

**COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF  
DRUMSTICK LEAVES EXTRACT VsRAGI PORRIDGE  
ININCREASING THE LEVEL OF HEMOGLOBIN AMONG  
WOMEN WITH IRON DEFICIENCY ANEMIA IN SELECTED  
COMMUNITY AREA AT KANCHIPURAM DISTRICT.**

**By**

**Ms. S. ANANDHI**



**A Dissertation submitted to**

**THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY,**

**CHENNAI.**

**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE  
DEGREE OF MASTER OF SCIENCE IN NURSING**

**SEPTEMBER- 2014**

## **CERTIFICATE**

This is to certify that **“COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF DRUMSTICK LEAVES EXTRACT Vs RAGI PORRIDGE IN INCREASING THE LEVEL OF HEMOGLOBIN AMONG WOMEN WITH IRON DEFICIENCY ANEMIA IN SELECTED COMMUNITY AREA AT KANCHIPURAM DISTRICT”**.is a bonafide work done by **Ms S.ANANDHI, M.Sc (N) II Year Student**, Adhiparasakathi College of Nursing, Melmaruvathur, in partial fulfillment of **THE TAMIL NADU Dr.M.G.R MEDICAL UNIVERSITY** towards the award of the degree of **Master of Science in Nursing, Branch-III, OBSTETRIC AND GYNAECOLOGICAL Nursing**, under my guidance and supervision during the academic year 2012- 2014.

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## **ACKNOWLEDGEMENT**

My most heartfelt gratitude is articulated to **HIS HOLINESS, ARUL THIRU AMMA,FOUNDER**, Adhiparasakthi Charitable, Medical, Educational and Cultural Trust, Melmaruvathur for his lavishing blessings, love and unseen force behind all the efforts.

I am grateful to **THIRUMATHI LAKSHMI BANGARU ADIGALAR, VICE PRESIDENT**,Adhiparasakthi Charitable, Medical, Educational and Cultural Trust, Melmaruvathur, for her valuable caring spirit and enduring support by giving all facilities throughout the study.

With due respect and honour I wish to express my thanks to **SHAKTHI TMT E. SRILEKHA SENTHILKUMAR MBBS., D.G.O.,CORRESPONDENT**, Adhiparasakthi College of Nursing for her guidance throughout the study.

I am much obligated to thank and gratitude our beloved Principal Madam, **Dr.N.KOKILAVANI.,M.Sc (N)., Ph.D., Principal**, Adhiparasakthi College of Nursing, Melmaruvathur. Her immense knowledge, constant encouragement, inspiration, motivation, excellent guidance, generous contribution, thoughtful

suggestions, have enabled me to mould this study into an appropriate way.

I wish to express my sincere thanks to **Dr.K. SIVAN KUMAR.,MBBS,M.D.,D.G.O**, Head of the Department of Obstetrics and Gynaecology, MAPIMS, for his valuable timely guidance and advice to complete the study.

I am greatly indebted and express my gratitude to **Associate professor.Mrs. M. GIRIJA, M.Sc.(N).,M.Phil., Vice Principallncharge**, Adhiparasakthi College of Nursing, Melmaruvathur for her expert advice, enduring support, patience and guidance which enlightened my path to complete the work systematically and helped me to complete my study.

My heartfelt thanks to **Ms.S. SHAKILA, M.Sc.(N)., Associate Professor**,Department of Obstetrics and Gynaecological Nursing, Adhiparasakthi College of Nursing, Melmaruvathur, for her kindness, tangible guidance and support throughout my study.

I acknowledge my sincere thanks to all the **OBSTETRIC AND GYNAECOLOGICAL FACULTY**, Adhiparasakthi College Of

Nursing, Melmaruvathur, for enduring support and encouraging advice, valuable guidance and support to complete the study.

I wish to extend my thanks to **Mr. B. ASHOK M.Sc., M.Phil., Assistant Professor** in Biostatistics, Adhiparasakthi College of Nursing, Melmaruvathur, for his valuable assistance in statistical analysis and making the dissertation in great success.

I wish to express my sincere thanks **Mr. A. SURIYANARAYANAN, M.A., M.Phil. Lecturer** in English, Adhiparasakthi College of Nursing for his timely help and advice in taking forward my study.

I wish to express my sincere thanks to all the **TEACHING FACULTY** of Adhiparasakthi College of Nursing, Melmaruvathur for their help during the study.

I would like to thank all the **NON TEACHING MEMBERS** of Adhiparasakthi College of Nursing, Melmaruvathur for their encouragement to complete my study.

I would like to thank **LIBRARIAN** for providing me the reference books and journals for my dissertation

I would like to thank one and all who have directly or indirectly helped me in successful completion of the work.



My deepest thanks to all the participants for their sincere co-operation and interest, without which my venture would not be a fruitful one.

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## CHAPTER -I

### INTRODUCTION

**“Women are more than capable of making our own choice about our bodies and our own health”- Michelle Obama**

Women represent more than half the world’s population, have a longer life expectancy than men and consume more health care resources. In that women are likely than men to require health care throughout their lives including regular health visit to reproductive health care providers. They are more likely to have chronic condition that requires continuous health care treatment.

**Joseph E Maakaron (2013)** says that Anemia is defined as a decrease in red blood cell mass. The function of the red blood cells is to deliver oxygen from the lungs to the tissues and carbon dioxide from the tissues to the lungs. This is accomplished by using hemoglobin, a tetramer protein composed of heme and globin. Anemia impairs the body’s ability for gas exchange by decreasing the number of red blood cells transporting oxygen and carbon dioxide.

**Iron-deficiency anemia** is a common [anemia](#) caused by insufficient dietary intake and absorption of [iron](#) or iron loss from bleeding which can originate from a range of sources such as the intestinal, uterine or urinary tract.



Several studies showed that most of the women suffer from iron deficiency anemia from long time, because of their life style changes and decreased intake of nutritional requirement and they believe that it's not a condition for which they should seek medical help. Hence it is the responsibility of the health care provider to create awareness regarding iron deficiency anemia, which helps in early identification of problem in the initial stage.

Iron deficiency causes approximately half of all anemia cases worldwide, and affects women more often than men. World estimates of iron deficiency occurrence are somewhat vague, but the true number probably exceeds one billion people. This can result if the body does not make enough red blood cells and bleeding causes loss of red blood cells more quickly than they can be replaced.

The most significant cause of iron-deficiency anemia in women over 50 years old, the most common cause of iron-deficiency anemia is chronic gastrointestinal bleeding from nonparasitic causes, such as [gastric ulcers](#), [duodenal ulcers](#) or [gastrointestinal cancer](#).

Anemia is one result of advanced-stage in [iron deficiency](#). When the body has sufficient iron to meet its needs, the remainder is stored for later use in all cells, but mostly in the [bone marrow](#), [liver](#), and [spleen](#). These stores are called [ferritin](#) complexes and are part of the [human](#) iron

metabolism systems. Ferritin complexes in humans carry about 4500 iron atoms and form into 24 [protein subunits](#) of two different types.

**World Health Organization (2013)** estimates the globally anemia affects 1.62 billion people which corresponds to 24.8% of population. The population group with the greatest number of individuals affected is non pregnant women i.e. about (468.4million). In India prevalence rate of non – pregnant women affected with anemia is 468 million (30%). The prevalence rate of Tamil Nadu is 62% of the female population suffers from iron deficiency anemia.

Iron deficiency anemia is a condition where lack of iron in the body leads to a reduction in the number of red blood cells. Iron is used to produce red blood cells, which help store and carry oxygen in the blood. If you have fewer red blood cells than normal, your organs and tissues will not get as much oxygen as they usually would. There are several different types of anemia and each one has a different cause, although iron deficiency anemia is the most common type.

Iron-deficiency also has important consequences for the future generations, as iron-deficiency anemia increases the risk for preterm labour, low birth weight, infant mortality and predicts iron-deficiency in infants after 4 months of age. iron-deficiency anemia is the major contributor, accounts for 3.7% and 12.8% of maternal deaths during

pregnancy and childbirth in Africa and Asia, respectively. It also leads to cognitive deficits and reduced intellectual performance among school children. In communities where iron-deficiency is highly prevalent, successful iron supplementation results in the disappearance of anemia as a public health problem except where malaria and HIV or hookworm infection rates are high.

Despite increased national and international awareness and recent governmental intervention programs, the prevalence of anemia among Indian women has remained higher than 45% since 1990, and anemia trends remain strongly correlated with iron-deficiency. In 2007 Indian government “12 by 12 initiative”, aimed at ensuring that all Indian adolescents have 12gm/dl hemoglobin by 2012, listed the main causes of anemia in India as low dietary intake, poor availability of iron, chronic blood loss due to hookworm infestation, and malaria.

Clinicians need to be aware of the causes for iron deficiency anemia and intervene with preventive approach.

**“An ounce of prevention is worth a pound of cure”**. Therefore as a nurse researcher, has pivotal role in creating awareness among women about modification of lifestyle and prevention of further

complications, which can help to improve the quality of life by providing education and support.

## **NEED FOR THE STUDY**

Iron deficiency anemia is a leading cause of maternal morbidity, mortality and poor birth outcomes in developing countries. Iron Deficiency Anemia is the most common nutrition deficiency worldwide. It causes reduced work capacity in adults and impacts motor and mental development in children and adolescents and women.

According to **World health organization**, almost 20 % of all women of the child bearing age in the United States were suffering from iron deficiency anemia as compared to 2 % of adult males. According to World health organization, in the developing countries, about 50-60 % of young children and pregnant females and 20-30 % non-pregnant females were affected by iron deficiency anemia. In countries where little meat in the diet, iron deficiency anemia is 6-8 times more prevalent than in North America. Thus it is one of the global problems, mainly affecting the developing countries. Pregnant and lactating females, growing children and elderly people with some underlying disease causing blood loss are at more risk as compared to other groups of population. However, nobody is immune to have an anemia. Anemia is caused by innumerable factors, the most common

deficiency of essential elements for hemoglobin synthesis, blood loss, repeated pregnancies in females of reproductive age, worm infestation in children, hemolysis due to known or unknown causes and bone marrow conditions causing suppression of red cell synthesis. Chronic ailments like chronic renal failure, rheumatoid arthritis and tuberculosis are also known causes. In elderly female's genital blood loss due to pelvic malignancies and in both sexes gastrointestinal blood loss is also an important cause of anemia in this age group.

In **India** prevalence of anemia among all women in the Indian sample is 52%. Fifteen percent of these women are classified as moderately anemic (Hb 7–9 gm/dl) and 2% as severely anemic (Hb<7 gm/dl). While there are regional differences, prevalence rates across the states are remarkably similar, reflecting underlying determinants that include diets low in heme-iron and high in phytates, high levels of malaria and other infectious diseases, and frequent reproductive cycling that decreases iron stores.

**Surga K et al (2012)** conducted cross sectional study to assess the prevalence of iron deficiency anemia in women at Bali and determine the risk factor for anemia. The study was conducted among 1,684 women in 42 villages at Bali. Study found that iron deficiency anemia among women was 46.2% most of the cases of anemia were mild. The risk

factors for anemia identified in this study were length of gestation, level of education, antenatal intake of iron pills. Study concluded that given the high prevalence of iron deficiency women, preventive measures e.g. iron supplement, iron fortification of food and health education should be encourage.

**Melakuumeta (2011)** a cross sectional study of analytic nature was conducted in 270 clustered villages drawn from nine administrative regions of the country. A total of 22,861 women of reproductive age (15 – 49yrs) were examined clinically for pallor and 5% of this subject were systemically selected and assessed further for their hemoglobin and serum ferritin status. The prevalence rate of iron deficiency anemia was 11.3% and 17% respectively. The majority of anemic women were in the category of mild (19.3%) to moderate (10.3%) and severe anemia was 0.9. The most affected age group was those been 36-44 and the difference noted was statistically significant.

**Sanku Dey et al. (2010)** conducted a cross sectional study among women in the reproductive age to know the prevalence rate of anemia. The study population consisted of 3934 ever-married women of reproductive age (15-49 years) from the state Meghalaya, India, which were taken from the National family health Survey -3, to explore the predictors responsible for the prevalence of anemia by using different

background characteristics such as age, place of residence, nutritional status, number of children ever born, pregnancy status, educational achievement, and economic status. As a response variable, anemia levels were categorized as a dichotomous variable, and the predicted probabilities were worked out through a binary logistic regression model, to assess the contribution of the predictors on anemia. A logistic regression analysis was performed for some selected predictors related to anemia levels. All the predictors, except total children ever born, were found to be statistically significant. The mean hemoglobin concentration evaluated as 117.43 g/L, and 49.6% of the women were found to be anemic. Women of the age group 20-24 years, are at high risk of anemia [P = 0.320, O.R. (95% C.I.) = 1.509 (0.671, 3.390)]. Pregnant, under nutritious, and poorest women are at high risk of anemia. Urban women are also at high-risk; however, higher educated women are at low risk of anemia.

Iron deficiency anemia can be prevented. Early recognition and prompt treatment of iron deficiency anemia in women is important to control and prevent the long term complications. Life style modification such as healthy diet with adequate amount of Vitamin 'c' rich diet along with iron rich food content, lots of fruits, vegetables, and nuts can improve the iron content in the body. More research is necessary in order to find answers to many clinical and theoretical aspects of the disease.

**STATEMENT OF THE PROBLEM:**

**“COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF DRUMSTICK LEAVES EXTRACT Vs RAGI PORRIDGE IN INCREASING THE LEVEL OF HEMOGLOBIN AMONG WOMEN WITH IRON DEFICIENCY ANEMIA IN SELECTED COMMUNITY AREA AT KANCHIPURAM DISTRICT”.**

**OBJECTIVES OF THE STUDY:**



- to identify the women with iron deficiency anemia at selected community area
- to administer drumstick leaves extract to group I and ragi porridge for group II
- to evaluate the hemoglobin level for both groups after intervention among women with iron deficiency anemia

### **OPERATIONAL DEFINITION:**

#### **ASSESS**

Refer to the process of assessing the level of hemoglobin among women with iron deficiency Anemia by using shali's method with hemoglobinometer.

#### **EFFECTIVENESS**

Refers to the extent to which drumstick leaves extract and ragi porridge have produced desirable effect on increasing hemoglobin level among group I and group II.

#### **RAGI PORRIDGE**

Ragi powder 100gm with 400ml of water, take ragi powder mix it well without any lump. Boil the water and add ragi paste, wait for 15 minutes and add jaggery for taste.

#### **DRUMSTICK LEAVES EXTRACT**

Drumstick leaves extract 150gm with 500ml of water, take the bowl. Boil the water, pore the water. Plunk the leaves and add to it. Wait for 10-15min, filter the water. Add salt for taste.

## WOMEN

Refers to those women who have started menstruation and prior to the menopause in the reproductive age group of 15 – 45years.

## IRON DEFICIENCY ANEMIA

It is a type of anemia that occurs due to insufficiency dietary intake or absorption of iron and failure to form hemoglobin, that contains iron (hemoglobin<11g %). Blood hemoglobin level was assessed by shali's method with hemoglobinometer.

## ASSUMPTIONS:

- Most of the women may suffer from iron deficiency anemia
- Ragi porridge and Drum stick leave extract supplementation may improve the hemoglobin level among women
- Increase in Hemoglobin level in women may reduce Iron deficiency anemia.

## HYPOTHESIS:

NULL HYPOTHESIS -  $H_0$

There is no significant effectiveness between drumstick leaves extract and ragi porridge in increasing hemoglobin level among women with iron deficiency anemia.

#### **ALTERNATIVE HYPOTHESIS - $H_1$**

There is significant effectiveness between drumstick leaves extract and ragi porridge in increasing hemoglobin level among women with iron deficiency anemia.

#### **DELIMITATIONS:**

- ✓ Data collection period was delimited only 6 weeks.
- ✓ The study was delimited to women residing in Orathy and Kadamalaiputhur villages in kanchipuram district.
- ✓ The study was delimited to women with iron deficiency anemia.

#### **PROJECTED OUTCOME**

This study would help to compare the effectiveness of drumstick leaves extract and ragi porridge. The findings of the study would help the women with iron deficiency anemia in the community to consume the drumstick leaf extract and ragi porridge in increasing hemoglobin level.

## **CONCEPTUAL FRAMEWORK**

A framework is the overall conceptual underpinnings of a study. It includes an overall rationale and conceptual definitions of key concepts. It presents logically constructed concepts to provide general explanation of the relationship between the concepts of the research study. It is used to guide implementation research, particularly in planning and constructing strategies and selecting tools often used in an implementation process or interventions to promote evidence-based best practice. It can also help to promote the association between the research activities.

A conceptual model gives a clear picture for logical thinking, for systematic observation and interpreting the observed data.

To describe the relationship of the concepts in the study modified **Ludwig Von Bertalanffy's general system theory** (1968) modified (9<sup>th</sup> September 2013), was applied. According to general system theory the system is a set of interacting parts within a boundary which makes the system work well to achieve its overall objective.

The four major concepts of this theory are:

#### **INPUT:**

It is an information, a form of energy and material that enters the system from the environment through its boundaries. In this study women with the age group of 15 – 45yrs with iron deficiency anemia and the demographic variables like age, education status, religion, occupation, marital status, income, type of family, nutritional status, habit of defecation, menstrual history, history of deworming in the past, sources of health information and the hemoglobin level was assessed by Shali's method with hemoglobinometer. .

#### **THROUGHPUT:**

Throughput refers to process in the action needed to accomplish the desired task. In this study process refers to administer drumstick leaves extract for group I and ragi porridge for another group.

### **OUTPUT:**

After the input and the throughput, the system returns to output to environment in an altered state and it is the end result or product of the system. It is a form of dietary supplements the client and enters the environment through the system boundaries which can be enhanced by the effectiveness of the drumstick leave extract ragi porridge procedure to increase the hemoglobin level and the effectiveness can be assessed by the post-test through shali's method

### **FEED-BACK:**

It allows the clients to monitor their internal function so that it can either restrict or encourage its input and output.



## **CHAPTER II**

### **REVIEW OF LITERATURE**

Review of literature refers to activities involve in identifying and searching for information on a topic and developing a comprehensive picture of the state of knowledge on that topic.

A review of related literature gives an insight into various aspect of the problem under study. The review serves as an integrated function that facilitates the accumulation of knowledge. Hence review of literature is important to a research in order to know what has been established and documented.

The investigator carried out an extensive review of literature on the research topic in order deeper insight into the problem and to collect maximum relevant information for building for foundation for the study.

The investigator organized in the following categories

PART – I: Literature related to iron deficiency anemia

PART – II: Literature related to Incidence and prevalence of iron deficiency anemia

PART – III: Literature related to health benefits of ragi and drumstick leaves



## **PART – I: Literature related to iron deficiency anemia**

**Peuranpaa, et al. (2014)** conducted study regarding effects of anemia and iron deficiency anemia on quality of life in women with heavy menstrual bleeding. Two hundred thirty six women were selected as study sample. They conclude at baseline, 63 women were anemic and 140 were severely iron deficient. Only 8% of the anemic women had taken iron supplementation. Twelve months after treatment three domain scores of RAND-36 increased more, and anxiety ( $p = 0.02$ ) and depression scores ( $p = 0.002$ ) decreased more in anemic compared with non anemic women. Improved Health related quality of life after treatment of heavy menstrual bleeding is associated with correction of anemia.

**Marshal, et al.(2012)** A descriptive, cross sectional study was conducted to determine the frequency and nutritional risk factors of iron deficiency among women of childbearing age (15-45 years) in Karachi. 200 hundred non pregnant women of childbearing age were selected using probability and purposive sampling technique. A questionnaire was used to collect the demographic and socioeconomic information and information about dietary habits, diagnosis of iron deficiency anemia was done on the basis of red cell morphology, peripheral blood smear, serum ferritin level, and stool examinations. The study findings revealed that the 89 out of 200 women were having iron deficiency and the dietary history revealed that 75 patients were having more than 4 cups of tea per day, and

indicated that the dietary habits of patients was one of the causative factors leading to iron deficiency anemia.

**Rakesh, et al .(2012)** conducted study on determinants of postpartum anemia among women from a rural population in southern India. Ninety three women were interviewed using structured questionnaire at 36wks gestation and then second and six weeks postpartum

**Tabish Hussai Li Yu Shu(2010)** cross sectional study was conducted to assess the level of awareness about causes, prevention and treatment of iron deficiency anemia among women of reproductive age. Women aged 18-45 years without any previous history of medical or gynecological problems were recruited. A total three hundred thirty nine women were surveyed for Iron deficiency anemia .77.9% women were aware of the term Iron Deficiency Anemia, with the highest proportion of 88.1% falling in age group 25-35 years. Most of the women were aware of the fact that their diet contains iron and its importance in health. Women who had children and of working class had greater knowledge about the iron deficiency anemia. The study concluded that Women of younger ages are more concern about their own health and much careful about their expected babies in terms of nutritional facts as compared to the elder ladies.

**Manmeetkaur and Kamaljit Singh,(2001-2009)** conducted quasi experimental study among 60 women of reproductive age group on effect of health education on knowledge, attitude and practices regarding anemia among rural

women in Chandigarh. Chi square test was used for statistical analysis. The study result revealed that 73.3% and 46.6% women in the control group did not know the causes and sign & symptoms of anemia. 93% women were in favour of including green leafy vegetable in their diet compared to 67% in control group. The study concluded that there was significant change in the knowledge & attitude of women who received health education. A co-ordinated communication strategy is required to improve anemia prevention practices in the community.

**Arnold Dh, et al. (2009)** conducted a study to assess the iron deficiency anemia-abruptio-placenta associated in pregnant women from the Pacific Northwest. A retrospective case control study of 145 abruptio-placenta case and 1710 control subjects were conducted. Iron deficiency anemia was assessed in early pregnancy and defined as hemoglobin level <10g/dl .Cigarette smoking status during pregnancy and reproductive history was abstracted from medical record. The result 11% of abruptio- placenta cases and 3.3% of control were diagnosed with iron deficiency anemia. Maternal iron deficiency anemia in early pregnancy was associated with a 3.60 fold increased risk of abruptio- placenta Maternal smoking during pregnancy was associated with a 2.40-fold increased risk. The study concluded that maternal iron deficiency anemia is associated with an increased risk of abruptio- placenta.

**Mendez Estraada Reo, et al .(2009)** conducted a study on iron deficiency and iron deficiency anemia in pregnant adolescent women, North Western

Mexico. One hundred eighty six women under 19yrs old during first & second semester were participated in the study. Pregnancy questionnaire and 24hrs recalls were administered to collect socioeconomic and dietary information respectively. Hemoglobin, hematocrit, ferritin and erythro

cyticprotoporphyrin values were measured hemoglobin and ferritin values were used to categories the recruited women into normal (37.4%) iron deficient (55.5%) and Iron deficiency Anemia (7.1%) group. The study concluded that high percentage of iron deficient women in this study is demanding the identification and attention of material factor and food habits that are risk of iron deficiency in pregnant women.

**Hotz C, et al. (2009)** conducted a study on efficiency of iron-fortified ultra rice in improving the iron status of women in Mexico. This study was to test the efficacy of rice fortified with microencapsulated, micronized iron. Pyrophosphate to improve the iron status of women 18-49 year of age non lactating and non pregnant women recruited from six factories. The women received a daily portion of cooked rice 5 days per weeks for a period of 6 month. The result suggest that average intake of iron from the fortificant was 13mg/day. Mean hemoglobin concentration also increased in the treatment group. The absolute reduction in anemia and iron deficiency was 10.3 and 15.1% point. Overall prevalence of anemia was reduced by 80% .The study concluded that fortification rice with iron technology is an efficacies for preventing iron deficiency.

**FW Lone, et al. (2008-2009)** conducted study on investigated the relationship between maternal anemia and perinatal outcome in a cohort of six hundred twenty nine pregnant women from October 2008 to 2009. Of these, 313 were anemic (hemoglobin <11g/L). Perinatal outcomes included preterm delivery, low birth weight, intrauterine growth retardation, perinatal death, low Apgar scores and intrauterine fetal death. Univariate and multivariate analyses were performed. The risk of preterm delivery and low birth weight among the anemic women was 4 and 1.9 times more respectively than the non-anemic women. The neonates of anemic women also had 1.8 times increased risk having low Apgar scores at 1 minute and there was a 3.7 greater risk of intrauterine fetal death among the anemic women than the non-anemic women.

## **PART – II: Literature related to Incidence and prevalence of iron deficiency anemia**

**Shill Kb, et al. (2013)** conducted cross sectional study in Bangladesh, regarding prevalence of iron deficiency anemia among university students in Noakhali region. Hemoglobin level of 300 randomly selected students was measured calorimetrically, using shali's haemoglobinometer. The study revealed that 55.3% students were found anemic. Student at the age of 20-22yrs were more anemic 43.4% than the other age group. The study concluded majority of university students were anemic can be prevented

by providing proper knowledge on the healthful diet, improved lifestyle and harmful effect of anemia to the students.

**Gebremedhin S, et al. (2013)** cross sectional study was conducted In order to assess the prevalence and correlates of prenatal anemia; a survey was conducted among seven hundred randomly selected pregnant women in rural Sidama, Southern Ethiopia. The prevalence's of anemia, Iron Deficiency anemia were 31.6%, 17.4% and 8.7%, respectively. The burden of anemia was significantly high among illiterates, women devoid of self-income, lowlanders, multiparas and women aged 25-34 years. Women who weren't on iron-folate supplementation had 1.90 (95% Confidence Interval times increased odds of anemia. Anemia was associated with iron deficiency, zinc deficiency and elevated C-reactive protein with odds ratio of 2.46 and 1.98 respectively however, it was not associated with vitamin A deficiency. Though Iron deficiency was a significant correlate of anemia, only 11.8% of anemia was attributable to it. Zinc, iron and vitamin A deficiencies did not show synergistic interaction in associating with anemia.

**AbrishamiF, et al. (2013)** conducted a study to frequency of iron deficiency anemia in girls studying in high schools. A total of 1500 high school girls educated in five regions of education of Mashhad (ages 14-18 years) were studied. From 1500 under-experiment people, 1094 cases were non-infected, 310 cases had iron deficiency anemia, and 96 cases had other disorders such as

thalassemia. This study revealed that the prevalence of iron deficiency anemia in young girls is moderate, so that it is important to reduce the prevalence of iron deficiency anemia in young girls.

**Al-Sayes, *et al.* (2011)** conducted a study to determine the prevalence of iron deficiency and iron deficiency anemia among apparently healthy Saudi young female university students studying at King Abdulaziz University in Jeddah. Three hundred ten blood samples were collected from the students. Their age ranged between 18 and 23 years and it was found that 25.9% of students had deficient iron store and 23.9% of students had iron deficiency anemia.

**Simon, *et al.* (2011)** revealed that up to 10% or more of adolescent and adult women less than 49 years are iron deficient. Hispanic American and African-American women have double the prevalence for anemia compared to Caucasian women. The risk for anemia in adolescent girls is about 3%.

**Siddharam, *et al.* (2010)** in his study reported that the prevalence of anemia was found to be 45.2%. A statically significant association was found with iron deficiency anemia, weight loss and anemia, pallor and anemia. In the study it was seen that among the 45.2% of anemic adolescent girls 40.1% had mild anemia, 54.92% had moderate anemia and 4.92% had severe anemia.

**Ayoya, *et al.* (2010)** revealed that the prevalence of anemia among pregnant and non-pregnant women is higher than 50% and 40%, respectively, in

all countries. Within countries, this prevalence varies by living setting (rural v. urban), women's age and education. Across countries, socio-economic and climatic differences have no apparent association with the prevalence of anemia among women. Several factors contribute either alone or jointly to the high rates of maternal anemia in this region. These include widespread nutritional deficiencies; high incidence of infectious diseases; low access to and poor quality of health services; low literacy rates; ineffective design, implementation and evaluation of anemia control programmes and poverty.

**Shamas, *et al.* (2010)** carried out study among medical female students between the age of 18-25 years of Tehran and found that the prevalence of ID was 40.9% and that of iron deficiency anemia was 3.8%. Normal iron status was found in 49.8% of the subjects. The remaining (5.5%) had other kinds of anemia or required confirmatory tests.

**Patel, *et al.* (2010)** in their study conducted amongst adolescent girls, in Gujarat, revealed that only 22% girls had normal Hemoglobin (i.e. 12-14gms) but 9% girls had severe anemia (below 8gms Hb) and 22% girls were nearer to anaemic level (8-10gms Hb), whereas 47% girls had normal Hb level i.e. 10-12 gms.

**Abdelrahim, *et al.* (2010)** conducted a cross-sectional study to investigate the prevalence of anemia, iron deficiencies amongst adolescent school girls in New Halfa, eastern Sudan. Out of 187 adolescent schoolgirls, 181 (96.8%) had



anemia; 21% had mild anemia; 66.8.1% had moderate anemia, and 12.1% had severe anemia.

**Kowsalya, *et al.* (2009)** conducted a study on prevalence of anemia in 100 adolescent girls (13-18 years) in Manipur. The results revealed that, among the total subjects, 30 were moderately anemic (7-10 g/dl) and 25 girls were mildly anemic (10-12 g/dl). Ten girls were severely anemic (<7.0 g/dl).

**Akramipour, *et al.* (2009)** conducted a cross-sectional study to determine the prevalence of iron deficiency anemia among adolescent school girls aged 14-20 years from 20 different high schools in Western Iran. The prevalence of anemia among adolescent school girls was 21.4%. Iron deficiency using a ferritin level was found in 23.7% of studied girls. There were 47 girls with iron deficiency anemia and ferritin. Around 57.3% of anemic girls were iron deficient.

**Turcatoet, *al.* (2009)** conducted a study to estimate the prevalence and incidence of anemia in adolescent girls predominantly of African-American origin. Baseline prevalence at first CBC age 12 or above was 13%. Of those not anemic at baseline, 12% developed anemia during follow-up, for an incidence rate of 3.3% per year.

**Karaoglu,*et al.* (2009)** reported that anemia prevalence was 27.1% (Hemoglobin < 11.0 gm/dl). Having four or more living children being at the third trimester and having a low family income were determined as the independent

predictors of anemia in pregnancy. Anemia was also associated with soil eating (PICA) in the univariate analysis of anemic women, 50.0% had a transferrin saturation less than 10% indicating iron deficiency, 34.5% were deficient in B12 vitamin and 71.7% were deficient in folate. Most of the anemia was normocytic-normochromic (56.5%) indicating mixed anemia.

### **PART – III: Literature related to health benefits of ragi and drumstick leaves**

**Rita sing et.al, (2013)** conducted study in know about the results of determining the effectiveness of ragi porridge increasing hemoglobin. The study sample one hundred and ninety eight adolescent girls. Among them 50% were observed to have normal hemoglobin level above 12gm/dl. 44% girls had mild anemia with hemoglobin level of 7.0gm/dl. In that 84 students with mild anemia were selected as subject for the study. 200ml of ragi porridge was administered for them 3 weeks and reassessment of hemoglobin was done by cyanmethaemoglobin method. Significant increase in hemoglobin levels was observed with girls.

**John Affiku, et al (2013)** examined the leaves of *Moringa oleifera* which was harvested from Lafia in Nasarawa State of Nigeria during the rainy season in June 2011 for proximate, mineral and phytochemical analysis. The results of proximate analysis revealed the presence of high crude protein (17.01%  $\pm$ 0.1) and carbohydrate (63.11%  $\pm$ 0.09). The leaves also contained appreciable amounts of crude fibre (7.09%  $\pm$ 0.11), fatty acid (1.69%  $\pm$ 0.09). The total ash content showed it contained minerals, Ca (1.91%  $\pm$ 0.08), K (0.97%  $\pm$ 0.01), Na (192.95 $\pm$ 4.4), Fe

(107.48±8.2), Mn (81.65±2.31), Zn (60.06±0.3) and P (30.15±0.5) parts per million (ppm). Magnesium (0.38% ±0.01) and copper (6.10±0.19) were the least. The benefits of essential nutrients and minerals of leaves of *Moringa oleifera* in maintaining good health were also highlighted in this study.

**Kathy et.al,(2013)** Effect of ragi vermicelli supplementation on anemic women. The study aimed at supplementing developed recipes from Finger millet (*Eleusine coracana*) or ragi Vermicelli on the hematological parameters of women age 15 – 45years. Pre-test Post –test design with test group (n=12) on supplementation and control group (n=12) in study period was designed. The supplementation was given for five days a week for a period of 45 days. Supplementation of Ragi vermicelli showed a significant 3.31 percent increase in the body weight, as well as a 2.65 percent significant increase in the BMI at the end of the supplementation period ( $p<0.05$ ). No significant change in hemoglobin was observed on the 46th day. The results showed a non-significant increase in the hematological parameters. Nutrition education programme increased the knowledge and awareness of dietary iron intake among the women ( $p<0.001$ ). Ragi which is rich in iron is an extremely low cost nutritious cereal and is very beneficial for maintaining a good health.

**Karkada, Suja (2012)** A study of compliance of anemic adolescent high school girls to iron supplementation and nutritional education and to find the effectiveness of these on scholastic performance, hematological parameters and

BMI in selected schools of Udupi district. “A study of compliance of anemic adolescent high school girl to iron supplementation and nutritional education and to find the effectiveness of these on scholastic performance, hematological parameters and BMI in selected schools of Udupi district.. The objectives of the study were to determine the prevalence of anemia among adolescent high school girls, to find the association between the prevalence of anemia with selected demographic variables, socio economic status, body mass index and attainment of menarche, to identify the demographic variables, scholastic performance, hematological parameters, BMI and socio economic of Anemia among adolescent school girls. 7of intervention and control group on the 1st, 45th and 90th day, to find the effectiveness of iron supplementation and nutritional education in terms of increase in scholastic performance, hematological parameters and BMI in anemia among adolescent school girls with mild anemia, to compare the scholastic performance, hematological parameters and BMI between intervention group 1 (iron supplementation) and group 2 (ragi porridge supplementation), between intervention groups and control group, to calculate the rate of compliance of anemic among adolescent high school girls to the interventions, to find the effectiveness of reinforcement of intervention to the noncompliant groups in terms of increase in scholastic performance, hematological parameters and BMI.

**Dr.Mangala Subramanian et, al.(2011)** study conducted on efficacy of moringaoleifera in treating iron deficiency anemia in women of reproductive age

group. Iron deficiency anemia is most prevalent among Indian women in reproductive age from lower socio economic strata and 80% of women with anemia suffer from iron deficiency anemia. This study was done with the intention of finding efficient substitutes in the form of non haem iron of vegetable origin i.e. Moringaoleifera leaves (drumstick) and jaggery to treat anemia. Women belonging to lower socio-economic strata in suburban/rural Bangalore aged 15-45 were the target group. A simple random sampling of 60 women suffering from iron deficiency anemia was taken where 30 women were assigned to the intervention group and 30 to the control group. Diagnosis of anemia was done using Tallqvist's haemoglobin scale. The intervention group was then given a therapy which consisted of 100gm of Moringaoleifera and jaggery in a ratio of 80:20 for thirty days. The inhibitors of iron absorption (milk, phytates, and tannins) were not taken along with the supplements. After thirty days the hemoglobin levels were analyzed again and recorded. The results were analyzed based on percentages and proportions. Student's t test was used to find out any significant difference between intervention and the control group. At the end of the supplementation period(30 days), the women in intervention group showed an increase in hemoglobin level. By the Student's t test, the post intervention data is highly significant=4.109 (P <0.001). This study shows that Moringaoleifera with jaggery has significantly improved hemoglobin levels of anemic women. This can be promoted in the community for women with iron deficiency anemia.

**Vanisha S Nambiar(2011)**study conducted oneffect of drumstick leaves supplementation on hematological indices of young girls (16-21 years).Drumstick leaves with its high beta carotene content along with vitamin C from lemon juice may have a positive impact in the mobilization of stored iron and increase hemoglobin levels of anemic subjects. To determine the effect of drumstick leaves and vitamin C supplementation on hematological indices of young girls (16-21 years). Based on pallor, 100/700 girls studying in first and second year the Faculty of Family and Community Sciences were selected and assessed for hematological and red cell morphology and were divided into Group A Beta carotene from drumstick leaves rich and 5.85 mg Vitamin C as lemon juice, Group B and Group C is without drumstick leaves for 45 days respectively. In Post supplementation data revealed 28.6% reduction of anemia in Group A, by followed by 5% in group B and 4.7% in group C. There was a positive change observed in red cellmorphology in Group A 18% and B 2.6% respectively. Similar results were seen for RBC, MCV and MCHC. Group B which received drumstick leaves showed small positive change in MCH showing a causal association between Vitamin A and iron metabolism. The study emphasizes that anemia is still prevalent even in young adult women of the middle and high-income groups of urban Vadodara (54%). It also shows a strong association between vitamin C from lemon juice and iron and a causal association between Vitamin A available from Drumstick leaves and iron metabolism. After supplementation with Vitamin A,

hematologic evidence and measures of iron status have improved. Vitamin A can play a role in improving utilization of available iron in young girls.

**Suganya (2011)** the study was conducted on effects of ragi mix supplementation on hematological profile of anemic adolescent girls. The supplement consist of 15gms of ragi mix made in 200ml of porridge with 25gms of jaggery. Sample size is 24 anemic adolescent girls. The supplementation was during the tea time for all the samples. This study significant at  $p < 0.05$  increasing the hemoglobin level on regularize MCV and MCH value.

**Meera Krishnan .G (2009)** examined the effectiveness of nutritional ball in terms of increase in hemoglobin level of adolescent children with iron deficiency anemia. Nutritional ball consist of wheat powder - 40gms, Bengal gram -16gms, groundnut -10gms, ragi – 30gms, jaggery – 20gms. The pre experimental one group pre test post test research design. After one month hemoglobin level was assessed. This study reveals that nutritional ball was effective for iron deficiency anemia and associate economic status with the study result.

## **CHAPTER III**

### **METHODOLOGY**

#### **RESEARCH APPROACH**

Research approach is an essential element of the research design which is the framework or guide used for the planning, implementation, and analysis of the study. It helps to decide about the presence or absence as well as manipulation and control over the variables. It the overall plan to test the hypothesis. This study was designed as comparative study to assess the effectiveness of ragi porridge Vs drumstick leaves extract among women with iron deficiency anemia through shali's test.

#### **RESEARCH DESIGN:**

Research design in an overall plan for addressing a research question, including specifications for enhancing the study's integrity. It directs selection of population, sampling procedure, method of measurement and plan for data collection and analysis. It maximizes control over factors that could interfere with the validity of findings. The research design guides the research in planning and implementing the study in a way that is most likely to achieve the intended goal.

The research design adopted for the study was quasi experimental research design.



## **SETTINGS**

The research was conducted in Orathy and Kadamalaiputhur villages at kanchipuram district. The villages were situated 12kms distance from the college campus.

## **POPULATION**

The population comprises of reproductive age group women at the age group between 15 – 45yrs, in Acharappakam community area at Kanchipuram district.

## **SAMPLE**

The study sample selected for the present study comprises of reproductive age group women with iron deficiency anemia residing in Orathy and Kadamalaiputhur in Acharappakam community area, at Kanchipuram district.

## **SAMPLE SIZE**

The sample size of the present study has 60. In that Group I – 30, Group II– 30.

## **SAMPLING TECHNIQUE**

The sampling technique used was non probability purposive sampling technique for the study

## **CRITERIA FOR SAMPLE SELECTION**

### **INCLUSIVE CRITERIA**

- ❖ Reproductive age group women diagnosed with iron deficiency anemia
- ❖ The sample who understood and able to speak Tamil or English
- ❖ Women who were willing to participate

### **EXCLUSIVE CRITERIA**

- ❖ Women who have normal hemoglobin level
- ❖ Women with other medical and surgical conditions
- ❖ Women with iron treatment and iron injection
- ❖ Menopausal Women

## **INSTRUMENTS FOR DATA COLLECTION**

The constructed tools are used for data collection procedure. The descriptions of the tools are:

### **SECTION - A**

Demographic variables such as age, educational status, religion, occupation, marital Status, type of family, dietary status, menstrual history, habit of defecation, history of deworming in past, source of health information.

### **SECTION - B**

### **ESTIMATION OF HEMOGLOBIN:**

## **SHALI'S METHOD WITH HEMOGLOBINOMETER**

### **PRINCIPLE:**

Blood is Added to N/10 Hcl which is convert Hemoglobin into acid hematin. Brown colour hematin is matched against the brown colour of the comparator.

### **TECHNIQUE:**

- Add N/10 Hcl with dropper in to the Hb meter up to 3gm%
- Fill pipette with 0.02ml of blood and wipe off the excess blood at nozzle of the pipette with moistened cotton. Blood may be taken from the finger prick
- Blow off the blood in the pipette in to the Hb meter tube. Rinse the pipette by drawing in and discharging the blood acid solution at least twice.
- Withdraw the pipette from the solution and rinse it with 2-3 drops of HCL so Hb acid solution sticking to the pipette goes into the tube. With draw the pipette. Allow acid to act RBC for 10 minutes to lyse the red cells and convert Hb to acid hematin
- Mix acid hematin with a glass rod provided with the Hb meter set.
- Match colour of the solution with that of the comparator in the natural light. If it is darker, add distilled water with a dropper and stir the solution with a glass rod. This process is continued till the colour of the solution matches the comparator colour.
- Take out the stirrer from the solution but keep it in the upper inside of the tube and take the reading from the upper side in gm%.

### **DATA COLLECTION PROCEDURE**

The study was conducted at Orathy and Kadamalaiputhur villages, Kancheepuram district. The data collection period was about 6 weeks by using the prepared tools. The pre-test was done. Group I supplemented by drumstick leave extract, group II supplemented by raggi porridge . Post-test was conducted and finally the reports were analyzed.

### **PREPARATION OF DRUMSTICK LEAVES EXTRACT**

The method of preparation of drumstick leave extract are as follows:

#### **INGREDIENTS:**

- Drumstick leaves - 150gms
- Water - 500ml

The extract should be prepared in the ratio of 4:1

#### **METHOD OF PREPARATION:**

- Take drumstick leaves
- Wrap them in a wet towel and leave the roll over night
- Leaves will fall of the branches
- Take 150gms of leaves
- Wash and rinse the leaves in plain water
- Boil plain water in vessel
- Put the leaves in boiled water, boiling would stop within 10 -15 min
- Filter the drum stick extraction
- A pinch of salt added
- Drumstick leave extract 200ml is ready to serve.

## **PREPARATION OF RAGI PORRIDGE**

The method of preparation of ragi porridge are as follows:

### **INGREDIENTS:**

- Ragi powder - 100gm
- Water – 400ml

### **METHOD OF PREPARATION:**

- Take 1 cup of water add 100gms of ragi powder
- Add ragi powder mix it well without any lump
- Boil the water
- Add ragi paste and cook on low flame until it reaches thickness
- Add little jaggery (25gm)
- Ragi porridge with the amount of 200ml is ready to drink
- It has to be taken within one hour after the preparation



## **CHAPTER IV**

### **DATA ANALYSIS AND INTERPRETATION**

This chapter deals with data analysis and interpretation of data collected from 60 samples of women with Anemia residing in Orathy and Kadamalai Puthur village. The chapter deals with description of the tool, pilot study report, reliability, validity and informed consent, scoring procedure, scoring interpretation, data collection procedure and statistical analysis.

### **DESCRIPTION OF THE TOOL**

The descriptions of the tools for section I and II are:

#### **SECTION I**

Demographic variables such as age, educational status, religion, occupation, marital status, type of family, dietary status, menstrual history, habit of defecation, history of deworming in past, source of health information.

#### **SECTION II**

Bio physiological measure is the tool used in this study. Estimation of hemoglobin through Shali's method with hemoglobinometer.

## **PILOT STUDY REPORT**

The study was conducted to assess the effectiveness of ragi porridge vs drumstick leaves extract among women with iron deficiency anemia at the community area. The investigator used purposive sampling technique to assess the effectiveness of intervention. There was an improvement in the hemoglobin level and statistical improvement also there. The co-operation of the President and community women were highly appreciable and the availability of various data and sources were extensively feasible for the study.

### **RELIABILITY:**

Reliability is the degree of consistency or dependability with an instrument measures an attribute. It is also concerns accuracy.

In order to establish the reliability of the tool. Test re-test method was used. The reliability of the tool was tested on 6 clients with iron deficiency anemia. The co efficient of reliability (R) was 0.76. Hence the tool was reliable to conduct the present study.

### **VALIDITY:**

The tool was prepared by the investigator, based on literature review, under the guidance of experts and on the basis of objectives and it was assessed. The content validity of the tool was obtained from Obstetric and Gynecological Nursing Experts.



## **INFORMED CONSENT**

Permission was obtained from the village presidents, Informed consent was given to all the women before pre-test and post-test to get their willingness to take blood sample. Assurance was given that confidentiality would be maintained.

## **DATA COLLECTION PROCEDURE**

The main study was conducted for six weeks among the patients who were diagnosed with anemia, who met inclusion criteria, by using purposive sampling technique. The investigator first introduced herself to the patients and established a good rapport with them. The demographic variable was collected from the women who diagnosed with anemia. Estimation of hemoglobin was done by Shali's method with hemoglobinometer. Two groups of women were selected from different village, one group was administered by raggi porridge and one group administered by drumstick extract. Post test was conducted and finally the report was analyzed.

## **SCORING PROCEDURE**

The instrument used for the study is Shalis method with hemoglobino meter, which can identify the hemoglobin level by gm%.

## **PLAN FOR DATA ANALYSIS**

The data had been organized, tabulated and analysed by using Descriptive statistics. Mean, Standard deviation and paired 't' test were carried out to assess the effectiveness of drumstick leaves extract and ragi porridge. Independent sample test was used to compare effectiveness of group I and II among women with iron deficiency anemia.

## **STATISTICAL METHOD**

The descriptive and inferential statistics method was used to find the mean, standard deviation, frequency percentage and paired 't' test was used to find the effectiveness of drumstick leaves extract and ragi porridge. Independent sample test was used to compare effectiveness of drumstick leaves extract Vs ragi porridge among women with iron deficiency anemia. **(Table 4.1)**

**TABLE 4.1 STATISTICAL METHOD OF DATA ANALYSIS**

<b>S. No</b>	<b>DATA ANALYSIS</b>	<b>METHOD</b>	<b>REMARKS</b>
1.	Descriptive statistical analysis	Frequency, percentage, mean, and standard deviation	To describe demographic variables among women with iron deficiency anemia
2.	Inferential statistical analysis	Paired 't' test  Independent sample test	It helps to evaluate the effectiveness of drumstick leaves extract and ragi porridge increase the hemoglobin level among women with iron deficiency anemia.  Compare the effectiveness of drumstick leaf extract and ragi porridge in increase hemoglobin level among women with iron deficiency anemia.

The Data were Interpreted under the following sections

**SECTION-A**

Frequency and Percentage distribution of Demographic variables of group I and group II women with iron deficiency anemia.

**SECTION-B**

Comparison of mean and standard deviation of pretest and post test for group I and group II women with iron deficiency anemia.

**SECTION- C**

Improvement score of the hemoglobin level among women with iron deficiency anemia before and after the intervention.

**SECTION-D**

Compare the effectiveness of groups I Vs group II women with iron deficiency anemia

**SECTION-A**

**TABLE 4.2: FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF GROUP I AND GROUP II AMONG WOMEN WITH IRON DEFICIENCY ANEMIA**

S.NO	DEMOGRAPHIC VARIABLES	GROUP 1 AND II			
		GROUP - I		GRIUP - 2	
		Frequency	Percentage	Frequency	Percentage
1.	<b>Age</b>				
	a) 15 - 25 Yrs	4	13.3%	5	16.7%
	b) 26 - 35 Yrs	15	50.0%	14	46.7%
	c) 36 - 45 Yrs	11	36.7%	11	36.7%
2.	<b>Educational Status</b>				
	a) Illiterate	14	46.7%	5	16.7
	b) Primary Level	3	10.0%	8	26.7
	c) Higher Secondary	12	40.0%	14	46.7
	d) Graduate	1	3.3%	3	10.0
3.	<b>Religion</b>				
	a) Hindu	23	76.7%	24	80.0%
	b) Muslim	2	6.7%	3	10.0%
	c) Christian	5	16.7%	3	10.0%
	d) Others	0	0%	0	0%
4.	<b>Occupation</b>				
	a) Unemployed b) Labour	3	10.0%	3	10.0%

	c) Business d) Home maker	17 3 7	56.7% 10.0% 23.3%	8 7 12	26.7% 23.3% 40.0%
5.	<b>Marital status</b> a) Married b) Unmarried c) Divorce d) Widow	17 6 1 6	56.7% 20.0% 3.3% 20.0%	23 4 0 0	76.7% 13.3% 0% 10.0%
6	<b>Monthly income</b> a) < 1000 b) 1001 – 2001 c) 2001 – 3001 d) > 3000	3 115 6 6	10.0% 50.0% 20.0% 20.0%	0 7 5 18	0.0% 23.3% 16.7% 60.0%
7.	<b>Type of family</b> a) Joint family b) Nuclear Family	5 25	16.7% 83.3%	5 25	16.7% 83.3%
8.	<b>Dietary Pattern</b> a) Vegetarian b) Non vegetarian	5 25	16.7% 83.3%	5 25	16.7% 83.3%
9.	<b>Menstrual history</b> a) Regular flow of menstruation b) Irregular flow of menstruation c) Excess flow of menstruation	17 10 3	56.7% 33.3% 10.0%	17 8 5	56.7% 26.7% 16.7%

10.	<b>Habit Of Defecation</b>				
	a) Open air defecation	11	36.7%	9	30.0%
	b) Usage of public toilet	3	10.0%	1	3.3%
	c) Usage of toilet at home	16	53.3%	20	66.7%
11.	<b>History of deworming in the past</b>				
	a) Yes	8	26.7%	3	10.0%
	b) No	22	73.3%	27	90.0%
12.	<b>Source of previous Health Information</b>				
	a) Mass Media	7	23.3%	6	20.0%
	b) Health Personnel	12	40.0%	19	63.3%
	c) Neighbours & friends	11	36.7%	5	16.7%

**Table 4.2** depicts the frequency and percentage distribution of the personal factor of demographic variables include age, educational status, religion, occupation, marital status, monthly income, type of family, dietary status, menstrual history, habit of defecation, history of deworming, source of previous health information.

### **Group – 1**

Out of 30 women 4(13.3%) were 15-25years, 15(50.0%) were 26-35years 11(36.7%) belong to 36-45years.

Regarding education status 14(46.7%) were illiterate,3(10.0%) had be primary educated,12(40.0%) are higher secondary,1(3.3%) belongs graduate.

With regard to religion 23(76.7%) hindu, 2(6.7%) muslim, 5(16.7%) Christians, none of them from the other religion.

Among the women 3(10.0%) unemployed, 17(56.7%) labour, 3(10.0%) belonged to the group of business, and 7(23.3%) were home makers.

Regarding marital status of the women in the group 17(56.7%) were married, 6(20.0%) unmarried, 1(3.3%) were divorced, 6 (20.0%) were to widow.

With regard to monthly income 3(10.0%) were earning >1000, 15(50.0%) earning the monthly income of Rs.1001 – 2000, 6(20.0%) were having the monthly income of Rs. 2001 – 3000, 6(20.0%) were having income above 3000.

Among the women 5(16.7%) belonged to joint family, 25 (83.3%) belonged to nuclear family.

Regarding the dietary pattern of the women 5(16.7%) vegetarian, 25(83.3%) non vegetarian.



Out of 30 women's menstrual history 17(56.7%) had regular, 10(33.3%) were irregular, 3(10.0%) had excessive menstrual bleeding.

Regarding mode of defecation 11 (36.7%) in open defecation in the fields, 3(10.0) were using public toilets, 16(53.3%) were using toilets in the home itself.

About the history of deworming 8(26.7%) took the tablet previously, 22(73.3%) did not take deworming tablet ever before.

Regarding sources of previous health information 7(23.3%) got from mass media, 12(40.0%) got health information from health personnel, 11(36.7%) persons were got from neighbours.

## **Group – II**

Out of 30 women 5(16.7%) were in 15-25years, 14(46.7%) were in 26-35years 11(36.7%) belonged to 36-45years.

Regarding educational status 5(16.7%) were illiterate, 8(26.7%) had primary education, 14(46.7%) had higher secondary, 3(10.0%) graduates.

In concern to religion 24(80.0%) hindu, 3(10%) muslim, 3(10%) Christians, none of them are from the other religion.

In case of occupational status 3(10.0%) were unemployed, 8(26.7%) were labour, 7(23.3%) belonged to the group of business, are 12(40%) were home makers.

Regarding marital status of the women 23(76.7%) were married, 4(13.3%) unmarried, none of them divorced, 3 (10.0%) belonged to widow.

In terms of monthly income, 7(23.3%) were earning Rs.1001 – 2000, 5(16.7%) were earning Rs. 2001 – 3000 and 18(60.0%) were having income above 3000.

Regarding family pattern 5(16.7%) belonged to joint family, 25 (83.3%) from nuclear family.

In case of dietary pattern of the women 5(16.7%) vegetarian, 25(83.3%) non vegetarian.

In case of menstrual history 17(56.7%) had regular, 8(26.7%) had irregular, 5(16.7%) had excessive menstrual bleeding.

Regarding mode of defecation 9 (30.0%) in open defecation in the fields, 1(3.3) were using public toilets, 20(66.7%) were using toilets in the home itself.

In case of history of deworming 3(10%) took the tablets previously, 27(90%) were did not take deworming tablets ever before.

Regarding sources of previous health information 6(20%) getting from mass media, 19(63.3%) were getting health information from health personnel, 5(16.7%) from neighbours.

## **SECTION-B**

**TABLE – 4.3.1 COMPARISON OF MEAN WITH STANDARD DEVIATION BETWEEN PRE AND POST TEST SCORE FOR GROUP I WOMEN WITH IRON DEFICIENCY ANEMIA.**

**Group –I**

### Paired Sample Statistics

		<b>Mean</b>	<b>N</b>	<b>Standard deviation</b>	<b>Standard error mean</b>
group I	pretest	8.9367	30	1.42996	.26114
	Post test	10.4067	30	1.42996	.26107

**Table – 4.3.1** shows that overall mean for group I among women diagnosed with iron deficiency anemia was 8.93, with standard deviation 1.43 in pretest and mean in post test was 10.40 with 1.42 of standard deviation.

### **TABLE – 4.3.2 COMPARISON OF MEAN WITH STANDARD DEVIATION BETWEEN PRE AND POST TEST SCORE FOR GROUP II WOMEN WITH IRON DEFICIENCY ANEMIA.**

#### **Group –II**

### Paired Sample Statistics

		<b>Mean</b>	<b>N</b>	<b>Standard deviation</b>	<b>Standard error mean</b>
group II	pretest	8.7067	30	1.61777	.29536
	Post test	10.6333	30	1.61295	.29448

**Table – 4.3.2** shows that overall mean for group II among women diagnosed with iron deficiency anemia was 8.70, with standard deviation 1.61 in pretest and mean in post test was 10.633 with 1.61 of standard deviation.

### **SECTION – C**

**TABLE – 4.4.1.IMPROVEMENT SCORE OF THE HEMOGLOBIN LEVEL AMONG WOMEN WITH IRON DEFICIENCY ANEMIA BEFORE AND AFTER THE INTERVENTION.**

#### **GROUP I**

#### **Paired Sample Test**

	<b>Paired difference</b>			
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Group I	Mean	Standard deviation	Standard error mean	95% confidence interval of the difference		T	df	P value
				lower	upper			
post test – pre test	1.4700	.17050	.03113	1.40634	1.53366	47.224	29	<0.0001

**\*SIGNIFICANT AT P<0.05**

**Table 4.4.1** reveals that the mean and standard deviation of improvement score for effectiveness of drumstick leaves extract among 30 women diagnosed with iron deficiency anemia, mean 1.47000, standard deviation .17050, confidence interval upper 1.53366, lower 1.40634, ‘t’ value 47.22, df 29 and P value is <0.0001.

**TABLE – 4.4.2 IMPROVEMENT SCORE OF THE HEMOGLOBIN LEVEL AMONG WOMEN WITH IRON DEFICIENCY ANEMIA BEFORE AND AFTER THE INTERVENTION.**

**GROUP II**

**Paired Sample Test**

	<b>Paired difference</b>			
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Group II	Mean	Standard deviation	Standard error mean	95% confidence interval of the difference		T	df	P value
				lower	upper			
Post test – pre test	1.92667	.17798	.03250	1.86021	1.99313	59.291	29	<0.0001

**\*SIGNIFICANT AT P<0.05**

**Table 4.4.2** reveals that the mean and standard deviation of improvement score for effectiveness of ragi porridge among 30 women diagnosed with iron deficiency anemia, mean 1.92667, standard deviation .17798, confidence interval upper 1.99313, lower 1.86021, ‘t’ value 59.291, df 29 and P value is <0.0001.

#### **SECTION-D**

**TABLE 4.5**

**COMPARE THE EFFECTIVENESS OF GROUPS I VS GROUP II**

INDEPENDENT SAMPLES TEST	Equality variance		T test for equality of Means					
	f	Sig	T	df	sig	Mean difference	Std.err or differe	95% Confidence interval of the difference

							nce	lower	upper
Post – test equal variances assumed	.009	.926	-.57 6	58	.567	-.22667	.39355	- 1.01468	.56110
Equal variene not assumed			-.57 6	57	.567	-.22667	.39355	- 1.01468	.56135

**Table 4.5** depicts that, there is a significant difference between the effectiveness of drumstick leaves extract Vs ragi porridge in increasing hemoglobin level among women with iron deficiency anemia. Hence null hypothesis was rejected.



## **CHAPTER - V**

### **RESULT AND DISCUSSION**

The result of the study had been discussed in relation to assess the effectiveness of drumstick leaves extract vs ragi porridge among women with iron deficiency anemia, a total number of 60 women had been selected for this study from different villages. The hemoglobin level was assessed before and after intervention and the improvement level was assessed.

#### **THE FIRST OBJECTIVE WAS TO IDENTIFY THE WOMEN WITH IRON DEFICIENCY ANEMIA AT SELECTED COMMUNITY AREA**

The identification of women with iron deficiency anemia had been carried out in Orathy and Kadamalaiputhur village. Their hemoglobin level was estimated by Shali's method with hemoglobinometer. After estimating hemoglobin level those who have Hemoglobin level below 11gm considered as women with iron deficiency anemia, who has met the inclusion criteria. The study reveals that in group I the pretest mean 8.9367 with standard deviation 1.43033. In group II the pretest mean value is 8.7067 with standard deviation 1.61777. There is slight difference between group I and group II mean with standard deviation values during the pretest.

**THE SECOND OBJECTIVE WAS TO ADMINISTER DRUMSTICK LEAVES EXTRACT ADMINISTERED TO GROUP I AND RAGI PORRIDGE FOR GROUP II**

Based on the above objective Ragi powder - 100gm, take 1 cup of water add 100gms of ragi powder. Add ragi powder mix it well without any lump, after that, boil the water (400ml) . Add ragi paste and cook on low flame until it reaches thickness add little jaggery (25gm). It is a preparation of ragi porridge. It has to take within one hour after the preparation. For the preparation drumstick leaves extract, Drumstick leaves - 150gms, Water - 500ml have to take. In method of preparation, leaves have to be boiled with plain water in vessel. After boiling, let the water with leaves away, add pinch of salt to essence. Both interventions were administered to the groups 200ml in the daily basis for 30 days.

**THE THIRD OBJECTIVE WAS TO EVALUATE THE HEMOGLOBIN LEVEL FOR BOTH GROUPS AFTER INTERVENTION DRUMSTICK LEAVE EXTRACT AND RAGI PORRIDGE AMONG WOMEN WITH IRON DEFICIENCY ANEMIA**

This study shows that in group I the post test mean 10.4067 with standard deviation 1.42996. In group II post test mean value is 10.6333 with the standard deviation of 1.61295. The improvement score of group I mean value was 1.4700 with standard deviation .1750, the 't' value was 47.224. Improvement score of group II mean value is 1.92667 with standard deviation .17798 and the 't' value

was 59.291. The P value of both group was  $P < 0.05$ . Which were statistically significant, it implies that group I and group II intervention was effective and showed increasing the hemoglobin level among women with iron deficiency anemia.

Hence null hypothesis was rejected. There is a significant difference between the effectiveness of drumstick leaves extract Vs ragi porridge in increasing hemoglobin level among women with iron deficiency anemia.

## **CHAPTER –VI**

### **SUMMARY AND CONCLUSION**

The present study was conducted to assess the effectiveness of drumstick leaves extract Vs ragi porridge among women with iron deficiency anemia. The total sample was 60 women, had been selected for this study from different villages, who met the inclusion criteria, through the purposive sampling method.

The investigator first introduced herself to the clients and developed good rapport with them. Selection of sample was done by after checking the hemoglobin level. The demographic variables and the intervention had been given immediate after selecting the samples.

### **CONCLUSION**

In the assessment of 60 samples, evaluation of hemoglobin level was done before and after the intervention among two groups. The hemoglobin level was improved in both two groups, P value < 0.05

Hence the null hypothesis was rejected. The result of the study is, there is a significant different between the effectiveness of drumstick leaves extract Vs ragi porridge in increasing hemoglobin level among women with iron deficiency anemia.

## **NURSING IMPLICATION**

The findings of the study had implications in different dimensions of nursing profession, (i.e) Nursing Practice, Nursing Education, Nursing Administration and Nursing Research. Many steps could be taken to strengthen the findings of the study which was bounded by the dimensions of Nursing professions.

## **NURSING PRACTICE**

- As obstetric and gynecological nurse having the responsibility to educate the women regarding the way to prevent iron deficiency anemia by dietary supplementation and hygienic measures.
- With emerging trends setting, nurse should have knowledge about food supplements which prevent iron deficiency anemia.

## **NURSING EDUCATOR**

- Nursing educator should give opportunity for the nursing students to learn about the prevention of anemia and the food products which would enhance the hemoglobin level
- Insist the students to have current knowledge about iron deficiency anemia.

## **NURSING ADMINISTRATION**

- With advance technology and ever growing challenges of health care needs, the college and hospital administration should have a responsibility to provide nurses, nurse educators and nurse students with continuing education on recent advancement in improving nursing care, knowledge and skills.
- The study findings would help the administrator to arrange continuing education programme for nurses above prevention of iron deficiency anemia.

## **NURSING RESEARCH**

In an extensive research innovative and creative ideas can be invited and provides evidence based nursing practice for the future research and researchers. Researcher can disseminate the research findings through conferences, seminars, journals, world wide web, mainly to create an awareness about the uses of natural remedies for promoting the health of the public.

## **RECOMMENDATION**

- The study can be conducted in the large samples
- A descriptive study to assess the knowledge attitude practice regarding dietary management of iron deficiency anemia can be conducted
- The similar study can be conducted among adolescent girls
- The study can be conducted in different settings
- An experimental study can be done to assess the effectiveness of non-chemical iron supplementation in preventing iron deficiency among women with reproductive age (18-45yrs).

## INPUT

### PRE TEST FOR WOMEN WITH IRON DEFICIENCY ANEMIA

- ❖ DEMOGRAPHIC VARIABLES
  - AGE
  - EDUCATIONAL STATUS
  - RELIGION
  - OCCUPATION
  - MARITAL STATUS
  - MONTHLY INCOME
  - TYPE OF FAMILY
  - DIETARY STATUS
  - MENSTRUAL HISTROY
  - HABIT OF DEFEICATION
  - HISTORY OF DEWARMING
  - SOURCE OF PREVIOUS HEALTH INFORMATION
- ❖ ASSESSMENT OF HEMOGLOBIN LEVEL THROUGH SHALI'S METHOD

## THROUGHPUT

### GROUP -I

SUPPLEMENTATION OF DRUMSTICK LEAVES EXTRACT 200ML FOR 30 DAYS

### GROUP -II

RAGI PORRIDGE 200ML FOR 30 DAYS

## OUTPUT

POST TEST – ASSESSMENT OF HEMOGLOBIN LEVEL AMONG GROUP I & II WOMEN WITH IRON DEFICIENCY ANEMIA THROUGH SHALI'S METHOD

### EFFECTIVENESS:

IN POST TEST THE HEMOGLOBIN LEVEL INCREASED FOR BOTH GROUP I & II

### INEFFECTIVENESS:

IN POST TEST THE HEMOGLOBIN LEVEL NOT INCREASED GROUP I & II

FEED BACK

Included in the study

Not included in the study

FIG 1.1 MODIFIED LUDWIG VON BERTANLAFFY'S GENERAL SYSTEM THEORY 2014

## BIBLIOGRAPHY

### BOOKS:

1. Bobak, (1995).”**Maternity Nursing**”. 4<sup>th</sup> edition. Mosby publication, London.
2. Basavanthappa.BT, (2003). “**Text Book of Medical Surgical Nursing**”. 1<sup>st</sup> edition. Jaypee publishers, New Delhi.
3. Bickerton, T. (1985) “**Medical surgical nursing**”,1<sup>st</sup> edition, William Heinemann Medical Books L TD,PP.
4. Breud, G. Bwere and Suzene, c., Smeltzer,(1992) “**Medical surgical nursing**”,8<sup>th</sup> edition, Philadelphia, Lippincott company.
5. Brunner & Suddarth’s ,(2007) . “**Text Book Of Medical Surgical Nursing**”. 11<sup>th</sup> edition. Lippincott Williams & Wilkins Publishers, Philadelphia.
6. Denise,F.Polit,Bernadette,P.Hungler, (1999). “**Nursing Research Principles and method**”. 6<sup>th</sup>edition. Lippincott William and Wilkins publications, Newyork.
7. Denise,F.Polit., Cheryl Tatano, Beck, (2002) ”**Nursing research principles and methods**”. 7<sup>th</sup> edition. Lippincott William and Wilkins publication, Newyork.
8. Dutta,D.C, (2004). “**Text book of obstetrics**”. 6<sup>th</sup> edition. New central book agency (P) Ltd, India.
9. Dutta,D.C,(2004). “**Text book of Gynaecology**”. 5<sup>th</sup> edition. New central book agency (P) Ltd, India.
- 10.Helen Varney., Jan, M.Kriebs and Carolyn, L.Gegor.(2004).”**Text book obstetrics**”. 6<sup>th</sup> edition. India publishers and Distributors. India. Hill (1984), “**Disorders of the Uterine Cervix, Cervix, Current Obstetric and Gynecologic Diagnosis & Treatment**”, 5<sup>th</sup> edition, Lange Medical publications.
11. Joyce .M . Black, (2003). “**Text book of Medical Surgical Nursing**”. Volume I. WB Saunders Publishers, Philadelphia.



12. Kothari, C.R. (2001) "**Research Methodology**", k.k Gupta publishers new delhi.
13. Lasley Ann, (2000). "**The New Midwifery**". 1<sup>st</sup> edition. Har Court Brace Publishers,  
London. Lewis, (1996). "**Text book of Medical Surgical Nursing**". 4<sup>th</sup> edition  
Mosby Publishers, Washington.
14. Luckmans, (1996). "**Text book of Medical Surgical Nursing**". 2<sup>nd</sup> edition. WB  
Saunders publishers,  
Philadelphia Philips, (2004). "**Text book of medical surgical nursing**". 3<sup>rd</sup>  
edition. WB Saunders publishers, Philadelphia.
15. Potter, A. Patricia and Perry G Anne, (1991). "**Basic Nursing Theory and  
Practice**". 2<sup>nd</sup> edition. Mosby publications (P) Ltd, New Delhi.
16. Ruth Bennet Linda (1996), "**Text book of Gynaecology**", 12<sup>th</sup> edition, Marylaw  
Churchill Living stone Publisher.
17. Shashank P. Arulekar. v, "**Practical Gynaecology and obstetrics**",  
2<sup>nd</sup> edition, Vora Medical Publications.
18. Shaw's, "**Text book of Gynaecology**", 5<sup>th</sup> edition, Jaypee Brothers Medical  
Publishers. Shafers (2003). "**Text book of medical surgical nursing**". 7<sup>th</sup>  
edition. BI publishers, New Delhi.
19. Swaminathan, M. (2004). "**Hand book of food and nutrition**". 1<sup>st</sup> edition. The  
Bangalore printing and publishing (P) Ltd. India. Pp: 341.
20. Sundare Rao (1998). An "**Introduction to Biostatistics**". 4<sup>th</sup> edition. Vegas  
publications (P) Ltd. New Delhi. Pp 48-59.
21. Susan, (2004). "**Text book of medical surgical nursing**". 3<sup>rd</sup> edition. WB  
Saunders Publishers, Philadelphia.
22. Susan M. Cohen, (2001). "**Maternal Neonatal and Women's Health Nursing**".  
1<sup>st</sup> edition. Spring House Publications, New York
23. Yon dell Monsten, (2001). "**Obstetrics Nursing outline**". 2<sup>nd</sup> edition. Jaypee  
Brothers Medical Publishers, New Delhi.



## **JOURNALS:**

1. Ministry of Health and Family Welfare. **“Community level Interventions to prevent and treat anemia”**. 2005-2006; Vol-1.
2. Sant-Rayn Pasricha et al. **“A community based field research project investigating anemia among young women”** living in rural Karnataka, India. National Family Health Study. 2009; Vol-59, Page 1186.
3. SNV Brahamam. **“National Nutrition Monitoring Bureau in India”**. Indian Journal Of Community Medicine. 2007; Vol-32(1): Page 7-9.
4. Park.K. **“Preventive and Social medicine”**. 18<sup>th</sup> Edition. Jabalpur Publisher: M/S anemia and Vit A deficiency Banarasidas Bhanot; 2005: Page 450.
5. Ndiaye H et al. **“Impact of a positive deviance Approach to improve the effectiveness of an Iron supplementation programme to control nutrition anemia”**. Food and Nutrition Bulletin. 2009; Vol-2: Page 128-136.
6. Lechting A et al. Decreasing stunting, in Peru: **“result of the good start in life program”**. Food and Nutrition Bulletin. 2009; Vol-30(1): Page 37-38.
7. Phuc TQ et al. **“Lesson learns from implementation of a demonstration programme to reduce the burden of anemia and hookworm in women”** in Yen

- Bai Province, Vietnam. Biomedical Central Public Health. 2009; Vol-28(9): Page 266.
8. Dr. Anant Mohn. **“Anemia is on the rise in India”**, says NFHS report. Agencies. Delhi: 2008.
  9. Suega K et al. **“Iron Deficiency anemia in women”** in Bali, Indonesia: A Profile of Risk Factor and Epidemiology. 2012; Vol-33(3): 604-607.
  10. Arnold DL et al. **“Iron deficiency anemia cigarette smoking and risk of abruptio-placenta”**. American Journal of Clinical Nutrition. 2009; Vol-85.
  11. Sharma A et al. **“Detection and Management in Anemia in pregnancy”**. Indian Journal of American Research. 2008; Vol-128(1): Page 45-51.
  12. Mendez Estrada Reo et al. **“Prevalence of iron deficiency and iron deficiency anemia in pregnant adolescent”**. Archivo Latinoamericano de Nutricion. 2007; Vol-58(2): 47-51.
  13. Hotz C et al. **“Efficacy of iron-fortified Ultra rice in improving the iron status of women”**. American Journal of Clinical Nutrition. 2009; Vol-85(4): 1127-1133.
  14. F.W. Lane et al. **“Investigated the relationship between maternal anemia and perinatal outcome”** in a cohort. Eastern Mediterranean Health Journal. 2008-2009 ; Vol-10(6); Page 8001-8007.

15. Meiciu Chang et al. **“A study of Prevalence of Anemia in Adolescent girls and reproductive age women”**. Archives of Medical Science. 2009; Vol-5(1): Page 63-68.
16. Manmeet Kaur, Kamaljit Singh. **“Effect of health education on knowledge, attitude and practice about anemia among rural women”**. Indian Journal of Community Medicine. 2001-09; Vol-26(3).
17. S. Mehnaz et al. **“Impact on iron, folate Vit C supplementation on the prevalence of iron deficiency anemia in non pregnant female”**. Indian Journal of Community Medicine. 2006; Vol-3: Page 3.
18. Insel BJ et al. **“Maternal Iron Deficiency and the risk of Schizophrenia in offspring”**. Archives General Psychiatry. 2008; Vol-65(10): Page 1136-1144.
19. Melaku Umeta et al. **“Iron deficiency among reproductive age group”**. Ethiopian Journal of Health. 2008; Vol-22(3): Page 252-258.
20. Nahala Hawalla et al. **“Iron deficiency is an important contributor to anemia among reproductive age women”**. Ecological of Food and Nutrition. 2004; Vol-43: Page 77-92.

## **INTERNET SOURCE**

- ❖ <http://www.google.com>
- ❖ <http://www.pubmed.com>
- ❖ <http://www.healthline.com>
- ❖ <http://www.who.org>
- ❖ <http://www.yahoo.com>
- ❖ <http://www.clipart.com>
- ❖ [www.who.int](http://www.who.int)



**SCHOLAR COLLECTING DEMOGRAPHIC VARIABLES**



**SCHOLAR CHECKING HEMOGLOBIN LEVEL THROUGH SHALI'S METHOD IN PRETEST**



**SCHOLAR PROVIDING RAGI PORRIDGE**



**SCHOLAR PROVIDING DRUMSTICK LEAVES EXTRACT**





**SCHOLAR CHECKING HEMOGLOBIN LEVEL THROUGH SHALI'S  
METHOD IN POST TEST**

Sir / Madam

Greetings from principal, Adhiparasakthi College of Nursing, Melmaruvathur. This is to inform you that our post graduate MSc Nursing II year student Ms. S. Anandhi is planning to conduct a research project on **“COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF DRUMSTICK LEAVES EXTRACT Vs RAGI PORRIDGE IN INCREASING THE LEVEL OF HEMOGLOBIN AMONG WOMEN WITH IRON DEFICIENCY ANEMIA IN SELECTED COMMUNITY AREA AT KANCHIPURAM DISTRICT”** under the TamilNadu Dr.M.G.R Medical University, Chennai. So we request you to kindly permit our student to conduct her research in your community area. We will abide the community area rules and regulations kindly consider and do the needful.

Thanking you,

## APPENDIX-I

### PART –A – DEMOGRAPHIC VARIABLES

#### 1. Age

- a) 15 - 25 Yrs [ ]
- b) 26 - 35 Yrs [ ]
- c) 36 - 45 Yrs [ ]

#### 2. Educational Status

- a) Illiterate [ ]
- b) Primary Level [ ]
- c) Higher Secondary [ ]
- d) Graduate [ ]

#### 3. Religion

- a) Hindu [ ]
- b) Muslim [ ]
- c) Christian [ ]
- d) Others [ ]

#### 4. Occupation

- a) Unemployed [ ]
- b) Labour [ ]

c) Business [ ]

d) Home maker [ ]

**5. Marital status**

a) Married [ ]

b) Unmarried [ ]

c) Divorce [ ]

d) Widow [ ]

**6. Monthly Income**

a) <1000/ Month [ ]

b) 1001 - 2000/ Month [ ]

c) 2001 – 3000 / Month [ ]

d) > 3000 [ ]

**7. Type of family**

a) Joint family [ ]

b) Nuclear Family [ ]

**8. Dietary Pattern**

a) Vegetarian [ ]

b) Non vegetarian [ ]

**9. Menstrual history**

a) Regular flow of menstruation [ ]

b) Irregular flow of menstruation [ ]

c) Excess flow of menstruation [ ]

**10. Habit Of Defecation**

a) Open air defecation [ ]

b) Usage of public toilet [ ]

c) Usage of toilet at home [ ]

**11. History of deworming in the past**

a) Yes [ ]

b) No [ ]

**12. Source of previous Health Information**

a) Mass Media [ ]

b) Health Personnel [ ]

c) Neighbors & Friends [ ]