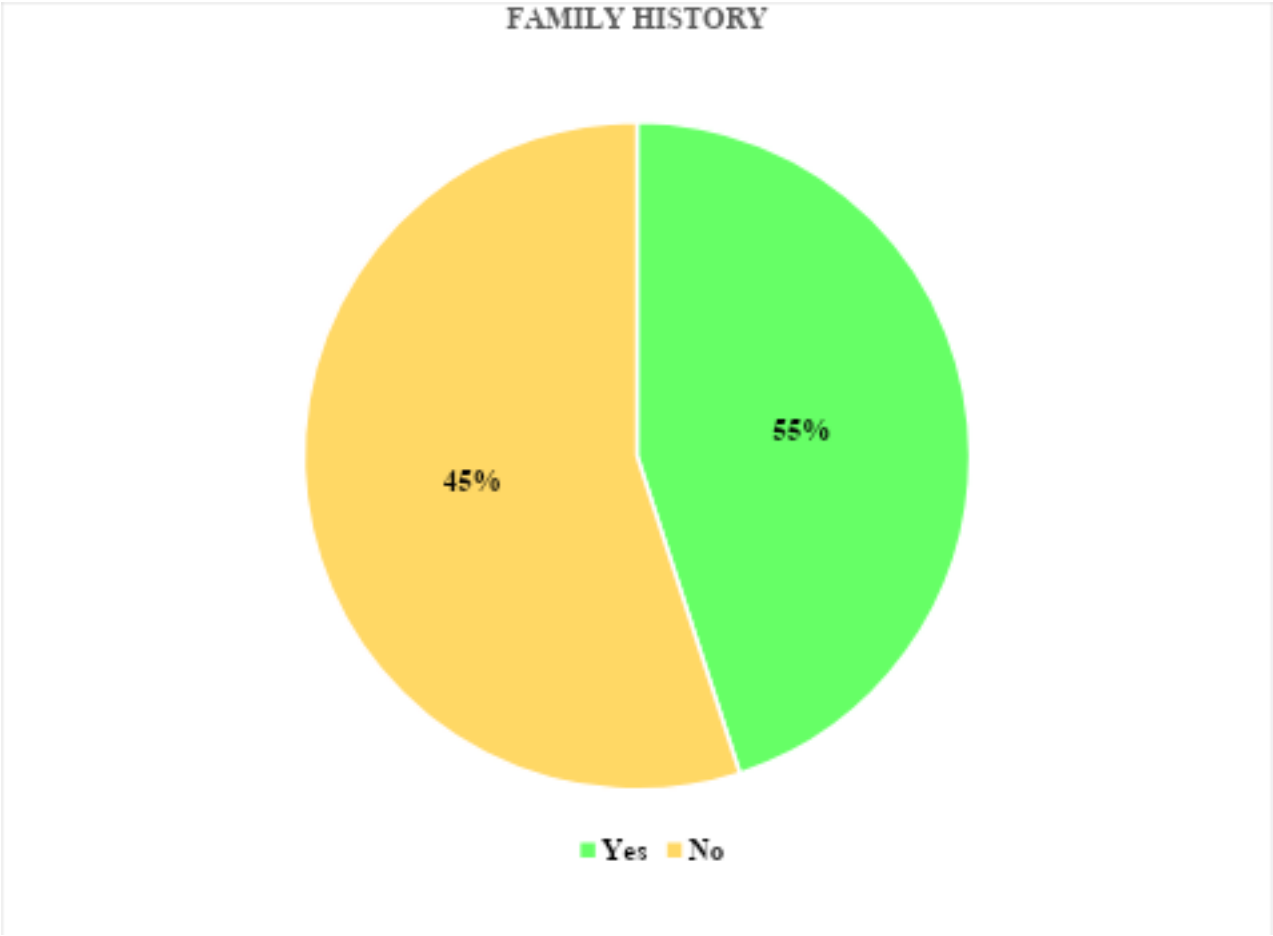


Figure 9: Pie Chart Showing Family History of Edema

The pie chart shows that **45%** of women reported a **positive family history** of edema, while **55%** did not. This indicates that nearly half the sample may have a genetic or hereditary predisposition to lower limb swelling.

10 EDEMA IN PREVIOUS PREGNANCY	N	%
Yes	51	85
No	9	15
TOTAL	60	100

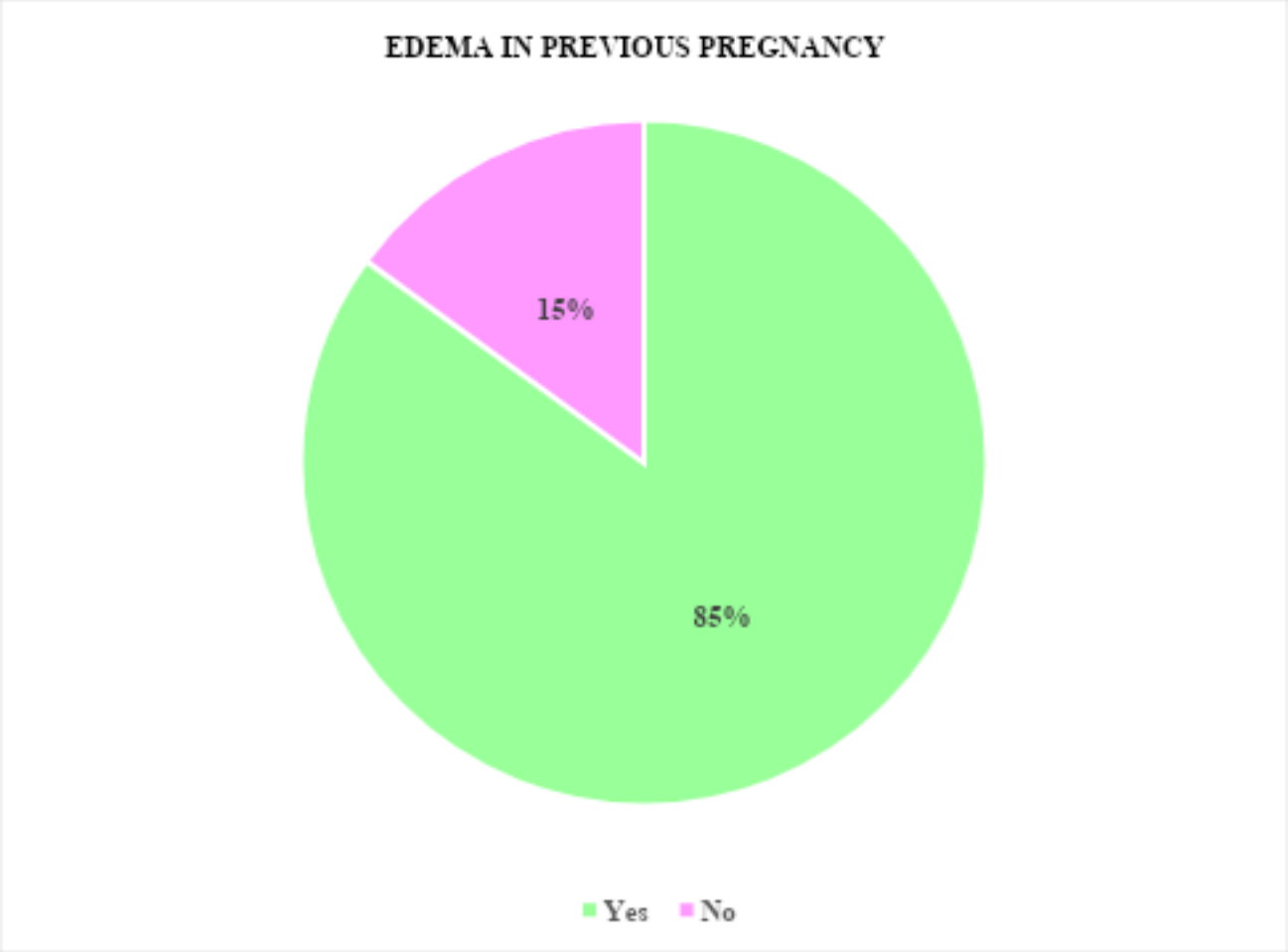


Figure 10: Pie Chart Showing Edema in Previous Pregnancy

A major portion (**85%**) of antenatal mothers had **experienced edema** in previous pregnancies, while **15%** had not. This suggests that edema is a recurring condition in a large portion of the sample.

11 SITTING FOR PROLONG TIME	N	%
Yes	3	5
No	57	95
Total	60	100

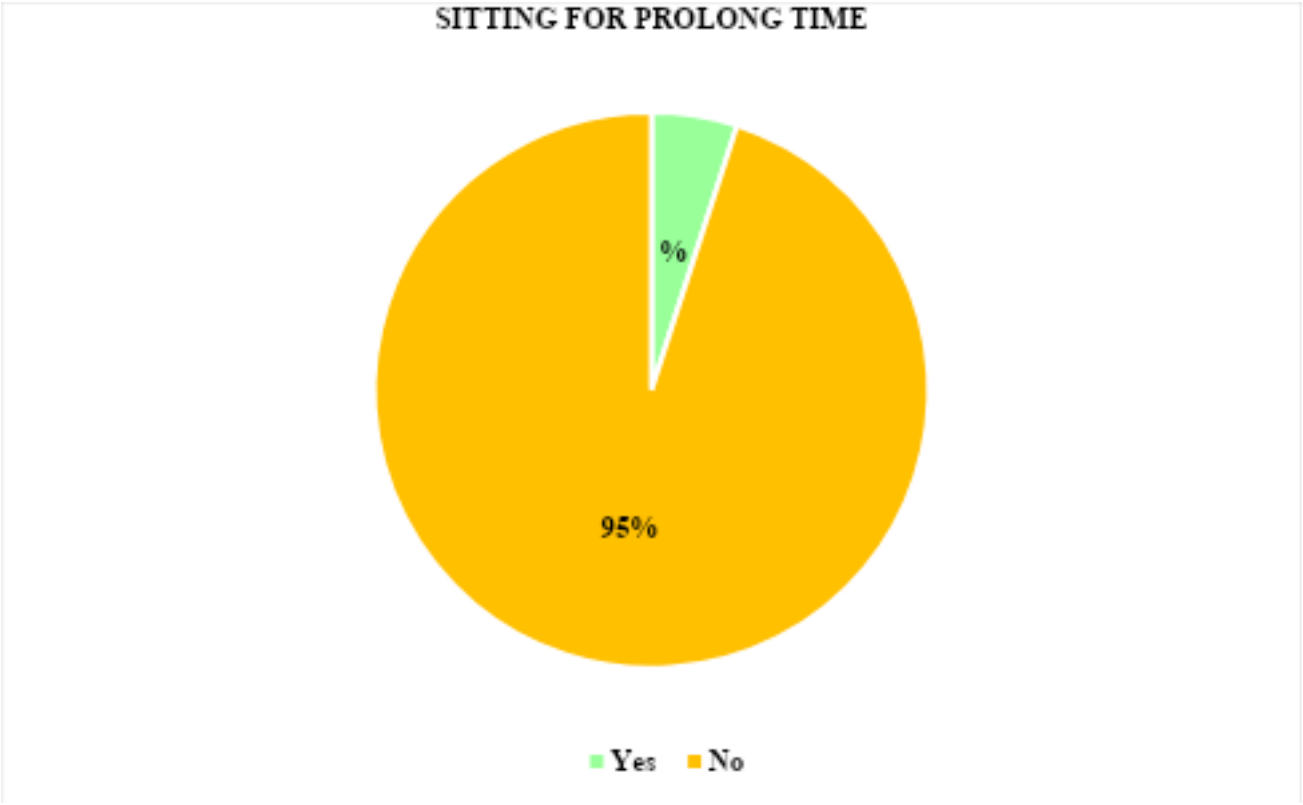


Figure 11: Pie Chart Showing Prolonged Sitting Behavior

The chart shows that only **5%** sit for prolonged periods, whereas **95%** do not. This signifies that prolonged sitting is not a major contributor to edema in this sample.

12 STANDING FOR PROLONG TIME	N	%
Yes	23	38.33
Occasional	3	5
No	34	56.67
TOTAL	60	100

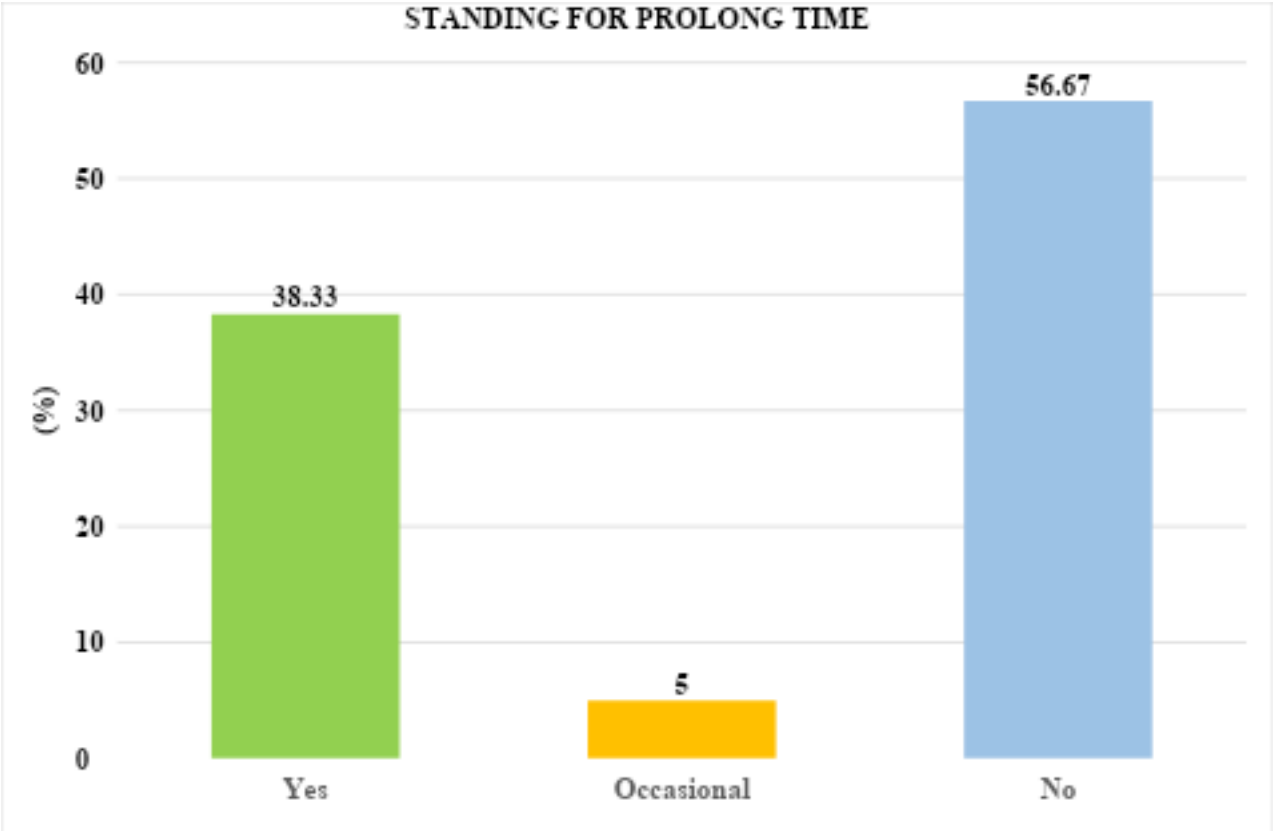


Figure 12: Clustered pyramid showing the distribution of subject on the basis Prolonged Standing Behavior

The Clustered pyramid demonstrates that **38.33%** stand for prolonged periods, **5%** occasionally stand long, while **56.67%** do not. This shows that prolonged standing is a considerable risk factor among almost 2/5th of the sample.

13 TYPES OF FOOTWEAR	N	%
Flat sandals	22	36.67
Sleeper	38	63.33
Total	60	100

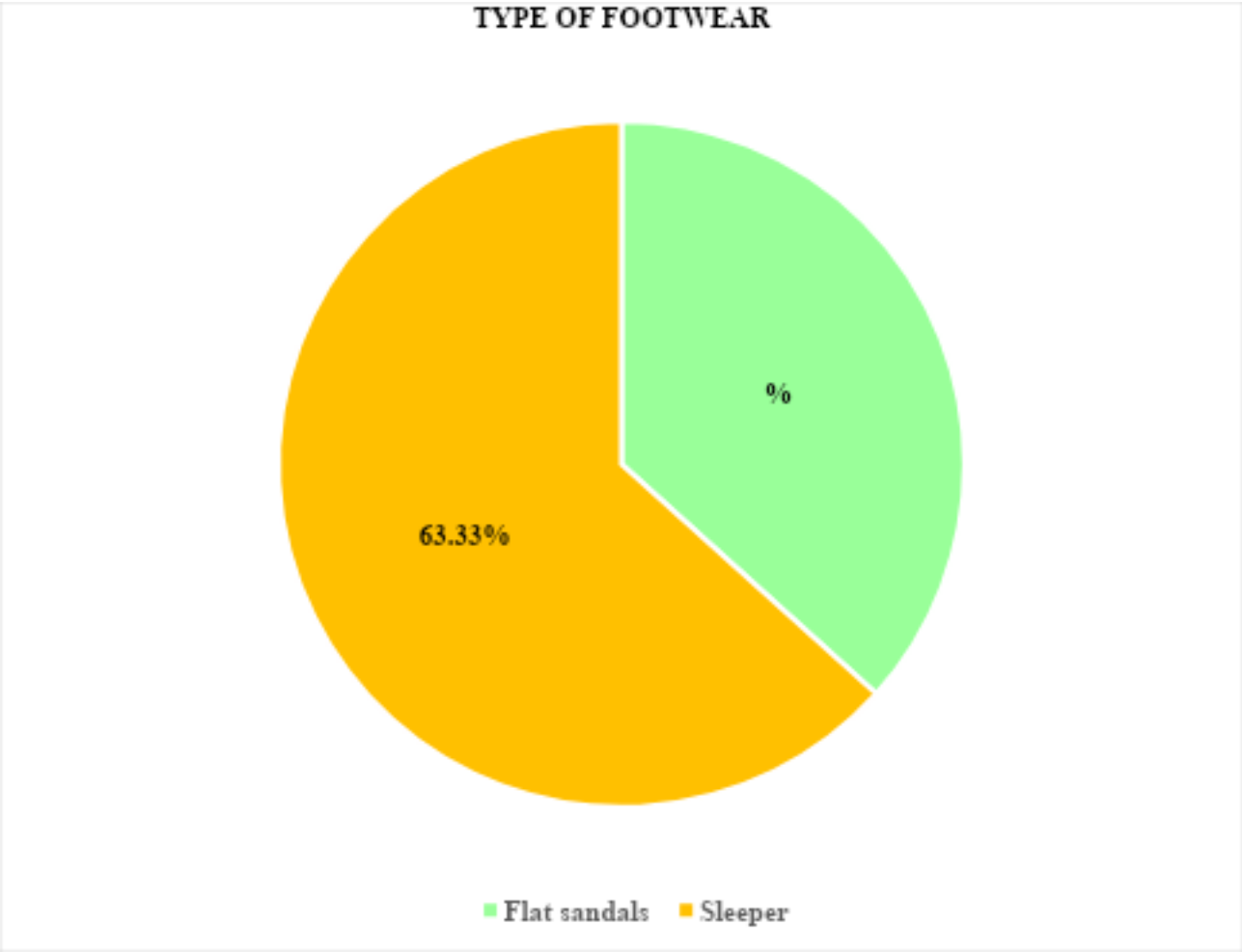


Figure 13: Pie Chart Showing Type of Footwear

The chart reveals that **63.33%** used **slippers**, and **36.67%** used **flat sandals**. Improper footwear may be contributing to discomfort and edema in some cases.

14 REST TAKEN IN AFTERNOON	N	%
< 2hours	36	60
2 hours	24	40
TOTAL	60	100

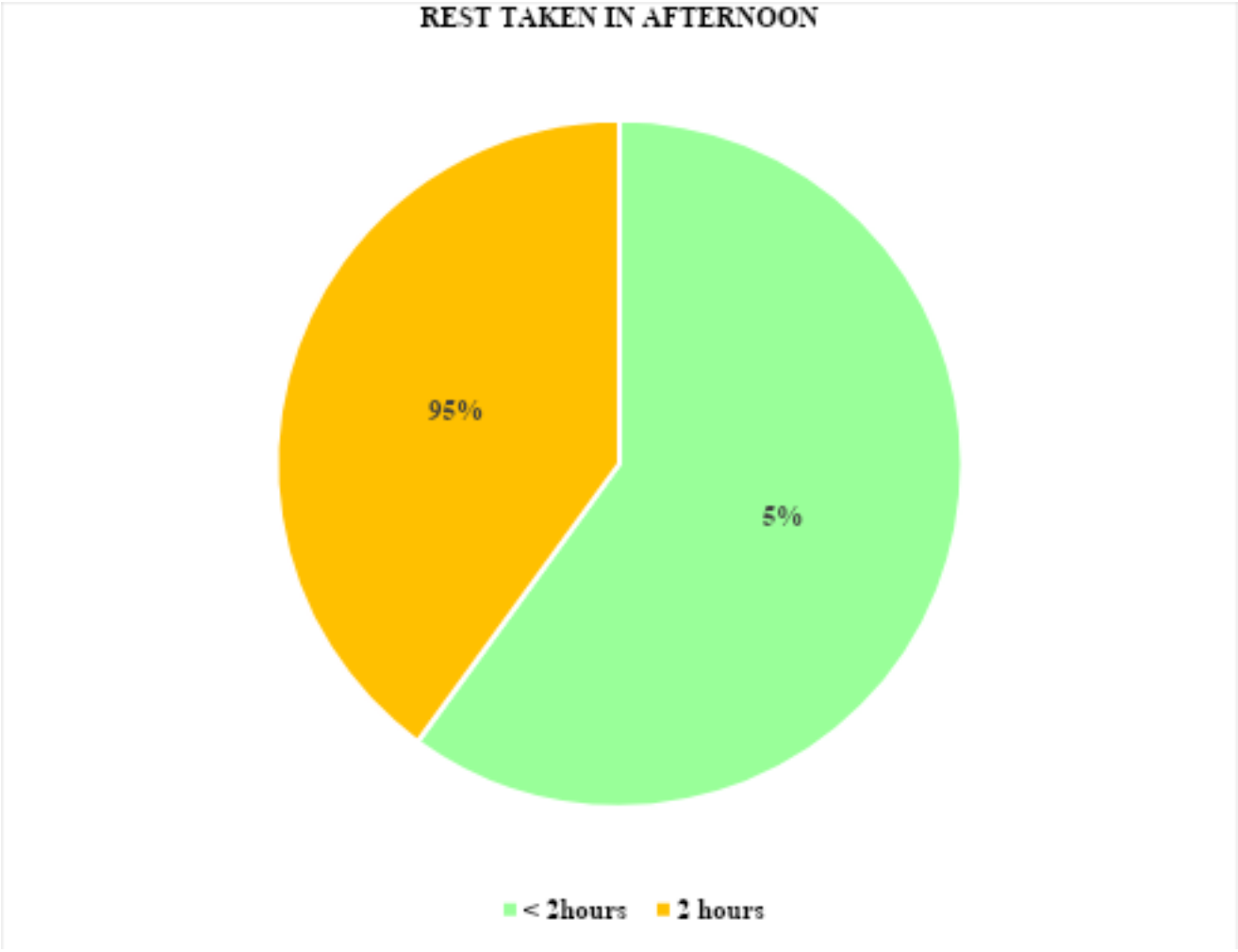


Figure 14: Pie Chart Showing Afternoon Rest

The pie chart indicates that **60%** of antenatal mothers rested **less than 2 hours**, and **40%** rested **exactly 2 hours** in the afternoon. Inadequate rest may increase leg edema in pregnancy.

15 SEVERITYS OF EDEMA	N	%
Evening	28	46.67
Night	32	53.33
TOTAL	60	100

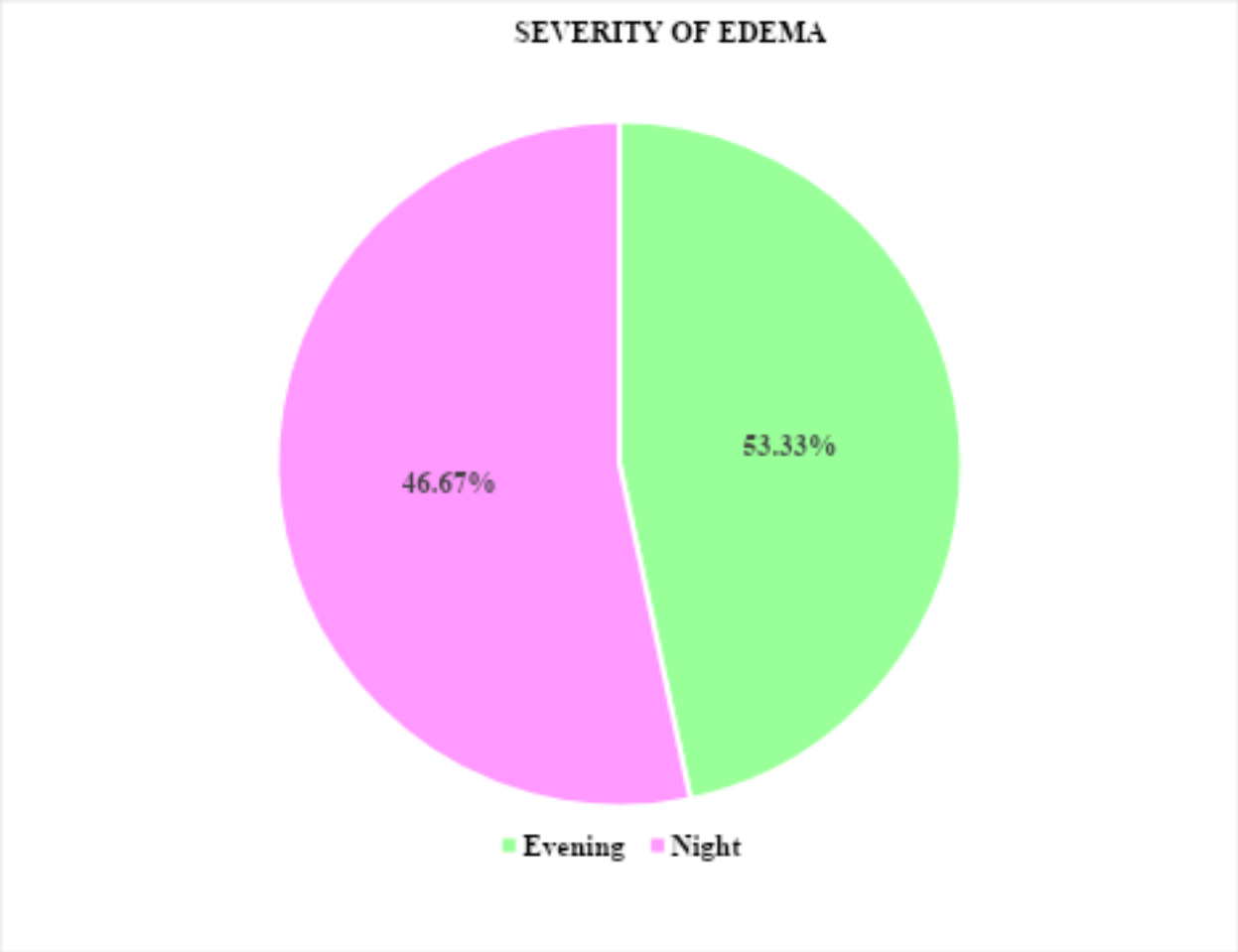


Figure 15: Pie diagram Showing the timing of Severity/Timing of physiological lower leg Edema

The distribution shows **53.33%** experience edema at **night**, and **46.67%** in the **evening**. This supports the physiological nature of edema—worsening as the day progresses.

4.3) Frequency and percentage distribution of subjects with dietary risk factors of physiological lower leg edema.

16 INTAKES OF WATER	N	%
1 - 2 liter	14	23.33
2 - 3 liter	46	76.67
TOTAL	60	100

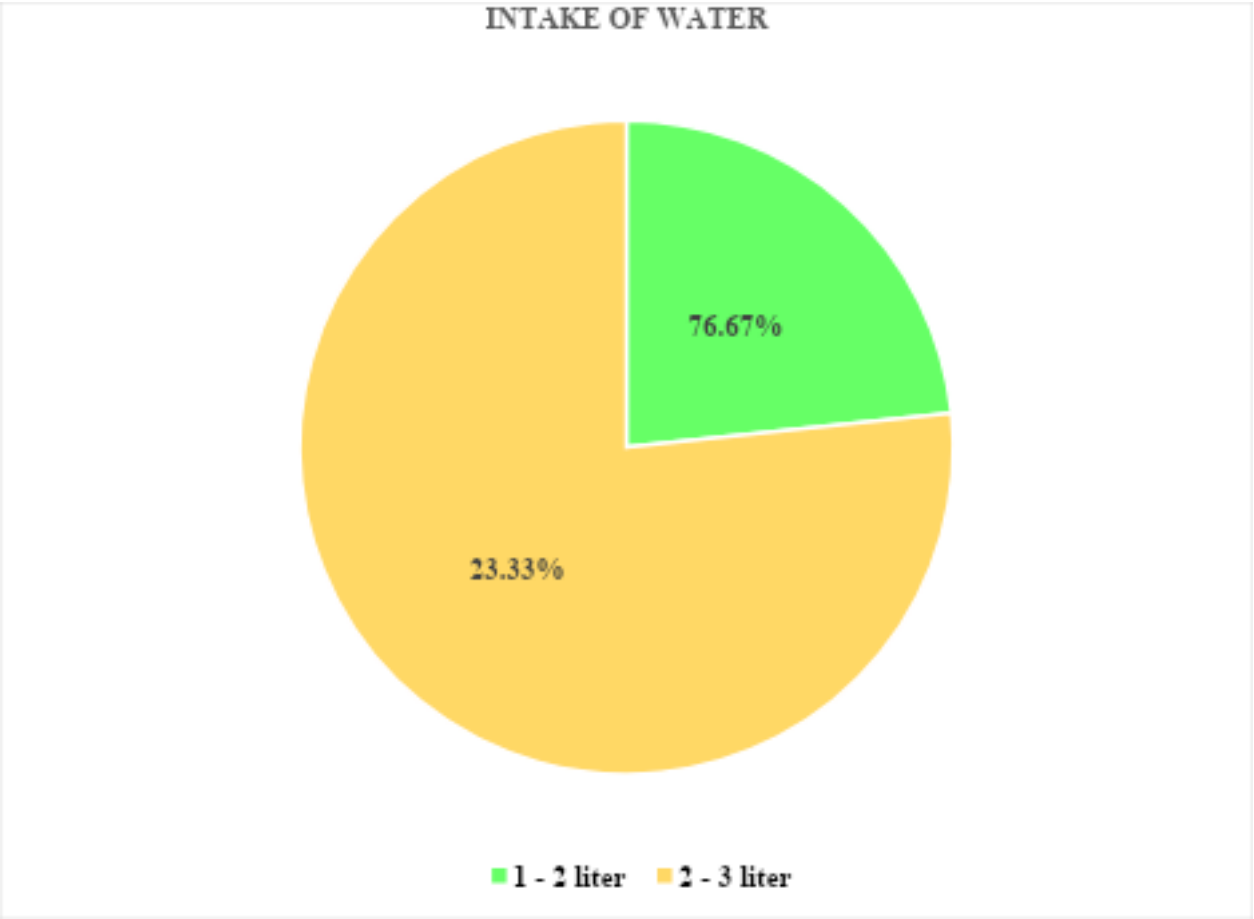


Figure 16: Pie Chart Showing the distribution of subject based on Intake of water

The chart shows **76.67%** consumed **2–3 liters** of water daily, and **23.33%** consumed **1–2 liters**. Adequate hydration was common among most participants.

17 COFFEE INTAKE	N	%
Yes	14	23.33
Occasional	13	21.67
No	33	55
TOTAL	60	100

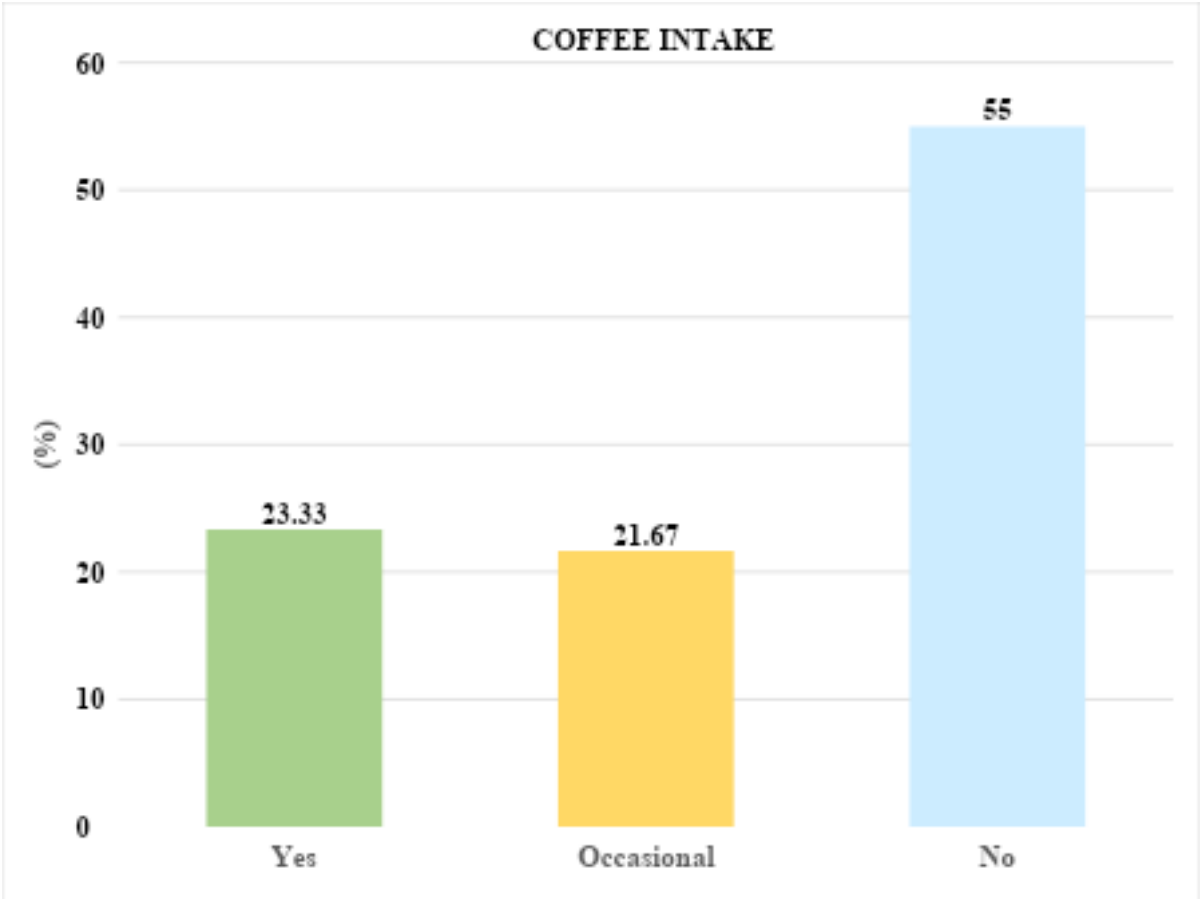


Figure 17: Pie Chart Showing Coffee Intake

The Bar diagram shows that **55%** did **not** consume coffee, **23.33%** consumed regularly, and **21.67%** consumed occasionally. High coffee intake was therefore not common among participants.

4.4) Frequency and percentage distribution distribution of subjects according to measures taken to reduce physiological lower leg edema

18 OTHER METHOD FOR REDUCE EDEMA	N	%
Leg elevation	21	35
Use pillow for elevation	10	16.67
NO	29	48.33
TOTAL	60	100

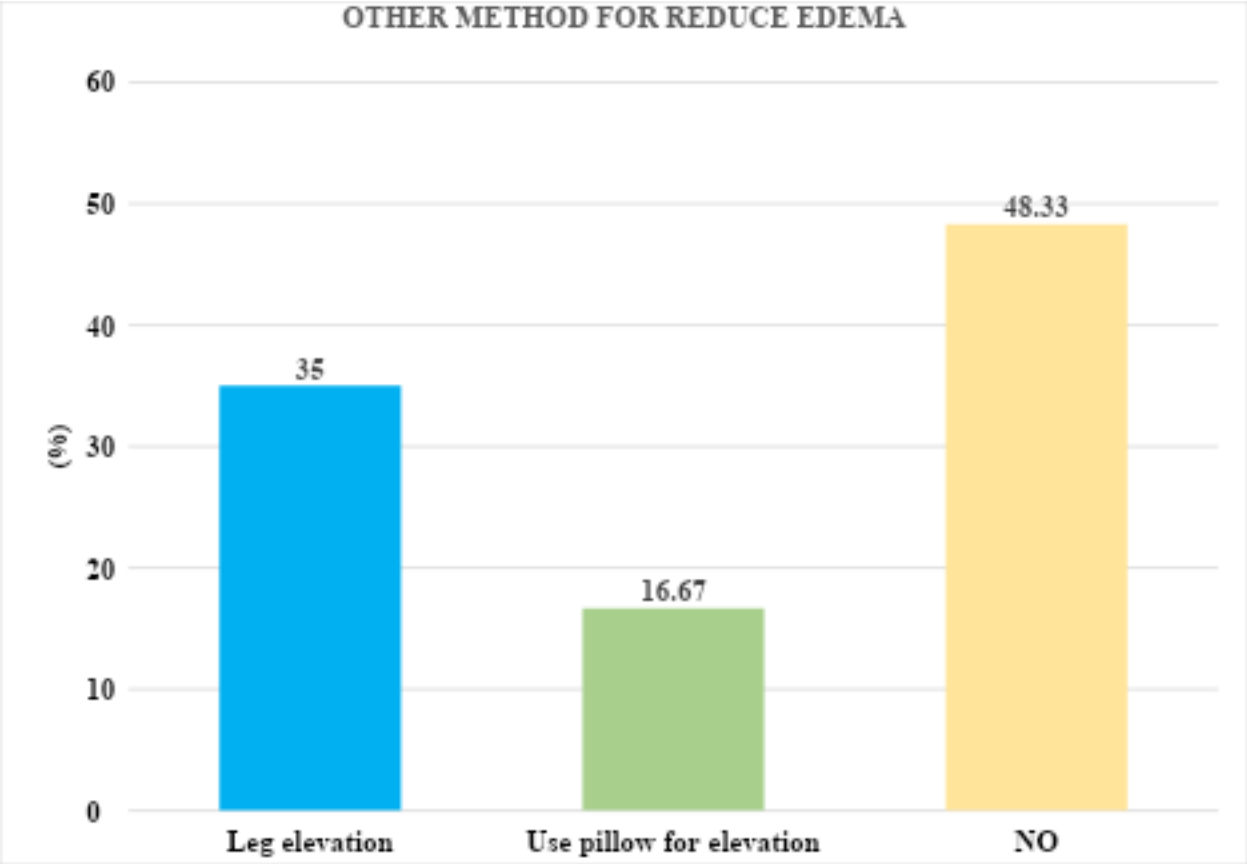


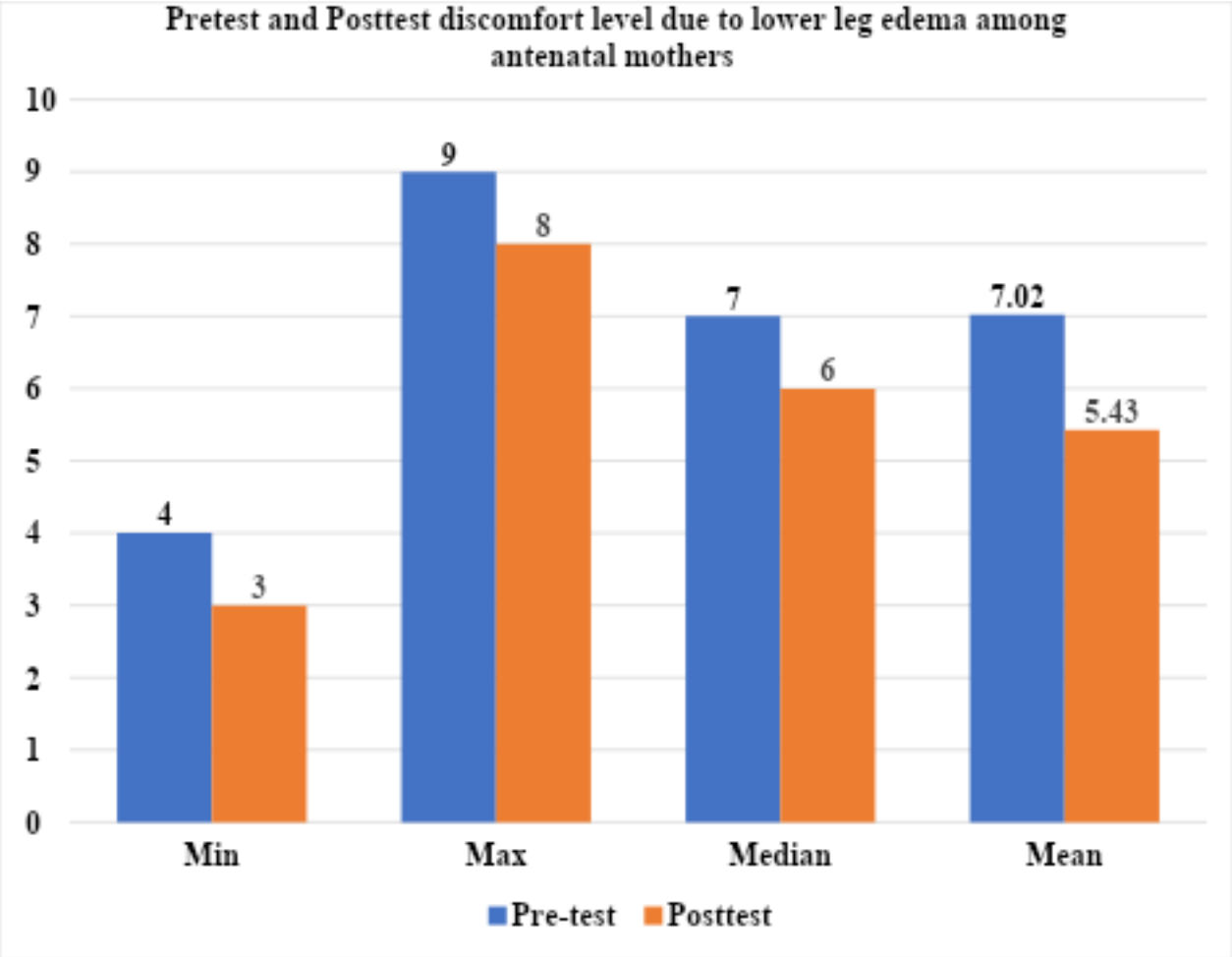
Figure 18: Pie Chart Showing Other Methods Used to Reduce Edema

The chart displays that **35%** practised **leg elevation**, **16.67%** used a **pillow**, while **48.33%** used **no method**. Almost half took no measures for edema relief.

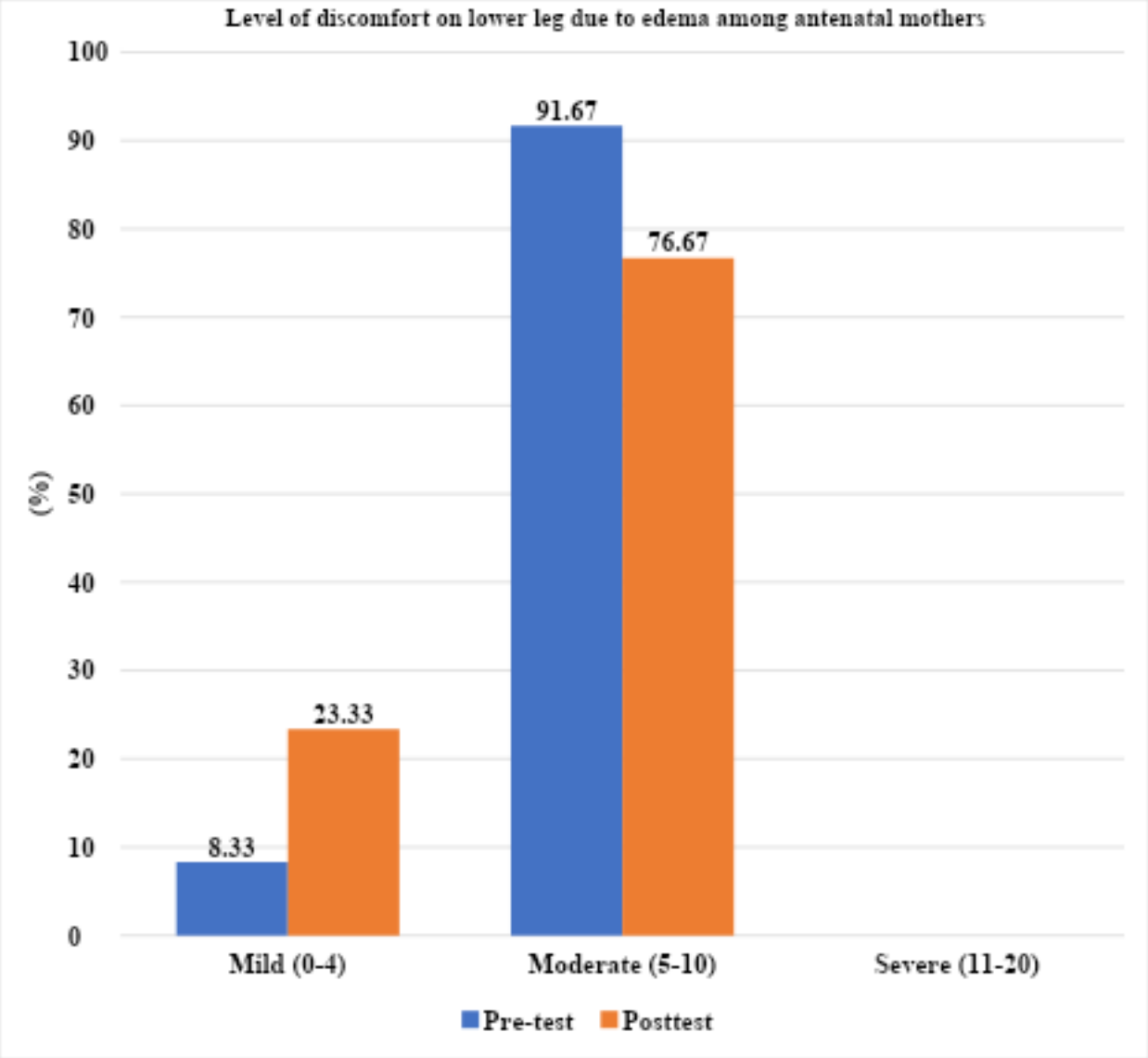
Section II Assessment of pre-test and post-test and post-test levels of discomfort due to physiological lower leg edema among antenatal mothers in experimental group.

1. To assess the pretest and posttest discomfort level due to lower leg edema among antenatal mothers.

	Pretest and Posttest discomfort level due to lower leg edema among antenatal mothers (N=60)					
	Max score	**Min-Max**	**Median**	**Mean**	**Mean %**	**SD**
PRE-TEST	20	4-9	7	7.02	35.1	1.59
POSTTEST	20	3-8	6	5.43	27.15	1.42

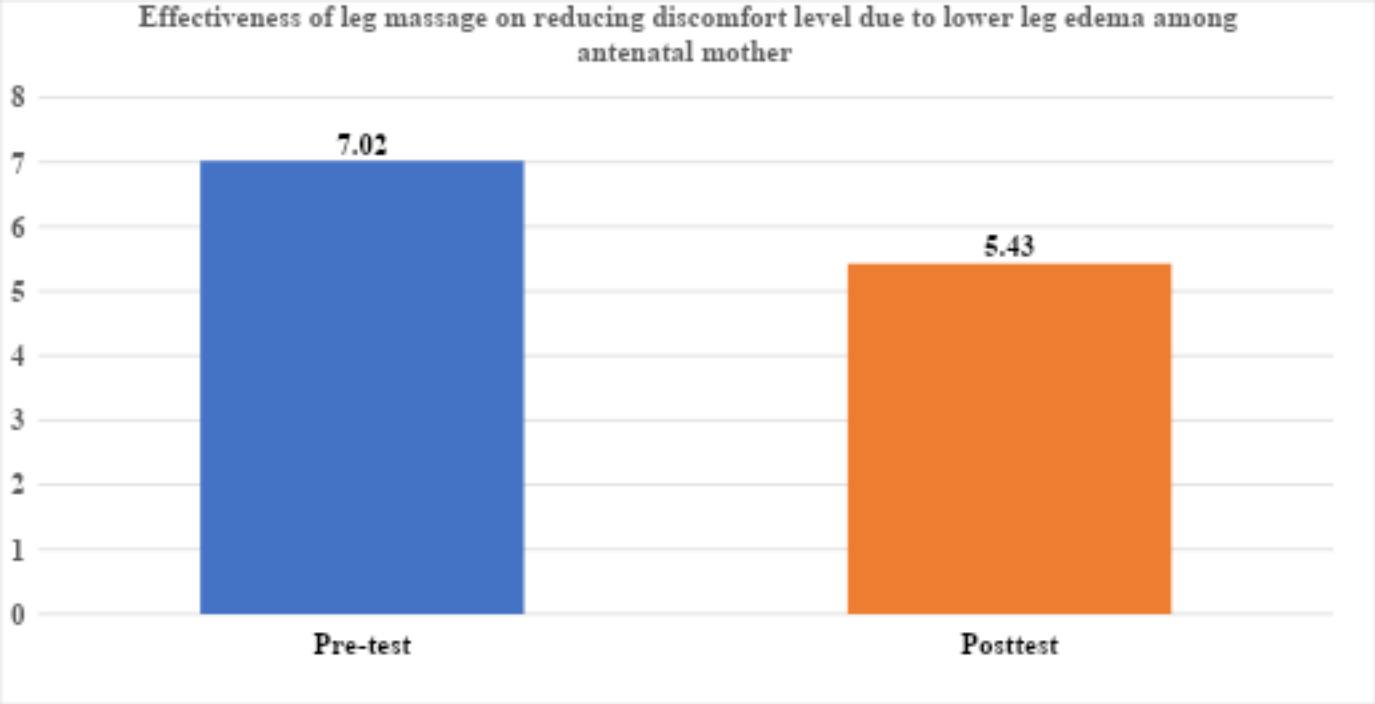


	Level of discomfort on lower leg due to edema among antenatal mothers			
	Mild (0-4)	**Moderate (5-10)**	**Severe (11-20)**	**Total**
PRE-TEST	5(8.33%)	55(91.67%)	0(0%)	60(100%)
POSTTEST	14(23.33%)	46(76.67%)	0(0%)	60(100%)



SECTION III Comparison of pre-test and post-test levels of discomfort in Experimental Group

	Pretest and Posttest discomfort level due to lower leg edema among antenatal mothers (N=60)					
	Mean	**Mean %**	**SD**	**Mean diff(% reduction)**	**Paired 't' value/Critical value**	**Significance**
PRE-TEST	7.02	35.1	1.59	-1.59(-7.95%)	21.99/3.46	P<0.001 HS
POSTTEST	5.43	27.15	1.42			



The above table compares discomfort score due to lower leg edema among antenatal mothers using paired' test. On applying the test, the difference in mean was found to be highly significant (t=21.99 p<0.001 HS). This shows mean discomfort score due to lower leg edema among antenatal mothers differ significantly and it shows leg massage was highly effective in reducing lower leg edema.

	Level of discomfort on lower leg due to edema among antenatal mothers			
	Mild (0-4)	**Moderate (5-10)**	**Severe (11-20)**	**Total**
PRE-TEST	5(8.33%)	55(91.67%)	0(0%)	60(100%)
POSTTEST	14(23.33%)	46(76.67%)	0(0%)	60(100%)
	Chi square value=5.06 ,df=2, critical value=3.84 , p<0.05 S			

The above table compares Level of discomfort on lower leg due to edema among antenatal mothers using non-parametric **chi-square test**. On applying the test, the difference in the distribution of samples according to **discomfort** level was found to be highly significant p<0.05 (chi square=5.06). In pretest 8.33% were in mild discomfort level whereas in posttest 23.33% cases were in mild discomfort level, this shows leg massage was highly effective.

Section IV Association between post-test level of discomfort and selected sociodemographic variables

Obj 4 : To find out the association on Posttest level of discomfort on lower leg due to edema on antenatal mothers with selected socio demographic variables.

1 AGE IN YEARS	Posttest level of discomfort on lower leg due to edema among antenatal mothers			Total	DF/Critical value	Chi-square value	Inference
	Mild (0-4)	Moderate (5-10)	Severe (11-20)				
18 – 25 years	3(16.67%)	15(83.33%)		18(100%)	3/7.82	1.19	P>0.05 NS
26 – 30 years	9(25.71%)	26(74.29%)		35(100%)			
31 – 35 years	2(33.33%)	4(66.67%)		6(100%)			
36 years or older	0(0%)	1(100%)		1(100%)			
2 EDUCATIONAL STATUS							
Illiterate	0(0%)	1(100%)		1(100%)	2/5.99	0.54	P>0.05 NS
Primary education							
Secondary education	12(25%)	36(75%)		48(100%)			
Graduate & above	2(18.18%)	9(81.82%)		11(100%)			
3 OCCUPATIONS							
Homemaker.	14(23.33%)	46(76.67%)		60(100%)			
Service							
Business							
Part time employed							
4 TYPES OF FAMILY							
Nuclear family	1(6.67%)	14(93.33%)	0(0%)	15(100%)	2/5.99	3.10	P>0.05 NS
Joint family	13(28.89%)	32(71.11%)	0(0%)	45(100%)			
Extended family							
5 AREA OF LIVING							
Urban area	10(22.22%)	35(77.78%)	0(0%)	45(100%)	2/5.99	0.12	P>0.05 NS
Rural area	4(26.67%)	11(73.33%)	0(0%)	15(100%)			
6 HEIGHT							
4 Feet to 4 feet 5 inch					2/5.99	0.06	P>0.05 NS
5 feet to 5 feet 5 inch	8(22.22%)	28(77.78%)		36(100%)			
6 feet to 6 feet 5 inch	6(25%)	18(75%)		24(100%)			
7 Weight							
40 to 50kg	2(22.22%)	7(77.78%)		9(100%)	3/7.82	1.62	P>0.05 NS
51 to 60 kg	8(30.77%)	18(69.23%)		26(100%)			
61 to 70 kg	3(15%)	17(85%)		20(100%)			
> 70 kg	1(20%)	4(80%)		5(100%)			

OBSTETRICAL HISTORY

8 GRAVIDA	Posttest level of discomfort on lower leg due to edema among antenatal mothers			Total	DF/Critical value	Chi-square value	Inference
	Mild (0-4)	Moderate (5-10)	Severe (11-20)				
G1	9(32.14%)	19(67.86%)		28(100%)	3/7.82	4.61	P>0.05 NS
G2	2(10%)	18(90%)		20(100%)			
G3	3(33.33%)	6(66.67%)		9(100%)			
G4	0(0%)	3(100%)		3(100%)			
9 FAMILY HISTORY							
Yes	2(7.41%)	25(92.59%)		27(100%)	1/3.84	6.96	P<0.05 S
No	12(36.36%)	21(63.64%)		33(100%)			
10 EDEMA IN PREVIOUS PREGNANCY							
Yes	12(23.53%)	39(76.47%)		51(100%)	1/3.84	0.007	P>0.05 NS
No	2(22.22%)	7(77.78%)		9(100%)			
11 SITTING FOR PROLONG TIME							
Yes	2(66.67%)	1(33.33%)		3(100%)	1/3.84	3.31	P>0.05 NS
No	12(21.05%)	45(78.95%)		57(100%)			
12 STANDING FOR PROLONG TIME							
Yes	7(30.43%)	16(69.57%)		23(100%)	2/5.99	1.70	P>0.05 NS
Occasional	0(0%)	3(100%)		3(100%)			
No	7(20.59%)	27(79.41%)		34(100%)			
13 TYPES OF FOOTWEAR							
Flat sandals	6(27.27%)	16(72.73%)		22(100%)	1/3.84	0.30	P>0.05 NS
Sleeper	8(21.05%)	30(78.95%)		38(100%)			
14 REST TAKEN IN AFTERNOON							
Less than 2hours	2(6.06%)	31(93.94%)		36(100%)	1/3.84	8.81	P<0.05 S
2 hours	9(37.5%)	15(62.5%)		24(100%)			
15 SEVERITYS OF EDEMA							
Evening	8(28.57%)	20(71.43%)		28(100%)	1/3.84	0.80	P>0.05 NS
Night	6(18.75%)	26(81.25%)		32(100%)			

16 INTAKE OF WATER	Posttest level of discomfort on lower leg due to edema among antenatal mothers			Total	DF/Critical value	Chi-square value	Inference
	Mild (0-4)	Moderate (5-10)	Severe (11-20)				
1 - 2 liter	2(14.29%)	12(85.71%)		14(100%)	1/3.84	0.83	P>0.05 NS
2 - 3 liter	12(26.09%)	34(73.91%)		46(100%)			
17 COFFEE INTAKE							
Yes	3(21.43%)	11(78.57%)		14(100%)	1/3.84	0.04	P>0.05 NS
Occasional	3(23.08%)	10(76.92%)		13(100%)			
No	8(24.24%)	25(75.76%)		33(100%)			

18 OTHER METHOD FOR REDUCE EDEMA							
Leg elevation	8(38.1%)	13(61.9%)		21(100%)	2/5.99	4.15	P>0.05 NS
Use pillow for elevation	1(10%)	9(90%)		10(100%)			
NO	5(17.24%)	24(82.76%)		29(100%)			

Table No. : Above Table shows the association between the Posttest level of discomfort on lower leg due to edema among antenatal mothers with selected socio-demographic variables such as **Age education**, **family type, area of living** using a non-parametric $\chi 2$ test.

On applying the chi-square test demographic variable, "**family history**" and "**rest taken in afternoon"** was **significantly associated** with the Posttest level of discomfort on lower leg due to edema among antenatal mothers. The 2 value of the **family history** was 6.96, which is greater than the table value (3.84) at P=0.05 for 1 degree of freedom. Similarly, 2 value of the **rest taken inafternoon** was 8.81 greater than the table value (3.84) at P=0.05 for 1 degree of freedom Hence **H1** i.e, there is a significant association between the Posttest level of discomfort on lower leg due to edema among antenatal mothers with selected socio-demographic variables **"family history**" and **"rest taken in afternoon**" is **accepted.**

Association between the Posttest level of discomfort on lower leg due to edema among antenatal mothers and other selected sociodemographic variables such as **age** ($\chi 2$=1.19, p>0.05), **education** (2=0.54, p>0.05), **family type** (2=3.10, p>0.05), were found to be statistically **not significant**. **Hence H0** that there is **no significant association** between selected socio-demographics like **age**, **education, family type, with** Posttest level of discomfort on lower leg due to edema among antenatal mothers is **accepted**

CHAPTER – V

RESULT AND DISCUSSION

"A nation is advanced in proportion to education and intelligence spread among masses"

Swami Vivekananda

According to Horace Secrist "Statistics are aggregates of facts, affected to a marked extent by multiplicity of causes, numerically expressed, enumerated or estimated according to reasonable standards of accuracy, collected a systematic manner for a predetermined purpose and placed in relation to each other.

The term analysis refers to as a method of organizing data in such a way that research question can be answered and hypothesis can be tested. This chapter present the analysis and interpretation of data assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." The data analysis was carried out based on the objective and hypothesis set by the invigilator. The data collected were organized, tabulated, analyzed and interpreted by statistical tables and graphs.

Objectives of the study

- To assess the effectiveness of leg massage in reducing discomfort level due to physiological lower leg edema among antenatal mothers attending ANC OPD in experimental group.
- To assess the association between the level of lower leg discomfort caused by edema in antenatal mothers with selected socio demographic variable.
- To identify the risk factors associated with physiological lower leg edema among antenatal mothers attending ANC OPD.

ORGANIZATION OF DATA

The data was organized under following section.

- **Section** I: Distribution of Antenatal Mothers According to Demographic Variables
- **Section II**: Assessment of Pre-Test and Post-Test Levels of Discomfort due to Physiological Lower Leg Edema among Antenatal Mothers in Experimental Group
- **Section III**: Comparison of Pre-Test and Post-Test Levels of Discomfort in Experimental Group.
- **Section IV**: Association between Post-Test Level of Discomfort and Selected Sociodemographic Variables.
- **Section V**: Identification of Risk Factors Associated with Physiological Lower Leg Edema.

Section I: Distribution of Antenatal Mothers According to Demographic Variables

This section includes data related to selected sociodemographic characteristics of antenatal mothers such as:

- Age
- Educational status
- Occupation
- Type of family
- Parity
- Gestational age
- Duration of standing per day
- Daily activity or lifestyle

(Data are usually presented in frequency and percentage distribution tables.)

Section II: Assessment of Pre-Test and Post-Test Levels of Discomfort due to Physiological Lower Leg Edema among Antenatal Mothers in Experimental Group.

This section presents the pre-test and post-test scores of discomfort level before and after leg massage among antenatal mothers. Data are presented in mean, standard deviation (SD), and mean difference to determine changes after intervention.

Section III: Comparison of Pre-Test and Post-Test Levels of Discomfort in Experimental Group

This section deals with the comparison between pre-test and post-test scores to determine the effectiveness of leg massage. Statistical tests such as the paired "t" test are applied to test the significance of the difference.

Section IV: Association between Post-Test Level of Discomfort and Selected Socio- demography Variables

This section examines whether there is any significant association between the post-test discomfort level and selected demographic variables of antenatal mothers. Tests such as the Chi-square test are used for this analysis.

Section V: Identification of Risk Factors Associated with Physiological Lower Leg Edema

This section identifies the common risk factors contributing to the occurrence of physiological lower leg edema among antenatal mothers, such as:

- Prolonged standing
- Limited physical activity
- Nutritional factors
- Gestational age
- Lifestyle and work pattern

HYPOTHESES

H_0 (Null Hypothesis):
There will be **no significant difference** between the pre-test and post-test levels of discomfort due to physiological lower leg edema among antenatal mothers after leg massage.

H_1 (Research Hypothesis):
There will be a **significant difference** between the pre-test and post-test levels of discomfort due to physiological lower leg edema among antenatal mothers after leg massage.

H_2 (Research Hypothesis):
There will be a **significant association** between post-test level of discomfort and selected **demographic variables** (such as age, parity, gestational age, and occupation) among antenatal mothers.

CHAPTER - VI
SUMMARY, CONCLUSION, IMPLICATION, LIMITATION AND RECOMMENDTATION

This chapter gives a brief summary of the study, major findings, recommendations and the conclusion drawn. It also highlights the implications for nursing practice, nursing education, nursing administration and nursing research.

SUMMARY

Edema is common during late pregnancy. It typically involves the lower extremities. Physiologic edema results from hormone-induced sodium retention which can be reduced by intermittently lying on the left side, by intermittently elevating the lower extremities, by wearing elastic compression stockings and by massage therapy.

Massage is the most widely used complementary therapy in nursing practice. Effective leg massage has many benefits as it provides relaxation, improves circulation. The present study is a study to assess the effectiveness of leg massage on physiological lower leg edema among antenatal mothers at selected Hospital, Durg district (C.G). The main objective is to compare the degree of physiological lower leg edema among antenatal mothers between before and after administration of leg massage by using self -structured tool for assessment. The wide literature search also helped in selection of appropriate conceptual planning, developing frame work and research plan.

The research design used in this study was one group pre-test post-test design under pre-experimental approach. The study was conducted in ANC OPD of Durg district Hospitals, (C.G). The sampling technique used in this study was non probability purposive sampling technique. The sample size was 60 and there was no control group. According to selection criteria, subjects were selected for the study. Questionnaire based on demographic variables and risk factors and self-structured edema assessment tool was used to assess the degree of physiological lower leg edema among antenatal mothers third trimester. The data were collected after ethical approval. Pretest level of edema was assessed by using self-structured edema assessment tools and a questionnaire to assess the risk factors. Leg massage was given to the mothers who belong to intervention group, The data was collected through interview and observation for all antenatal mothers who had physiological lower leg edema. both descriptive and inferential statistics were used for analysis of the data.

CONCLUSION:

The study findings concludes that leg massage is an effective, inexpensive method in reducing the degree of physiological lower leg edema among antenatal mothers third trimester attending ANC OPD, Leg massage should become a routine activity among antenatal mothers with physiological lower leg edema. The present study was intended to evaluate the effectiveness of leg massage on physiological lower leg edema among antenatal mothers at selected Hospital, Durg district C.G.

NURSING IMPLICATIONS:

The present study has implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing practice:

- Nurses can implement the practice of leg massage in reducing physiological lower leg edema among antenatal mothers in clinical and community settings.
- Nurses can assess the physiological lower leg edema using pitting edema scale on daily basis.
- Nurses can involve in educating antenatal mothers with physiological lower leg edema and their families

on the importance of leg massage in reducing physiological lower leg edema

Nursing education:

- The nursing curriculum should be updated with evidence-based nursing research on leg massage in reducing the physiological lower leg edema among antenatal mothers.
- Continuing nursing education and nursing educational conferences among staff nurses will help to promote and update their knowledge on administration of leg massage for reducing physiological lower leg edema among antenatal mothers.
- Workshops should be organized about the effect of leg massage on physiological lower leg edema among antenatal mothers.

Nursing administration:

- Provision should be made for staff working in antenatal ward to get training in leg massage.
- Nursing administrators need to facilitate the utilization of research-based nursing intervention such as leg massage in the management of physiological lower leg edema among antenatal mothers.

Nursing research:

- The study can be a baseline for further studies related to lower leg edema.
- Survey research can be conducted about the satisfaction of nurses and family members regarding leg massage on physiological edema reduction.

LIMITATIONS

1. The study was conducted in a single selected hospital at Durg District, which limits the generalizability of the findings to other settings.
2. The sample size was small; hence the results cannot be generalized to the entire population of antenatal mothers.
3. The study was limited to antenatal mothers attending ANC OPD; home-bound or hospitalized antenatal mothers were not included.
4. The duration of the study was short, restricting the assessment of long-term effects of leg massage on edema and discomfort.
5. The study included only one intervention (leg massage) and did not compare its effectiveness with other non-pharmacological methods such as limb elevation, hydrotherapy, or compression stockings.
6. The assessment of discomfort was based on self-reported responses, which might have introduced some degree of subjectivity or bias.
7. Factors such as dietary habits, fluid intake, and environmental temperature were not controlled, which may have influenced the edema levels.
8. The study did not assess inter-rater reliability for measurements such as pitting edema, which could affect consistency in data collection.

RECOMMENDATIONS

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

1. Replication of the study can be conducted on a larger sample size and in different settings to enhance the generalizability of the results.
2. Comparative studies can be undertaken to evaluate the effectiveness of leg massage versus other non-pharmacological interventions such as limb elevation, hydrotherapy, or compression stockings in reducing physiological lower leg edema.
3. Longitudinal studies can be carried out to assess the long-term effectiveness of leg massage throughout various trimesters of pregnancy.
4. Awareness programs and health education sessions can be organized for antenatal mothers to educate them about preventive measures and self-care practices to reduce leg edema and discomfort during pregnancy.
5. Nursing professionals and students should be trained in simple, evidence-based, non-invasive interventions like leg massage as part of routine antenatal nursing care.
6. Nurse administrators can incorporate leg massage protocols into the standard operating procedures (SOPs) for antenatal care in outpatient departments.
7. Further research can focus on identifying factors influencing the effectiveness of leg massage such as frequency, duration, and technique used.
8. Experimental studies can explore the psychological and emotional benefits of leg massage on maternal well-being and pregnancy-related anxiety.

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S. no	Time	Specific objective	Content	Teaching and learning activity	A.V.aids	Evaluation
1	2 min	To introduce about the leg massage	INTRODUCTION Pregnancy and the associated changes are a normal physiological process in response to the development of the fetus. These changes happen in response to many factors; hormonal changes, increase in the total blood volume, weight gain, and increase in fetus size as the pregnancy progresses. All these factors have a physiological impact on the pregnant woman: the musculoskeletal, endocrine, reproductive, cardiovascular, respiratory, nervous, urinary, gastrointestinal and immune systems are affected, along with changes to the skin and breasts. The full gestation period is 39-40 weeks, and a pre-term birth is classed as delivery before 37 weeks gestation, although there is variation internationally and it is thought that the length of human pregnancies also varies naturally. During pregnancy it is reported that 95.5% of 140 pregnant women had foot edema. Also, an increase in lower extremity and ankle circumference due to edema was observed in 83% of pregnant women. In pregnant women, the severity of symptoms such as night cramps, bloating, pain, and fatigue may increase due to edema in the lower extremities. Women with leg and foot edema can be treated non-pharmacologically using leg elevation, relaxing, immersion in water, bandaging, compression stockings, foot massage, intermittent pneumatic compression, reflexology, and interstitial fluid movement monitoring. Foot massage is a typical non-pharmacological technique used by medical professionals**. (Merve Yilmaz Menek 2024)**	Discussio n and answering	Chart	Explain about the leg massage.

S. no	Time	Specific objective	Content	Teaching and learning activity	A.V.aids	Evaluation
2.	2 min	To define leg massage	DEFINITION A leg massage is a therapeutic technique that involve the manual manipulation of the muscles, tendons, and soft tissues of the legs using various movements such as stroking, kneading, pressing and rubbing. It is performed to ; ● Promote relaxation and relieve muscles tension. ● Improve blood and lymphatic circulation. ● Reduce pain, swelling or fatigue in the legs. ● Support recovery after physical activity. ● Enhance overall well-being. **According to Tappan (2013)** "A leg massage is a manual therapy technique involving rhythmic manipulation of the legs to enhance circulation, relieve muscle tension, and promote relaxation." **According to Salvo S.G. (2021)** "A leg massage is a therapeutic technique that involve the manipulation of the muscles, tendons, and soft tissues of the legs to promote relaxation, improve circulation, reduce muscle tension and alleviate pain or fatigue." **According to Mark F. Beck**	Explanation and questioning	Chart	Define the Leg massage.

S. no	Time	Specific objective	Content	Teaching and learning activity	A.V.aids	Evaluation
3	2 min	To tell about the purpose and importance of leg massage.	➢ Improves venous return. ➢ Reduces edema. ➢ Relieves cramps and discomfort. ➢ Promote relaxation and sleep.	Discusses benefits, Interact ask question.	Black board	What is the purpose of the lower leg massage.
4	1 min	To explain about the indication of leg massage.	● Leg pain. ● Leg cramps. ● Mild edema on lower leg during pregnancy. ● Restlessness.	Explanation and questioning	Flash card	Tell about the indication of the leg massage.
5	2 min	To list out the contra – indication of lower leg massage.	❖ Varicose vein. ❖ Deep vein thrombosis. ❖ Skin lesions. ❖ Infection or high-risk pregnancy.	Discussion	PPT	List out the contra – indication of lower leg massage.
6	10 min	To elaborate the steps of lower leg massage.	**STEPS OF LOWER LEG MASSAGE** **1. Preparation** ● ash hands thoroughly. ● osition the mother comfortably (semi-fowlers position) ● pply suitable massage oil (e.g. coconut oil) to reduce friction. **2. Effleurage (Light Stroking)** ● egin with gentle, long strokes from ankle to	Demonstrate and Explain step by step	PPT, Chart	Demonstrate the procedure of lower leg massage.

S. no.	Time	Specific objective	Content	Teaching and learning activity	A.V. aids	Evaluation
			Knee using both palms • romotes relaxation and warms the tissues. • uration 1 – 2 minutes. **3. <u>Petrissage</u> (Kneading)** • se the fingers and thumbs to gently knead the calf muscles. • elps stimulate blood flow reduce muscle tension. • uration 2- 3 min. 4. **<u>Thumb circling</u> (Circular friction)** • pply small, circular movements with the thumbs around the ankle area and shin. • ocus on soft tissue, avoiding bony prominences. • uration 1 minutes. **5. <u>Tapotement</u> (Rhythmic tapping optional)** • ight tapping or hacking movement using the side of the hands. • sed for stimulation and muscle tone (optional in pregnancy).			

- uration 30 seconds, 1 minutes if tolerated.

6. Effleurage (Closing strokes)

- inish with gentle upward strokes from ankle to knee to calm and relax.
- elps drain any mobilized fluid towards lymphatic areas.
- uration 2 minutes.

7. Rest and observation

- llow the mother to rest for a few minutes after the massage.
- bserve for signs of discomfort, dizziness or skin reaction.

TOTAL DURATION

10 minutes per leg, preferably in the evening when edema is more noticeable.

NURSING MANAGEMENT OF LOWER LEG MASSAGE

1. Assessment Phase

- **Subjective Data:**
  - ssess for complaints of heaviness, discomfort, or swelling in the lower limbs.
  - ecord the mother's level of discomfort using a numerical

rating or visual analogue scale.

- sk about daily activities, rest pattern, and standing duration.

- **Objective Data:**
  - nspect for visible edema, pitting, and color changes in lower legs.
  - easure circumferential diameter of both ankles and calves using a measuring tape.
  - ecord vital signs before initiating massage.
  - bserve for any contraindications such as varicose veins, thrombophlebitis, or open wounds.

2. Planning Phase

- **Goal:**

To reduce discomfort and edema in the lower legs through effective leg massage technique.

- **Objectives:**
  - o promote venous return and lymphatic drainage.
  - o relieve muscle tension and improve comfort.
  - o enhance maternal relaxation and promote well-being.

3. Implementation Phase

A. Preparation

- **Environment:**
  - rovide privacy and ensure a calm, comfortable setting.
  - aintain room temperature at a comfortable level.
- **Equipment Required:**
  - lean towels.
  - ild massage oil or lotion (hypoallergenic).
  - easuring tape.
  - illow or bolster for leg elevation.
- **Patient Preparation:**
  - xplain the procedure to the mother to gain cooperation and reduce anxiety.
  - osition the mother in a semi-Fowler's or supine position with legs elevated slightly.

B. Procedure for Lower Leg Massage

1. **Hand Hygiene:** Wash hands thoroughly before the procedure.
2. **Warm-up:** Rub both hands together to warm the palms.
3. **Application of Oil:** Apply a small amount of oil/lotion over the lower legs.
4. **Massage Technique:**
   - se **effleurage** (light, long strokes) from ankle upward toward the knee to

enhance venous return.

- se **petrissage** (gentle kneading and squeezing) on calf muscles to improve circulation.
- epeat each stroke 5–10 times, alternating between legs.
- uration: 10–15 minutes for both legs.

5. **Completion:**
   - ipe off excess oil with a clean towel.
   - e-measure leg circumference post-massage if required.
   - levate legs on a pillow for 10–15 minutes after massage.

4. Evaluation Phase

- Assess for:
  - eduction in leg circumference.
  - ecrease in discomfort level as reported by the mother.
  - mprovement in comfort, relaxation, and mobility.
- Document findings and compare pre- and post-intervention data.

5 Health Education

- Encourage the mother to:
  - void prolonged standing or sitting with legs down.
  -

			levate legs periodically during rest. ○ ear comfortable footwear and loose clothing. ○ aintain adequate hydration and balanced diet. ○ erform gentle ankle and foot exercises to promote circulation.				
			6. Documentation • Record: ○ ate, time, and duration of massage. ○ re- and post-assessment findings. ○ ype of technique used. ○ other's response and level of comfort. ○ ny abnormal findings or adverse reactions. **7. Nursing Responsibilities** • Ensure safety and comfort throughout the procedure. • Maintain privacy and confidentiality. • Monitor for any contraindications before performing massage. • Educate the mother about benefits and precautions related to leg massage. • Report any complications such as increased pain, redness, or swelling to the healthcare provider.				

CONCLUSION

Lower leg massage is an effective technique that promotes relaxation, improved blood circulation, reduced muscle tension and relief from fatigue or pain by following systematic steps beginning with effleurage to warm the tissues moving through petrissage and friction to work deeper muscles and finishing with gentle strokes and stretching. the massage helps restore comfort, flexibility and vitality to the lower leg. Regular lower leg massage can also aid in preventing cramps, enhancing recovery after physical activity and supporting overall well -being.

RECAPITULIZATION

1. Introduction about the physiological lower leg edema of antenatal mothers third trimester.
2. Define the lower leg edema.
3. To tell about the purpose and importance of lower leg massage.
4. To explain the indication of lower leg massage.
5. To list out the contraindication of lower leg massage.
6. To elaborate the steps of lower leg massage.

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GOVERNMENT COLLEGE OF NURSING

DURG C.G

SUBJECT – OBSTETRICS AND GYNECOLOGICAL NURSING

LESSON PLAN ON

PHYSIOLOGICAL LOWER LEG EDEMA AMONG ANTENATAL MOTHERS

THIRD TRIMESTER

SUBMITTED TO
SUBMITTED BY

GUIDE - DR. MRS BHAVNA CHAKRABORTY
ASSOCIATE PROFESSOR.
CO- GUIDE – MRS ELSY VARGHESE
PROFESSOR

MRS OMESHWARI MAHANTI
MSC NURSING FINAL YEAR
GOVT. COLLEGE OF NURSING
DURG (C.G.)

LESSON PLAN ON- PHYSIOLOGICAL LOWER LEG EDEMA AMONG ANTENATAL MOTHERS THIRD TRIMESTER

Course - MSc nursing final year

Subject - Obstetrics and gynecological Nursing

Topic - Physiological lower leg edema among antenatal mothers third trimester

No. of participant -

Name of teacher - Dr Mrs. Bhavna Chakraborty

Method of teaching – Questioning, answering, lecture cum discussion

A.v. aids - PPT, Chart, flip book

Place -

Date -

Time -

PREVIOUS KNOWLEDGE – Student already have basic knowledge of the circulatory system and how blood and fluid circulate in the body.

They are familiar with common causes of edema in the lower during pregnancy.

CENTRAL OBJECTIVE – Student will be able to define lower leg edema, identify its causes and explain the steps for assessment and

Management of a patient with physiological lower leg edema.

SPECIFIC OBJECTIVE

1. Introduction about the physiological lower leg edema of antenatal mothers third trimester.
2. Define the lower leg edema.
3. To tell about the purpose and importance of lower leg massage.
4. To explain the indication of lower leg massage.
5. To list out the contraindication of lower leg massage.
6. To elaborate the steps of lower leg massage.

GOVERNMENT COLLEGE OF NURSING, DURG (C.G.

Institute Ethical Committee

.....CERTIFICATE OF APROVAL.....

To : UMESHWARI MAHANTI

Review Date :

Reference :

Title of Study : "A Quasi – Experimental study to Assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among Antenatal mothers attending A. OPD in selected hospital at Durg District C.G"

The Institute Ethics Committee, Government College of Nursing Durg (Chhattisgarh) reviewed and discussed your above reference research proposal in the meeting held on .....at ..... Government College of Nursing Durg.

The following documents were reviewed;

- **Covering letter**
- **Research Project Proposal**
- **Participant Information Sheet and Consent Form**
- **Tools and Specific Intervention**

The following members of Institute Ethics Committee were present at meeting held on 31/05/25 **at** 9AM-5PM **at Government College of Nursing Durg.**

tificate of Approval: Proposal No....15.....Gcon D
.....Ref.....Dated...31/05/2025

Principal Investigator, you are responsible for fulfilling the following requirements
roval:

. This approval is valid for entire duration of the study (i.e 01 months) The review application must be submitted to the IEC-GCON Durg in order to continue the study beyond the approved period.
. All the co-investigators must be informed the status of the project.
. Chages, amendments and addendum to the protocol or the consent form must be submitted to the IEC-GCON Durg for re-review and approval prior to the activation of the changes.
Any change of study site, change of investigators, termination of study (with the reason to do so) should be informed to IEC Gcon Durg.
The IEC proposal number assigned to the project should be cited in any correspondence.
Any Serious Adverse event (SAE) occurring during the course of the study should be reported to the IEC-Gcon Durg.
New information that becomes available which could change the risk: benefit ratio must be submitted promptly for IEC review.
Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The IEC may conduct audits of all study records and consent documentation may be part of such audits.
The study progress report should be made available for the IEC review on every 6 month.
. The final report of the study must e submitted to IEC-Gcon Durg after the completion of the study.

is hereby, confirmed that neither you nor of the study team members have rticipated in the voting/ decision making procedures of the committee.

ncerely,

. Mrs. Roja Princy
airperson
stitute Ethics Committee
ovt. College of Nursing, Durg

Mrs. Sapna Thakur
Member Secretary
Institute Ethics Committee
Govt. College of Nursing, Durg

INFORMED CONSENT DOCUMENT FOR RESEARCH STUDY

PARTICIPANT INFORMATION SHEET (PIS)

STUDY TITLE - "a quasi – experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mother attending ANC OPD in selected hospital at Durg district (c.g.)"

PURPOSE OF STUDY - to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mother attending ANC OPD, and to facilitate normal delivery.

PRINCIPAL INVESTIGATOR – Omeshwari mahanti MSc nursing final year.
Government college of Nursing kachandur Durg.

METHODOLOGY – A total 60 ANC patient will be purposive non - randomly assigned to one group. To assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers.

PROCEDURE – Leg massage given to the experimental group mothers for 20 minutes for 5 consecutive days. Gentle effleurage and petrissage massage on both legs. The procedure performed in a clean, private and comfortable setting.

DURATION – One year, but you may leave the study at any time. If you decide to stop participation in the study, there will be no penalty to you and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with this institute.

RISK AND BENEFITS – The study involve a non- invasive, low risk intervention, mild discomfort during or after the massage session due to pressure or sensitivity in the legs.
Leg massage provides benefits of the patient such as psychological relief, relaxation and a sense of well- being during and after massage therapy. participants may learn simple massage techniques for self -care.

CONFIDENTIALITY – Efforts may be keeps to your study related information confidential outside the study, your name will be linked to your data. One year after the publication of this study results, your identifying information will be destroyed.

INCENTIVE – No other incentive will be given for participating in this study.

PARTICIPATION RIGHT – The institutional Ethical committee responsible for human participants, Research at Government college of Nursing Kachandur Durg reviewed this research project and found it will be acceptable according to the applicable ethical guidelines for biomedical research and law of land and IEC policy designed to protect the right and welfare of participants in research.

CONTACTS AND QUESTIONS – For any question, concern or complaint about this research study, you may contact Omeshwari Mahanti on 7828521190 or amitchandel124@gmail.comfor question about your rights as a participant in this study, or to discuss other study related concerns or complaints with someone who is not a part of the research team you may contact to this number only.

Dr. Sonali's
ADVANCED PHYSIOTHERAPY CENTRE
Specialist in : Pediatrics, Pain Care, Spine Care & Matrix Rhythm Therapy
Sonali Shrivastava
B.P.T., M.P.T., PhD. [Mangalore], C.M.R.T.[Germany]
CDNT [New Delhi] International Researcher [UK, SACN]
Certified in : MaRhyThe, Dry Needling, IASTM, NDT, Manual Therapy, GM & HINE (Australia),
Advisor in : Nutrition & Wellness (Nutrilite-California)
Diploma: Naturopathy Diet & Nutrition, Accupressure, Accupuncture, Yoga
451
810077
@gmail.com

"Prevention is Better than Cure"

CERTIFICATION OF LEG MASSAGE

This is to certify that **Omeshwari Mahanti,** student of M.Sc. Nursing Final year Government college of Nursing, Durg (an affiliated to pt. DeendayalUpadhyay Memorial Health Science and Ayush University of Chhattisgarh) started Leg Massage training under supervision of **Dr. Mrs. Sonali Shrivastav, Advanced Physiotherapist, Shri Shankaracharya Institute of Medical Science, Junwani, Durg.** She is trained by the undersigned and can proceed with conduct for the Titled – **"A QUASI-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF LEG MASSAGE IN REDUCING DISCOMFORT DUE TO PHYSIOLOGICAL LOWER LEG EDEMA AMONG ANC MOTHERS ATTENDING ANC OPD IN SELECTED HOSPITAL AT DURG DISTRICT"** is trained and certified by me.

Hence, she can proceed with Leg massage technique for the completion on this research study. Pilot study to be started from Mon 23/6/25.

NAME OF TRAINER: - Dr Sonali S (PhD)

DESIGNATION: - Physiotherapy consultant

Signature of Trainer

Place - Durg

Date – 20/6/25

...ATION OF LEG MASSAGE

Dr Sonali Shrivastava is an excellent physical therapist, wise clinicians and natural leader in research who distinguishes herself by her self-motivation, curiosity, and strong rapport with patients in her expertise. She is an outstanding candidate to pursue training in pain management. Dr Sonali Shrivastava graduated in 2008, postgraduates in 2011 and doctorate in 2023 with BPT, MPT degrees from RGUHS Bangalore and PhD from Srinivas University Mangalore, India. Dr Sonali Shrivastava stands out among physiotherapists in India devoted, meticulous and conscientious. She has excellent clinical judgement, demonstrating a genuine interest in getting to the heart of patients' complaints. She takes advantage of every opportunity to learn. She demonstrates unbounding professionalism and executes all her responsibilities to the very highest level. During her professional career Dr Sonali Shrivastava has demonstrated dedication to research. She conducted her own clinical trials, research focussed on effect of Matrix Rhythm therapy, in motor dysfunction, cerebral Palsy, and pain in preterm infants. Under the mentorship of Dr Edwin Dias, professor Department of Paediatrics, Srinivas institute of medical sciences, Mangalore, she conducted a study in cerebral palsy management which was published in Scopus journal in 2018. Till date Dr Sonali Shrivastava has published 7 peer reviewed articles as well a chapter on Cerebral Palsy in 2022. She presented at AIIMS Delhi on Early Intervention in cerebral palsy: Evidence based practice on 15th December 2024. As further evidence of great promise Dr Sonali Shrivastava was selected to present her Poster in ISPP, Halifax 2023 and IASP 2024.She is certified in GMs and HINE by Queen's land University, Australia. She is a registered physiotherapist in Chhattisgarh State, India. She is a member of Indian Association of Neonatal therapists, Indian association of physiotherapy, Matrix Rhythm therapy health care partner. She is leading the department of Physiotherapy in Shri Shankaracharya institute of medical sciences, Bhilai Chhattisgarh, India as Associate professor, HOD and Interdisciplinary Research Associate since 2018 till date.

In summary given, Dr Sonali's outstanding physical therapy skills talent for research, excellent fund of knowledge and proven leadership abilities.

This is to certify that **Omeshwari Mahanti,** student of M.Sc. Nursing Final year Government college of Nursing, Durg (an affiliated to pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) started Leg Massage training under supervision of **Dr. Mrs. Sonali Shrivastav, Advanced Physiotherapist, Shri Shankaracharya Institute of Medical Science, Junwani, Durg.** She is under training by the undersigned and can proceed with conduct for the Titled – **"A Quasi-experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among ANC mothers attending ANC OPD in selected hospital at Durg District".** She will be trained and certified by me after 3 months of completion Hence, she can proceed with Leg massage technique for the completion on this research study.

NAME OF TRAINER: - Dr Sonali Shrivastava
DESIGNATION: - Associate Professor, SSIMS, Consultant & Proprietor in APC, Durg
Place - Durg, CG
Date - 29/5/25

Signature of Trainer
29/5/25

LETTER SEEKING PERMISSION TO CONDUCT THE PILOT STUDY

From,
Omeshwari Mahanti,
M.Sc. Nursing final year,
Government college of Nursing, Durg (C.G.)

To,
Block medical officer,
Lal Bahadur shastri Hospital Supela, Durg, (C.G.)

Forwarded through,
The Principal,
Mrs. Rema Rajesh,
Government College of Nursing, Durg (C.G.)

Subject: - A Letter requesting permission for Pilot study.

Respected Sir/ Madam,

I am MSc Nursing Final year student of Obstetrics and Gynaecological Nursing speciality at Government College of Nursing, Durg (C.G.). I would like to conduct my research study with the title **"A Quasi- experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among ANC mothers at Durg, district"**. As a requirement for the partial fulfilment of the Master of Science in Nursing degree in Pt. DEENDAYAL UPADHYAY MEMORIAL HEALTH SCIENCE AND AYUSH UNIVERSITY RAIPUR (C.G.).

With this regard, I request you to kindly permit me for the conduction of pilot study at your hospital.

Thanking you

Date - 26/4/25

Forwarded for approval

23/6/2025
Medical Officer
Govt. Hospital
Supela, Bhilai (C.G)

26/4/25

Your's sincerely,
Omeshwari Mahanti,
M.Sc. Nursing Final year,
Govt. College of Nursing,
Durg (c.g.)

From,
Mrs. Omeshwari mahanti,
M.Sc. Nursing final year
Govt. college of Nursing Durg, (C.G.)

To,
Dr. Mrs. Archana Rantai,
Professor,
Shreyas college of Nursing,
Bhilai, (C.G.)

Forwarding Through

The Principal,
Mrs. Rema Rajesh,
Govt. college of Nursing,
Durg, (C.G.)

Subject: - **A letter requesting permission for tool validation.**

Respected Madam,

I am M.Sc. nursing final year student of Obstetrics and Gynecology nursing specialty at Government college of nursing Durg (C.G.). I have undertaken study with title "**A quasi-experimental study to assess the effectiveness of leg massage in reducing discomfort due physiological lower leg edema among antenatal mother attending ANC OPD in selected hospital at Durg District.**" I need to get validated the enclosed for proceeding for the further study.

So, kindly do needful for the validation of the tool. Your expert opinion and kind co-operation will be highly beneficial for my research study

Date:-

"Thanking you in anticipation"

Your sincerely,
Mrs. Omeshwari mahanti,
M.Sc. nursing final year,
Govt. College of Nursing,
Durg (C.G.)

19/05/25

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Mrs. Sutanuka Choudhary

DESIGNATION: - Associate Professor.

INSTITUTE: - Shookaracharya Swami Swaroopanand College of

Place: - Bhilai

Date: - 16.06.2025

Shookaracharya Swami Swaroopanand College of Nursing Junwani Bhilai

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - MRS. KUMUD KUMAR

DESIGNATION: - Professor

INSTITUTE: - SSSCN.

Place: - Jamgaon Bhilai CG

Date: - 13/06/25

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Mrs. Sutanuka Choudhary

DESIGNATION: - Associate Professor.

INSTITUTE: - Shookaracharya Swami Swaroopanand College of

Place: - Bhilai

Date: - 16.06.2025

Shankaracharya Swami Swaroopanand College of Nursing Junwani Bhilai

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Prof Dr Seema Sahu

DESIGNATION: - Professor

INSTITUTE: - P.G. College of Nursing, Bhilai

Place: -

Date: -

P.G. COLLEGE OF NURSING
HOSPITAL SECTOR, BHILAI (C.G.)

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Mrs. Nancy Martin

DESIGNATION: - Asso. Prof. (OBG)

INSTITUTE: - Shrishankaracharya college of Nursing, Hudco Bhila

Place: - BHILAI

Date: - 04/06/25

SHRI SHANKARACHARYA COLLEGE OF NURSING HUDCO BHILAI SHSU

Nancy 04/06/25

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Dr. Priti Bhatt

DESIGNATION: - Asso. Prof.

INSTITUTE: - SSCN, Rudeo.

Place: - Bhilai

Date: - 13/6/25

ACHARYA COLLEGE OF NURSING BHILAI

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

DR. MRS. SUSHILA BAIS
DEGINATION - PROFESSOR
REG. NO.-28719034
P.G. COLLAGE OF NURSING
SECTOR-9, HUDCO, BHILAI C.G.

NAME OF VALIDATOR: - Prof. Dr. Sushila Bais

DESIGNATION: - Professor

INSTITUTE: - P.G College of Nursing, Bhilai

Place: - Bhilai

Date: - 5/6/25

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool developed by Mrs. Omeshwari Mahanti, student of MSc Nursing Final Year, Government College of Nursing, Durg (an affiliated to Pt. Deendayal Upadhyay Memorial Health Science and Ayush University of Chhattisgarh) is verified by the undersigned and can proceed with this Tool and conduct for the Tool Validation Titled – "A Quasi - experimental study to assess the effectiveness of leg massage in reducing discomfort due to physiological lower leg edema among antenatal mothers attending ANC OPD in selected hospital at Durg district." is found to be valid by me.

Hence, she can proceed with the Tool for the completion of this research study.

NAME OF VALIDATOR: - Dr. Archana Rantan

DESIGNATION: - Professor cum Vice Principal

INSTITUTE: - Shreyas college

Place: - Bhilai

Date: - 2/6/2025