

DISSERTATION ON

**A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW
MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND
HEALING IN CLIENTS WITH DIABETIC FOOT ULCER IN SELECTED
WARDS AT RAJIV GANDHI GOVERNMENT GENERAL
HOSPITAL, CHENNAI.**

**M.Sc (NURSING) DEGREE EXAMINATION
BRANCH-I MEDICAL AND SURGICAL NURSING**

**COLLEGE OF NURSING
MADRAS MEDICAL COLLEGE, CHENNAI-03.**



A dissertation submitted to
**THE TAMILNADU DR. MGR. MEDICAL UNIVERSITY,
CHENNAI-600 032.**

In partial fulfilment of the requirement for the degree of
MASTER OF SCIENCE IN NURSING

April 2016

CERTIFICATE

This is to certify that this dissertation titled “**a study to assess the effectiveness of Yellow myrobalan (Kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected wards at Rajiv Gandhi Government General Hospital, Chennai.**” is a bonafide work done by Mrs. J .Jayanthi, II year M.Sc (N), College of Nursing, Madras Medical College, Chennai. Submitted to the Tamilnadu **Dr.M.G.R. Medical University**, Chennai in partial fulfilment of the requirements for the award of degree of Master of Science in Nursing, Branch I, Medical and Surgical Nursing, under our guidance and supervision during the academic period from 2014–2016.

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MASTER OF SCIENCE IN NURSING
APRIL 2016**

ACKNOWLEDGEMENT

“From the lord, my soul; all my inmost being, praise his holy name, my help comes from the lord, the maker of heaven and earth”.

Nothing concrete can be achieved without an optimal inspiration during the course of work. There are several hands and hearts behind this work to bring it to this final shape for which I would like to express my gratitude. I wish to acknowledge my sincere and heartfelt gratitude to the Almighty of god for this marvelous grace shown from the beginning to the end of the study.

The encouragement is a booster of the human lifewith this anyone can achieve easily. I thank everyone who encouraged me to achieve to complete this task effectively. I would like to express my deep and sincere gratitude to **Dr.R.Vimala,M.D.,**Dean, Madras Medical College, Chennai, for granting me permission to conduct the study in this esteemed institution and I express my heartfelt gratitude to **Dr.Sudhaseshaiyan M.D.,** Vice President, Madras Medical College, Chennai.

I express my sincere thanks to **Dr.V.Kumari.M.Sc(N),,Ph.D.,**College of Nursing, Madras Medical College,Chennai,for her support, constant encouragement and valuable suggestions helped in the fruitful outcome of this study.

I express my sincere thanks to **Dr.R.Lakshmi, M.Sc (N),,Ph.D.,MBA.,**formal principal and additional post of Assistant Director of Medical Education (Nursing), kilpauk, Chennai, for her support, constant encouragement and valuable suggestions helped in the fruitful outcome of this study.

I extend my heartfelt thanks to our madam **Mrs.A.Thahira Begum M.Sc(N),,M.Phil.,MBA.,** Head of department , Medical Surgical Nursing, College

of Nursing, Madras Medical College, Chennai, for her timely assistance and guidance in pursuing the study.

It is my immense pleasure and privilege to express my gratitude to **Prof. Dr. P. Dharmarajan, M.D, and Dip. Diab.** Director and Professor, Institute of diabetology, Madras Medical College, Chennai, and **Dr. Tamilarasi. B, M.Sc (N), Ph.D.,** Principal, Madha College Of Nursing, Kundrathur, Chennai for validating the tool.

I also gratitude to **Dr. P. Ragumani, M.S,** Director, and professor, Institute Of General Surgery, Madras Medical College, Chennai, for this timely help to bring out the fruitful outcome of this study and successful completion of dissertation on time.

I render my sincere gratitude to **Prof. Dr. Muthukumar, M.S.,** Institute Of General Surgery, Madras Medical College, Chennai, for giving permissions and also for the valuable suggestions and guidance to complete this study.

I extend my sincere thanks to our madam, **Mrs. J.S. Elizebath Kalavathy, M.Sc(N),** College Of Nursing, Madras Medical College, Chennai, for her continuous support to complete this study effectively.

I extend my thanks to **Mrs. Dominic Arokiya Mary, M.Sc (N), Mrs. K. Shanthi Devi, M.Sc(N), and Mrs. K. Saroja, M.Sc(N),** Lecturer, College of Nursing, Madras Medical College, Chennai, for their timely guidance in pursuing the study.

I would like to thank our lecturers and other faculties for their encouragement to complete the study.

I express my gratitude to the **Nursing superintendent Grade-1, Staff Nurses** in selected wards, at Rajiv Gandhi government general hospital, Chennai, for their assistance and help during my data collection.

I am extremely thankful to **Mrs. S. Valarmathy M.Sc, M.Phil.,** Research officer, department of epidemiology, M.G.R. Medical University, Guindy, Chennai, for her suggestion and guidance on statistical analysis.

I extend my thanks to **Mr. Ravi, M.A, M.L.I.Sc.,** Librarian, College Of Nursing, Madras Medical College, Chennai, for his co-operation and assistance which built the sound knowledge for this study and also to the Librarian Of Tamil Nadu, Dr.M.G.R Medical University, Chennai, for their co-operation in collecting the related Literature for this study.

I extend my thanks to Senior Medical Record Officer, Course coordinator, Rajiv Gandhi Government General Hospital, Chennai, for his guidance and timely help.

Above all, I would like to express my deepest gratitude to all the diabetic clients in the Diabetology and surgical wards, who had enthusiastically participated in this study without whom it was not possible for me to complete this study.

I owe my great sense of gratitude to Mr.Ahamedshajee B.Sc, and Mr.Ramesh, B.A., MSM-Xerox, for his timely help for his enthusiastic help and sincere effort in typing the manuscript with much value computer skills.

I express my thanks to the respectful my family members for their immense love, support, prayer and encouragement inspired me to reach at this point in my life.

Abstract

Title: A study to assess the effectiveness of Yellow myrobalan (kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected wards at Rajiv Gandhi Government General Hospital, Chennai.

Diabetes is the global epidemic problem with devastating human, social and economic consequences. Diabetic foot ulcer is the most serious and costly complications and important cause of morbidity in diabetic people over the years.

Need for the study: The recent statistical data shows that diabetic foot ulcers are suggest that around 10% of people with diabetes develop foot ulcers. Foot ulceration is the precursor to approximately 85% of all diabetic amputations and it is estimated that 14%- 20% of clients with foot ulcers will have to undergo amputation infection. So different treatment modalities needed to care and minimize the complications of diabetic foot ulcer, thus provoked the researcher to do this study.

Objectives

- ❖ To assess the grading level of diabetic foot ulcer among clients
- ❖ To evaluate the effectiveness of yellow myrobalan (Kadukkai) powder dressing on wound healing among experimental group as post-test.
- ❖ To compare the wound healing process between experimental and control group.
- ❖ To find the association between wound healing process and Kadukkai powder dressing with selected demographic variable among experimental group.

Key words

Effectiveness, Yellow Myrobalan (Kadukkai) powder dressing and diabetic foot ulcer.

Research Methodology

Research Approach: Quantitative research approach

Study setting: In selected wards at Rajiv Gandhi Government General Hospital Chennai.

Research design : True experimental study.

Study population : clients with diabetic Foot ulcer admitted in selected wards at Rajiv Gandhi Government General Hospital Chennai.

Sample size: Total 60 samples

Sampling technique : Simple random sampling

Sampling tool : Wagner Wound Assessment Tool

Data collection procedure:A formal written permission was obtained from selected departments, the study purpose and method was explained to all subjects and informed written consent obtained, the information regarding demographic profile and clinical related information were collected from 60 diabetic foot ulcer subjects, subjects were assessed both experimental and control group based on the Wagner Wound Assessment Scale in pretest and posttest, routine care was not altered and also I spend 30minutes for each subjects.

Data Analysisdata were analyzed by using,descriptive statistical analysis (mean, standarddeviation, frequency and percentage to describe the demographic variables of diabetic foot ulcer) and inferential statistical analysis (paired 't'test chi-square test).

Study results:The effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing among clients with diabetic foot ulcer, the percentage of dressing score with 95% confidence interval in experimental group 25.4%(19%-31.2%).

Discussion Kadukkai powder dressing with diabetic foot ulcer subjects shows a significant result when compared to the routine care group and hence the hypothesis is proved.

Conclusion The diabetic patient with foot ulcer in the Experimental group had improved the wound healing activity and thereby faster wound healing of the foot ulcer.

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LIST OF ABBREVIATION

DM	Diabetes mellitus
DFU	Diabetic foot ulcer
IDF	International diabetes federation
PVD	Peripheral vascular disease
OEPT	Optimal extraction and purification technology
LEAD	Lower extremity arterial disease
AGEs	Advanced glycation end products
CVA	Cerebro vascular accident
IGR	Impaired glucose regulation
PNP	Peripheral polyneuropathy
HRQL	Health related quality of life
DPP	Diabetes prevention programme
SD	Standard deviation
R	correlation coefficient
H	Hypothesis
X ²	Chi square test
CI	Confidence interval
P	Probability level
N	Number of subjects
FIG	Figure
DF	Degree of freedom

CHAPTER - I

Introduction

“The most important Practical lesson that given to nurses is to teach them what to observe”.

Florence Nightingale

Healthy life is the valuable gift of an individual, if a person is healthy enough according to me he is the richest person in his own world. But there is certain disease condition which affects the normalcy of many of a people in our existing world. Such as heart problems, neurological problems, orthopedic problems, metabolic disorders especially diabetes mellitus, etc., among which diabetes is one of the most important health issue in today's world which may affect the entire life pattern of an individual.

World diabetes foundation in 2014, estimated that 360 million people worldwide have Diabetes mellitus responding roughly 9% of adult population of 40-70 years. The number is expected to reach 552 million by 2030 representing 11% of the adult population.

Diabetes is the global epidemic problem with devastating human, social and economic consequence. Diabetes is the third leading cause of death by disease globally and accounts for 50% of total death annually.

Diabetes mellitus is the leading cause of death by disease because of its high rate of cardio vascular involvement and morbidity, The economic cost, hospitalization rates for direct and indirect treatment and care increase day by day. It is also a complex disorder with profound consequences both acute and chronic. Genetic and environment factors play a role in the development of the disease.

The Diabetes mellitus is a pan metabolic, vascular and tri hormonal disorder due to insulin deficiency or insulin resistance, glucagon excess, incretin deficiency characterized by chronic hyperglycemia which may lead to

acute and chronic complications. Diabetes mellitus is the commonest form of diabetes constituting 90% the diabetes population. The global prevalence of diabetes mellitus is estimated to increase from 8.3% in 2013 to double the amount around 2030. The WHO has predicted that the major burden will occur in developing countries.

As per the report of international diabetes foundation (IDF), India is looming epidemic of diabetes and known as the capital for diabetes. According to IDF, India has highest number of, 171 million people suffering from diabetes million people suffering from diabetes mellitus, followed by china 56.2million.

The acute and chronic complication of diabetes is the major cause of hospital admission, studies suggested than; Asian clients had more evidence of micro and macro vascular complications.

Data from Chennai based Rajiv Gandhi Government General Hospital shows the diabetes accounts for of all lower extremities amputations and diabetes have a fold higher risk of requiring amputations are compared to their ago sex matched non-diabetes controls 10% of all hospital admission is for diabetic foot problem.

As per American diabetes association 2010 reports that approximately 10% of all persons with diabetes will develop a foot ulcer during the course of their diseases 84% of lower extremely amputation are proceeded by foot ulcers of this 14-24% will proceed to major amputation.

Complication of Diabetes Mellitus:

Acute Complications	Chronic Complications
<ul style="list-style-type: none"> • Hyperglycemic Hyperosmolar State • Diabetic Ketoacidosis • Diabetic Coma 	<ul style="list-style-type: none"> • Micro Vascular Complications • Macro Vascular Complications

Micro Vascular Complications	Macro Vascular Complications
<p>The Common Micro Vascular Complications with its incidence related to Diabetes Mellitus includes the following,</p> <ul style="list-style-type: none"> ➤ Coronary Artery Disease ➤ Diabetic Neuropathy ➤ Diabetic Nephropathy ➤ Diabetic Retinopathy 	<p>The Common Macro Complications with its incidence related to Diabetes Mellitus includes the following,</p> <ul style="list-style-type: none"> ➤ Stroke ➤ Peripheral Vascular Disease ➤ Diabetic Myonecrosis <p>Diabetes can affect the feet due to,</p> <ul style="list-style-type: none"> ● Neuropathy ● Peripheral Vascular Disease ● Infection

Prevalence of Diabetes (WHO-2014)

Country	In 2000-2014	In 2030
Africa	1,71,000,000-366 Million	3,66,000,000-552Million
America	33,016,000-29.1million	66,812,000-366million
Europe	33,332,000-385millon	47,973,000-438million
India	31,705,000-171million	79,441,000-366million

Institutional Statistics of Diabetic Mellitus

Year	Inclients	Out- clients
2010	808	20,32,000
2011	1564	2,40,000
2012	1703	2,89,000
2013	1505	2,42,000
2014	1398	2,01,000

Diabetic Foot Ulcer

Diabetic foot ulcers are the sores that occur on the feet of the people with Type 1 and Type 2 diabetes mellitus. Diabetic foot ulcer is defined as

major erosions of the epithelium that extends into the dermis and deeper tissues and is associated with reduced healing capacity (kinmond-2003). The main risk factors that causes diabetic foot ulcer are peripheral neuropathy and micro as well as macro vascular ischemia. Peripheral neuropathy causes loss of pain or feeling into the toes, legs, and arms due to the distal nerve damage and low blood flow supply (atherosclerosis), very less oxygen supply, and eventually death of tissue in feet occurs.

Healing stages of diabetic foot ulcers

1. More exudating, severely edematous, necrotized wound
2. More exudating, edematous, necrotized wound
3. More exudating, edematous wound
4. Exudating, edematous wound
5. Less exudating, less edematous and less epithelialized wound
6. More epithelialized wound

Diabetic foot ulcer prevalence

Country	Prevalence
• India	
-South India	15%
-North India	14.30%
• America	10 to 15%
• Africa	8.7%
• Iran	25 to 29%
• Kenya	4.6%
• Nigeria	21.2%
• Nether land	20.4%

Managing diabetic foot ulcer

There are many ways to manage diabetic foot ulcer. Depends upon the condition of the wound, patient's age, feasibility, and the medical facilities available the care giver will go for an appropriate type of management for diabetic foot ulcer. It includes,

- Medications (in the form of tablets or insulin injection)
- LSM (Life Style Modifications - dietary modification and exercise)

Following complementary and alternative therapy.

It can be given singly or as a combination of one or two or all, depending upon the Condition and the need of the patient. Among which performing or doing the dressing procedure it is the one of the easiest and cost effective way of treatment which gives much more advantages for the clients while giving management for the diabetic clients. Especially when the patient is suffering with foot ulcer performing and doing the dressing procedure with yellow myrobalan (Yellow Myrobalan (kadukkai)) powder will help the patient to improve the wound healing, anti ulcer activity, and anti inflammatory activity to the affected area thus eases the rich of wound healing process.

Yellow Myrobalan (kadukkai) powder dressing and diabetes

- Its paste with water is found to be anti-inflammatory, analgesic and having purifying and healing capacity **for wounds**.
- Its decoction as a lotion is surgical dressing for healing the wound earlier.
- Anti-bacterial and antioxidant properties
- Wide antibacterial and antifungal activity, esp. against E. coli.

The extracts exert an antibacterial effect against salmonella typing, salmonella typhimurium, staphylococcus aureus, pseudomonas aeruginosa, entero-pathogenic strains of escherichia coli and yersinia enterocolitica, which indicates that the extracts of the fruit.

1.1 Need for the study:

Diabetes is an important risk for lower extremity arterial disease (LEAD). LEAD in diabetes mellitus compounded by the presence of peripheral vascular disease neuropathy and suspects for infections, Mortality rate is increases patient with LEAD, particularly of foot ulceration, or gangrene.

The current statistical data shows that **50/1,00,000** of people suffering with diabetes mellitus throughout the world, In India the statistical data shows that 62 million of people suffering with diabetes mellitus.

Infection is one of the most important factors in determining the risk of amputation in clients with diabetes. If a standardized treatment is applied with a multidisciplinary foot care team, major amputation can be avoided in about 80%-90% of clients with limb threatening ischemia and in 95% of clients with infection. Foot ulceration is the precursor to approximately 85% of all diabetic amputations and it is estimated that 14%-20% of clients with foot ulcers will have to undergo amputation infection. Because amputation are related to high mortality and morbidity.

Diabetic foot ulcers are the common and most incidental problem among diabetes mellitus. Experts suggest that around 10% of people with diabetes develop foot ulcers. Foot ulcers can affect people with Type 1 and Type 2 diabetes. Diabetes influences Foot ulcers in a number of ways, and it is important for people with diabetes mellitus to understand the potentially several consequences of leaving a foot ulcer untreated.

Foot ulcers can occur in anyone, and refers to a patch of broken down skin usually on the lower leg or feet. When blood sugar levels are high or fluctuate regularly skin that would heal normally heal may not properly repair itself because of nerve damage.

Foot ulcer may be serious for some people with diabetes, the end result of a foot ulcer can be an amputation, less serious foot ulcers can still take a long time to heal and be very uncomfortable this time.

When I worked in selected ward during my first year m.sc(n) period that time I have seen many clients were suffering with diabetic foot ulcer, and clients risk factor during that illness period and they were received routine medical management, that time I was desired why? We need not to provide dressing with traditional medicine, because the traditional medicines are highly effective in promoting wound healing activity and it has the fastening effect in wound healing. So, now I am going to do the dressing procedure with the help of traditional medicine, which is Yellow Myrobalan (Yellow Myrobalan (kadukkai)) powder, dressing.

1.2 Statement of the problem:

“A study to assess the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected ward, at Rajiv Gandhi Govt. General Hospital, Chennai.

1.3 Objectives

- ❖ To assess the grading level of diabetic foot ulcer among clients
- ❖ To evaluate the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing among experimental group as post-test.
- ❖ To compare the wound healing process between experimental and control group.
- ❖ To find the association between wound healing process and Yellow Myrobalan (Kadukkai) powder dressing with selected demographic variable and clinical related variables among experimental group.

1.4 Operational definitions

Assessment refers to the systematically and continuously collect validate Information about the diabetic foot ulcer clients.

Effectiveness of Yellow Myrobalan (Kadukkai) powder dressing refers to the desired effect in wound healing of diabetic foot ulcer.

Wound healing is an innate mechanism of action and stepwise repair of lost cellular matrix that forms the largest component of the dermal skin layer.

Wound infection is a common complication often resulting in delayed wound healing with adverse clinical and financial consequences.

Diabetic foot ulcer is a major complication of diabetes mellitus can occur in clients with diabetes.

Diabetic mellitus is a pan metabolic, vascular And tri hormonal disorder due to insulin deficiency insulin resistance, glucagon excess, Incretin deficiency characterized by chronic hyperglycemia which may lead to acute and chronic complications.

Yellow Myrobalan (kadukkai) powder [or] Chebulic myrobalan used in the treatment of foot ulcer. It contains chebulic acid, tannic acid, Gallic acid used for diabetic foot ulcer; this product is a safer herbal remedy for ulcer. Traditional century old proven Indian medicine without any side effect or reactions, long lasting products, is a non-steroidal and non-systemic anti-inflammatory action.

Powder dressing act as a hygroscopic agent that absorb and retain moisture from the air and reduction between skin surfaces and clothing.

1.5 Assumptions

The researcher assumes that,

- Diabetic clients may have inadequate knowledge regarding Yellow Myrobalan (Kadukkai) powder dressing.
- Procedure of doing Yellow Myrobalan (Kadukkai) powder dressing among clients with diabetic foot ulcer this will promote the wound healing process.
- Yellow Myrobalan (Kadukkai) powder dressing may reduce the infection, and promotes the wound healing.

- Practice of Yellow Myrobalan (Kadukkai) powder dressing will provides the anti diabetic activity, anti ulcer activity, anti fungal activity and anti-inflammatory activity

1.6 Hypothesis

H₁: There will be a statistically significant difference between pre- test and post -test level of grading of wound healing among clients with diabetic foot ulcer by doing the procedure of Yellow Myrobalan (Kadukkai) powder dressing among clients

H₂: There will be a statistically significant association between the posttest by level of grading of wound healing after the dressing procedure among diabetic foot ulcer clients with selected variables.

1.7 Delimitations

- ✓ This study is conducted for a clients with diabetic foot
- ✓ ulcer with sample for experimental and control group.
- ✓ The study period is four weeks.
- ✓ Clients who got admitted in selected wards at Rajiv Gandhi Government General Hospital, Chennai.
- ✓ Only 60 subjects were taken for study.

CHAPTER II

REVIEW OF LITERATURE

The purpose of the review of literature is to obtain comprehensive knowledge bare and in depth information about effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer about wound healing process.

This chapter deals with the selected studies, which are related to objectives of the proposed study.

2.1 Review of related to studies

2.2 Conceptual frame work

2.1 Review of related literature

The research has reviewed the relevant literature in support of problem statement of the present study. Literature from 2003 to 2014 were reviewed. The extensive review of literature has been done and it is organized according to the following three aspects.

Part I: Studies Related to Diabetes Mellitus and Diabetic Foot Ulcer

Part II: Studies Related to Yellow Myrobalan (Kadukkai) Powder

Part III: Studies related to effectiveness of Yellow Myrobalan (Kadukkai) powder on wound healing in clients with diabetic foot ulcer.

Part I: Literature related to diabetes mellitus and diabetic foot ulcer

Jeffcoate.w.j. (2003) was conducted a study on ulcer related outcomes with diabetic foot disease, city hospital, Nottingham, under cohort study method, the study were found to be classified ulcer according to the size, depth and sepsis compared with patient related outcomes, in 449patients the results emphasize the poor prognosis of lesions managed with only 50.2% of all ulcers

healing at some stage without amputation within 12 months and another being resolved by amputations.

Nalini Singh, et.al (2005) Prevention of diabetic foot ulcers begins with screening for loss of protective sensation, which is best accomplished in the primary care setting with a brief history and the Semmes-Weinstein monofilament. Specialist clinics may quantify neuropathy with bio thesiometry, measure plantar foot pressure, and assess lower extremity vascular status with Doppler ultrasound and ankle-brachial blood pressure indices. These measurements, in conjunction with other findings from the history and physical examination, enable clinicians to stratify clients based on risk and to determine the type of intervention. Educating clients about proper foot care and periodic foot examinations are effective interventions to prevent ulceration.

Peggy Souleodegard.et.al(2007)was conducted a study to assess the pharmacological therapy Only articles published in English between 1990 and May 7, 2007, and including individuals of all ages with type 1 or type 2 diabetes mellitus were included. Retrospective and prospective studies reporting adherence to medications using self-report, pill counts, medication possession ratios, and electronic monitoring devices were included. Database analyses of prescription records from various organizations or countries were included only if adherence to pharmacologic therapy was stated. Surveys and questionnaires assessing medication taking were also included. The data from the selected literature was abstracted independently.

Mundetx.Pou, et.al (2008) conducted a study to find out the prevalence and incidence of chronic complications and mortality in a cohort of type 2 diabetic clients. The aim of the study was to evaluate the prevalence, incidence of micro vascular and macro vascular complications, final events, and mortality in type 2 diabetic clients, followed over a period of 10years in spain.The study was done in 317 type2 diabetic clients treated at a primary care centre, followed for 10years.Variables were described by means of ratio, mean values and standard deviation. The chi square test was used to compare ratios and the

student's 'test to compare mean values. The result of the study showed that the prevalence of an increase in nephropathy(12%),in retinopathy(6.2%) and in neuropathy (2.1%).a decrease in ischemic cardiomyopathy (6.2%),an increase in peripheral vascular disease (5.6%).cerebrovascular,events and diabetic foot remaining unchanged. The highest incidence rates (1000 subjects/year) were nephropathy 43, neuropathy39 and ischemic cardiomyopathy 32.The prevalence of cardiovascular risk factors increased over the follow-up; being high blood pressure the most noticeable (30%).overall mortality was 28/1000 subjects/year, being cardiovascular disease the main cause (31.2%).The study concluded that the prevalence and incidence of chronic complications and risk factors are in Spain.

Iverson,Marjolin.N.et.al.,(2009)was conducted a study in Norway,nord-trondelag health study based on the comparative study method, the study were to compare the mortality rates for individuals with and without history of diabetic foot ulcer, population based study included 155 diabetes mellitus with history of foot ulcer and 1399 diabetes mellitus without history of foot ulcer, the study results were 49% of diabetes mellitus individuals with an history of foot ulcer, and compared with 35.2%of diabetes mellitus without an history of foot ulcer, analyses adjusted for age,sex,education,current smoking, and waist circumferences risk of mortality compared with the non diabetic group.

Krishnarajah.G.,(2009) was reported a study on glycaemic variability and complications, in patients with diabetes mellitus evidence from a systemic review of literature under interventional and observational study group, diabetes type-1,diabetes type-2.A study were analyzed totally 18 subjects,8 on type-1 diabetes mellitus and 10 were on type-2 diabetes mellitus patients.Type-1 revealed that glucose variability has little impact on the development of diabetic complications, whereas type-2 diabetes mellitus a significant positive association between glucose variability and the development of diabetic retinopathy, cardiovascular events and mortality was reported in 9of 10 studies.

Goodridge, Donna, et, al(2009).Foot ulcers are a common, serious, and costly complication of diabetes, preceding 84% of lower extremity amputations in diabetic clients and increasing the risk of death by 2.4-fold over diabetic clients without ulcers. Health-related quality of life (HRQOL) is worse among individuals with diabetes than individuals without diabetes, and complications of diabetes, including foot ulcers, have a major negative effect on HRQOL. Diabetic foot ulcers are associated with reduced mobility and deficits related to activities of daily living that adversely affect HRQOL. Qualitative studies have confirmed clinical observations that diabetic foot ulcers have a huge negative psychological and social effect, including reduction in social activities, increased family tensions for clients and their caregivers (spouses or partners), limited employment, and financial hardship. Quantitative studies confirm the findings of qualitative studies that diabetic foot ulcers exert a negative effect on physical functioning, psychological status, and social situation. Recent advances include the development and validation of disease-specific HRQOL surveys for diabetic clients with foot ulcers. Disease-specific surveys may improve the evaluation of HRQOL as a function of ulcer healing, the effect of different treatment methods on HRQOL, and the relationship between treatment-specific HRQOL, patient compliance, and treatment efficacy.

Ira B. Lamster (2009) the term “diabetes mellitus” describes a group of disorders characterized by elevated levels of glucose in the blood and abnormalities of carbohydrate, fat and protein metabolism. A number of oral diseases and disorders have been associated with diabetes mellitus, and periodontitis has been identified as a possible risk factor for poor metabolic control in subjects with diabetes. Although a number of oral disorders have been associated with diabetes mellitus, the data support the fact that periodontitis is a complication of diabetes. Clients with long-standing, poorly controlled diabetes are at risk of developing oral candidiasis, and the evidence indicates that periodontitis is a risk factor for poor glycemic control and the development of other clinical complications of diabetes. Evidence suggests that periodontal changes are the first clinical manifestation of diabetes. Diabetes is

an important health care problem. The evidence suggests that oral health care providers can have a significant, positive effect on the oral and general health of clients with diabetes mellitus.

Sue E. Gardner, et, al (2010) the identification and diagnosis of diabetic foot ulcer (DFU) infections remains a complex problem. Because inflammatory responses to microbial invasion may be diminished in persons with diabetes, clinical signs of infection are often absent in persons with DFUs when infection is limited to localized tissue. In the absence of these clinical signs, microbial load is believed to be the best indicator of infection. Some researchers, however, believe microbial load to be insignificant and type of organism growing in the ulcer to be most important. Previous studies on the microbiology of DFUs have not provided enough evidence to determine the microbiological parameters of importance. Infection-related complications of DFUs include wound deterioration, osteomyelitis, and amputation. Risk factors for amputation include age, peripheral vascular disease, low transcutaneous oxygen, smoking, and poor glycaemic control. These risk factors are best measured directly with physiological measures of arterial perfusion, glycemic control, sensory neuropathy, plantar pressures, and activity level and by controlling off-loading, diabetic foot ulcer disburden has not been examined as a risk factor for infection-related complications.

Part II: Studies Related to Yellow Myrobalan (kadukkai) Powder

Kiranmande, et, al (2010) Haritaki- Means one which is originated from Hari's (God's) home or Which is green in nature; here green stands for faith and fertility. Or that carries away all the illnesses from the body. It is said that when Indra (king of deities in Hindu mythology) was drinking nectar in heaven, a drop of the fluid fell on the earth and produced Haritaki. Haritaki is also used as a purgative in ayurvedic treatments. It is also used as a tonic and expectorant. Haritaki is also known to possess strong anti-mutagenic properties. Haritaki is used in the treatment of mouth ulcers, stomatitis, asthma, cough, candidiasis, gastroenteritis, skin diseases, and leprosy act. It is also used

for treatment of intermittent fever, rheumatic pain and fever, wounds and arthritis. Haritaki is one of the best herbs for treatment of Vatadosha. It is used as a natural remedy for Vata disturbances like flatulence, indigestion ect. Haritaki is contradicted in person with weak digestion and also in pregnancy. Haritaki is also believed to improve intelligence and alertness in a person.

Reetu Ahirwar, (2011) was explained haritaki in her own way. There is six type of Haritaki :-Vijaya, Rohini, Putana, Amrita, Abhya, Jeewanti and Cheataki. Also there is three more division: - small Haritaki, big Haritaki and yellow Haritaki. Action of Haritaki:-Vijaya works at all types of diseases. Haritaki is useful in vitiation of all the three humors. It is better esp. in Vata disorders. Its paste with water is found to be anti-inflammatory, analgesic and having purifying and healing capacity for wounds. Its decoction as a lotion is surgical dressing for healing the wound earlier. Equal parts of three myrobalan and catechu are made in a paste with clarified butter or some bland oil work as an ointment in chronic ulcerations, ulcerated wounds and other skin diseases with discharge. These ointments could be a substitute for Gall ointments used in Britain.

Ammas, et al (2011) Terminalia was found to have anti-diabetic activity. The extracts of Terminalia for its anti-hypoglycemic and anti-diabetic activity was conducted against the advanced glycation end products (AGEs)-induced endothelial cell dysfunction and was found out that the treatment of chebulic acid reduced glycer-AGE induced formation. The methanolic and ethanolic extracts of the plant was found to reduce the glucose level. Anti-inflammatory activity was expected to be present in terminalia chebula and was tested in the Swiss albino mice. Triphala treatment was found to significantly inhibit the paw volume and also the levels of lysosomal enzymes, lipid per oxidation and inflammatory mediator tumour necrosis factor. However the anti-oxidant status was found to show an increase in the plasma, liver and spleen of monosodium urate crystal-induced mice on comparison with the control mice. β -glucuronidase and lactate dehydrogenase level were also found to be reduced in Triphala treated monosodium urate crystal-incubated polymorpho nuclear

leucocytes. Results obtained from the above studies clearly indicated that Triphala possess a strong anti-inflammatory effect against gouty arthritis.

R Rathinamoorthy et al., (2012) Reported as the study was focused on treatment of water and methanol extracts of Terminalia chebula fruits and citric acid as a cross linking agent on cotton plain-woven fabric. The active antimicrobial compounds in extracts were analyzed by high performance liquid chromatography. The fabric samples were tested for antibacterial activity against bacterial Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris, and Salmonella typhi under agar diffusion strains like test and quantitative analysis. The treated samples showed 99% of reduction against Staphylococcus aureus and 86.25% reduction against Escherichia coli as per quantitative analysis.. Process parameters were optimized using the response surface methodology adopted using Box Behnken design and the correlation coefficient was found to be 0.932 in the case of *Staphylococcus aureus* and 0.66 in the case of *Escherichia coli*.

Mande (2012) Haritaki has laxative, rejuvenative, purgative, astringent and dry properties. The paste of its fruit is effective in reducing swelling, hastening the healing process and cleansing the wounds and ulcers. The paste gives relief to the eyelids, in case of conjunctivitis. Gargling with haritaki decoction helps in stomatitis, oral ulcers and sore throat. It serves as a good astringent for loose gums, bleeding and ulceration in gums. In a paste form it can also be used to heal wounds and chronic ulcers. Haritaki is also available in powder form. The powder of this fruit is brownish in color and is shown in figure 5. The observation under microscope shows a few fibers, vessels with simple pits and groups of sclerosis. The hydro alcoholic extract of T.chebula fruit was tested for its wound healing activity in the alloxan induced diabetic rats by using the excision and dead space wound models which showed a significant increase in the wound healing activity in the fruit extract treated rats. The Terminalia chebula extract was found to promote the healing of wound contraction in alloxan induced diabetic rats when applied topically by

means of increasing the rate and extent of wound closure. The wound healing activity of the ethanol extract of fruit of Terminalia chebula was also evaluated on excision and incision model in the albino rats in the form of an ointment.

DollySingh, Deepthi Singh, et.al, (2014) was conducted a study yeungnam university,korea.The study was focused on the traditional medicines used in the treatment of wound healing, the terminalia chebula (Kadukkai) extracts where found to reducing toxic effect and to increasing higher cellular activity proven under live dead-assay and phalloiden/cytokeratin staining method, and it is found to be used as a bioactive compound for wound healing without affecting normal cellular matrix.

PART III:Studies related to effectiveness of Yellow Myrobalan (Kadukkai) powder on wound healing in clients with diabetic foot ulcer.

Vimala G et al., (2010) was conducted a study on anti ulcer activity, in ayurvedic Terminalia chebula (combretaceae) is commonly known as 'myrobalan, it is locally called Yellow Myrobalan (Kadukkai).This drug available in powder form also make an excellent paste as an application for chronic ulcerations and ulcerated wounds and it also called as 'king of medicine' because of its, extraordinary power of wound healing. This medicine has been demonstrated to possess multiple pharmacological and medicinal activities such as anti diabetic; anti-inflammatory and wound healing activity and also Antibacterial activity of Terminalia chebula extracts against several bacterial strains have been reported.

Kunli,yenpeng diao,et,al.,(2011)was conducted a study on terminalia chebula (yellow myrobalan) extracts promote the cutaneous wound healing the study was done in rats by casein method. The extracts of terminalia chebula is an effective components in promoting the process of wound healing, after optimal extraction and purification of tannin extracts was increased 81%,the tannin extract showed the inhibition of staphylococcus aureus and klebsiella pneumonia in vitro,after excision of wounds, divided into group-1,and group-

2, in 10 consecutive days, group-1 was taken tannin extracts medicine, the wound healing quality of group-1 was found to be better than group-2.

Hong Yang et,al (2011) Conducted a study on Tannins extracted from immature fruits of *terminalia chebula fructus retz*. Are considered as effective components promoting the process of wound healing. The objective of this study is to explore the optimal extraction and purification technology (OEPT) of tannins, while studying the use of this drug in the treatment of a cutaneous wound as well as its antibacterial effects. The content of tannin extracts was measured by the casein method, and antibacterial ability was studied by the micro-dilution method *in vitro*. In wound healing experiment, group I, II and III were treated with Vaseline ointment, tannin extracts (tannin content: 81%) and erythromycin ointment, respectively (5 mg of ointment were applied on each wound). To evaluate the process of wound healing, selected pharmacological and biochemical parameters were applied. After optimal extraction and purification, content of tannin extracts was increased to 81%. Tannin extracts showed the inhibition of *staphylococcus aureus* and *klebsiella pneumonia in vitro*. After excision of wounds, on days 7 and 10, the percent of wound contraction of group II was higher than that of group I. After being hurt with wounds, on days 3, 7, and 10, the wound healing quality of group II was found to be better than that of group I in terms of granulation formation and collagen organization. After wound creation, on day 3, the vascular endothelial growth factor expression of group II was higher than that of group I.

Pradeep Bhat, Ganesh R.Hedge, et.al.,(2012), was conducted the study in biodiversity hotspots, in Karnataka state of india, regarding documentation analysis of ethanomedicinal plants in the treatment of wounds, collection of information through semi-structured open ended interviews with a questionnaire, recording 106 medicinal plant species of 55 families and 86 formulations to treat different types of wound treated by traditional healers and they found 106 plants in traditional practices for curing various type of

wounds. The statistical analysis confirmed high degree of wound healing in traditional medicinal practices.

Aruna S et al., (2014) was conducted a study the demand for herbal therapeutics is increasing gradually in the world. The Indian system of medicines uses herbal preparations in majority for the management of diseases. Globally a large number of Pharmacological studies have been conducted extensively on various medicinal plants. In recent years a lot of research is being conducted on terminalia chebula (Haritaki). The pharmacological studies of Haritaki (or) Terminalia chebula, herbal drugs, in Indian medicinal plants.

Thilagavathy G (2014) Said that ,many Indian plants have been used from time immemorial to treat various diseases and infections in traditional medicinal systems It is a medicinal plant widely distributed throughout India, Burma, and Srilanka. Terminalia chebula is one of the most commonly used plants in traditional systems of medicine in Indian sub-continent. Terminalia chebula is called the ‘King of Medicine’ in Tibet and is always listed at the top of the list in Ayurvedic Materia Medica due to its extraordinary power of healing.. Terminalia chebula, 33% of the total phytoconstituents are hydrolysable tannins (which may vary from 20-50%) and are responsible for pharmacological activity. These tannins contain phenolic carboxylic acid like gallic acid, ellagic acid, chebulic acid and gallotannin acid.

Pooja Agrahari et al (2014) was conducted a study of Terminalia chebula (Combretaceae) is also called the “King of medicines” in Tibet and is always listed first in the Ayurvedic material medica because of its extraordinary powers of healing with a wide spectrum of biological activity. A number of chemical constituents have been isolated from the plant extract that include chebulin, ellagic acid, 2,4-chebulyl-D-glucoopyranose, arjunglucoside I, arjungenin, chebulinic acid, Gallic acid, ethyl gallate, punicalagin, terflavin A, terchebin, luteolin and tannic acid. The plant is an important constituent of an herbal formulation, contains the name TRIPHALA which is very popular traditional medicine for chronic disorder like diabetes.

2.2 Conceptual frame work

Modified Orem's Theory of Self Care Deficit

The conceptual framework of the present study as depicted in the diagram was developed on the basis of Orem's theory of self care. Self care deficit theory or nursing is composed of six basic concepts and one related or peripheral concept. The basic or core concepts are self-care, self care agency, therapeutic self care demand, self care deficit, nursing agency and nursing system.

❖ Self care (dependent care)

The practice of activities that individuals, initiate and perform on their own behalf in maintaining life, health and well being (1991). In this study the diabetic clients with foot ulcer will acquire demand or requirements to sustain and maintain life called as health deviated self care requirement i.e., ignorance of care of foot ulcer.

❖ Self care agency (dependent care agency)

Self care agency is the power of individuals to engage in self care and the capability for self care. The person who uses the power or self care ability in the self care agent. In this study the self care agency is the clients with diabetic foot ulcer.

❖ Therapeutic self care demand

It can be thought of as a collection of action to be performed or 'a programme of action'. This totality of care action is performed to meet the self care requisites. In this study, the therapeutic self care demand is the need for information, education, communication and demonstration regarding Yellow Myrobalan (kadukkai) powder dressing to promote wound healing process.

❖ Self care deficit

A self care deficit is the relationship between self care demands of the individuals in which capabilities for self care are not equal to meeting some or all of the components of their therapeutic self care demands. In this study the self care deficit is the inadequate care to promote wound healing process.

❖ **Nursing agency**

In this study the investigator is the nursing agency carries out the information on wound healing of the diabetic foot ulcer in selected wards, at Rajiv Gandhi Government General Hospital, Chennai. Where the pre assessment of the wound was done and the frequent regular interval the post assessment also was carried out on wound healing.

❖ **Nursing system**

All the actions and the interactions of the nurses and clients in nursing practice situation. There are three types of nursing systems, i.e., wholly compensatory, practically compensatory and supportive educative system. In this study the investigator has chosen the supportive educative system as nursing system in which demonstration of performing Yellow Myrobalan (Kadukkai) powder dressing was explained in a structured manner with the help of flash cards and administered to the clients of those who are having diabetic foot ulcer.

STEP-1: Identification of a need for help

Identification involves individualization of the diabetic subjects, his/her experiences and recognition of the subject's perception of his condition. In this study the investigator identifies the demographic variables, medical related information and assessment of wound using Wagner wound assessment scale. The central purpose is to promote wound healing process effectively.

STEP-2: Ministration of help

Ministration is providing the needed help. It requires the identification of the need for help, the selection of a helping measure appropriate to that need, and the acceptability by the patient. Yellow Myrobalan (kadukkai) powder dressing was provided to subjects with diabetic foot ulcer to promote wound healing process.

STEP-3: Validation that need for help was met

Validation is evidenced that the diabetic foot ulcer subjects with functional ability will be restored as a result of the help given. It is validating that the needed help was delivered in achieving the central purpose. The step involves the post assessment after ministering the help analysis to make suitable decision and recommended action either to continue or modify the nursing action.

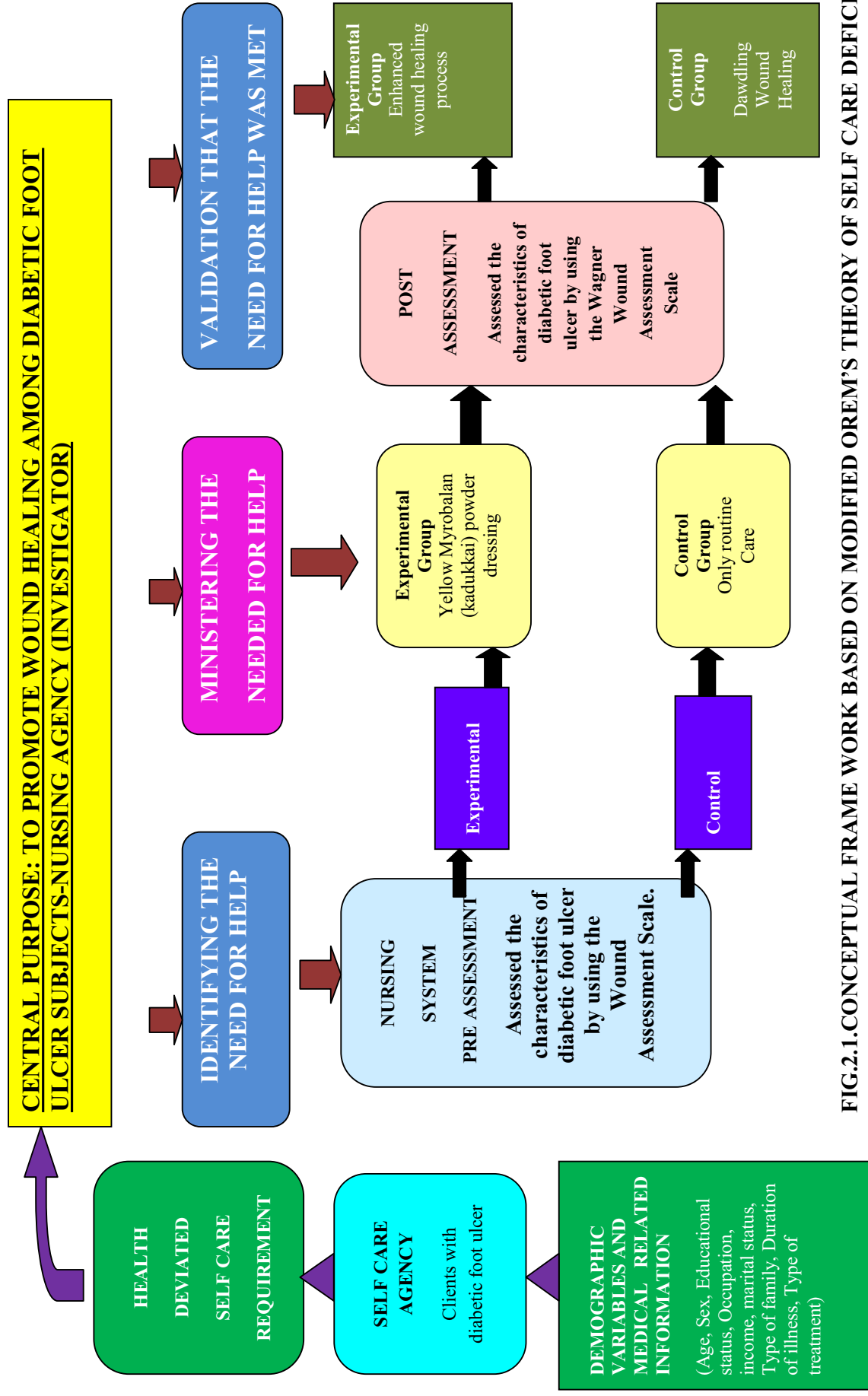


FIG.2.1.CONCEPTUAL FRAME WORK BASED ON MODIFIED OREM'S THEORY OF SELF CARE DEFICIT

CHAPTER - III

RESEARCH METHODOLOGY

This chapter deals with methodology which was adopted for the study and includes the description of research approach, research design, variables, setting of the study population, sample size and sampling techniques, criteria for sample selection, development and description of tool, data collection procedure and plan for data analysis.

3.1 Research Approach

In this study the quantitative research approach was used, the investigation aims at evaluating the effectiveness of practicing Yellow Myrobalan (Kadukkai) powder dressing among diabetic foot ulcer clients to study the effectiveness of wound healing process, it also helps the researcher with the suggestions of possible conclusions to be drawn from the data.

3.2 Duration of the study:

Four weeks (from 15.07.2015 to 14.08.2015)

3.3 Study Setting: The study was conducted in selected wards at Rajiv Gandhi Government General Hospital Chennai. It is one of the biggest hospitals in south Asia. This hospital consists of the medical, surgical and nursing specialties and super specialties, it is an educational research institute as well as referral hospital. The total bed strength of this hospital is 3000.

3.4 Study Design: Is the structural framework for the study implementation and it is true print of the study (Talbot, 1995). In the present study, true experimental research (pre test- post test only) design was adopted, the overall plan for

collecting and analyzing data including specification for enhancing the internal and external validity of the tool.

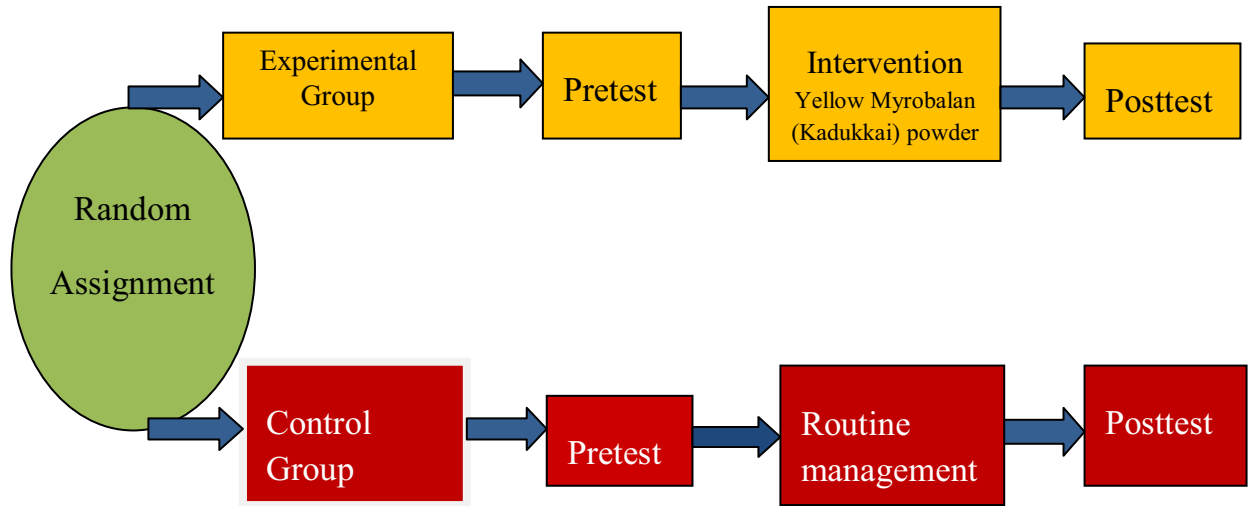


Fig-3.1 Schematic Diagram of study design

3.5. Study population is the subjects and events potentially available for the research study. In this study, the population includes the clients with Diabetic Mellitus with foot ulcer admitted at Rajiv Gandhi Government General Hospital, Chennai.

3.6 Sample Size

The sample size for this study was 60

(Experimental group-30 and Control group-30)

3.7 Sampling criterion

3.7.1 Inclusion criteria

- ❖ Clients with diabetic foot ulcer in the age group of 40 and above.
- ❖ Clients who are available in selected wards during the data collection Period.
- ❖ Clients who are willing to give consent for the procedure of doing Yellow Myrobalan (Kadukkai) powder dressing.
- ❖ Clients who are able to speak and understand Tamil and English language.

3.7.2 Exclusion criteria.

- ❖ Clients with history of allergy to (Yellow Myrobalan (Kadukkai)) yellow myrobalan powder dressing.
- ❖ Clients with other associated problems like gangrene in the foot.

3.8 Sampling technique:

Study samples were collected by method of simple random sampling technique, selected samples were divided as two groups by selecting odd numbers and even numbers, odd numbers were allotted for experimental group and even numbers were allotted as control group and who fulfilled the inclusion criteria, were included in the study.

3.9 Research variables

The categories of variables discussed in this study were,

- ❖ **Independent variable:**

Yellow Myrobalan (Kadukkai) powder dressing.

- ❖ **Dependent variable:**

Diabetic foot ulcer.

3.10 Development and description of the tool

3.10.1 Development of the tool

Appropriate tool was selected with the help of review of literature from the text book, internet search and discussion with expert's opinion of medical, nursing and statistician the tool was prepared.

3.10.2 Description of the tool

Section A: Consist of Demographic variables (Age, Sex, Occupation, Income, educational status, marital status and type of family)

Section B: Consist of clinical related information (Diagnosis, duration of illness, type of treatment, type of medication used and type of diet).

Section C: Wagner Wound Assessment Scale.

Section D: Healing Stages of Diabetic Foot Ulcers

Scoring key

Wagner Wound Assessment Scale.

1 - Intact Skin	Score 0
2- Superficial ulcer of skin or subcutaneous tissue	Score 1
3 - Ulcers extend into tendon, bone, or capsule	Score 2
4 - Deep ulcer with osteomyelitis, or abscess	Score 3
5 -Gangrene of toes or forefoot	Score 4
6 - Midfoot or hind foot gangrene	Score 5

* **High score indicates the severity of diabetic foot ulcer.**

* **Low score indicates the healthy.**

Healing stages of diabetic foot ulcers

1. More exudation, severely edematous, necrotized wound
2. More exudation, edematous, necrotized wound
3. More exudation, edematous wound
4. Exudation, edematous wound
5. Less exudation, less edematous and less epithelialized wound
6. More epithelialized wound

3.10.3 Intervention Protocol

S.No	Protocol	Experimental group	Control group
1.	Place	Rajiv Gandhi Government General Hospital, Chennai. (Selected wards)	Rajiv Gandhi Government General Hospital, Chennai. (Selected wards)
2.	Recipient	Clients with diabetic foot ulcer	Clients with diabetic foot ulcer
3.	Intervention	Yellow Myrobalan (Kadukkai) powder dressing	Routine dressing care.
4.	Dose	20grams of Yellow Myrobalan (Kadukkai) powder for each dressing.	-----
5.	Duration	21days	21days
6.	Frequency	Daily dressing	Daily dressing
7.	Time	7.30am to 4.00pm	7.30am to 4.00pm
8.	Administered by	The investigator	The investigator

3.10.4 Content validity

The experts validated the relevance, sequence, adequacy of language of the tool. Validity of the tool was assessed using content validity. They suggested certain modifications in tool. After the modifications they agreed this tool for evaluate the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected wards, at Rajiv Gandhi Government. General Hospital, Chennai.

3.11 Ethical consideration

The study proposal tool, objective, intervention and data collection procedure were approved by the research and the Institutional ethics committee, Madras Medical College, Chennai. Permission was obtained from the professor and Head of the Department, Institute of Diabetology and the professor and Head of the Department, Institute of General Surgery, Rajiv Gandhi Government General Hospital, and Chennai, all subjects were carefully informed about the purpose of the study. Ensured confidentiality of the study result. The freedom was given to the client to leave the study at his/her will without assigning any reason. No routine care was altered or withheld. The investigator followed the ethical guidelines which were issued by the research committee, written consent was obtained from all subjects.

3.12 Pilot study

Formal permission was obtained from the concerned higher authorities at Rajiv Gandhi Government General Hospital, Chennai. The pilot study was conducted in selected wards at Rajiv Gandhi Government General Hospital, Chennai. Samples were selected with the help of Wagner Wound Assessment Scale within the range of 0-5 among 10 samples, 5 samples were in experimental group and 5 samples were in control group. Informed consent was obtained from the subjects. Yellow Myrobalan (Kadukkai) powder dressing was performed for experimental group and routine care was provided for the control group. Pre and post- assessment of the wound was done to study the wound healing process by using wound assessment scale for both the group. The data were analyzed and the result of the study revealed that, it was highly effective of doing Yellow Myrobalan (Kadukkai) powder dressing, Study was practically feasible, and this medicine was found reliable for proceeding with the main study.

3.13 Reliability

After pilot study reliability of the tool was assessed by using Simple random technique interrater method and its correlation coefficient r –value was 0.81. This correlation coefficient is very high and it is good tool for evaluate the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected wards, at Rajiv Gandhi Government General Hospital, Chennai.

3.14 Data collection procedure

A formal written permission was obtained from the professor and Head of the Department, Institute of diabetology and the professor and Head of the Department, Institute of General Surgery, at Rajiv Gandhi Government General Hospital, Chennai.

Study samples were collected by method of simple random sampling technique, selected samples were divided as two groups by selecting odd numbers and even numbers, odd numbers were allotted for experimental group and even numbers were allotted as control group and who fulfilled the inclusion criteria, were included in the study.

The subjects for the study were selected based on the Wagner Wound Assessment Scale within the grade of 0-5. The study purpose and method were explained to all subjects and informed written consent was obtained. Confidentiality was assured to all the subjects. The information regarding demographic profile and medical related information were collected from 60 diabetic subjects by interviewing them and observing health records. 30 subjects were included for experimental and 30 subjects were included for control group. Routine care was not altered.

Phase-1

The pre assessment of the wound was done with the help of Wagner Wound Assessment Scale for all subjects and it was recorded on the first day of the study.

Phase-2

Preparation of powder paste

- 1packet =100grams of Yellow Myrobalan (Kadukkai) powder.
- 20grams of Kadukkai powder.
- 10ml or 20ml of distilled or sterile water to make paste.

Purposes of yellow myrobalan (Kadukkai) powder

- To improve wound healing status.
- To reduce the wound exudates.
- To improve blood circulation.
- To reduce the inflammation.
- To cleansing the wound and ulcer.
- To improve fastening the healing process.

About Yellow Myrobalan (Kadukkai) powder dressing was explained to the diabetic foot ulcer subjects, and the subjects were helped to do Yellow Myrobalan (Kadukkai) powder dressing with the help of distilled water. The same procedures were followed for all the subjects for a period of 21days and periodically assess the healing stages of diabetic foot ulcer by wound assessment scale done daily. The control group subjects were treated with routine dressing management.

Phase-3 At the 22nd day the investigator assessed the wound healing process after the intervention with the help of Wagner Wound Healing Assessment Scale for

both experimental and control group to evaluate the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing.

3.15 Data entry and Data analysis

Time taken for each patient for the procedure, data was collected and analyzed in terms of the objectives of the study using descriptive and inferential statistics.

Descriptive statistics include

1) Mean, standard deviation, frequency and percentage describe the demographic profile and clinical related information of diabetic foot ulcer clients.

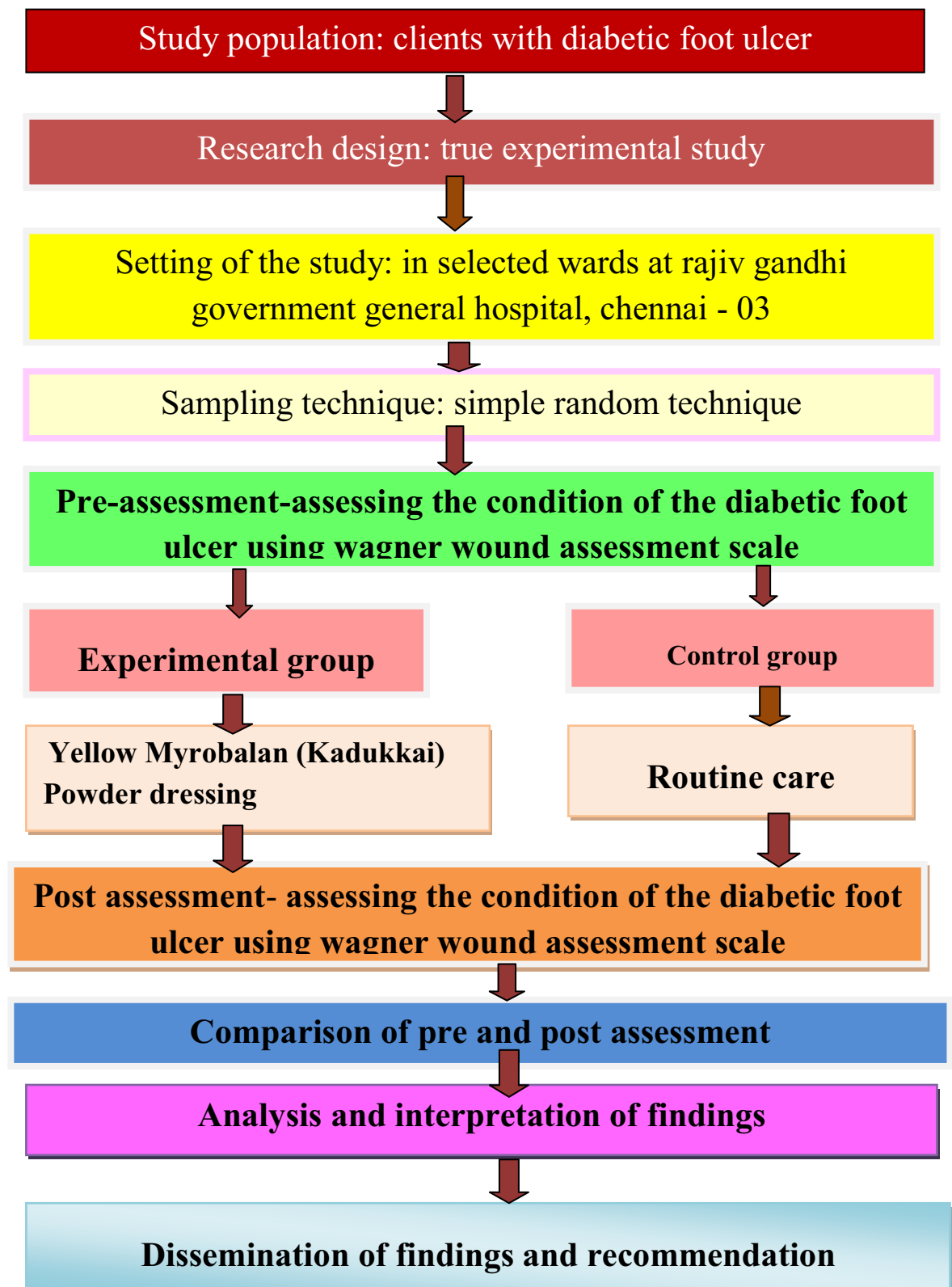
Inferential statistics include

1) Paired 't' test to assess the effectiveness of Yellow Myrobalan (Kadukkai)

Powder dressing on wound healing process in experimental groups.

2) Chi-square test to associate between the selected demographic variables and clinical related variables.

Fig-3.2.SCHEMATIC REPRESENTATION OF THE RESEARCH STUDY



CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of data collected from 60 diabetic foot ulcer clients admitted in selected wards, at Rajiv Gandhi Government General Hospital, Chennai. Statistical procedure enabled the researcher to deduce, summarize, organize, evaluate, interpret and communicate the numeric information in a meaningful and intelligible way. Analysis and interpretation of the data were based on collection of the data through Simple Random Technique. Descriptive and inferential statistics were used for the analysis of the data. Data were tabulated and presented according to the objectives.

4.1 Organization of the data

Section I

Distribution of demographic variables of diabetic foot ulcer clients

Section II

Distribution of clinical variables of diabetic foot ulcer clients.

Section III

Distribution of grading level of diabetic foot ulcer among clients in experimental and control group.

Section IV-

Distribution of effectiveness of Yellow Myrobalan(Kadukkai) powder dressing on diabetic foot ulcer among experimental and control group.

Section V

Distribution of comparison of wound healing process between Experimental and control group.

Section VI

Distribution of post-assessment of wound healing process in clients

with diabetic foot ulcer in experimental and control group.

Section VII

Distribution of association between wound healing process and Yellow Myrobalan (Kadukkai) powder dressing with selected Demographic variables and clinical related variables among Experimental group.

Section –I: Distribution on demographic variables of clients with diabetic foot ulcer

Table 4.1: Demographic profile: Frequency and percentage distribution of subjects in the experimental and control group regarding their back ground factors of clients with diabetic foot ulcer.

S.NO	Demographic variables		group				Chi square
			Experiment		Control		
			f	%	f	%	
1.	Age	40 -49 years	9	30.0	15	50.0	$\chi^2=2.78$ p=0.42
		50 -59 years	13	43.3	8	26.6	
		60 -69 years	6	20.0	5	16.7	
		≥70 years	2	6.7	2	6.7	
2.	Gender	Male	22	73.3	16	53.3	$\chi^2=2.58$ p=0.10
		Female	8	26.7	14	46.7	
3.	Marital Status	Married	20	66.7	22	73.3	$\chi^2=1.09$ p=0.77
		Unmarried	2	6.7	1	3.3	
		Divorced/Separated	1	3.3	2	6.7	
		Widower/Widow	7	23.3	5	16.7	
4.	Religion	Hindu	23	76.7	20	66.6	$\chi^2=1.74$ p=0.48
		Christian	4	13.3	8	26.7	
		Muslim	3	10.0	2	6.7	
5.	Type of Family	Nuclear Family	12	40.0	14	46.7	$\chi^2=0.51$ p=0.77
		Joint Family	16	53.3	15	50.0	
		Broken Family	2	6.7	1	3.3	
6.	Educational Status	illiterate	8	26.7	6	20.0	$\chi^2=3.33$ p=0.34
		Elementary	18	60.0	15	50.0	
		Higher Secondary	2	6.7	7	23.3	
		Graduate and above	2	6.7	2	6.7	
7.	Occupation	House Wife	2	6.7	2	6.7	$\chi^2=3.46$ p=0.48
		Government	4	13.3	6	20.0	
		Private	14	46.7	17	56.7	
		Pensioner	5	16.7	4	13.3	
		Unemployed	5	16.7	1	3.3	
8.	Family monthly Income	< Rs.3000	5	16.7	5	16.7	$\chi^2=2.24$ p=0.52
		Rs.3001-5000	7	23.3	3	10.0	
		Rs.5001-8000	12	40.0	13	43.3	
		> Rs.8001	6	20.0	9	30.0	
9.	Area of Residence	Rural	11	36.7	12	40.0	$\chi^2=0.07$ p=0.77
		Urban	19	63.3	18	60.0	
10.	Dietary Pattern	Vegetarian	9	30.0	8	26.7	$\chi^2=1.52$ p=0.47
		Non-Vegetarian Mixed Diet	6	20.0	3	10.0	
			15	50.0	19	63.3	

The table shows the distribution of subjects in demographic variables of clients with diabetic foot ulcer.

Age distribution, the study participants in experimental group 30.0% (9) were belongs to the age group 40-49 years and control group 50% (15), age group between 50-59 years in experimental group 43.3%(13) and control group 26.6%(8),age group 60-69years in experimental group 20.0%(6) and control group 16.7% (5) and age group 70 and above 70years in experimental group 6.7%(2) and in control group 6.7%(2).

Gender distribution regarding the gender distribution subjects was male

73.3 %(22) in experimental group and in control group 53.3% (22) and female was 26.7 %(8) and control group 46.7 % (14).

Marital status, higher numbers of married subjects participated in this study 66.7% (20) Experimental and 73.3% (22) Control group. Unmarried subjects 6.7%(2)in experimental group and in control group 3.3% (1),divorced/separated subjects were in experimental group 3.3% (1) and in control group 6.7%(2) and Widower/Widow subjects were in experimental group 23.3%(7)and in control group 16.7% (5).

Religion subjects were mainly Hindus in the76.7 %(23)experimental group and control group 66.6%(20),Christian 13.3%(4)experimental group and control group26.7%(8)and Muslim subjects were in experimental group 10.0%(3) and in control group 6.7% (2).

Type of family, regarding Type of family subjects in experimental grand control oup40.0%(12) and in control group 46.7% (14) and 53.3%(16) and control group 50.0% (15) belongs to joint family and broken family subjects were 6.7% (2) in control group 3.3% (1).

Educational status, majority of them were educated up to illiterate level in experimental group 26.7%(8) and control group 20.0%(6), elementary subject were 60%(18) experimental and 50 %(15) control group, higher secondary subjects were 6.7% (2) and control group 23.3% (7) and graduate and above subjects were 6.7%(2) in experimental group and in control group 6.7%(2).

Occupation regarding house wife Subjects were in Experimental group 6.7% (2) control group 6.7%(2), government subjects were in experimental group 13.3% (4) and control group 20.0%(6), 46.7% (14) and control group 56.7 % (17) members were working in private concerns, pensioner subjects were 16.7%(5)and control group 13.3%(4) and unemployed subjects were 16.7% (5) and in control group 3.3%(1).

Income, almost all the study participants were belongs to low socio economic status among that around <Rs.3000 in experimental and control group 16.7% (5),Rs.3001-5000 in experimental group 23.3% (7) and control group 10.0% (3),Rs.5001-8000 in experimental group 40% (12) in control group 43.3% (13) and >Rs.8001 subjects were in experimental group 20.0% (6) and in control group 30.0% (9).

Area of residence, subjects were from urban in experimental group 63.3 %(19) control group 60%(18) and rural area of residence in experimental group 36.7% (11) and in control group 40.0% (12).

Dietary pattern, regarding vegetarian subjects were in experimental group 30.0% (9) and control group 26.7% (8), Non-vegetarian subjects were in experimental group 20.0% (6) and control group 10.0% (3) and 50%(15) in experimental group and in control group 63.3% (19) members were following mixed group dietary pattern.

Section–II: Distribution on clinical related variables of clients with diabetic foot ulcer

Table 4.2: Clinical related variables

s.no	Clinical related variables		Group				Chi square test
			Experiment		Control		
			F	%	F	%	
1.	Type of Diet	CHO Rich Diet	1	3.3	1	3.3	$\chi^2=0.00$ p=1.00
		Mixed Diet	29	96.7	29	96.7	
2.	H/o. Ch. Illness	Yes	22	73.3	25	83.3	$\chi^2=0.88$ p=0.34
		No	8	26.7	5	16.7	
3.	If yes, Specify	Nil	8	26.7	5	16.7	$\chi^2=1.66$ p=0.78
		Hypertension	14	46.7	15	50.0	
		Cardiovascular problems	4	13.3	6	20.0	
		Chronic Kidney Disease	3	10.0	2	6.7	
		Neurological Problems	1	3.3	2	6.7	
4.	H/o. Any Medication for Chronic Illness	Yes	22	73.3	25	83.3	$\chi^2=0.88$ p=0.35
		No	8	26.7	5	16.7	
5.	Duration of Illness	1-2 Years	13	43.3	18	60.0	$\chi^2=2.20$ p=0.53
		2-5 Years	11	36.7	9	30.0	
		5-10 Years	3	10.0	2	6.7	
		>10 Years	3	10.0	1	3.3	
6.	Duration Under Diabetic Medication	< 2Years	13	43.3	19	63.3	$\chi^2=3.01$ p=0.53
		2 - 5 Years	10	33.4	8	26.7	
		5 -10Years	4	13.3	2	6.7	
		>10 Years	3	10.0	1	3.3	
7.	Type of Medication	Diet and Medication	2	6.7	1	3.3	$\chi^2=4.42$ p=0.22
		OHA-Oral Hypoglycaemic Agent	3	10.0	1	3.3	
		Insulin	19	63.3	26	86.7	
		Insulin and Oral Hypoglycaemic Agent	6	20.0	2	6.7	
8.	Grade of D/F/U	Grade -1	13	43.3	10	33.3	$\chi^2=2.51$ p=0.47
		Grade -2	12	40.0	07	23.3	
		Grade -3	05	16.7	08	26.7	
		Grade -4	00	0.0	05	16.7	

The findings shows that clinical related variables of clients with diabetic foot ulcer

Type of diet majority of the study subjects are following mixed type of diet in both groups 96.7 % (29) and carbohydrate rich diet subjects were in experimental group 3.3% (1) and in control group 3.3% (1).

History of chronic illness in considering 73.3% (22) of them in experimental group and 83.3% (21) in control group were having history of chronic illness and were in no history of chronic illness in experimental group 26.7% (8) and in control group 16.7% (5).

If yes, specify, nearly 46.7 % (14) in experimental and 50% (15) in control group subjects are suffering with hypertension, were in cardiovascular problem in experimental group 13.3% (4) and control group 20.0% (6), chronic kidney disease were in experimental group 10.0% (3) and control group 6.7% (2) and were subjects with neurological problems in experimental group 3.3% (1) and in control group 6.7% (2).

History of medication for chronic illness subjects constituting the history of consuming medications for chronic illness is very less, in experimental group 73.3 % (22) and in control group 83.3 % (25) and no history of consuming diabetic medication for chronic illness in experimental group 26.7% (8) and in control group 16.7% (5).

Duration of illness the participants are having this illness about 1-2 years, i.e. 43.3% (13) in experimental and 60% (18) in control group, 2-5 years duration of illness in experimental group 36.7% (11) in control group 30.0% (9), 5-10 years duration of illness in experimental group 13.3% (10) and control group 6.7% (2) were in more than 10 years of having this illness in experimental group 10.0% (3) and control group 3.3% (1).

Duration under diabetic medication the study subjects were in taking diabetic treatment is about less than 2years, 43.3 %(13) in experimental and 63.3 %(19) in control group ,in 2-5 years 33.4%(10) experimental group and control group 26.7% (8), in 5-10years were taking diabetic medication in experimental group 13.3% (4) and control group 6.7%(2) and more than 10years were taking diabetic medication in experimental group 10.0% (3) and control 3.3% (1).

Type of medication regarding the study subjects were in diet and medication 6.7%(2)experimental group and control group 3.3%(1),were oral hypoglycaemic agent subjects 10.0% (3) in experimental group and control group 3.3% (1),insulin were in experimental group 63.3% (19) and control group 86.7 %(26), subjects 20.0% (6) in experimental and 6.7 %(2) in control group were using insulin and oral hypoglycaemic agent as the drug of choice.

Grade of diabetic foot ulcer majority of the subjects were in grade-1 diabetic foot ulcer in experimental 43.43%(13) control group 33.3% (10), were grade-2 diabetic foot ulcer in experimental group 40.0% (12)control group 23.3 %(07),were have grade -3 diabetic foot ulcer 16.7% (5) in experimental group and control group 26.7% (08) and grade-4 diabetic foof ulcer were in experimental group 00% (0) and control group 16.7%(05).

Section-III: Distribution on grading level of diabetic foot ulcer in control and experimental group.

Table 3: pretest and posttest grading level of diabetic foot ulcer healing score (control)

Wagner Grading system		Test				Chi square test
		Pre test		Post test		
		F	%	F	%	
G-0	Intact skin	00	0.0	03	10.0	$\chi^2=6.11$ $p=0.19$
G-1	Superficial ulcer of skin	10	33.3	06	20.0	
G-2	Ulcers extend into tendon, bone or capsule	07	23.3	12	40.0	
G-3	Deep ulcer with osteomyelitis of abscess	08	26.7	05	16.7	
G-4	Gangrene of toes or forefoot	05	16.7	04	13.3	
G-5	Midfoot or hind foot gangrene	00	0.0	00	0.0	
Total		30	100.0	30	100.0	

In pretest

Among control group, none of them were have intact, were had Superficial ulcer of skin (10) 33.3%, were had ulcers extend into tendon, bone to capsule 23.3% (07), were in deep ulcer with osteomyelitis of abscess, 26.7%(08) and were had Gangrene of toes or forefoot and 16.7%(05) none of them do not having the mid foot or hind foot gangrene grade of diabetic foot ulcer.

In posttest

Among control group were had intact skin 10.0%(03), were had Superficial ulcer of skin 20.0%(06), were had ulcers extend into tendon, bone to capsule 40.0%(12), were had deep ulcer with osteomyelitis of abscess 16.7% (05) and were had gangrene of toes or fore foot and 13.3%(04) were do not have the mid

foot or hind foot gangrene of diabetic foot ulcer. Statistically there is no significant difference; it was confirmed using chi square test.

Table 4: Pretest and posttest Grading level of diabetic foot ulcer healing score (experiment)

Wagner Grading System		Test				Chi square test
		Pre-test		Post-test		
		F	%	F	%	
G-0	Intact skin	00	0.0	07	23.3	$\chi^2=8.75$ $p=0.05^*$
G-1	Superficial ulcer of skin	13	43.3	12	40.0	
G-2	Ulcers extend into tendon, bone or capsule	12	40.0	09	30.0	
G-3	Deep ulcer with osteomyelitis or abscess	05	16.7	02	6.7	
G-4	Gangrene of toes or forefoot	00	0.0	00	0.0	
G-5	Midfoot or hindfoot gangrene	00	0.0	00	0.0	
Total		30	100.0	30	100.0	

In pretest

Among Experimental group, none of them were have intact, were have Superficial ulcer of skin (13) 43.3%, were had Ulcers extend into tendon, bone to capsule 40.0%(12), were in deep ulcer with osteomyelitis of abscess, 16.7%(05) and were none of them do not have Gangrene of toes or forefoot and the mid foot or hind foot gangrene grade of diabetic foot ulcer.

In posttest

Among Experimental group were have intact skin 23.3%(07), were had Superficial ulcer of skin 40.0%(12), were had ulcers extend into tendon, bone to capsule 30.0%(09), were had deep ulcer with osteomyelitis of abscess 6.7% (02) and were none of them do not have gangrene of toes or fore foot and mid foot or hind foot gangrene of diabetic foot ulcer in the grading level of healing score. Statistically there is significant difference.

$\chi^2=8.75$ $p=0.05^*$ it was confirmed using chi square test.

Section-IV: Distribution on effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer.

Table4.5: Effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer.

Diabetic foot ulcer		Maximum score	Mean dressing score	Mean Difference in dressing score with 95% Confidence interval	Percentage of dressing score with 95% Confidence interval
Experiment	Pretest	5	4.02	1.27(0.97-1.56)	25.4 % (19.4%-31.2%)
	Posttest	5	1.37		
Control	Pretest	5	4.13	0.40(-0.01-0.69)	8.0% (-0.2% 13.8%)
	Posttest	5	3.43		

Above table shows the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer.

Experiment clients are reduced 25.4% of dressing score after yellow Myrobalan powder dressing on Diabetic Foot Ulcer among clients .In Control clients, they are reduced 8.0% of score after having routine treatment. This shows the effectiveness of **Yellow Myrobalan (Kadukkai) powder dressing**. Differences between pretest and posttest score was analyzed using percentage with 95% CI (Confidence Interval) and mean difference with 95% CI (Confidence Interval).

Section-V: Distribution on comparison of wound healing process in clients with diabetic foot ulcer between experimental and control group.

Table 4.6: Comparison of experiment and control group level of diabetic foot ulcer (pretest)

Wagner Grading system		Group				Chi square test
		Experiment		Control		
		F	%	F	%	
G-0	Intact skin	0	0.0	00	0.0	$\chi^2=7.40$ $p=0.06$
G-1	Superficial ulcer of skin	13	43.3	10	33.3	
G-2	Ulcers extend into tendon, bone or capsule	12	40.0	07	23.3	
G-3	Deep ulcer with osteomyelitis of abscess	05	16.7	08	26.7	
G-4	Gangrene of toes or forefoot	00	0.0	05	16.7	
G-3	Midfoot or hind foot gangrene	00	0.0	00	0.0	
Total		30	100.0	30	100.0	

* Significant at $P \leq 0.05$ ** Highly significant at $P \leq 0.01$ *** Very high significant at $P \leq 0.001$

The above table shows the comparison of pre test level of diabetic foot ulcers among in experimental and control group. There is no statistical significance found.

Table 4.7: Comparison of experiment and control group level of diabetic foot ulcer (posttest.)

Wagner Grading system		Group				Chi square test
		Experiment		Control		
		F	%	F	%	
G-0	Intact skin	07	23.3	03	10.0	$\chi^2=9.37$ $p=0.05^*$
G-1	Superficial ulcer of skin	12	40.0	06	20.0	
G-2	Ulcers extend into tendon, bone or capsule	09	30.0	12	40.0	
G-3	Deep ulcer with osteomyelitis of abscess	02	6.7	05	16.7	
G-4	Gangrene of toes or forefoot	00	0.0	04	13.3	
G-5	Mid foot or hind foot gangrene	00	0.0	00	0.0	
Total		30	100.0	30	100.0	

* Significant at $P \leq 0.05$ ** Highly significant at $P \leq 0.01$ *** Very high significant at $P \leq 0.001$

The above table shows the comparison of post test level of diabetic foot ulcer level among experimental and control group. There is a statistical significant. $\chi^2=9.37$ $p=0.05^*$, It was confirmed using chi square test.

Table 4.8: Comparison of Experiment and Control group healing score in clients with diabetic foot ulcer.

	No. of clients	Group				Mean Difference	Student Independent t-test
		Experiment		Control			
		Mean	SD	Mean	SD		
Pre-test	30	3.23	0.73	3.30	0.84	0.07	$\chi^2=0.32$ $p=0.74$
Post-test	30	1.97	1.03	2.90	1.12	0.93	$\chi^2=3.34$ $p=0.001^{***}$

The above table shows the comparison of healing score between experimental and control group. There is significant mean difference among pre and post test scores in experimental group. The mean difference is 0.93, $\chi^2=3.34$ $p=0.001^*$, this results shows statistically significant.

Table 4.9: Comparison of pretest and posttest dressing score

Diabetic foot ulcer	No. of clients	Group				Mean Difference	Student paired t-test
		Pre-test		Post-test			
		Mean	SD	Mean	SD		
Experiment	30	3.23	0.73	1.97	1.03	1.26	$\chi^2=8.83$ $p=0.001^{***}$
Control	30	3.30	0.84	2.90	1.12	0.40	$\chi^2=1.87$ $p=0.06$

* Significant at $P \leq 0.05$

** Highly significant at $P \leq 0.01$

*** Very high significant at $P \leq 0.001$

Above table shows the comparison of mean wound dressing score of experimental and control group.

Experiment group

In Mean pretest, clients were have 3.23 dressing score and in posttest, they were have 1.97 score. Difference is 1.26 score. The difference between pretest and posttest score is large and it is statistically significant. Differences between pretest and posttest score was analyzed using Student paired-test.

Control group

In Mean pretest clients were have 3.30 dressing score and in posttest, they were have 2.90 score. Difference is 0.40score. The difference between pretest and posttest score is small and it is not statistically significant. Differences between pretest and posttest score was analyzed using Student paired t-test.

Section-VII: Distribution on association between wound healing process and Yellow Myrobalan(Kadukkai) powder dressing with selected demographic variables and clinical related variables among experimental group.

Table 4.10: Association between level of Yellow Myrobalan (Kadukkai) powder dressing score and demographical variables (Experimental Group)

s.no	DEMOGRAPHIC VARIABLES		Level of Dressing score				Total	Chi square test
			Below average(≤ 1.27)%		Above average(> 1.27)%			
1.	Age	40 -49 years	2	22.2	7	77.8	9	$\chi^2=7.55$ $p=0.05^*$
		50 -59 years	6	46.1	7	53.9	13	
		60 -69 years	5	83.3	1	16.7	6	
		≥ 70 years	2	100.0	0	0.0	2	
2.	Gender	Male	12	54.5	10	45.5	22	$\chi^2=0.68$ $p=0.40,$
		Female	3	37.5	5	62.5	8	
3.	Marital Status	Married	11	55.0	9	45.0	20	$\chi^2=3.34$ $p=0.34,$
		Unmarried			2	100.0	2	
		Divorced/Separated			1	100.0	1	
		Widower/Widow	4	57.1	3	42.9	7	
4.	Religion	Hindu	12	52.2	11	47.8	23	$\chi^2=1.37$ $p=0.50$
		Christian	1	25.0	3	75.0	4	
		Muslim	2	66.7	1	33.3	3	
5.	Type of Family	Nuclear Family	5	41.7	7	58.3	12	$\chi^2=3.33$ $p=0.17$
		Joint Family	10	62.5	6	37.5	16	
		Broken Family			2	100.0	2	
6.	Education Status	Illiterate	6	75.0	2	25.0	8	$\chi^2=8.53$ $p=0.03^*$
		Elementary	9	50.0	9	50.0	18	
		Higher Secondary	0	0.0	2	100.0	2	
		Graduate and above	0	0.0	2	100.0	2	
7.	Occupation	House Wife	2	100.0	0	0.0	2	$\chi^2=6.14$ $p=0.18,$
		Government	1	25.0	3	75.0	4	
		Private	5	35.7	9	64.3	14	
		Pensioner	4	80.0	1	20.0	5	
		Unemployed	3	60.0	2	40.0	5	
8.	Income	< Rs.3000	3	60.0	2	40.0	5	$\chi^2=1.81$ $p=0.61$
		Rs.3001-5000	2	28.6	5	71.4	7	
		Rs.5001-8000	7	58.3	5	41.7	12	
		> Rs.8001	3	50.0	3	50.0	6	
9.	Area of Residence	Rural	6	54.5	5	45.5	11	$\chi^2=0.14$ $p=0.70,$
		Urban	9	47.4	10	52.6	19	
10.	Dietary Pattern	Vegetarian	6	66.7	3	33.3	9	$\chi^2=0.41$ $p=0.81$
		Non-Vegetarian	2	33.3	4	66.7	6	
		Mixed Diet	7	46.7	8	53.3	15	

Above table shows the association between level of reduction of Yellow Myrobalan (Kadukkai) powder dressing on Diabetic Foot Ulcer and demographic variables among clients in the experimental group. Elder and more educated are reduced more score than others. Statistical significance was calculated using chi square test.

Significant variables

Age distribution, the study participants in experimental group 22.2% (2) below average and above average 77.8%(7) were belongs to the age group 40-49 years and below average 46.1%(6) and above average 53.9%(07) age group between 50-59 years in experimental group, below average 83.3%(05) and above average 16.7% (1) age group 60-69 years in experimental group and were in 70 and above 70 years in experimental group below average 100.0%(2) and above average 0.0% P=0.05* significant variable

Educational status, majority of them were educated up to illiterate level in experimental group below average 75.0%(06) and above average 25.0%(2), elementary subject were in below average 50%(09) and above average 50% (09) in experimental group and higher secondary subjects were in below average 0.0%(0) and above average 100%(2) and graduate and above subjects were below average 0.0% (0) and above average 100.0% (2) in experimental group. P=0.03* Significant variable.

There was significant association between these demographic variables among clients with diabetic foot ulcer in the experimental group.

Table 4.11: Association between level of Yellow Myrobalan(Kadukkai) powder dressing score and demographical variables (Control Group)

s.no	Demographic variables		Level of Dressing score				Total	Chi square test
			Below average(≤ 0.40)		Above average(> 0.40)			
			F	%	F	%		
1.	Age	40 -49 years	6	40.0	9	60.0	15	$\chi^2=3.30$ $p=0.35$
		50 -59 years	5	62.5	3	37.5	8	
		60 -69 years	2	40.0	3	60.0	5	
		≥ 70 years	2	100.0			2	
2.	Gender	Male	8	50.0	8	50.0	16	$\chi^2=0.00$ $p=1.00$
		Female	7	50.0	7	50.0	14	
3.	Marital Status	Married	11	50.0	11	50.0	22	$\chi^2=3.20$ $p=0.36$
		Unmarried			1	100.0	1	
		Divorced/Separated	2	100.0			2	
		Widower/Widow	2	40.0	3	60.0	5	
4.	Religion	Hindu	11	55.0	9	45.0	20	$\chi^2=4.20$ $p=0.12$
		Christian	2	25.0	6	75.0	8	
		Muslim	2	100.0			2	
5.	Type of Family	Nuclear Family	6	42.9	8	57.1	14	$\chi^2=1.35$ $p=0.51$
		Joint Family	8	53.3	7	46.7	15	
		Broken Family	1	100.0			1	
6.	Educational Status	Illiterate	3	50.0	3	50.0	6	$\chi^2=2.21$ $p=0.53$
		Elementary	7	46.7	8	53.3	15	
		Higher Secondary	3	42.9	4	57.1	7	
		Graduate and above	2	100.0			2	
7.	Occupation	House Wife	2	100.0			2	$\chi^2=4.52$ $p=0.33$
		Government	3	50.0	3	50.0	6	
		Private	7	41.2	10	58.8	17	
		Pensioner	3	75.0	1	25.0	4	
8.	Income	< Rs.3000	3	60.0	2	40.0	5	$\chi^2=2.22$ $p=0.56$
		Rs.3000-5000	1	33.3	2	66.7	3	
		Rs.5000-8000	5	38.5	8	61.5	13	
		> Rs.8000	6	66.7	3	33.3	9	
9.	Area of Residence	Rural	8	66.7	4	33.3	12	$\chi^2=2.23$ $p=0.16$
		Urban	7	38.9	11	61.1	18	
10.	Dietary Pattern	Vegetarian	5	62.5	3	37.5	8	$\chi^2=1.30$ $p=0.52$
		Non-Vegetarian	2	66.7	1	33.3	3	
		Mixed Diet	8	42.1	11	57.9	19	

Above Table shows the association between level of reduction of [Yellow Myrobalan(Kadukkai)] powder dressing on Diabetic Foot Ulcer and demographic variables among clients in the control group. None of the variables are significant. Statistical significance was calculated using chi square test.

Table 4.12: Association between level of Yellow Myrobalan (Kadukkai) powder dressing score and clinical related variables (Experiment)

s.no	Clinical related variables		Level of Dressing score				Total	Chi square test
			Below average(≤ 1.27)		Above average(> 1.27)			
			F	%	F	%		
1.	Type of Diet	Carbohydrate Rich Diet			1	100.0	1	$\chi^2=1.03$ $p=0.31$
		Mixed Diet	15	51.7	14	48.3	29	
2.	H/o. Chronic Illness	Yes	14	63.6	8	36.4	22	$\chi^2=6.13$ $p=0.01^*$
		No	1	12.5	7	87.5	8	
	If yes, Specify	Nil	1	12.5	7	87.5	8	$\chi^2=6.05$ $p=0.08$
		Hypertension	7	50.0	7	50.0	14	
		Cardiovascular problems	4	100.0			4	
		Chronic Kidney Disease	3	100.0			3	
3.	H/o. Any Medication for Chronic Illness	Yes	12	54.5	10	45.5	22	$\chi^2=0.68$ $p=0.40$
		No	03	37.5	05	62.5	08	
4.	Duration of Illness	1-2 Years	4	30.7	9	69.3	13	$\chi^2=8.01$ $p=0.05^*$
		2-5 Years	5	45.5	6	55.5	11	
		5-10 Years	3	100.0	0	0.0	3	
		>10 Years	3	100.0	0	0.0	3	
5.	Duration Under Diabetic Medication	< 2Years	6	46.2	7	53.8	13	$\chi^2=1.81$ $p=0.61$
		2 - 5 Years	6	60.0	4	40.0	10	
		5 -10Years	1	25.0	3	75.0	4	
		>10 Years	2	66.7	1	33.3	3	
6.	Type of Medication	Diet and Medication	1	50.0	1	50.0	2	$\chi^2=1.05$ $p=0.78$
		OHA-Oral Hypoglycaemic Agent	1	33.3	2	66.7	3	
		Insulin	9	47.4	10	52.6	19	
		Insulin and Oral Hypoglycaemic Agent	4	66.7	2	33.3	6	
7.	Grade of D/F/U	Grade -1	3	23.1	10	76.9	13	$\chi^2=6.90$ $p=0.03^*$
		Grade -2	8	66.7	4	33.3	12	
		Grade -3	4	80.0	1	20.0	05	
		Grade -4	0	0.0	0	0.0	00	

Above table shows the association between level of reduction of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer and treatment related variables among clients in the experiment group. No chronic illness and less duration of illness clients are benefitted more than others.

Statistical significance was calculated using chi square test.

Significant variables

History of chronic illness in considering below average 63.3% (14) above average were 36.4%(8) them in experimental group and subjects were no history of chronic illness in experimental group below average 12.5% (1) and above average 87.5%% (07).

P=0.01** highly significant.

Duration of illness the participants were have this illness about 1-2 years in below average 30.7%(4) and above average were 69.3% (09) in experimental group and were have 2-5 years duration of illness in experimental group below average were 45.5% (05) and above average were 55.5% (06) and subjects were have 5-10 years duration of illness in experimental group below average were have 100.0% (3) and above average 0.0% (0)and subjects were more than 10 years of having this duration of illness in experimental group below average were have 100%(03) and above average were 0.0%(0).

P=0.05*significant

Grade of diabetic foot ulcer majority of the subjects were in grade-1 diabetic foot ulcer in experimental group below average 23.1% (03)and above average were have 76.9% (13), were have grade-2 diabetic foot ulcer in experimental group below average 66.7% (08) and above average were 33.3% (12),were have grade -3 diabetic foot ulcer in experimental group below average were 80.0%(04) and above average 20.0%(05) and grade-4 diabetic foot ulcer subjects were in experimental group below average and above average have 00% (0).

P=0.03*significant.

Table 4.13: Association between levels of Yellow Myrobalan (Kadukkai) powder dressing Score and clinical related variables (control)

s.no	Clinical related variables		Level of Dressing score				Total	Chi square test
			Below average(≤ 0.40)		Above average(> 0.40)			
			F	%	F	%		
1.	Type of Diet	Carbohydrate Rich Diet	1	100.0	0	0.0	1	$\chi^2=1.03$ $p=0.31$
		Mixed Diet	14	48.3	15	51.7	29	
2.	History of Chronic Illness	Yes	13	52.0	12	48.0	25	$\chi^2=0.24$ $p=0.62$
		No	2	40.0	3	60.0	5	
3.	If yes, Specify	0	2	40.0	3	60.0	5	$\chi^2=0.93$ $p=0.92$
		Hypertension	7	46.7	8	53.3	15	
		Cardiovascular problems	4	66.7	2	33.3	6	
		Chronic Kidney Disease Neurological Problems	1 1	50.0 50.0	1 1	50.0 50.0	2 2	
4.	History of Any Medication for Chronic illness	Yes	13	52.0	12	48.0	25	$\chi^2=0.24$ $p=0.62$
		No	2	40.0	3	60.0	5	
5.	Duration of illness	1-2 Years	9	50.0	9	50.0	18	$\chi^2=3.11$ $p=0.37$
		2-5 Years	4	44.4	5	55.6	9	
		5-10 Years	2	100.0			2	
		>10 Years			1	100.0	1	
6.	Duration Under Diabetic Medication	< 2Years	9	47.4	10	52.6	19	$\chi^2=1.55$ $p=0.67$
		2 - 5 Years	5	62.5	3	37.5	8	
		5 -10Years	1	50.0	1	50.0	2	
		>10 Years	0	00	1	100.0	1	
7.	Type of Medication	Diet and Medication	0	00	1	100.0	1	$\chi^2=4.15$ $p=0.24$
		OHA-Oral Hypoglycaemic Agent	1	100.0	0	0.0	1	
		Insulin and Oral Hypoglycaemic Agent	12	46.2	14	53.8	26	
8.	Grade of D/F/U	Grade -1	4	40.0	6	60.0	10	$\chi^2=1.47$ $p=0.69$
		Grade -2	3	42.8	4	57.2	07	
		Grade -3	5	62.5	3	37.5	08	
		Grade -4	3	60.0	2	40.0	05	

Above table shows the association between level of reduction of Yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer and treatment related variables among clients in the control group .None of the variables are statistically significant.

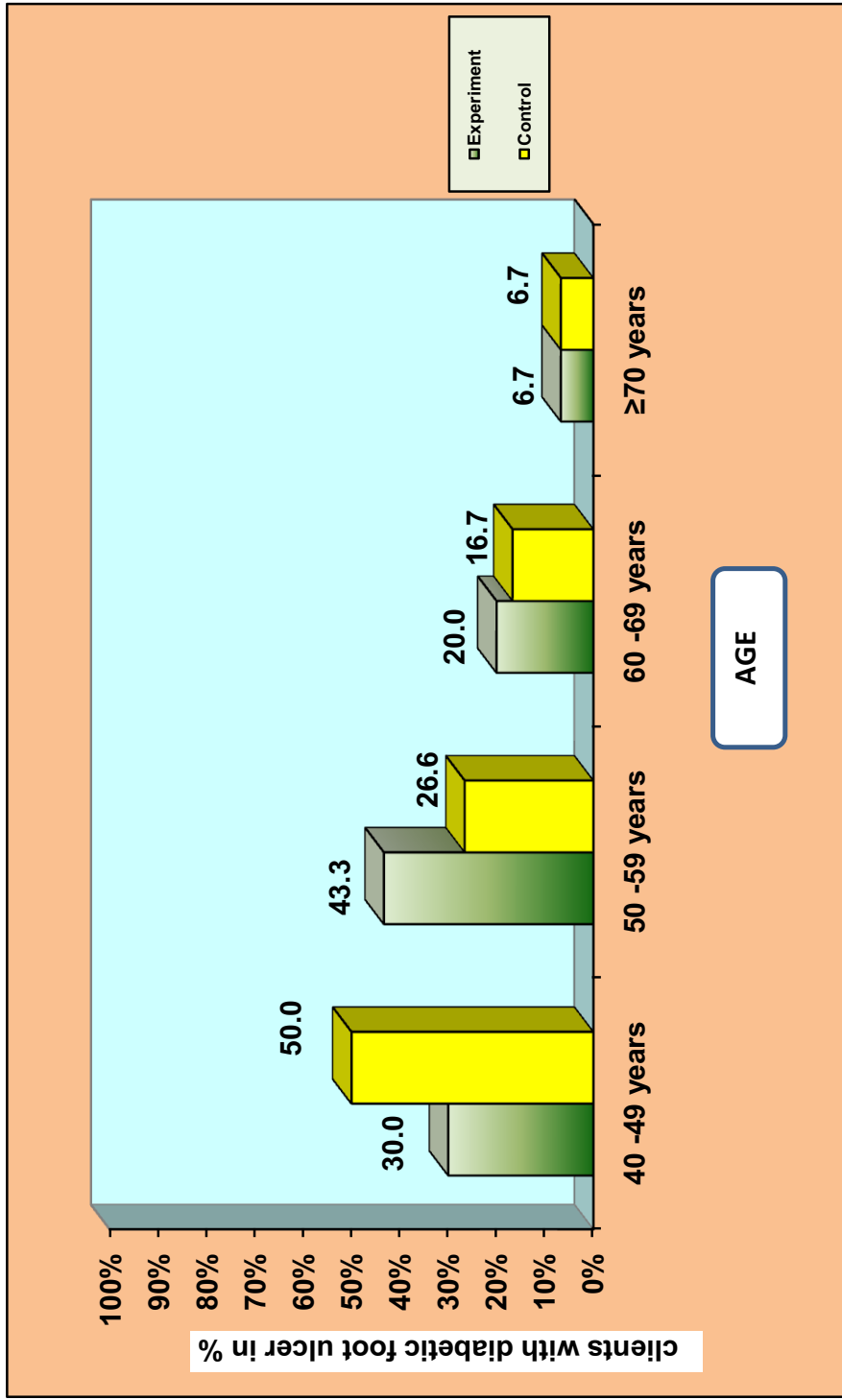


Figure- 4.1 Frequency and percentage of Age wise distribution

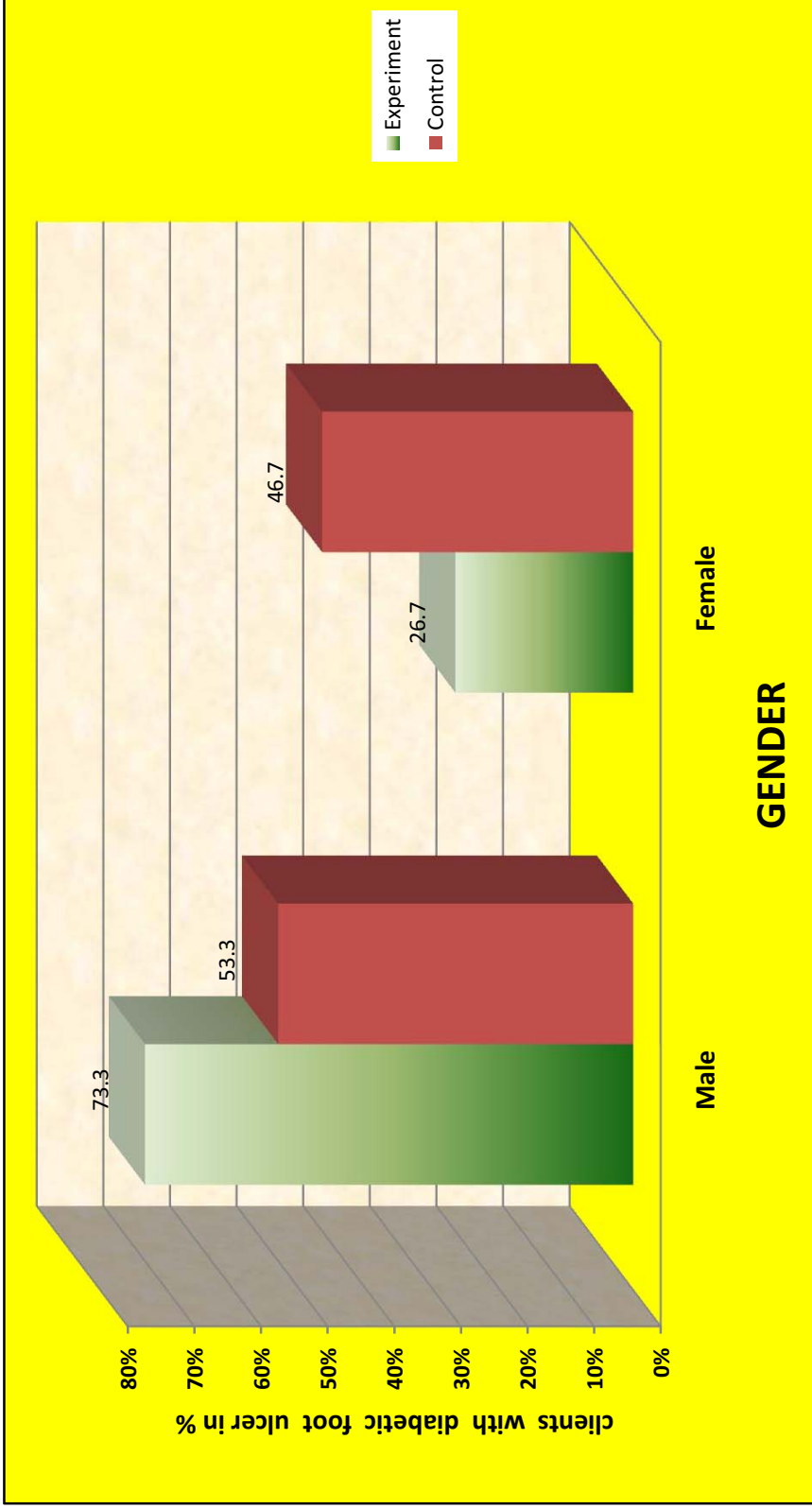


Figure -4.2 Frequency and percentage of Gender wise distribution

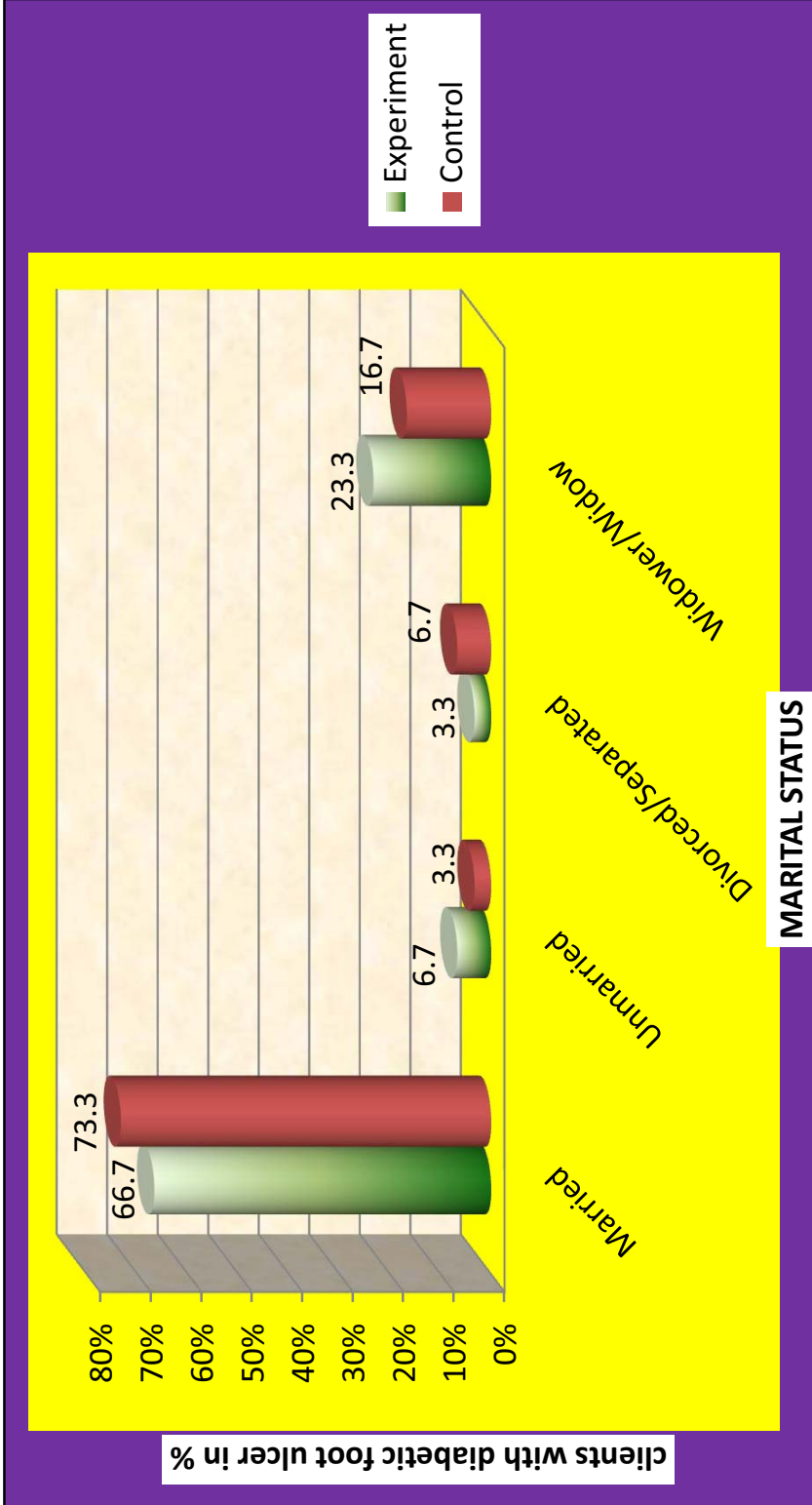


Fig-4.3 Frequency and percentage of distribution of marital status

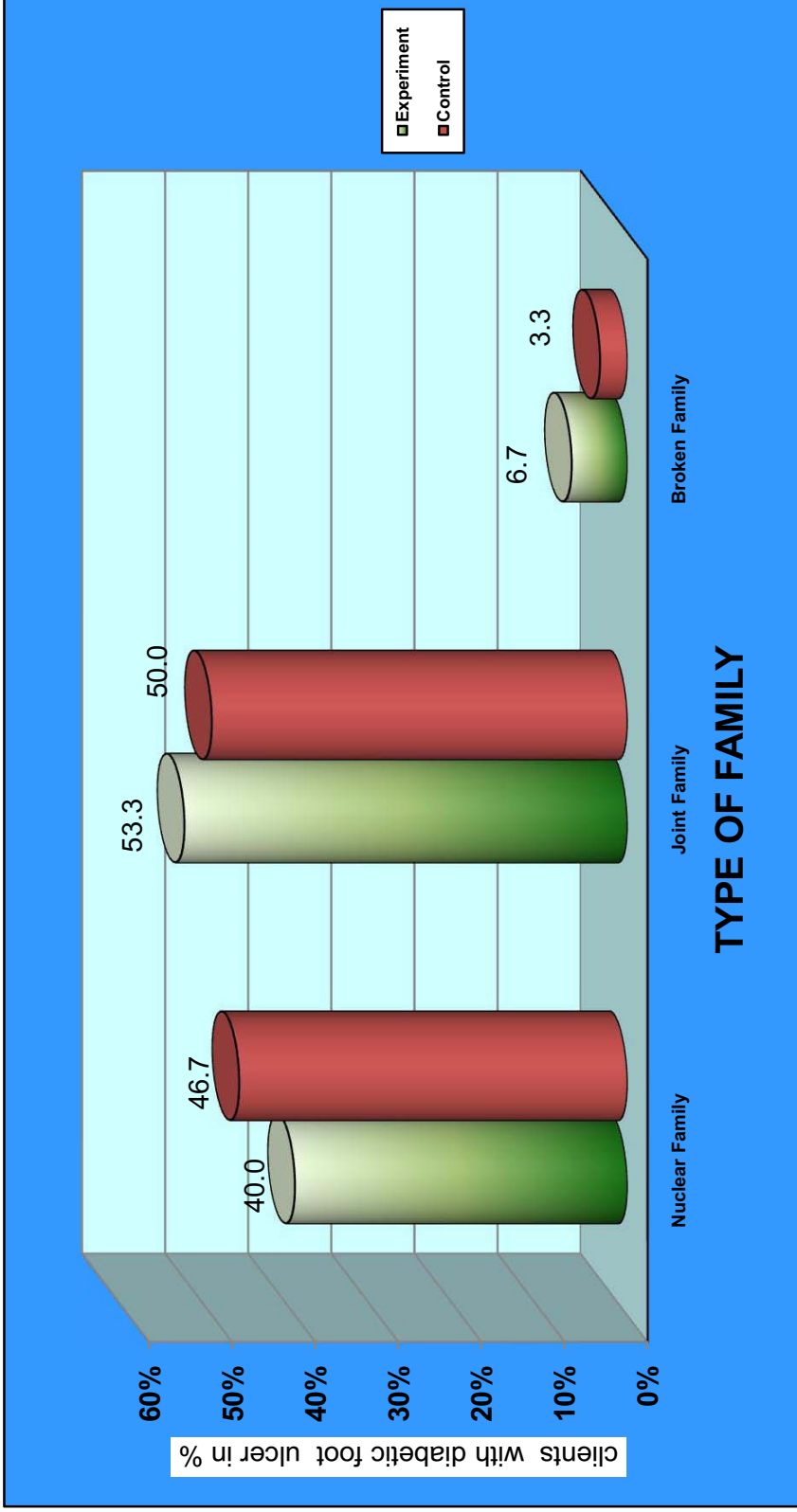


Figure-4.4 Frequency and percentage of distribution of type of family

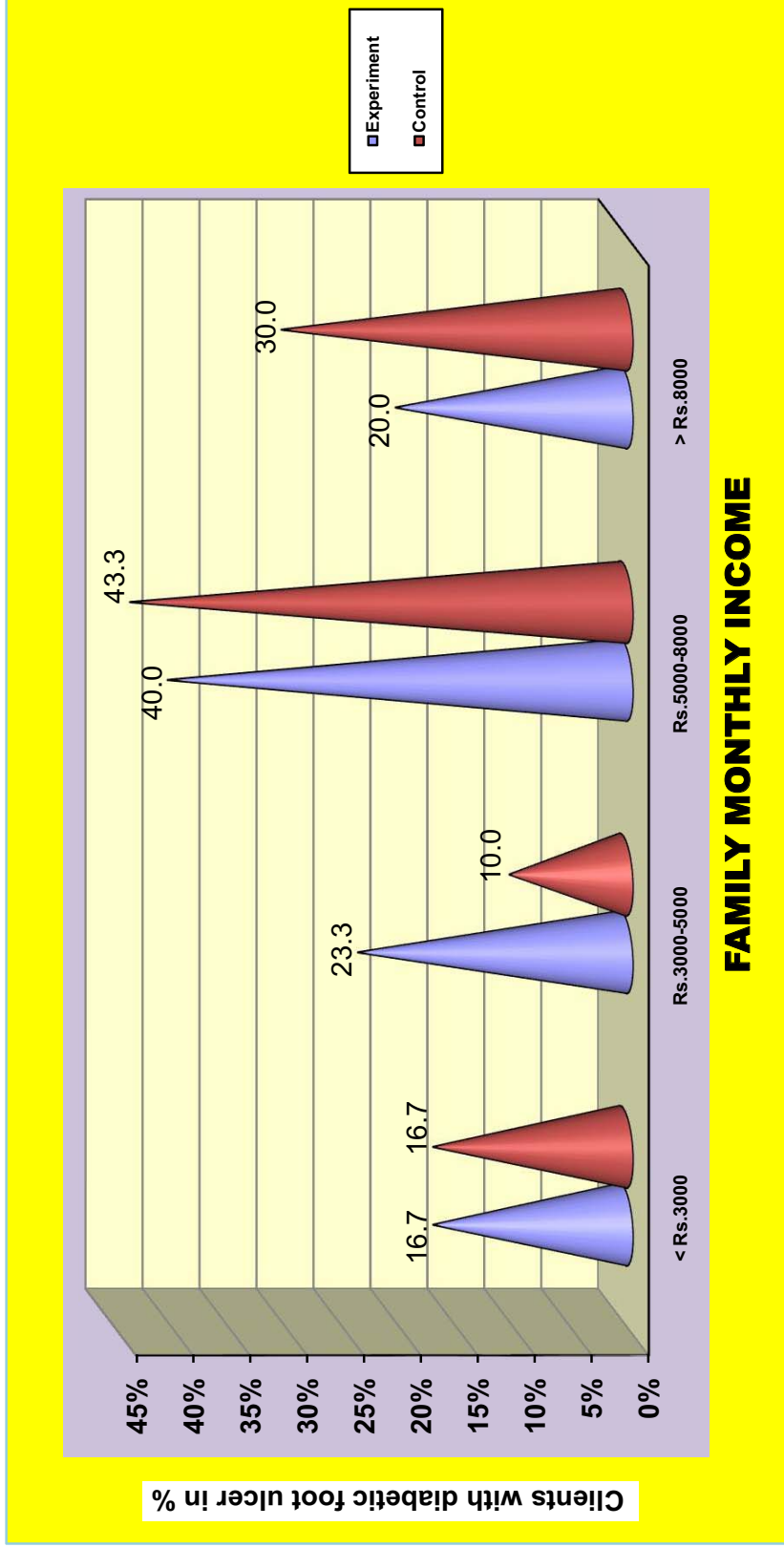


Fig-4.5 Frequency and percentage of distribution of family monthly income

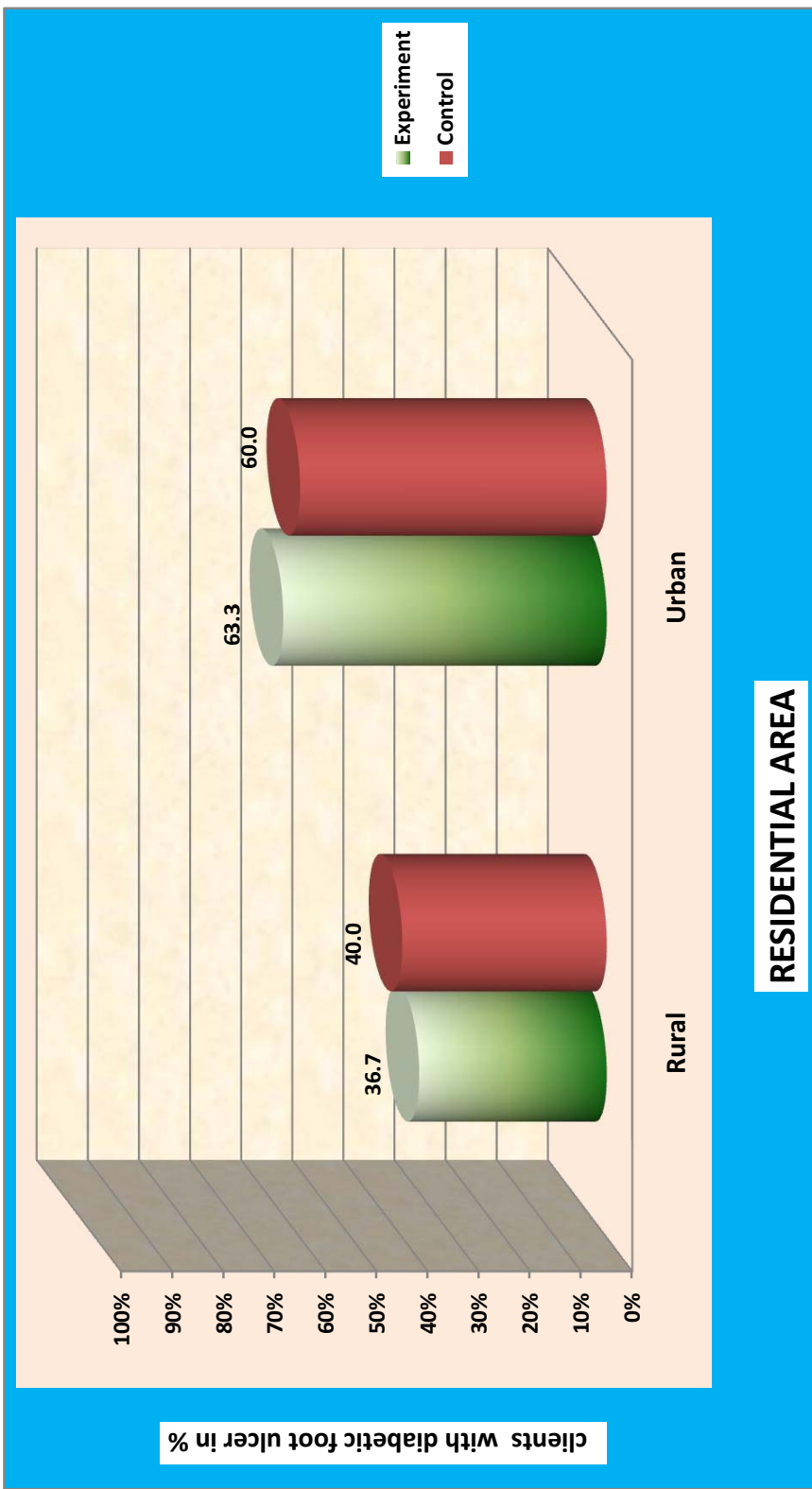


Fig-4.6 Frequency and percentage of type of living area of study participant



Fig-4.7 Frequency and percentage of distribution of duration of illness

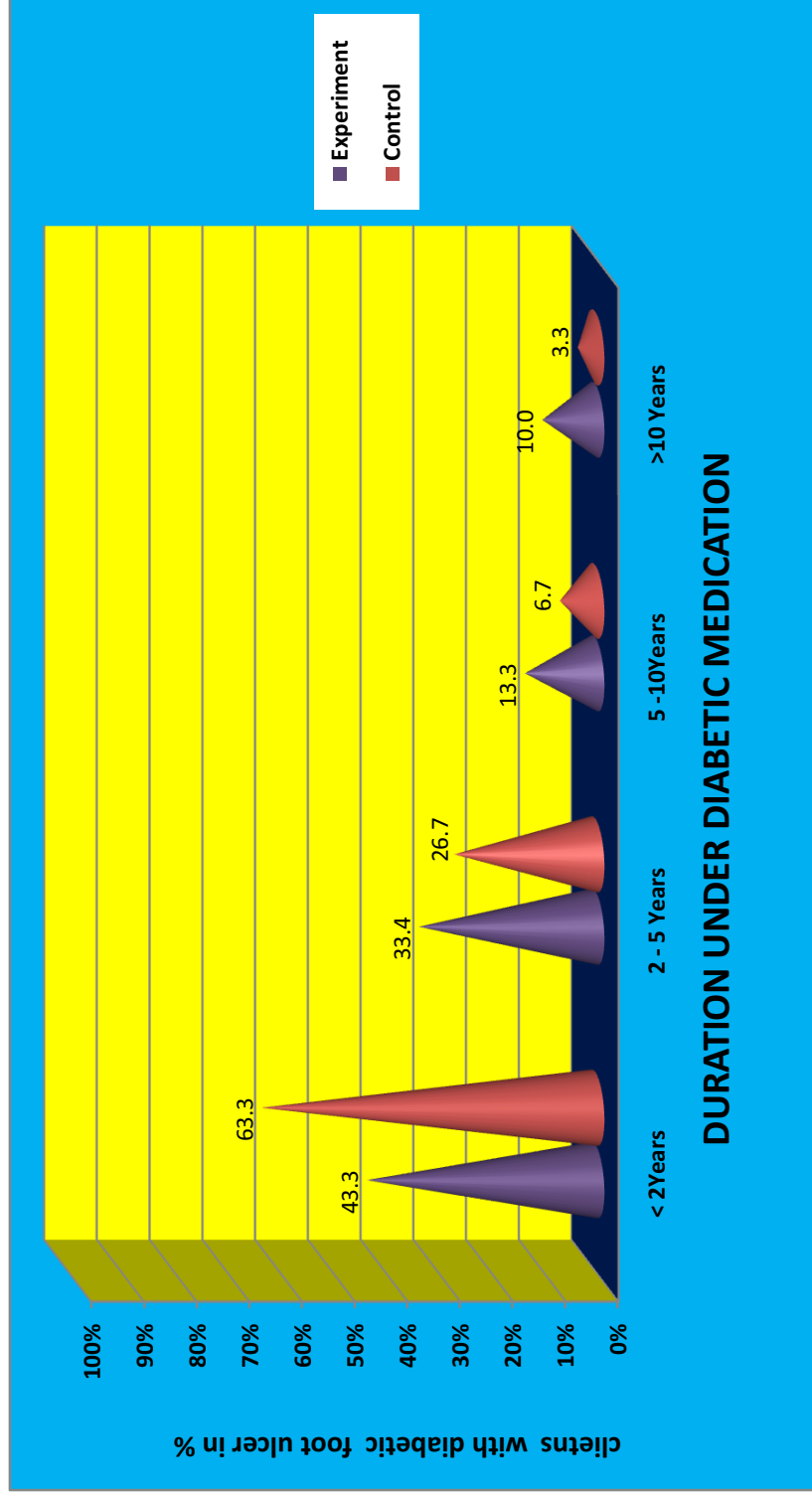


Fig-4.8 Frequency and percentage of duration under diabetic medication

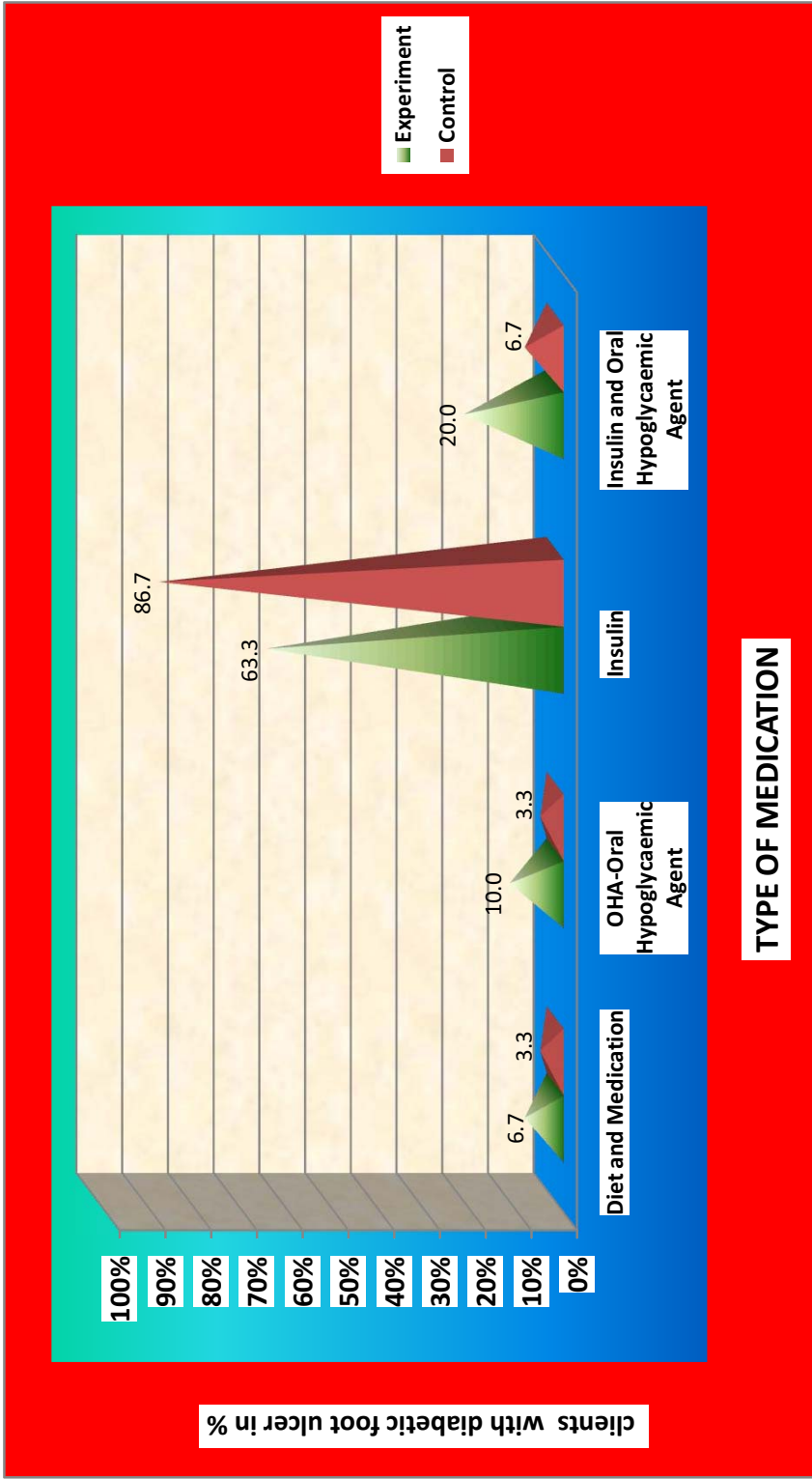


Fig-4.9 distribution of type of diabetic medication used in experimental and control group

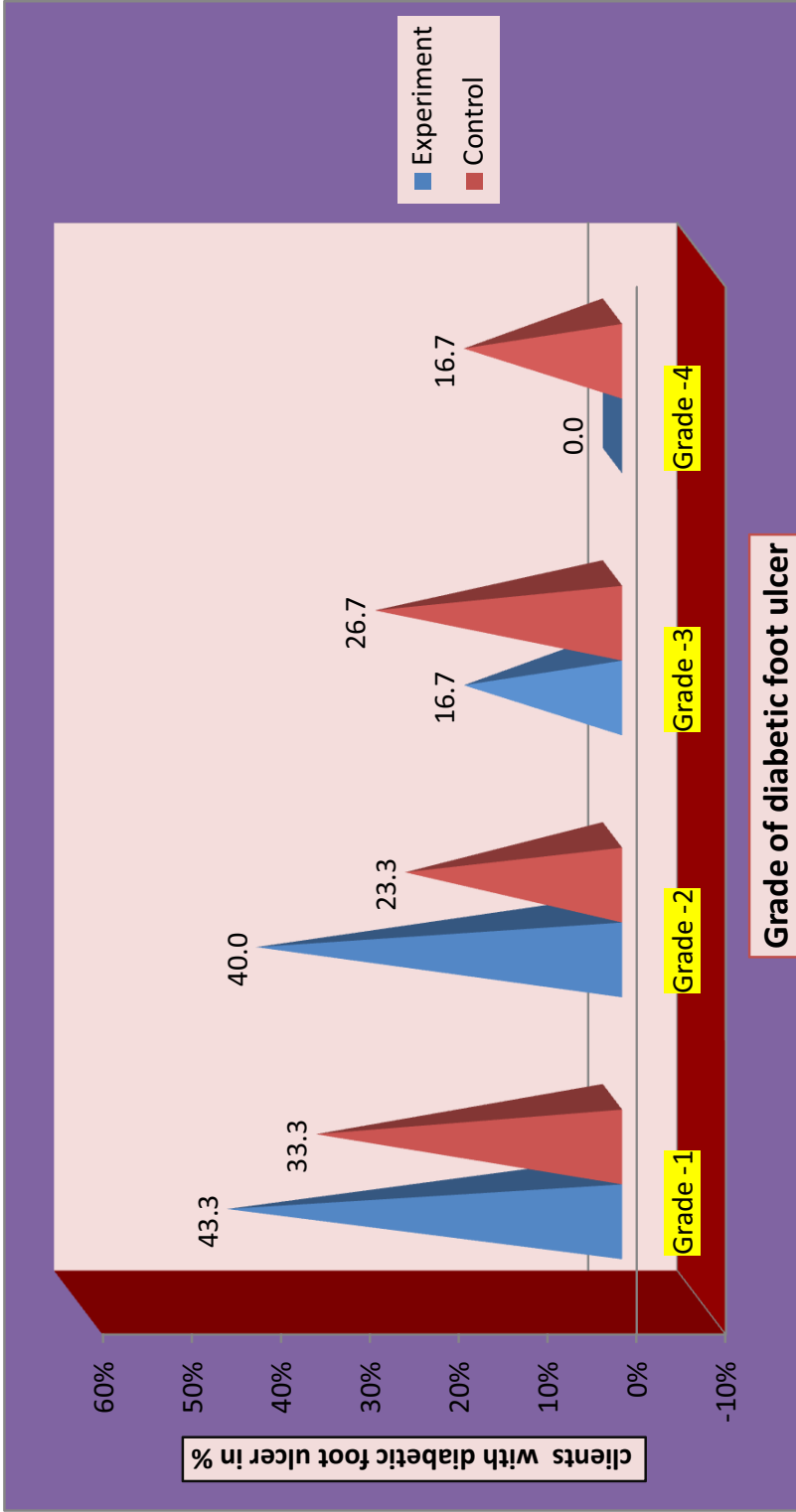


Fig-4.10 Frequency and distribution of grade of diabetic foot ulcer

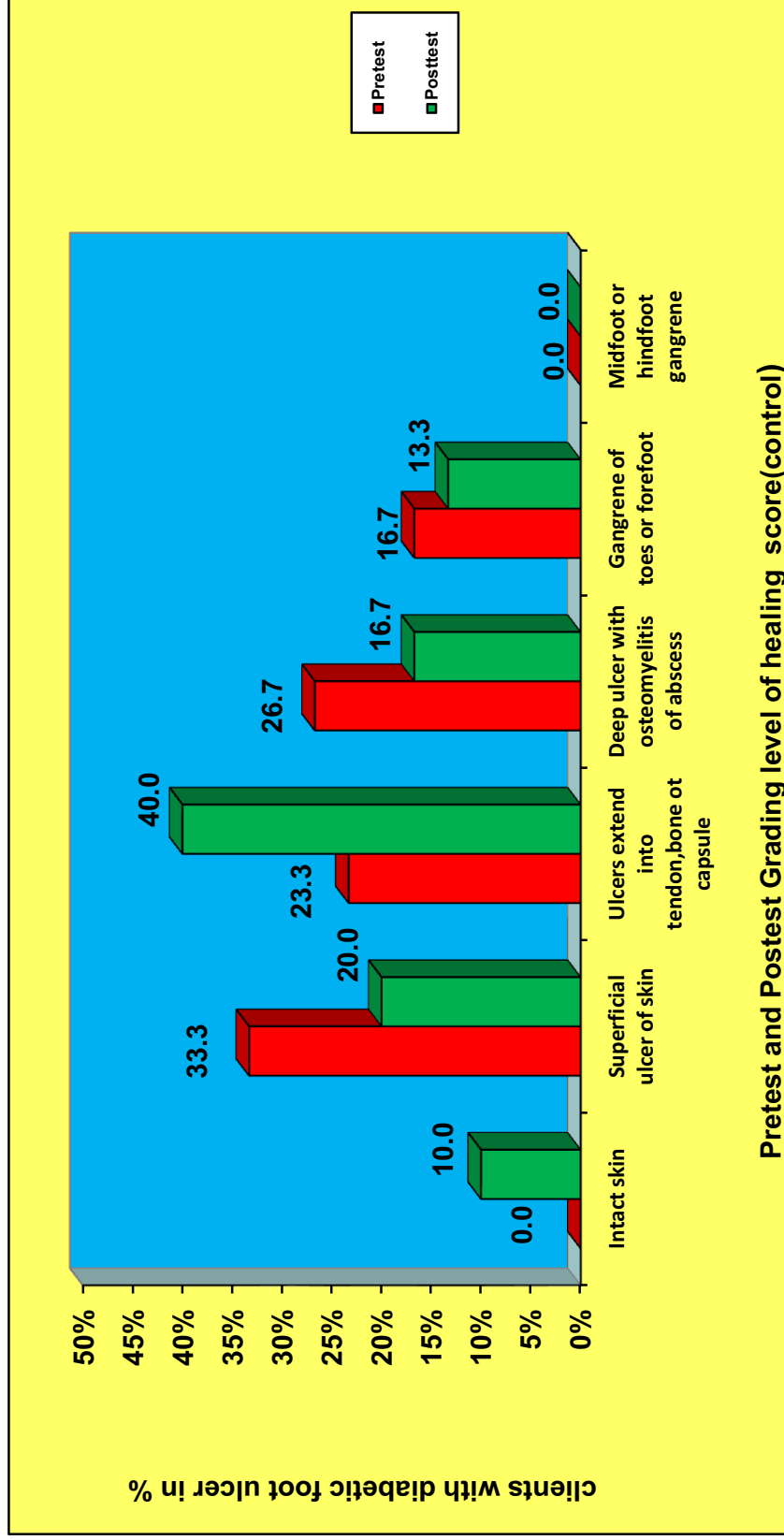
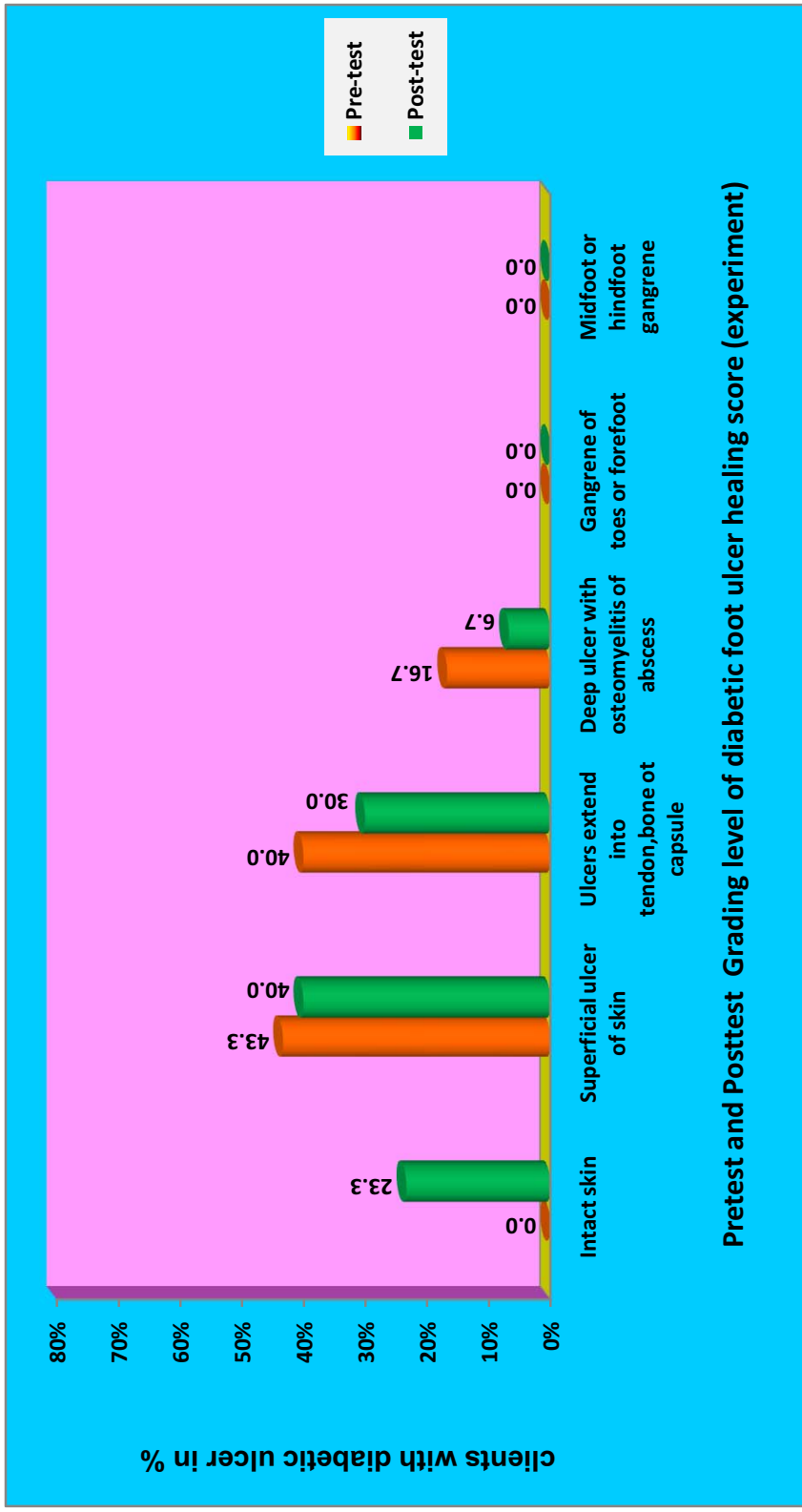


Fig- 4.11 pretest and posttest grading level of healing score in clients with diabetic foot ulcer (control)



Pretest and Posttest Grading level of diabetic foot ulcer healing score (experiment)

Fig-4.12 Description of pretest and posttest grading level of diabetic foot ulcer healing score (Experimental Group)

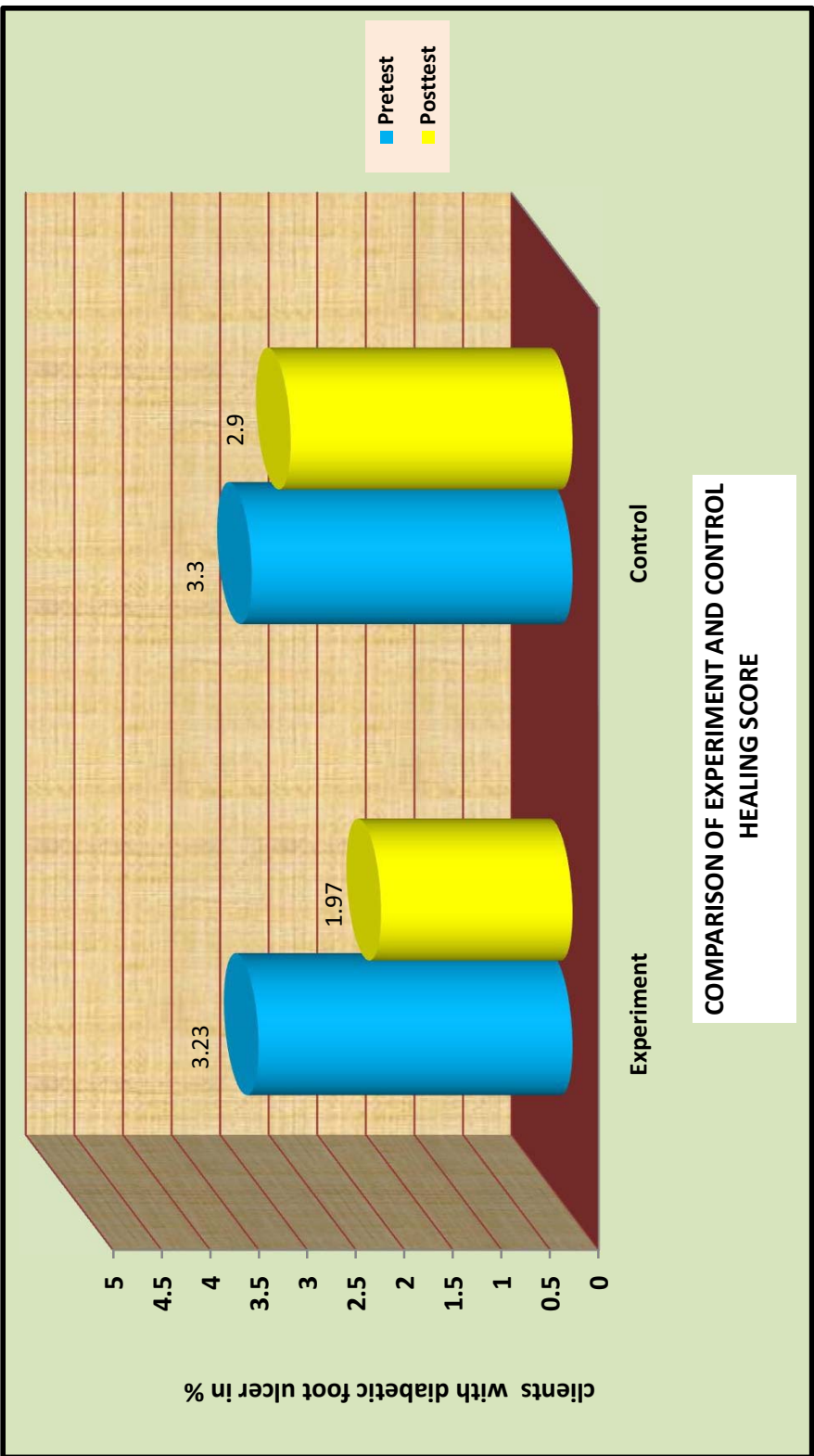


Fig-4.13 Distribution and comparison of healing score in experimental and control group

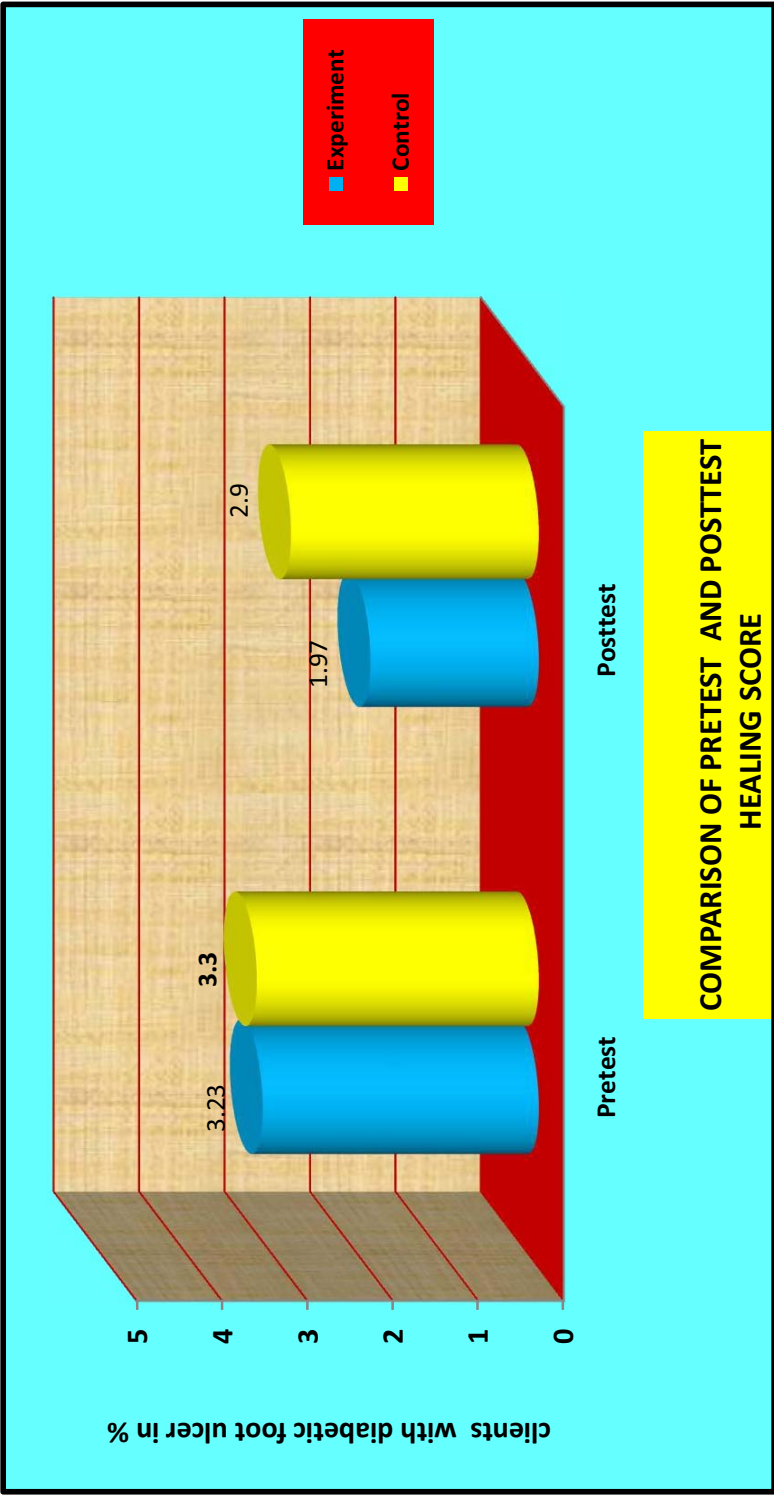


Fig-4.14 Distribution and comparison of pre and post test healing score.

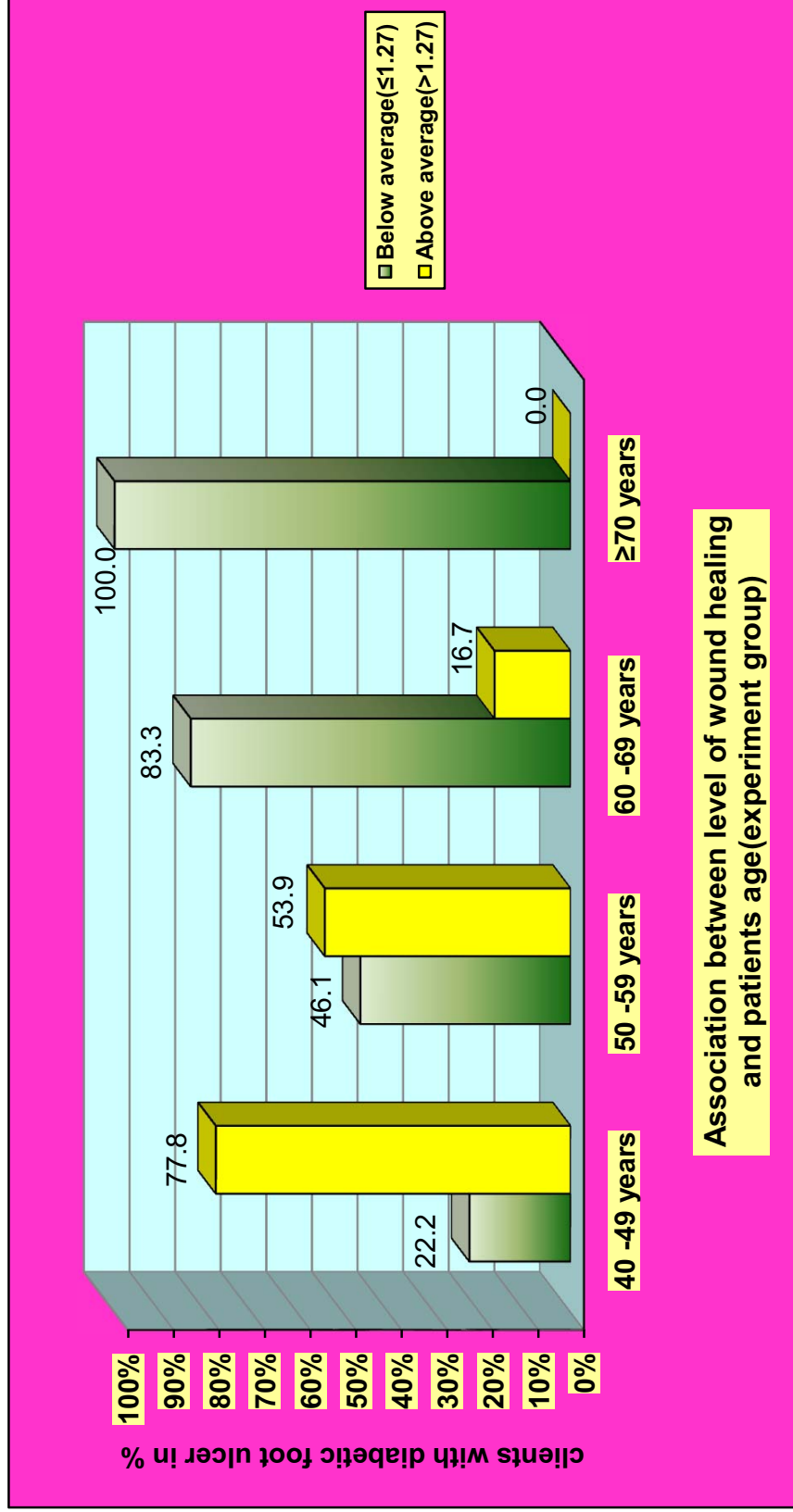
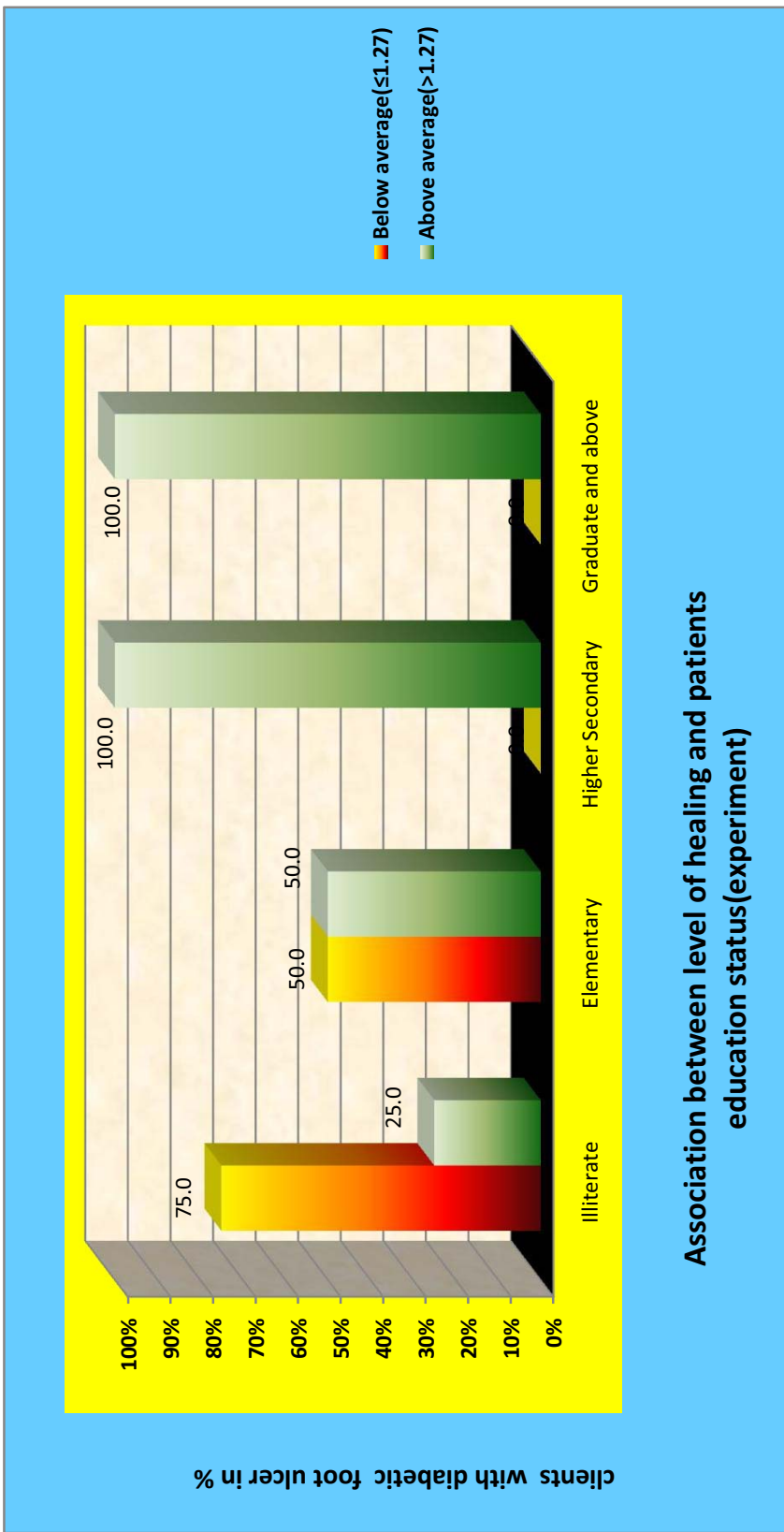


Fig-4.15 Association between level of wound healing and clients Age (Experimental Group).



Association between level of healing and patients education status(experiment)

Fig-4.16 Association between level of wound healing and educational status (experimental group)

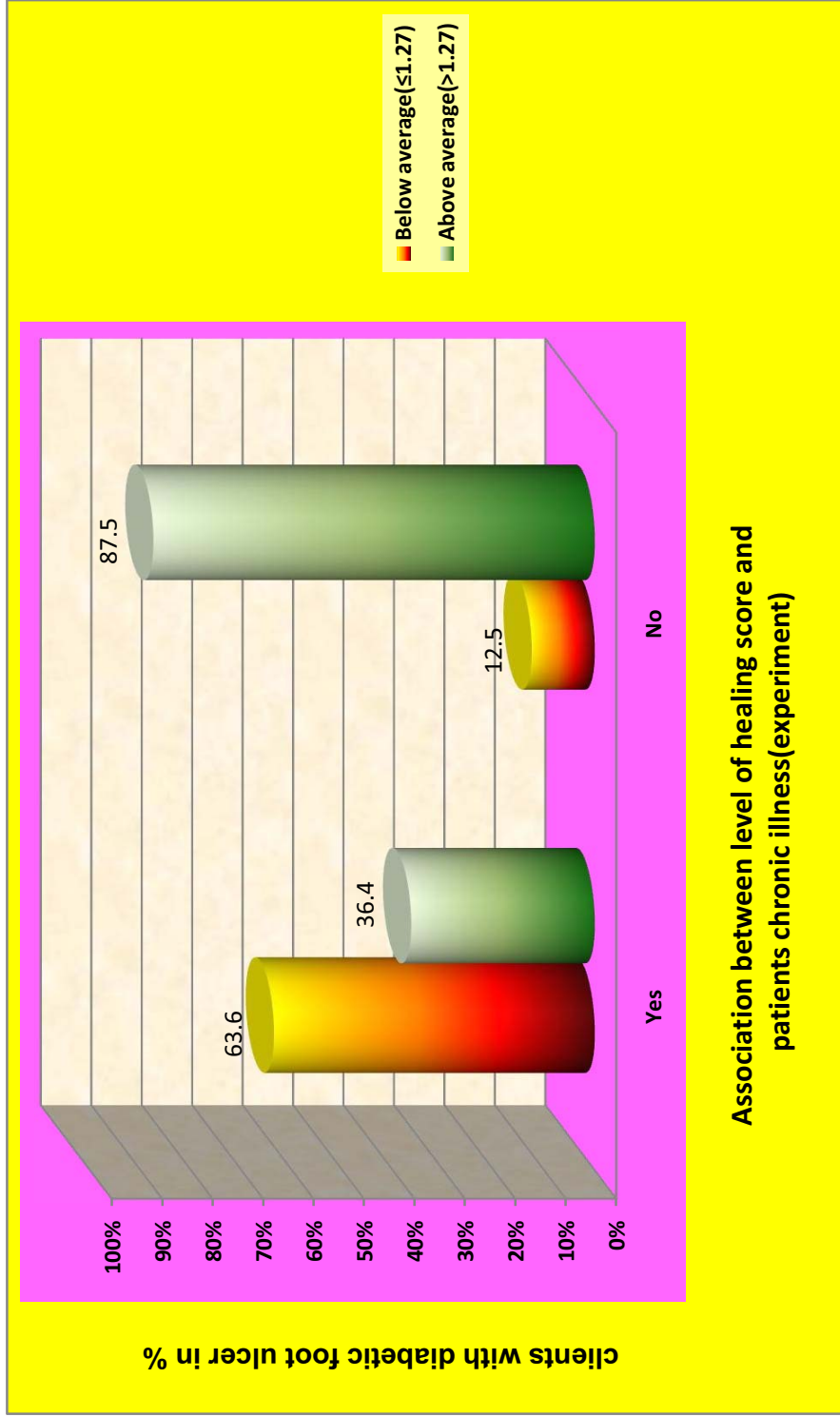


Fig-4.17 Association between level of healing score and patient's chronic illness (Experimental Group)

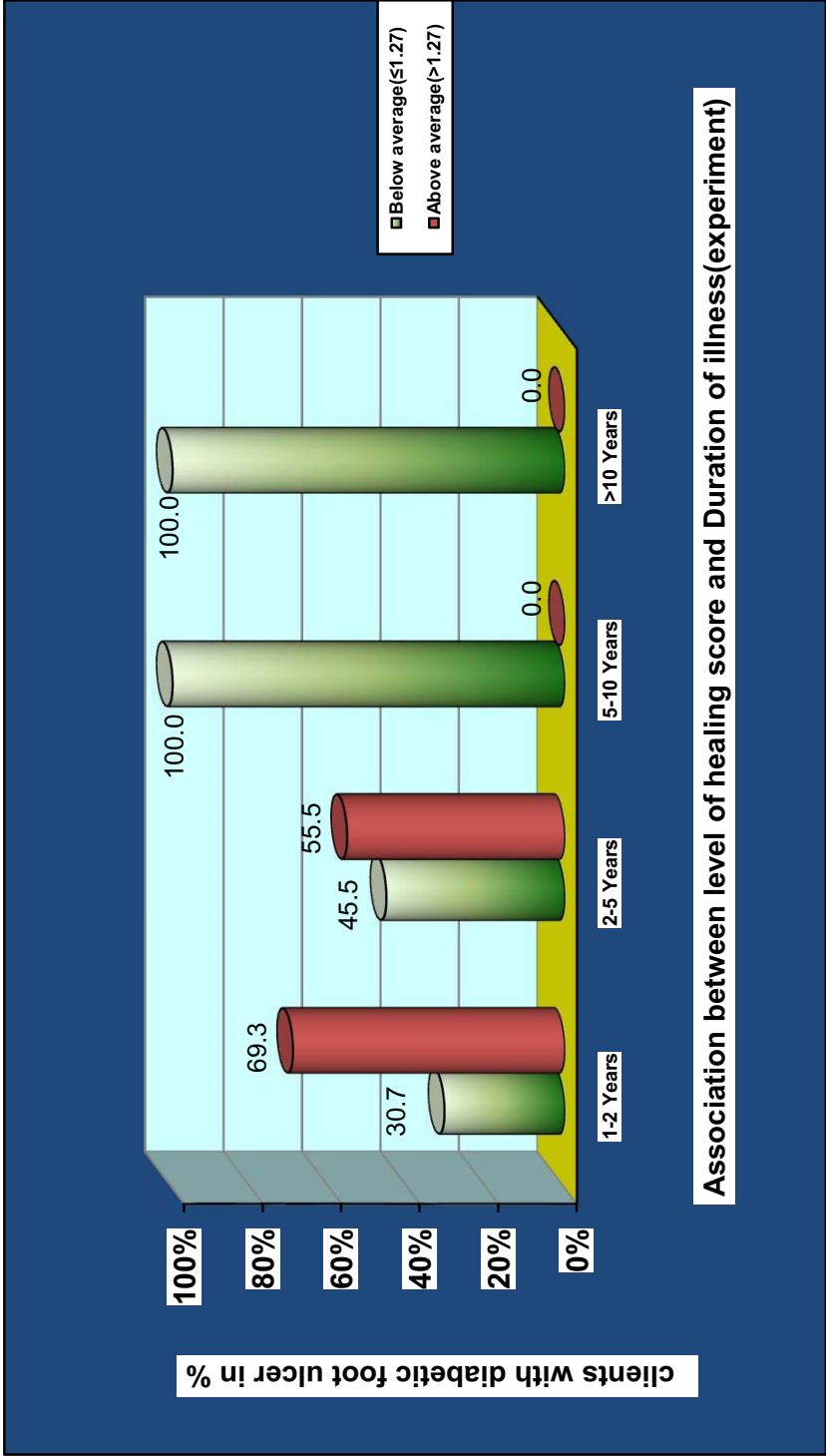


Fig-4.18 Association between level of healing score and Duration of illness (Experimental group)

CHAPTER V

SUMMARY OF THE RESULTS

This chapter deals with the detailed summary of the results findings of the study obtained from the statistical analysis. The purpose of the study was to **assess** the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing process among diabetic foot ulcer clients admitted in selected ward, at Rajiv Gandhi Government General Hospital, Chennai.

Extensive literature review and studies related to supervised procedure of Yellow Myrobalan (Kadukkai) powder dressing to improve the wound healing activity among diabetic foot ulcer clients to provided evidenced based nursing care and guidance for the study. This has helped to design the research study methodology, and to develop the tool for data collection and the protocol for the intervention of Yellow Myrobalan (Kadukkai) powder dressing. The conceptual framework developed for the study was based on the Modified Orem's theory of self-care deficit.

The tool used for data collection was validated by the experts from the area of medical, nursing and statistician. Reliability of the tool was assessed by using inter rater reliability correlation coefficient. The instrument was found to be reliable. Pilot study was conducted on 10 samples to find out the appropriateness and feasibility of conducting the study and it was found feasible.

Formal written permission was obtained from the Director and professor, Institute of diabetology and Institute of General Surgery. The data collection period was four weeks from 15.07.2015 to 14.082015, done in selected ward at Rajiv Gandhi Government General Hospital, Chennai.

Study samples were collected by method of simple random sampling technique, selected samples were divided as two groups by selecting odd numbers and even numbers, odd numbers were allotted for experimental group and even

numbers were allotted as control group and who fulfilled the inclusion criteria, were included in the study.

Pre-assessment of the wound was done by using Wagner Wound Assessment Scale and the characteristics of the foot ulcer was pre-assessed with help of Wound Assessment Scale in both Experimental and Control on the first day of the study. The intervention of Yellow Myrobalan (Kadukkai) powder dressing procedure was performed to Experimental group daily for 21 consecutive days. Control group received their routine care. The wound assessment was done on daily during the intervention period.

Post-assessment of the foot ulcer was done with the help of same Wound Assessment Scale on the end of the 21st day. The evidence of intervention and wound healing were marked. Intervention was done at the bedside.

Descriptive statistics (percentage, frequency distribution, mean and standard deviation) and inferential statistics (t-test, chi-square test) were used to analyze the data and to assess the hypothesis. The data were then interpreted and discussed based on the objectives of the study, hypotheses and relevant studies from literature reviewed.

The summary of the results findings of the study will be discussed based on the objectives.

Findings of the study results of the demographic variables were described in the forms of frequency and percentage distribution.

- ❖ Majority of the study participants in experimental group 43.3% were belongs to the age group 50-59 years. Were as in control group majority (50%) of them were in the age group between 40-49 years.
- ❖ Regarding the gender distribution majority of them were males 73.3% (Experimental), 53.3% (Control).

- ❖ Higher numbers of married subjects participated in this study 66.6% (Experimental), 73.3% (Control).
- ❖ Most of them were Hindus 76.7 % (Experimental), 66.6% (Control).
- ❖ Nearly 53.3% in experimental and 50% in control group members living in joint family
- ❖ Majority of them were educated up to primary level in this study 60% in experimental and 50% in control.
- ❖ Experimental group 46.7% in and 56.7% in control group members were working in private concerns.
- ❖ Almost all the study participants were belongs to low socio economic status among that around 40% in experimental and 43.3% in control group was having monthly income about Rs 5001-8000.
- ❖ Majority of the clients were from urban community 63.3% in experimental and 60% in control group.
- ❖ 50% in experimental and 63.3% in control group members were following mixed group dietary pattern.

Findings of the study results the clinical related variables were described in the forms of frequency and percentage distribution.

- ❖ Majority of the study subjects were following mixed type of diet in both groups (96.7%)
- ❖ 73.3% of them in experimental group and 83.3% in control group were having history of chronic illness.
- ❖ Nearly 46.7% in experimental and 50% in control group subjects were having Hypertension.
- ❖ 73.3% in experimental and 83.3% in control group members were taking medications for chronic illness.
- ❖ Majority of the participants were had this illness about less than 2 years, i.e. 43.3% in experimental and 60% in control.
- ❖ Most of the study subjects were in taking diabetic treatment was about

< 2years, 43.3% in experimental and 63.3% in control group.

- ❖ Experimental group 63.3% and 86.7% in control group were using insulin as the drug of choice.
- ❖ Majority of the subjects were have grade 1 diabetic foot ulcers in pretest of experimental group 43.3 % (13) and post test 40.0%(12).
- ❖ In pretest majority of study subjects among control group were have superficial ulcer of skin 33.3 % (10).
- ❖ Inpost test majority of study subjects among were haveulcers extend into tendon, bone or capsule 40.0% (12) belongs to control group. Statistically there was no significant difference. It was confirmed by using chi square test
- ❖ Regarding the majority of study subjects in pretest of experimental group clients were having3.23 dressing score and in posttest, theywere having 1.97 score difference was 1.26 score. The difference between pretest and posttest score was large and it was statistically significant. Differences between pretest and posttest score was analyzed using Student pairedt-test.
- ❖ Considering control group in pretest clients were have 3.30 dressing score and in posttest, they were having 2.90 score. Difference was 0.40 score. The difference between pretest and posttest score was small and it was not statistically significant. Differences between pretest and posttest score was analyzed using Student paired t-test.
- ❖ On an average, experiment clients were reduced 25.4% of dressing score after yellow Myrobalan (Kadukkai) powder dressing on diabetic foot ulcer among clients .In Control clients, they were reduced 8.0% of score after having routine treatment. This shows the effectiveness of **Yellow Myrobalan (Kadukkai) powder dressing**. Differences between pretest and posttest score was analyzed using percentage with 95% CI and mean difference with 95% CI.

CHAPTER-VI

DISCUSSION

This chapter deals with the detailed discussion of the study obtained from the statistical analysis. The purpose of the study were to assess the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on to improving and promoting the wound healing process in clients with diabetic foot ulcer who were admitted in selected wards, at Rajiv Gandhi Government General Hospital, Chennai.

Diabetes is a disease which needs lifelong treatment. If untreated or improperly treated diabetes can leads to so many ill effects; it shortens life considerably or debases its quality substantially. Research has shown that improved wound healing process in the diabetic patient with foot ulcer in the Experimental group had improved the wound healing activity and thereby faster wound healing of the foot ulcer. So in addition to the pharmacological treatment.

Yellow Myrobalan (Kadukkai) powder dressing can be used as an effective complimentary treatment modality for managing diabetic foot ulcer. On an average, experiment clients were reduced 25.4% of dressing score after yellow Myrobalan powder dressing on Diabetic Foot Ulcer among clients .In Control clients, they were reduced 8.0% of score after having routine treatment. This shows the effectiveness of **Yellow Myrobalan (Kadukkai) powder dressing**. Differences between pretest and posttest score was analyzed using percentage with 95% CI and mean difference with 95% CI (confidence interval).The future of this field of nursing science promised to be one of the rapid significant growths, the results of which will directly influence patient care in the aspect of promoting wound healing as that of “evidenced based nursing care”.

Objective I: The first objective of the study is to assess the grading level of diabetic foot ulcer among clients.

In pretest among control group, none of them were have intact, were had Superficial ulcer of skin (10) 33.3%, were had Ulcers extend into tendon, bone or capsule 23.3% (07), were in deep ulcer with osteomyelitis of abscess, 26.7%(08) and were had Gangrene of toes or forefoot and 16.7%(05) none of them not having the midfoot or hind foot gangrene grade of diabetic foot ulcer.

In pretest among experimental group, none of them were have intact, were had Superficial ulcer of skin (13) 43.3%, were had Ulcers extend into tendon, bone to capsule 40.0%(12), were in deep ulcer with osteomyelitis of abscess, 16.7%(05) and were none of them nothave Gangrene of toes or forefoot and the midfoot or hind foot gangrene grade of diabetic foot ulcer.

This study is supported by **NaliniSingh, David G.Armstrong, Benjamin A. Lipsky; et.al (2005)** conducted a study on Prevention of diabetic foot ulcers. Which was best accomplished in the primary care setting with a brief history and the Semmes-Weinstein monofilament. Educating clients about proper foot care and periodic foot examinations were effective interventions to prevent ulceration. Other possibly effective clinical interventions include optimizing glycemic control, smoking cessation, intensive podiatric care, debridement of calluses, and certain types of prophylactic foot surgery. The value of various types of prescription footwear for ulcer prevention was not clear.

Objective II: To evaluate the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing among experimental group as post-test.

In the effectiveness among experiment group were reduced 25.4% of wound dressing score after yellow Myrobalan powder dressing on Diabetic Foot Ulcer among clients .In Control clients, they were reduced 8.0% of score after having routine treatment. This shows the effectiveness of **yellow Myrobalan**

powder dressing. Differences between pretest and posttest score was analyzed using percentage with 95% CI and mean difference with 95% CI.

R Rathinamoorthy et al., (2012) Reported as the study was focused on treatment of water and methanol extracts of Terminalia chebula fruits act as a cross linking agent on cotton plain-woven fabric. The fabric samples were tested for antibacterial activity against bacterial Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris, and Salmonella typhi under agar diffusion strains like test and quantitative analysis. The results indicated that the treated cotton fabric shows a clear microbial resistance with 27-38mm zone of inhibition in the agar diffusion test against all the above mentioned strains. The treated samples showed 99% of reduction against Staphylococcus aureus and 86.25% reduction against Escherichia coli as per quantitative analysis. Box Behnken design and the correlation coefficient was found to be 0.932 in the case of Staphylococcus aureus and 0.66 in the case of Escherichia coli.

Objective III: To compare the wound healing process between Experimental and control group.

Among control group were had intact skin 10.0%(03), were had Superficial ulcer of skin 20.0%(06), were had ulcers extend into tendon, bone to capsule 40.0%(12), were had deep ulcer with osteomyelitis of abscess 16.7% (05) and were had gangrene of toes or forefoot and 13.3%(04) were not have the midfoot or hind foot gangrene of diabetic foot ulcer. Statistically there is no significant difference; it was confirmed using chi square test.

Among Experimental group were had intact skin 23.3%(07), were had Superficial ulcer of skin 40.0%(12), were had ulcers extend into tendon, bone to capsule 30.0%(09), were had deep ulcer with osteomyelitis of abscess 6.7% (02) and were none of them not have gangrene of toes or fore foot and midfoot or hind foot gangrene of diabetic foot ulcer in the grading level of healing score. Statistically there is significant difference.

$\chi^2=8.75$ $p=0.05$ *it was confirmed using chi square test.

In mean pretest, clients were have 3.23 dressing score and in posttest, they were have 1.97 score. Difference is 1.26 score. The difference between pretest and posttest score is large and it is statistically significant. Differences between pretest and posttest score was analyzed using Student paired-test.

This Study was Supported by **Vimala G et al., (2010)** conducted a study on promoting wound healing activity, in ayurvedic study Terminaliachebula (combretaceae) was commonly known as''myrobalan, it was locally called ''kaduk-kai.'This drug available in powder form also make an excellent paste as an application for chronic ulcerations and ulcerated wounds and it also called as 'king of medicine' because of its, extraordinary power of wound healing. This medicine has been demonstrated to possess multiple pharmacological and medicinal activities such as anti diabetic; anti-inflammatory and wound healing activity and also Antibacterial activity of Terminalia chebula extracts against several bacterial strains have been reported. Extracts from different parts of diverse species of plants like root, flower, leaves, seeds, etc. exhibit antibacterial properties were applied on cotton material for wound, following in our traditional practice.

Objective IV: To find the association between wound healing process and Yellow Myrobalan (Kadukkai) powder dressing with selected demographic variables and clinical related variables among experimental group.

In the association between levels of wound healing gain score and their demographic variables in experimental group in Yellow Myrobalan (Kadukkai) powder dressing on Diabetic Foot Ulcer and demographic variables among clients in the experimental group .Elder and more educated were reduced more score than others. Statistical significance was calculated using chi square test.

In the association between levels of wound healing gain score with Yellow Myrobalan (Kadukkai) powders dressing on Diabetic Foot Ulcer and treatment

related variables among clients in the experiment group .no chronic illness and less duration of illness clients were benefitted more than others. Statistical significance was calculated using chi square test.

Hypothesis

H₁: There was a statistically significant difference between pretest and posttest level of grading of wound healing among clients with diabetic foot ulcer by doing the procedure of Yellow Myrobalan (Kadukkai) powder dressing among clients. (Objective III).

H₂: There was a statistically significant association between the post test by level of grading of wound healing after the dressing procedure among diabetic foot ulcer clients with selected variables. (Objective IV).

CHAPTER VII

CONCLUSION AND RECOMMENDATIONS

Diabetic foot ulcer is the most serious and costly complications and important cause of morbidity in diabetic people over the years. Diabetic foot ulcers are the sores that occur on the feet of the people with Type 1 and Type 2 diabetes mellitus. Diabetic foot ulcer is defined as major erosions of the epithelium that extends into the dermis and deeper tissues and is associated with reduced healing capacity (kinmond-2003). The main risk factors that causes diabetic foot ulcer are peripheral neuropathy and micro as well as macro vascular ischemia. Peripheral neuropathy causes loss of pain or feeling into the toes, legs, and arms due to the distal nerve damage and low blood flow supply (atherosclerosis), very less oxygen supply, and eventually death of tissue in feet occurs.

This chapter explains about limitations of the study, implications and recommendations were given for different areas of nursing such as practice, administration, education, and research in the Health care delivery system.

7.1. Nursing Implication

The finding of the study have the following implications in different branch of nursing that is, nursing practice, nursing education, nursing administration and nursing research results. By evaluating the effectiveness Kadukkai powder dressing among the patients with diabetic foot ulcer the investigator received a clear picture regarding the different steps to be taken in different fields to improve the same.

Implications for Nursing Practice

- Yellow Myrobalan (Kadukkai) powder dressing was an effective measure to promote wound healing activity nurse should effectively use this measure to promote wound healing capacity.

- Kadukkai powder dressing helps in reducing the need and frequency of administration of antibiotics.
- Kadukkai powder dressing promotes purifying, hastening and cleansing capacity of the wound.
- Nurses can plan the goal of nursing management and enhance the nurse patient relationship and sense of well being of the patient through the development of mutually agreeable goals.
- It was an effective means of communication which provides physical contact in a very acceptable way within the Indian culture.
- Kadukkai powder dressing can be taught to the loved ones who were caring for diabetic patients with foot ulcer.

Implications for Nursing Administration

- Nursing administrator should conduct in-service education program for staff nurses about caring patients with Diabetic foot ulcer.
- Nursing administrator should supervise and guide nurse's application of dressing and care of foot ulcer.
- Nursing administrator should monitor the standard of practice to promote excellence of caring patients with diabetic foot ulcer.

Implications for Nursing Education

- Kadukkai powder dressing need to be included in the curriculum and practiced.
- In service education programme should be conducted for nursing personnel and help nurse to gain knowledge upon which further researches can be conducted.

Implications for Nursing Research

- Nursing researcher should encourage the clinical nurse to apply the research findings in this daily nursing care activity.

- Nursing researcher should motivate the clinical nurse to do further research studies on the effect of Kadukkai powder dressing on promoting wound healing process.
- Nursing researcher should conduct periodic review of research findings and disseminate findings through conference, national and international journals.

7.2 Limitations of the study

- The study was limited a period of four weeks.
- The study was limited to only 40 and above old subjects.
- Only 60 subjects were taken for this study.
- The study was limited to only one hospital.
- The time period under taken for the study was not sufficient to monitor the progress of the wound status.

7.3 Recommendations for further study

- ❖ Randomized controlled trial can be done.
- ❖ Similar study can be conducted for a larger group.
- ❖ Effect of Kadukkai powder dressing for a prolonged period can be studied.
- ❖ A comparative study can be conducted to assess the effectiveness of Kadukkai powder dressing and combination with other products used for routine dressing care.
- ❖ The staff nurses can implement this mode of dressing for diabetic foot ulcer after proper education on application of Kadukkai powder for wound healing.
- ❖ The staff nurses can be trained to assess the wound characteristics to monitor for wound healing.
- ❖ Further research can be conducted with the help of other wound assessment scale.

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SECTION 'A' DEMOGRAPHIC PROFILE

1. Age of the person

(A) 40-49 Years

(B) 50-59 Years

(C) 60-69 Years

(d) 70 and above

2. Gender

(A) Male

(b) Female

3. Marital Status

(a) Married

(b) Unmarried

(c) Divorced/Separated

(d) Widower/Widow

4. Religion

(a) Hindu

(b) Christian

(c) Muslim

(d) Others

5. Type of Family

(a) Nuclear Family

(b) Joint Family

(c) Broken Family

(d) Paying Guest

6. Educational Status

(a) No formal education

(b) Elementary

(c) Higher Secondary

(d) Graduate and above

7. Occupation

(a) House Wife

(b) Government

(C) Private

(d) Pensioner

(e) Unemployed

8. Family Monthly Income(Rupees)

(a) 3000

(b) 3001-5000

(c) 5001-8000

(d) 8001

9. Area of Resistance

(a) Rural

(b) Urban

10. Dietary Pattern

(A) Vegetarian

(b) Non-Vegetarian

(c) Mixed Diet

(SECTION-B) CLINICAL RELATED INFORMATION

1. Type of Diet

- (a) Carbohydrate Rich Diet
- (b) Cholesterol Rich Diet
- (c) Protein Rich Diet
- (d) Mixed Diet

2. History of Chronic Illness

- (A) Yes (B) No

2. (A) If yes, Specify

- (a) Hypertension
- (b) Cardiovascular problems
- (c) Chronic Kidney Disease
- (d) Neurological Problems

3. History of Consuming Any Medication for the chronic illness,

- (a) Yes (b) No

3. (A) If Yes, Specify

4. Duration of Illness (Type 1/Type 2 DM).

- (A) 1-2 Years
- (B) 2-5 Years
- (C) 5-10 Years
- (d) >10 Years

5. The Duration of which she (or) he under Diabetic Medication.

- (a) < 2Years
- (B) 2-5 Years
- (c) 5-10Years
- (d)>10Years

6. Type of Diabetic Medication.

- (a) Life-style modification (Diet and Medication)
- (b) OHA-Oral Hypoglycemic Agent
- (c) Insulin
- (d) Insulin and Oral Hypoglycemic Agent

7. Grade of Diabetic Foot Ulcer

- (a) Grade -0
- (b) Grade -1
- (c) Grade -2
- (d) Grade -3
- (e) Grade -4
- (f) Grade -5

1)வயது (வருடங்களீல்)

அ) 40-49வயதிற்குள்,

ஆ) 50-59வயதிற்குள்

இ) 60-69 வயதிற்குள்

ஈ) 70 வயதிற்குமேல்

2) பாலினம்

அ) ஆண்

ஆ) பெண்

3) திருமணவிவரம்

அ) திருமணம் ஆனவர்

ஆ) திருமணம் ஆகாதவர்

இ) விவாகரத்து ஆனவர்

ஈ) வாழ்க்கை துணை இழந்தவர்

4) மதம்

அ) இந்து

ஆ) முஸ்லிம்

இ) கீருஸ்தவர்

ஈ) பிற மதத்தினர்

5) குடும்பப்பிரிவு

அ)தனிக்குடும்பம்

ஆ)கூட்டுக்குடும்பம்

இ)பிரிந்த குடும்பம்

6) கல்வி தகுதி

அ)படிக்காதவர்

ஆ)ஆரம்ப நிலைக் கல்வி

இ)உயர் நிலை கல்வி

ஈ)பட்டப்படிப்பு

7) வேலையின் தன்மை

அ)இல்லத்தரசி

ஆ)அரசு வேலை

இ)தனியார் வேலை

ஈ)ஓய்வுதியம் பெருபவர்

உ)வேலையில்லாதவர்

8)வருமானம்

அ)ரூபாய் 3000/மாதம்

ஆ)ரூபாய் 3000-5000/மாதம்

இ)ரூபாய் 5000-8000/மாதம்

ஈ)8000 மற்றும் அதற்கு மேல்

9)வசிக்கும் இடம்

அ)கிராமப்புரம்

ஆ)நகர்ப்புரம்

10)உணவின் தன்மை

அ)சைவம்

ஆ)அசைவம்

இ)இரண்டும் கலந்து

SECTION III

WAGNER WOUND ASSESSMENT SCALE


S.NO	CHARECTERISTICS	SCORE
1.	Intact Skin	0
2.	Superficial ulcer of skin or subcutaneous tissue	1
3.	Ulcers extend into tendon, bone, or capsule	2
4.	Deep ulcer with osteomyelitis, or abscess	3
5.	Gangrene of toes or forefoot	4
6.	Midfoot or hind foot gangrene	5

Wagner Classification of Diabetic Foot Ulcer (DFU)

Grade 0

- Preulcer stage
- Skin is intact
- Redness of skin
- Calluses
- Bony deformities

It Can be prevented
It should be reassesd
Annually



GRADE-0 DIABETIC FOOT ULCER

Wagner Classification of DFU

Grade 1

Superficial (shallow)
Ulceration

Should be reassessed
every 3 monthly



GRADE-1 DIABETIC FOOT ULCER

Wagner Classification of DFU

Grade 2

- Deep ulceration
- Visible Tendon, or bone in wound



Aggressive treatment is must

GRADE-2 DIABETIC FOOT ULCER

Wagner Classification of DFU

Grade 3

- Deep Abscesses
- Osteo Myelitis (Infection of Bone)

Chances of losing leg



GRADE-3 DIABETIC FOOT ULCER

Wagner Classification of DFU

Grade 4

Localized gangrene of toes /
forefoot

Needs Amputation
(Cutting) of Toe or
part of foot



GRADE-4 DIABETIC FOOT ULCER



GRADE-5 DIABETIC FOOT ULCER

HEALING STAGES OF DIABETIC FOOT ULCERS

1. More exudating, severely edematous, necrotized wound
2. More exudating, edematous, necrotized wound
3. More exudating, edematous wound
4. Exudating, edematous wound
5. Less exudating, less edematous and less epithelial zed wound
6. More epithelialzed wound

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சி தலைப்பு : சர்க்கரை நோயினால் கால்களில் ஏற்படும் புண்ணை கடுக்காய் பொடி பயன்படுத்தி கட்டுப்போடுவதால் புண் எளிதில் குணமடைகிறது என்பதை குறித்த ஆய்வு.

ஆய்வாளர் பெயர் : ஜெ.ஜெயந்தி

பங்கேற்பாளர் பெயர் :

தேதி :

வயது/பால் :

இடம் : சர்க்கரை நோயாளர் வார்டு, அரசு ராஜிவ் காந்தி பொது மருத்துவமனை, சென்னை.

- ஆய்வாளர் மேற்கொள்ளும் ஆராய்ச்சியில் பங்கேற்க யாருடைய கட்டாயமுமின்றி முழுமனதுடனும் சுயநினைவுடனும் சம்மதிக்கிறேன்.
- ஆய்வாளர் மேற்கொள்ள போகும் பரிசோதனைகளை மிக தெளிவாக விளக்கிக்கூறினார்.
- எனக்கு விருப்பமில்லாத பட்சத்தில் ஆராய்ச்சியிலிருந்து எந்நேரமும் விலகலாம் என்பதையும் ஆய்வாளர் மூலம் அறிந்து கொண்டேன்.
- இந்த ஆராய்ச்சி ஒப்புதல் கடிதத்தில் உள்ள விவரங்களை நன்கு புரிந்துகொண்டேன். எனது உரிமைகள் மற்றும் கடமைகள் ஆராய்ச்சியாளர் மூலம் விளக்கப்பட்டது.
- நான் ஆராய்ச்சியாளருடன் ஒத்துழைக்க சம்மதிக்கிறேன். எனக்கு ஏதேனும் உடல்நலகுறைவு ஏற்பட்டால் ஆராய்ச்சியாளரிடம் தெரிவிப்பேன்.
- நான் வேறு எந்த ஆராய்ச்சியிலும் தற்சமயம் இடம்பெறவில்லை என்பதை தெரிவித்து கொள்கிறேன்.
- இந்த ஆராய்ச்சியின் தகவல்களை வெளியிட சம்மதிக்கிறேன், அப்படி வெளியிடும்போது என் அடையாளம் வெளிவராது என்பதை அறிவேன்.
- எனக்கு இந்த ஒப்புதல் கடிதத்தின் நகல் கொடுக்கப்பட்டது.

.....
ஆய்வாளர் கையொப்பம்

தேதி

.....
பங்கேற்பாளர் கையொப்பம்

தேதி

ஆராய்ச்சி தகவல் தாள்

ஆராய்ச்சி தலைப்பு : சர்க்கரை நோயினால் கால்களில் ஏற்படும் புண்ணை கடுக்காய் பொடி பயன்படுத்தி கட்டுப்போடுவதால் புண் எளிதில் குணமடைகிறது என்பதை குறித்த ஆய்வு.

ஆய்வாளர் பெயர் : ஜெ.ஜெயந்தி

பங்கேற்பாளர் பெயர் :

தேதி :

வயது/பால் :

ஆய்வாளர் மேற்கொள்ளும் ஆராய்ச்சியில் பங்கேற்க யாருடைய கட்டாயமுமின்றி முழுமனதுடனும் சம்மதிக்கலாம். இதில் பங்கேற்பதன் நோக்கம். இந்த ஆராய்ச்சியில் தகவல்களை தெரிந்து கொள்வதற்காகவும். அதனை பயன்படுத்துவதற்காக மட்டும் தான்.

இந்த ஆராய்ச்சியின் நோக்கம், சர்க்கரை நோயினால் கால்களில் ஏற்படும் புண்ணை கடுக்காய் பொடி பயன்படுத்தி கட்டுப்போடுவதால் புண் எளிதில் குணமடைகிறது என்பதை குறித்த அறிவை சர்க்கரை நோயாளிகளுக்கு உண்டாக்குவது.

ஆராய்ச்சி மேற்கொள்ளும் முறை

இந்த ஆராய்ச்சியில் தயார் செய்த கேள்வி மூலம், சர்க்கரை நோயாளிகளுக்கு கடுக்காய் பொடி பயன்படுத்தி கட்டுப்போடுவதால் புண் எளிதில் குணமடைகிறது என்பதை கற்றுதருவதற்கு முன்பு மற்றும் பின்பு அவருடைய அறிவுதிறன் மேம்படுவதை அறியலாம்.

இதனால் ஆய்வாளருக்கான பயன்

இதனால் பங்கேற்பாளருக்கான பயன்

இந்த ஆய்வு, சர்க்கரை நோயினால் கால்களில் ஏற்படும் புண்ணால் ஏற்படும் பின்விளைவுகளை தவிர்க்க, அவரின் அறிவு திறனை மேம்படுத்துகிறது.

ஆராய்ச்சியில் பங்கேற்கவில்லை என்றாலும், உங்களின் சராசரி வாழ்கைமுறை, மருத்துவரின் ஆலோசனை மற்றும் சிகிச்சை முறையில் எந்த வித மாற்றமும் ஏற்படாது என்பதை தெரிவிக்கிறேன்.

இந்த ஆராய்ச்சியில் பங்கேற்க விருப்பம் இல்லை என்றால் உங்களின் முழுமனதுடன் நீங்கள் இந்த ஆராய்ச்சியில் இருந்து விலகி கொள்ளலாம் என்பதை தெரிவிக்கிறேன். இந்த ஆராய்ச்சியில் உங்களின் மருத்துவதகவல்களை பாதுகாப்பாக வைத்துக்கொள்கிறேன் என்பதை தெரிவிக்கிறேன். இந்த ஆராய்ச்சியின் தகவல்களை வெளியிடும் போது, உங்களை பற்றிய அடையாளங்கள் வெளிவராது என்பதை உறுதி கூறுகிறேன்.

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ஆய்வாளர் கையொப்பம்

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பங்கேற்பாளர் கையொப்பம்

தேதி

தேதி

PATIENT CONSENT FORM

TITLE: A Study to assess the effectiveness of Yellow Myrobalan (Kadukkai) powder dressing on wound healing in clients with diabetic foot ulcer in selected wards, at Rajiv Gandhi Government General hospital, Chennai.

Name of the Participants :
Date :
Age/Sex :
Name Of The Investigator : **Mrs.J.Jayanthi**
Name Of The Institution : Rajiv Gandhi Government General Hospital,
Chennai.
Enrollment no :

Documentation of the informed consent:

- ❖ I have read/it has been Read for me, the information in this form. I was free to ask any questions and they have been answered am over 18 years of age and exercising my free power of choice, hereby give my consent to be included as a participant in the study.
- ❖ I have read and understood the consent form and the information provided to me.
- ❖ I had the consent document explained in detail to me
- ❖ The investigator has been explained about the nature of the study.
- ❖ My rights and responsibilities have been explained to me by the Investigator.
- ❖ I agree to co-operate with the investigator and I will inform to her immediately if I suffer from any unusual symptoms.
- ❖ I am aware of the fact that I can opt out of the study at anytime without having to give any reason and this will not affect my Future treatment in this hospital.
- ❖ I hereby give permission to the investigators to release the Information obtained from me as a result of participants in this study to the regulatory authorities, Government agencies and Institutional Ethics Committee. I understand that they are publicly presented.
- ❖ My identity will be kept confidential if my data are publicly presented.
- ❖ I am aware that if I have question during this study, I should Contact the concerned investigators.

.....

.....

Signature of the Investigator

Signature of the Participant

Date

Date

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No. 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Mrs.J.Jayanthi
M.Sc., (Nursing)
College of Nursing
Madras Medical College
Chennai - 600 003.

Dear Mrs.J.Jayanthi,

The Institutional Ethics Committee has considered your request and approved your study titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF [KADUKKAI] YELLOW MYROBALAN POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVT.GENERAL HOSPITAL,CHENNAI". No.01102014.**

The following members of Ethics Committee were present in the meeting held on 21.10.2014 conducted at Madras Medical College, Chennai-3.

- | | |
|---|----------------------|
| 1. Dr.C.Rajendran, M.D., | : Chairperson |
| 2. Dr.R.Vimala, M.D., Dean, MMC, Ch-3 | : Deputy Chairperson |
| 3. Prof.B.Kalaiselvi, M.D., Vice-Principal, MMC, Ch-3 | : Member Secretary |
| 4. Prof.R.Nandhini, M.D., Inst.of Pharmacology, MMC | : Member |
| 5. Prof.K.Ramadevi, Director i/c, Inst.of Biochemistry, MMC | : Member |
| 6. Prof.Saraswathy, M.D., Director, Pathology, MMC, Ch-3 | : Member |
| 7. Prof.S.G.Sivachidambaram, M.D., Director i/c, Inst.of Internal Medicine, MMC | : Member |
| 8. Dr.Raghumani, M.S., Professor of Surgery, MMC | : Member |
| 9. Thiru S.Rameshkumar, Administrative Officer | : Lay Person |
| 10. Thiru S.Govindasamy, B.A., B.L., | : Lawyer |
| 11. Tmt.Arnold Saulina, M.A., MSW., | : Social Scientist |

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


Member Secretary, Ethics Committee

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that a tool prepared by **Ms. J.Jayanthi**, studying M.Sc.Nursing II year, College of Nursing, Madras Medical College, undertaking a research study on “**A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI**”.-03 has been validated by me and is found to be valid up to date and she can proceed with this tool to conduct the main study.

Name : *Dr. P. Satheswaran*

Designation : *Director + Prof*

Date : *16/7/2015*

Place : *CHENNAI-3.*

[Signature]
16/7/2015
SIGNATURE WITH SEAL
Director and Professor
Institute of Diabetology
Madras Medical College,
Rajiv Gandhi Government General Hospital
Chennai - 600 003

CERTIFICATE FOR CONTENT VALIDITY

This is to certify that tool prepared by **Ms. J.Jayanthi**, studying M.Sc.Nursing II year ,College of Nursing, Madras Medical College, undertaking a research study on

“ A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI”.-03” has been validated by me and is found to be valid upto date and she can proceed with this tool to conduct the main study has been validated by me and is found to be valid upto date and she can proceed with this tool to conduct the main study.

Signature :

Name : DR. TAMILARASI . B

Designation : PRINCIPAL

Date : 15.07.2015

Place : CHENNAI

Seal :




PRINCIPAL
MADHA COLLEGE OF NURSING
MADHA NAGAR, KUNDRATHUR,
CHENNAI - 600 069
PHONE : 24780736

From

Ms. J.Jayanthi
M.Sc(Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The Dean,
Madras Medical College
Chennai -3.

Through Proper Channel,

Respected Sir/Madam,

Sub: Requesting Permission to conduct a research study-reg

I, **Ms. J.Jayanthi**, studying M.Sc.Nursing II year ,College of Nursing, Madras Medical College, request you to kindly grant me permission for the study proposed to conduct on the topic“ **A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI**”. to fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

Thanking you,

Date: **09.07.2015**

Place: **Chennai-03.**

Yours sincerely,

J. Jayanthi
(J.Jayanthi)

*Propn 12
By
01/07/15
Forwarded
Del:
01/07/15*

14/7/15

PERMISSION LETTER

From

Ms. J.Jayanthi
M.Sc (Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The Director,
Institute of General Surgery,
Rajiv Gandhi Government General Hospital
Chennai -3.

Through Proper Channel,
Respected Sir/Madam,

Sub: Requesting Permission to conduct a Research study-reg

I, **Ms. J.Jayanthi** , studying M.Sc.Nursing II year ,College of nursing, Madras Medical college, request you to kindly grant me permission for the study proposed to conduct on the topic “ **A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI**”. To fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

Thanking you,

Date: 09.07.2015

Place: Chennai-03.

Yours sincerely,

J. Jayanthi
(Ms. J.Jayanthi)

Permit to inform list of pts in concerned & concern unit chief on a many basis
Ph
09.07.15

Dr. P. RAGUMANI, M.S
DIRECTOR
Institute of General Surgery
Madras Medical College
CHENNAI-600 003

*Permit
J.J
01.07.15*
*Forwarded
J.J
01/07/15*

PERMISSION LETTER

From

Ms. J.Jayanthi
M.Sc (Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The The HOD & PROFESSOR, (S4 Unit)
Institute of General Surgery,
Rajiv Gandhi Government General Hospital,
Chennai -3.

Through Proper Channel,

Respected Sir/Madam,

Sub: Requesting Permission to conduct a Research study-reg

I, **Ms. J.Jayanthi** , studying M.Sc.Nursing II year ,College of nursing, Madras Medical college, request you to kindly grant me permission for the study proposed to conduct on the topic “ **A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI**”. To fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

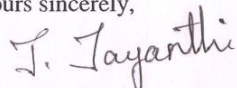
Thanking you,

Date: 27/07/15

Place: Chennai

Siv  28/7/15

Yours sincerely,


(Ms. J.Jayanthi)

PERMISSION LETTER

From

Ms. J.Jayanthi
M.Sc (Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The Director,
Institute of Diabetology
Rajiv Gandhi Government General Hospital
Chennai -3.

Through Proper Channel,
Respected Sir/Madam,

Sub: Requesting Permission to conduct a Research study-reg

I, **Ms. J.Jayanthi** , studying M.Sc.Nursing II year ,College of nursing, Madras Medical college, request you to kindly grant me permission for the study proposed to conduct on the topic “ **A STUDY TO ASSESS THE EFFECTIVENESS OF YELLOW MYROBALAN (KADUKKAI) POWDER DRESSING ON WOUND HEALING IN PATIENTS WITH DIABETIC FOOT ULCER IN SELECTED WARDS AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI**”. to fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

Thanking you,

Yours sincerely,

J. Jayanthi
(Ms. J.Jayanthi)

Date: 01.07.2015

Place: Chennai '03.

7/7/15 Please put in after
Dean/IC appnt

[Signature]
Director and Professor,
Institute of Diabetology,
Madras Medical College,
Rajiv Gandhi Government General Hospital
Chennai - 600 003

Pamela
01.07.15

Forwarded
J.J.
01/07/15