

**A STUDY TO ASSESS THE EFFECTIVENESS OF DRUMSTICK
LEAVES POWDER ON BLOOD GLUCOSE LEVELS
AMONG CLIENTS WITH HYPERGLYCEMIA
IN SELECTED COMMUNITY AT TRICHY.**

**By
K. ANU**



**A dissertation submitted to
THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI.
In partial fulfillment of the requirement for the Degree of
Master of Science in Nursing**

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AT TRICHY**

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**A DISSERTATION SUBMITTED TO
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G.	Certificates for validity <ul style="list-style-type: none"><li data-bbox="646 793 873 825">❖ Questionnaire<ul style="list-style-type: none"><li data-bbox="732 846 979 877">• Tool in English

ABSTRACT

A study to assess the effectiveness of drumstick leaves powder on reduction of blood glucose levels among clients with hyperglycemia in selected community at Trichy.

This study was aimed to assess the effectiveness of drumstick leaves powder on reduction of blood glucose levels among clients with hyperglycemia in selected community at Trichy.

The study was an evaluative approach. This study made use of Quasi experimental non equivalent pretest and post test control group design. Conceptual frame work adopted in the study was the Rosenstoch's (1974) Becker and Maiman's Health belief model (1975). A total of 60 samples out of which 30 samples for experimental group and 30 for control group were selected by purposive sampling technique who fulfilled the inclusion criteria. Pre test was done for both experimental and control group. Blood glucose was assessed by electronic glucometer. Drumstick leaves powder was given to the experimental group twice daily for 30 consecutive days under the supervision of investigator. Post test was done for experimental and control group using the same instrument.

The data were analyzed using descriptive and inferential statistics. The independent 't' value of blood glucose was 3.038. Which was significant at $P < 0.05$ levels. This showed that there is a significant reduction in the levels of blood glucose in experimental group.

The study findings revealed that there was no significant association between post test levels of blood glucose scores among hyperglycemic clients with their selected demographic variables.

The above study findings revealed that drumstick leaves powder was helpful in reducing the blood glucose among hyperglycemic clients.

CHAPTER - I

INTRODUCTION

**“It is health that is real wealth
And not pieces of gold and silver.”**

- Mahatma Gandhi

BACKGROUND OF THE STUDY

WHO., (2004), States that Health is a state of physical, mental and social wellbeing and not merely the absence of disease or infirmity.

Tortora., (2008), states that Metabolism is a chemical process that occurs within a living organism in order to maintain life. Our body is are very sensitive to errors in metabolism. A metabolic disorder occur when the metabolism process fails and causes the body to have either too much or too little of the essential substances needed to stay healthy.

Metabolic disorders can take many forms, there are, Disease in the liver, pancreas, endocrine glands or other organs involved in metabolism and nutritional deficiencies. Hyperglycemia is a elevated blood glucose level. In postprandial level greater than 140 mg/dl. The risk factors of hyperglycemia includes, obesity, sedentary life style, increasing age and genetic. The causes of hyperglycemia are, Eat too many grams of carbohydrates for the amount of insulin you took, or eat too many carbs in general, infection, stress, Become inactive or exercise less than usual, physical activity, especially when your blood sugar levels are high and insulin levels are low

Joyce M.Black., (2008), States that The symptoms of hyperglycemia are Increased thirst, Headaches, Trouble concentrating, Blurred vision, Frequent peeing, Fatigue (weak, tired feeling), Weight loss, Blood sugar more than 140 mg/dL.

Brunner & Suddarth's., (2011), States that Treatment of hyperglycemia requires elimination of the cause, hyperglycemia can be treated with lifestyle modification, Drink more water, Exercise, Change your eating habits.

Lewis., (2009), states that, Nutrition, meal planning, weight control and decreased activity are the foundation of hyperglycemia.

Brunner and suddarth's (2014) states that, the meal plan must consider the patient's food preferences, lifestyle, usual eating times, and ethnic and cultural back ground.

Francis Maria (2014) states that, Drumstick leaves is a natural medicine for a hyperglycemia anti-oxidant and anti-inflammatory properties of drumstick help to control the blood sugar levels and also the drumstick leaf increases satiety and slows the breakdown of food.

Drumstick leaves is used for treating hyperglycemia. It contains about 73% of mono unsaturated oil that has the ability to regulate blood sugar levels and as a result can reduce the harmful built up of sugar in the blood. In addition drumstick leaves also have a stabilizing effect on blood pressure and control of glucose levels. It has been naturally boost the immune system which usually becomes compromised in those who suffer hyperglycemia.

Hyperglycemia often causes circulatory problems which can be managed through anti inflammatory supplements and Drumstick leaves have more than 36 natural anti inflammatory components.

NEED FOR THE STUDY

Diabetes is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease. In 2000, India (31.7 million) topped the world with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place respectively. According to Wild et al. the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India.

It is predicted that by 2030 diabetes mellitus may afflict up to 79.4 million individuals in India, while China (42.3 million) and the United States (30.3 million) will also see significant increases in those affected by the disease. India currently faces an uncertain future in relation to the potential burden that diabetes may impose upon the country. Many influences affect the prevalence of disease throughout a country, and identification of those factors is necessary to facilitate change when facing health challenges.

Indian Council of Medical research (ICMR) revealed that a lower proportion of the population is affected in states of Northern India (Chandigarh 0.12 million, Jharkhand 0.96 million)

Tran quang binh ET, al, (2012) the national urban survey conducted the metropolitan cities of India, it was reported that in Kolkata 11.7 percentage of people are affected. In Maharashtra 9.2 million peoples are affected by hyperglycemia.

Riyaz Ahmad bhat (2015),6.1 per cent in Kashmir Valley (Northern India), 11.6 per cent in New Delhi (Northern India), and 9.3 per cent in West India (Mumbai). The mean age of both the men and women was 37 years.

Ashton Acton (2011), states that, prevalence rate is 16.6% in Hyderabad (south India), 12.4 per cent in Bangalore (South India), Tamil Nadu 4.8 million and 13.5 per cent in Chennai (South India).

The investigator during her community posting she found that most of the client suffer from the symptoms of hyperglycemia. This motivates the investigator to conduct this study regarding the effect of drumstick leaves powder on blood sugar levels. Drumstick leaves which is used cost effective and easy accessible.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of drumstick leaves Powder on blood glucose levels among clients with hyperglycemia in selected community at Trichy.

OBJECTIVES

1. To assess the pre test and post test level of blood glucose among clients with hyperglycemia in experimental and control group.
2. To compare the pre test and post test level of blood glucose among clients with hyperglycemia in experimental group and control group.
3. To compare the post test level of blood glucose among clients with hyperglycemia between experimental and control group.
4. To find the association between the post test level of blood glucose among clients with hyperglycemia with their selected demographic variables in experimental group.

HYPOTHESIS

H₁: There will be a significant difference between pre test and post test levels of blood glucose among clients with hyperglycemia

H₂: There will be a significant difference between the post test levels of blood glucose among clients with hyperglycemia in experimental and control group.

H₃: There will be a significant association between the post test levels of blood glucose among clients with hyperglycemia with their selected demographic variables.

Operational definition

Effectiveness

Sones.C, (2001), It means producing an intended result.

In this study effectiveness refers the effect on blood glucose as determined by the significant difference in pre and post test scores among hyperglycemia clients using statistical measurements.

DRUMSTICK LEAVES POWDER

Umesh Rudrappa., (2002), Drumstick leaves is an herbaceous plant grown for its nutritious leafy greens, flower buds and mineral rich green pods. It is the richest source of vitamin A; 100gm of fresh leaves 7563IU or 252 percentage of daily require levels. It is excellent source of vitamin C 100g of pods contain 145 microgram or 235% of daily require levels of vitamin C and 50 types of anti oxidant, other minerals such as calcium, iron, copper, manganese, zinc, selenium and magnesium.

In this study it refers to the drumstick leaves that are taken from the plant, dried in the shade and powder which is mixed with warm water and given twice a day.

HYPERGLYCEMIA

American Diabetes Association., (2004), an excess of glucose in the bloodstream that is above 140 mg/dl.

In this study it refers to newly diagnosed clients with increased blood glucose.

ASSUMPTION

- Drumstick leaves powder would be effective in reducing the blood glucose level.
- Nurses play a vital role in the administration of drumstick leaves powder for hyperglycemic clients.
- Complication of hyperglycemia is preventable.

DELIMITATIONS

The study is delimited to,

- The sample size was limited to 60 hyperglycemic clients.
- The period of Data collection was 5 weeks.

PROJECTED OUTCOME

Drumstick leaves is one of the best known medicinal plant. The drumstick plant to been consumed by humans. One serving of these leaves in powdered form contains almost 50 types of anti oxidant and 90 different nutrients continuous consumption of drumstick leaves treats huge number of health problem. It is easily available and accessible source for all kinds of people. It is also one of the treatment of hyperglycemia and effective home remedy for hyperglycemia.

The study will help to evaluate the effectiveness of drumstick leaves powder on post prandial levels of blood glucose among clients with hyperglycemia.

The finding of the study will help the nurse to understand the effectiveness of drumstick leaves powder controlling post prandial blood glucose levels in clients with hyperglycemia in hospital and community setup.

CHAPTER - II

REVIEW OF LITERATURE

A literature review involves the systematic identification, location, scrutiny and summary of written materials that contain information on a research problem.

PART I

Section A: Studies related to prevalence of hyperglycaemia.

Section B: Studies related to usefulness of drumstick leaves.

Section C: Studies related to effectiveness of drumstick leaves on Hyperglycaemia.

SECTION A: STUDIES RELATED TO HYPERGLYCAEMIA

Chiu-shong Liu (2014), et al, occupation noise and the prevalence of hyperglycaemia conducted study regarding. This cross-sectional study aimed to investigate the association between occupational noise exposure and the prevalence of hyperglycaemia among workers. The prevalence of hyperglycaemia among high-exposure, median-exposure, low-exposure and office workers were 10.2%, 13.2%, 11.3% and 9.9%, respectively. After controlled for age, sex, education level, body mass index, cigarette smoking, alcohol drinking and regular exercise, the odds ratio of hyperglycaemia between the high-exposure and office workers was 3.96 (95% confidence interval = 0.83–18.83), which had a marginal difference ($p = 0.08$).

Zhonghua Liu Xing Bing sue za zhi (2014), study conducted regarding study on the secular changes of bmi, prevalence rates of overweight, obesity and related factors in an urban elderly population. A two-round population-based cross-sectional study was conducted in an elderly population. The prevalence rates of overweight and obesity were both significantly declined in women, but not in men. The age standardized prevalence rates on overweight

(BMI \geq 24 kg/m²) were 47.9% in men and 44.9% in women in 2001, and were 47.2% and 41.0% respectively for men and women in 2010; the age-standardized prevalence rates of obesity (BMI \geq 28 kg/m²) were 19.2% in men and 24.2% in women in 2001, both significantly declined to 15.5% and 18.0% in 2010, respectively. Positive correlations were found between the levels of blood pressure, glucose lipids and BMI.

Alvarez I c, et, al, (2013), metabolic response to high intensity exercise training in sedentary hyperglycaemic and hypercholesterolemia women. Forty six sedentary women with a body mass index (BMI) over 25kg/m² were assigned to four groups, according to their metabolic profile. BMI and waist circumference decreased significantly after 12 weeks of intervention. Similarly, glucose decreased significantly after 12 weeks of intervention in all groups. The reduction was of higher magnitude in those groups with hyperglycaemia (H = -16%, HH = -22%, N = -7, 5%, NH = -9, 6%). However, lipid profile (TG, total cholesterol, LDL and HDL) improved significantly only in the hypercholesterolemia groups. Physical activity programs incorporating high intensity training can improve glucose and lipid profile in women with metabolic disorders. Moreover, this benefit is greatest in those individuals with highest metabolic burden.

Perez a, et, al, (2012), study conducted regarding relationship between the degree of hyperglycaemia control and diabetes characteristics and hyperglycaemia treatment in type 2 diabetes. Cross-sectional epidemiological study was conducted in Spain with consecutive sampling. We analyzed data from 6,801 clients enrolled by 734 specialist and 965 primary care physicians: 97.8% received pharmacological treatment (30.3% monotherapy, 51, 4% dual therapy, 16.1% triple therapy and 26.6% insulin). HbA (1c) was 7.3 (1.2) % and 40.4% of clients had HbA (1c) <7.0%. In the multivariate analysis, insulin therapy (odds ratio [OR] 0.329; IC (95%) 0,267-0,405) and the presence of components of metabolic syndrome (hypertriglyceridemia and/or low HDL

and/or abdominal obesity (OR 0.728; IC (95%) 0,595- 0,890) were associated with poor glycaemic control.

Chaowai fu, et, al, (2011), conducted study regarding high prevalence of hyperglycaemia and the impact of household income transforming rural china. A cross-sectional study was carried out in 4 rural communities of East China in 2006-07. The crude prevalence of IFG and DM were 5.4% and 2.2%, respectively. The crude hyperglycaemic proportion increased significantly over age from 2.8% in the 18-24 year group to 11.1% in the 55-64 year group ($\chi_{\text{trend}}^2 = 43.18$, $p < 0.001$) with no significant difference between men and women ($\chi^2 = 3.30$, $p = 0.192$). After adjustment for covariates including age (continuous), sex, BMI (continuous), smoking, alcohol drinking, and regular leisure physical activity, subjects in the high house hold income group had a significantly higher risk of IFG compared with the medium household income group (OR: 1.74, 95% CI: 1.11-2.72) and no significant difference in IFG was observed between the low and medium household income groups. Education and farmer occupation were not significantly associated with IFG.

Albert Barceló, et, al. (2007) conducted a study regarding prevalence of diabetes and intermediate hyperglycaemia among adults from the first multinational study of Non communicable disease in six Central American countries. Survey was a cross-sectional survey based on a probabilistic sample of the non institutionalized population of five Central American populations conducted between 2003 and 2006. The total sample population was 10,822, of whom 7,234 (67%) underwent anthropometry measurement and a fasting blood glucose or 2-h oral glucose tolerance test. The total prevalence of diabetes was 8.5%, but was higher in Belize (12.9%) and lower in Honduras (5.4%). Of the screened population, 18.6% had impaired glucose tolerance impaired in fasting glucose.

Salvador Villalpando, et al, (2007), conducted study regarding body mass index associated with hyperglycaemia and alterations of components of metabolic syndrome in Mexican adolescents. Data for this analysis was obtained from the Mexican Health Survey (MHS) (2000). It was also higher for females with a history of DM2 (RP=1.12, p<0.02), but not for males. The percentage of being in quintile 5 for insulin distribution was significantly higher for obese males (RP=3.51, p<0.001) and females (RP=3.3, p<0.001) than for non-obese counterparts. It was also higher for male (RP=1.28, p<0.02) and female (RP=1.27, p<0.02) subjects with a history of DM2. Finally, the Percentage for being in quintile 5 for TG distribution was significantly higher for obese males (RP=4.71, p<0.001) and females (RP=1.75, p<0.001) than for their non-obese counterparts.

Deborah Jeweller (2006), et al, conducted study regarding the prevalence of hyper-and hypoglycaemia among in clients with diabetes. survey of a broad cross section of 44 academic and community hospitals revealed that among 999 in clients with diabetes, marked, persistent hyperglycaemia was very common and often treated by sliding-scale regimens alone, while severe hypoglycaemia was rare. Cohort was experiencing at least one episode of glucose <60 mg/dl. Severe hypoglycaemia (<40 mg/dl) and recurrent hypoglycaemia (<60 mg/dl for 3 days) occurred in <5% of clients in both cohorts. Hypoglycaemia was more common in clients with more severe diabetes and in the subset of clients treated with basal insulin.

Tian n, ying x, jiang (2005), conducted study regarding the prevalence of hyperglycaemia and related factors among rural adults aged 35 years old and above in yuhuan country, Zhejiang province. A cross-sectional study was carried out as a baseline study of rural yuhuan health population cohort in all communities in yuhuan country, china. Among 118 274 eligible subjects, the average fasting glucose was (5.4 ± 1.8) mmol/ L and the average for men was higher than that for women. The crude prevalence of diabetes, impaired fasting

glucose and hyperglycaemia were 10.1%, 19.4% and 29.5% (the age and sex standardized one was 9.3%, 19.8% and 29.1%), respectively. There were significant gender differences in both the average level of fasting glucose and the prevalence of hyperglycaemia ($P < 0.001$).

SECTION B: STUDIES RELATED TO USEFULNESS OF DRUMSTICK LEAVES:

Stohs, Hartman (2015), States that review of the safety and efficacy of moringa olifera conducted study regarding. Moringa olifera leaves, seeds, bark, roots, sap, and flowers are widely used in traditional medicine, and the leaves and immature seed pods are used as food products in human nutrition. Leaf extracts exhibit the greatest antioxidant activity, and various safety studies in animals involving aqueous leaf extracts indicate a high degree of safety. No adverse effects were reported in association with human studies. Moringa olifera have been published, which have demonstrated anti-hyperglycaemic (anti diabetic) and anti-dyslipidemia activities, the results of published studies to date involving M.olifera are very promising. Additional human studies using standardized extracts are highly desirable.

Abdull razis AF, Ibrahim md, Kntayya sb (2014), health benefits of moringa olifera conducted study regarding. Moringa olifera is a multi-purpose herbal plant used as human food and an alternative for medicinal purposes worldwide. It has been identified by researchers as a plant with numerous health benefits including nutritional and medicinal advantages. Moringa olifera contains essential amino acids, carotenoids in leaves, and components with nutraceutical properties, supporting the idea of using this plant as a nutritional supplement or constituent in food preparation. Moringa olifera is its very wide range of vital antioxidants, antibiotics and nutrients including vitamins and minerals. Almost all parts from Moringa can be used as a source for nutrition with other useful values. This mini-review elaborates on details its health benefits.

Vanisha S Nambiar, Shilpa Parnami, Parul Guin, (2010), conducted study regarding effect of drumstick leaves supplementation on haematological indices of young girls (16-21years). To determine the effect of DL and vitamin C supplementation on haematological indicates the young girls (16-21 years). There was a positive change observed in red cell morphology (normocytic normochromic) in Group A (18%) and B (2.6%) respectively. Similar results were seen for RBC, MCV and MCHC. Group B which received drumstick leaves showed small positive change in MCH showing a causal association between VA and iron metabolism.

Saeedeh arabshahi-delouee, mehranaalami, asna urooj (2009), study conducted regarding drumstick (*moringa olifera*) leaves: a potential source of natural lipid antioxidants. Antioxidant activity of methanolic extract of drumstick leaves (200, 500 and 1,000 ppm) in soybean oil was assessed by an accelerated oxidation test (70C, 10 days) and a heating test (180C, 1 h). Results of this study revealed high thermal stability of antioxidant components of drumstick extract and the antioxidant potential of the extract in inhibiting lipid peroxidation of soybean oil. Thus, the extract of drumstick leaves is recommended as an alternative source of natural antioxidants.

Anwar f, Latif S, Ashra M, (2007), *Moringa olifera*: a food plant with multiple medicinal uses conducted study regarding. *M. olifera* is very important for its medicinal value. Various parts of this plant such as the leaves, roots, seed, bark, fruit, flowers and immature pods act as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, anti-inflammatory, antiulcer, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, anti-diabetic, hepato-protective, antibacterial and antifungal activities, and are being employed for the treatment of different ailments in the indigenous system of medicine, particularly in South Asia. This review focuses on the detailed phytochemical composition, medicinal uses, along with pharmacological properties of different parts of this multipurpose tree

Anwarul Hassan Gilani (2006), conducted a study on *Moringa olifera*- A food plant with multiple medicinal uses. It has an impressive range of medicinal uses with high nutritional value. Different parts of this plant contain a profile of important minerals, and are a good source of protein, vitamins, β -carotene, amino acids and various phenolics. Various parts of this plant such as the leaves, roots, seed, bark, fruit, flowers and immature pods act as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, anti-inflammatory, antiulcer, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, anti hyperglycaemic, anti diabetic, hepato protective, antibacterial and antifungal activities, and are being employed for the treatment of different ailments in the indigenous system of medicine, particularly in South Asia.

Perumal Siddhuraju (2003), reported that Antioxidant Properties of Various Solvent Extracts of Total Phenolics Constituents from Three Different Agro climatic Origins of Drumstick Tree Leaves Water, aqueous methanol, and aqueous ethanol extracts of freeze-dried leaves of *Moringa olifera* Lam. Nonetheless, increasing concentration of all the extracts had significantly ($P < 0.05$) increased reducing power, which may in part be responsible for their antioxidant activity. On the basis of the results obtained, moringa leaves are found to be a potential source of natural antioxidants due to their marked antioxidant activity. This is the first report on the antioxidant properties of the extracts from freeze-dried moringa leaves. Overall, both methanol (80%) and ethanol (70%) were found to be the best solvents for the extraction of antioxidant compounds from moringa leaves.

SECTION C: STUDIES RELATED TO DRUMSTICK LEAVES EFFECT ON BLOOD GLUCOSE:

Rajathi.A (2015), conducted a study on Effectiveness of Drumstick leaves extract to reducing Blood Glucose level among Hyperglycemic Clients. The aim of this study to assess the pre test fasting and postprandial blood

glucose level among increased blood glucose samples before and after consumption of drumstick leaves. Quantitative approach, pre –experimental design was adopted for this study. 30 mothers who's suffering with Hyperglycemia and who fulfils inclusion criteria are selected by using convenient sampling method. The study shows the effectiveness of drumstick leaves on glucose level with the p value ($p < 0.05$).

Francis Maria (2013), conducted study regarding effectiveness of drumstick leaves in reducing the blood glucose level among increased blood glucose samples. The purposive sampling technique was used. A pre-experimental research approach with one group pre test and post test design was used. The study findings revealed that the drumstick leaves were effective in reducing the increased blood glucose levels with the mean score of pre - test blood glucose level in fasting was $144 + 23.19$ and the post test, mean blood glucose level was $130.26+19.52$. The mean score of pre test post prandial blood glucose level was $180.10 + 27.52(p<0.05)$ and post test mean blood glucose was $162.63+37.97(p<0.05)$.

Majambu Mbikay (2012), conducted study regarding therapeutic potential of moringa olifera leaves in chronic hyperglycaemia and dyslipidemia. Phytochemical analyses have shown that its leaves are particularly rich in potassium, calcium, phosphorous, iron, vitamins A and D, essential amino acids, as well as such known antioxidants such as β -carotene, vitamin C, and flavonoids. The experimental group consumed a daily total of 4.6g of dehydrated M. Olifera leaves, as four 550-mg tablets twice daily, for 50days. Compared to the control group, the experimental group experienced a 1.6% fall in plasma TC ($P<0.05$) and a 6.3% increase of HDL-C, However, relative to baseline, final non-HDL-C and TC/HDL-C values decreased by 3.7 and 6.6%, respectively ($P<0.001$), indicating that the treatment induced a lesser atherogenic lipid profile.

Veeranam arun giridhari, malathi, K.geetha, (2011), study was conducted regarding anti hyperglycaemia property of drumstick (*moringa olifera*) leaf tablets. The results showed that post prandial blood glucose of experimental group initially was 210 mg/dl and it reduced to 191, 174 and 150 mg/dl respectively after the first, second and third month of supplementation. In control group post prandial blood glucose level was reduced to 169, 167, 163 mg/dl respectively, after first, second and third month of study from the initial value of 179 mg/dl. The results indicated that drum stick leaves are suitable source of green leafy vegetable to reduce the hyperglycaemia complications in hyperglycaemia clients.

T.a.oyedepo (2004), et al, study conducted regarding The purpose of this study is to evaluate the effect of aqueous leaf extract of *Moringa olifera* (Moringaceae) on plasma glucose level, total cholesterol level, triglycerides (TG), high-density lipoprotein (HDL) and low-density lipoprotein (LDL). Experimental method and random sampling technique was adopted for this study. The result showed significant increases ($P<0.05$) in plasma cholesterol, TG and LDL level of the hyperglycaemia control group when compared with the normal control group while there were no significant differences in the *Moringa olifera*-treated hyperglycaemia group and the normal control group. Oral administration of aqueous leaf extract of *Moringa olifera* may reduce the plasma lipid imbalances associated with hyperglycaemia.

Michel ples Howell ho (2000), study conducted regarding comparative effect of *moringa olifera* lam tea and hyperglycaemic clients. Baseline measurements of fasting blood sugar levels showed a low of 76 mg/dl and a high of 222 mg/dl for the 43 respondents. For the hyperglycaemic group, there was a drop in blood sugar readings ($z=-2.976$, $p<.01$), and this was highly significant. The mean value of the initial blood sugar measurements was 108.11mg/dl. After taking tea, the blood sugar level was changed for both

groups. Generally, the blood sugar level was lower with mean value of 102.62 mg/dl for the 43 respondents. A comparison of the change in blood sugar levels for the normal and the hyperglycaemic group showed a significant difference, indicating a greater change for the hyperglycaemic group ($F=16.22$, $p<0.001$).

CONCEPTUAL FRAMEWORK

Conceptual framework is a process of ideas which are formed and utilized for the development of a research design. It helps the researcher to know what data needs to be collected and gives directions to an entire research process.

The conceptual framework of the present study was based on modified Rosenstoch's (1974) Becker and Maiman's Health belief model (1975). This model addresses the relationship between a person's belief and behavior through three components, individual perception, modifying factors and likelihood of action.

The framework was selected for the present study as it provides a way of understanding and predicting how the drumstick leaves powder helps in reducing the blood glucose level. The three components of the model incorporated into the study as follows.

Individual perception of susceptibility to an illness

It implies the feelings of an individual about a disease. In the present study it implies the hyperglycemic client perception of their susceptibility to develop complication of hyperglycemia.

Individual perception of the seriousness of an illness

It describes how an individual perception is influenced and modified by using demographic variables, level of knowledge regarding hyperglycemia and level of satisfaction of drumstick leaves powder to the hyperglycemic clients.

Likelihood action

It depends on the perceived benefits of the preventive action minus the perceived barriers to the preventive action, which include control of blood sugar level within normal limits by the administration drumstick leaves leaf powder and life style changes. Hyperglycemic client take certain measures to reduce barriers like minimizing inconvenience and discomfort. The study ensures that the client have adequately perceived the benefits of drumstick leaves powder in reducing the blood glucose level.

CHAPTER - III

METHODOLOGY

In this chapter methodology includes research approach, research design, setting of the study, population, sample, criteria for sample collection, sample size and sampling procedure, instrument and scoring procedure, validity, method of data collection and plan of data analysis.

RESEARCH APPROACH

An evaluative approach was used to conduct the study.

RESEARCH DESIGN

The research design selected for this study is quasi experimental non equivalent pre test and post test control group design which is represented below.

GROUPS	PRE TEST	INTERVENTION	POST TEST
Experimental group	O ₁	X	O ₂
Control group	O ₃	-	O ₄

The symbols used:

- O₁ & O₃ - Collection of demographic data, pre test to assess the level of Blood Glucose among clients with Hyperglycemia in experimental and control group.
- X - Provide drumstick leaves powder to a group of clients with Hyperglycemia daily in the morning and evening for 30 days.
- O₂ & O₄ - Post test to assess the level of Blood Glucose among with Hyperglycemia in experimental group and control group.

VARIABLES:

Dependant variables: Level of blood glucose.

Independent variables: Drumstick leaves powder.

DEMOGRAPHIC VARIABLES:

Demographic variables are age, sex, marital status, educational status, occupational status, family income, family history of diabetes mellitus, body mass index, habits, food habits, exercise pattern.

SETTING OF THE STUDY

The study was conducted at konalai for experimental group. The population of the community is 3000. It was situated 1 km near to Indira College of nursing.

The study was conducted in kalpalayam for control group. The population of the community is 2750. It was situated 10 kms near to Indira College of nursing.

POPULATION

Clients who are diagnosed hyperglycaemia.

SAMPLE

Clients with hyperglycaemia who are living in konalai and kalpalayam community at Trichy.

SAMPLE SIZE AND SAMPLING PROCEDURE**SAMPLE SIZE**

The sample size consists of 60 hyperglycaemic clients.30 samples in experimental group and 30 samples in control group.

SAMPLING TECHNIQUE

Purposive sampling technique was used to select the samples for the study.

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA

- Females those who are having increased blood glucose level
- Available during the period of data collection
- Clients living in konalai and kalpalayam.
- Those who are not under treatment for hyperglycaemia

EXCLUSION CRITERIA

Clients who are:

- Pregnant mothers.
- Male clients.
- Hyperglycemic client below 30 years.
- Who are not willing to participate in the study.

INSTRUMENT AND SCORING PROCEDURE

DESCRIPTION OF THE INSTRUMENT

The tool consists of two parts.

Part I

It consist of demographic variables such as age, sex, marital status, educational status, occupational status, family income, and family history of diabetes mellitus, body mass index, habits, food habits, exercise pattern.

Part II

Check the level of Blood glucose for clients those who fulfilled inclusion and exclusion criteria by using electronic glucometer.

Part II

To assess the level of blood glucose (post prandial). The score was interpreted as follows,

Level of blood glucose	Score
Normal	<140mg/dl
Mild hyperglycemia	141 -155 mg/dl
Moderate hyperglycemia	156 -170 mg/dl
Severe hyperglycemia	171 – 185 mg/dl

VALIDITY

Validity refers to the degree to which an instrument measures what it is supposed to measure. The demographic data with the objective of the study were given to the 4 nursing experts, 1 medical officer and 1 statistician. They have given certain suggestions regarding tool, method of data collection and categorization of blood glucose. I have incorporated these suggestions into my study.

RELIABILITY:

The reliability of the tool was determined by using test retest method ($r=0.08$). Hence the tool was considered highly reliable for proceeding with the study.

PILOT STUDY

The pilot study was conducted in puthur uthamanur community area, Trichy for a period of 7 days. The investigator obtained an oral and written permission from the president of puthur uthamanur village and participants prior to the study.

The purpose of the study was explained to the subjects. 10 clients who met the inclusion criteria were selected using purposive sampling technique. The first 5 samples were selected as experimental group and the next 5 samples

were selected as control group. On first day pre test was done for both control and experimental group by using electronic glucometer. Drumstick leaves powder was provided for experimental group twice a day for 7 days under the supervision of the investigator. Post test was conducted for both experimental and control group on 8th day by using electronic glucometer.

Data were analyzed by using descriptive and inferential statistics. The findings of the pilot study showed that the mean pre test in level of blood glucose score was 155.6 (SD \pm 12.66) and the mean post test score was 132.4(SD \pm 14.69) in experimental group. The post test mean score was less than pre test mean score. The mean difference was 23.2 with the paired't' value of 1.96 which was significant at P< 0.05 level, which showed that drumstick leaves powder was effective in reducing blood glucose level. The mean post test scores of level of blood glucose in experimental group was 132.4(SD \pm 14.69) and mean post test scores of level of blood glucose in control group was 157 (SD \pm 14.12). The mean difference was 24.6 with the independent't' value of 3.325 which was significant at P<0.05 level, which showed that drumstick leaves powder was effective in blood glucose. The findings revealed that the study is feasible and practicable to conduct the main study.

DATA COLLECTION

The main study was conducted in konalai and kalpalayam community area at Trichy. Konalai community area is for experimental group and kalpalayam community area is for control group. Data collection was done for a period of 5 weeks. The investigator obtained an oral and written consent from the president of konalai and kalpalayam community area and from the samples prior to the study. The purpose of the study was explained to the samples. 60 samples (30 for experimental group & 30 for control group) were selected by using purposive sampling technique. On the first 3 days, pre test was conducted to the samples by electronic glucometer for both control and experimental group. For each samples 15 minutes was used to collect the data. The data were

collected for 20 samples per day 10 in control and 10 in experimental group. Drumstick leaves powder was provided to the experimental group under the supervision and guidance of the investigator for twice a day for a period of 30 days. On the 31st day post test was conducted for experimental and control group using the same method.

PLAN FOR DATA ANALYSIS

The collected data were analyzed by using descriptive and inferential statistics. Frequency percentage was used to describe the demographic variables of clients with hyperglycemia in experimental and control group. Mean, Standard deviation was used to assess the pre test and post test level of blood glucose among clients with hyperglycemia in experimental and control group. Paired't' test was used to compare the pre test and post test level of blood glucose level. Independent't' test was used to compare the post test level of blood glucose among clients with hyperglycemia between experimental and control group. Chi-Square test was used to find out the association between the post tests level of blood glucose among clients with hyperglycemia with their selected demographic variables in experimental group.

PROTECTION OF HUMAN SUBJECTS:

The study was approved by the dissertation committee prior to the conduct of pilot and main study. The investigator obtained a written and oral permission from the president of konalai village. Oral and written consent was obtained from the samples by explaining the purpose of the study prior to the data collection. The investigator has been used antiseptic solution before and after collection of blood sample. Confidentiality was maintained throughout the study.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the description of sample characteristics, analysis and interpretation of the data collected to assess the effectiveness of drumstick leaves Powder of blood glucose level among clients with hyperglycemia in selected community at Trichy.

ORGANIZATION OF THE DATA

- SECTION A:** Distribution of demographic variables of clients among Hyperglycemia in experimental and control Group.
- SECTION B:** Assess the levels of blood glucose before and after the administration of Drumstick Leaves Powder among clients with hyperglycemia in experimental and control group.
- SECTION C:** Comparison between the pre test and post test level of blood glucose among clients with hyperglycemia in experimental group.
- SECTION D:** Comparison between the post test level of blood glucose among clients with hyperglycemia in experimental group and control group.
- SECTION E:** Association between the post test levels of blood glucose among Clients with hyperglycemia with their selected demographic variables in experimental Group.

SECTION A: DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF CLIENTS WITH HYPERGLYCEMIA

TABLE: 1: Frequency and percentage distribution of demographic variables among clients with hyperglycemia in experimental group and control group. $n_1 = 30, n_2=30$

S.NO	DEMOGRAPHIC VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP	
		F	%	F	%
1	AGE				
1.1	31 – 40 YEARS	5	16.6%	5	16.6%
1.2	41 – 50 YEARS	9	30.0%	12	40.0%
1.3	51 – 60 YEARS	13	43.3%	13	43.3%
1.4	>60 YEARS	3	10.0%	0	0%
2	MARITAL STATUS				
2.1	MARRIED	21	70.0%	17	56.6%
2.2	UNMARRIED	2	6.6%	5	16.6%
2.3	DIVORCE	3	10.0%	2	6.6%
2.4	WIDOW	4	13.3%	6	20.0%
3	EDUCATION				
3.1	ILLITRATE	5	16.6%	11	36.6%
3.2	PRIMARY	13	43.3%	12	40.0%
3.3	SECONDARY	8	26.6%	7	23.3%
3.4	HIGHER SECONDARY	4	13.3%	0	0%
3.5	GRADUATE	0	0%	0	0%
4	OCCUPATION				
4.1	SEDENTARY WORKER	4	13.3%	10	33.3%
4.2	MODERATE WORKER	18	60.0%	13	43.3%
4.3	HEAVY WORKER	8	26.66%	7	23.3%
5	INCOME PER MONTH				
5.1	<5000				
5.2	5001-10000	6	20.0%	7	23.3%
5.3	10001 – 15000	16	53.3%	11	36.6%
5.4	15001 – 20000	8	26.6%	9	30.0%
5.5	>20001	0	0%	3	10.0%
		0	0%	0	0%

6	FAMILY HISTORY OF DIABETES MELLITUS				
6.1	FATHER	3	10.0%	4	13.3%
6.2	MOTHER	7	23.3%	3	10.0%
6.3	BOTH PARENTS	11	36.6%	13	43.3%
6.4	OTHERS (GRAND	0	0%	3	10.0%
6.5	PARENTS) NONE	9	30.0%	7	23.3%
7	BMI				
7.1	UNDER WEIGHT <18.5	3	10.0%	2	6.6%
7.2	NORMAL 18.5 – 24.9	11	36.6%	19	63.3%
7.3	OVER WEIGHT 25.0 – 29.9	10	33.3%	8	26.6%
7.4	OBESE 30.0 – 39.9	6	20.0%	1	3.3%
7.5	EXTREME OBESE >40.0	0	0%	0	0%
8	HABITS				
8.1	SMOKING	0	0%	1	3.3%
8.2	ALCOHOLISM	6	20.0%	5	16.6%
8.3	SMOKING &	4	13.3%	4	13.3%
8.4	ALCOHOLISM	3	10.0%	8	26.6%
8.5	USING TOBACCO	0	0%	0	0
8.6	OTHERS NONE	17	56.6%	12	40.0%
9	FOOD HABITS				
9.1	VEGETAIAN	5	16.6%	3	10.0%
9.2	MIXED	25	83.3%	27	90.0%
10	DO YOU EXERCISE REGULARLY?				
10.1	REGULAR	0	0%	4	13.3%
10.2	IRREGULAR	1	3.3%	4	13.3%
10.3	OCCASSIONA	6	20.0%	10	33.3%
10.4	NEVER	23	76.6%	12	40.0%

Table 1 depicts the distribution of demographic variables among clients with Hyperglycemia

With regard to age, in experimental group majority 13 (43.3%) belonged to age group of 51-60 years, 9(30%) belonged to age group of 41-50 years, 5(16.6%) belonged to 31-40 years, 3(10%) belonged to above 60 years. In control group majority 13(43.3%) belonged to age group of 51-60 years, 12(40%) belonged to age group of 41- 50 years, 5(16.6%) belonged to 31 - 40 years.

With regard to Marital status, in experimental group majority 21(70%) were married, 4(13.33%) were widow or widower, 3(10%) were divorce, 2(6.6%) were unmarried. In control group majority 17(56.6%) were married, 6(20%) were widow or widower, 5(16.6%) were unmarried, and 2(6.6%) were divorce.

With regard to education, in experimental group majority 13 (43.3%) had primary education, 8 (26.6%) had secondary education, 5(16.6%) had illiterate, 4(13.3%) had higher secondary education. In control group majority 12(40%) had primary, 11(36.6%) had illiterate, 7(23.3%) had secondary education.

With regard to occupation, in experimental group majority 18(60%) were moderate worker, 8(26.6%) were heavy worker, 4(13.3%) were sedentary worker. In control group majority 13(43.3%) were moderate worker, 10(33.3%) were sedentary worker, 7(23.3%) were heavy worker.

With regard to income, in experimental group majority 16(53.3%) had income between Rs.5001 – Rs.10, 000, 8(26.7%) had income between Rs.10, 001 – Rs.15,000, 6(20%) had income below Rs5000. In control group 11(36.6%) had income between Rs. 5001 – Rs.10, 000, 9(30%) had income between Rs. 10,001 – Rs.15, 000, and 7(23.3%) had income below 5000, 3(10%) had income between Rs. 15,001 – Rs.20, 000.

With regard to family history of Diabetes Mellitus, in experimental group majority 11(36.6%) were both parents, 9(30%) were none, 7(13.3%) were Mother, and 3 (10%) were Father. In control group majority 13(43.3%) were both parents, 7(23.3%) were none, 4(13.3%) were Father. 3(10%) were Mother, and 3(10%) Others.

With regard to BMI, in experimental group majority 11(36.6%) were Normal 18.5-24.9, 10(33.3%) were Overweight 25.0-29.9,6(20%) were Obese

30.0 –39.9, 3(10%) were under weight <18.5. In control group majority 19(63.4%) were Normal 18.5-24.9, 8(26.6%) were Overweight 25.0-29.9, 2(6.6%) were Underweight <18.5, and 1(3.3%) were Obese 30.0-39.9.

With regard to Habits, in experimental group majority 17(56.6%) were none, and 6(20%) were Alcoholism, 4(13.3%) were Smoking and Alcoholism, and 3(10%) were use Tobacco. In control group majority 12(40%) were none, 8(26.6%) were using tobacco, 4(13.3%) were Alcoholism, 5(16.6%) were Smoking and Alcoholism, 1(3.3%) were Smoking.

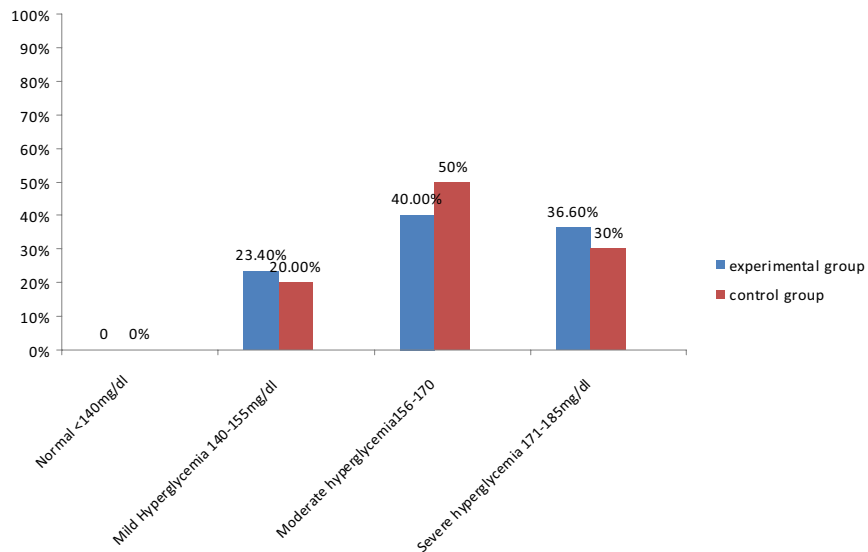
With regard to Food habits, in experimental group majority 25(83.3%) were Mixed, and 5(16.6%) were Vegetarian. In control group majority 27(90%) were Mixed and 3(10%) were Vegetarian.

With regard to Exercise Pattern, in experimental group majority 23(76.6%) were Never, and 6(20%) were occasionally, and 1(3.3%) were irregularly. In control group majority 12(40%) were never, 10(33.3%) were occasionally, 4(13.3%) were irregularly, and 4(13.3%) were regularly.

SECTION B: Assess the levels of blood glucose before and after the administration of Drumstick Leaves Powder among clients with hyperglycemia in experimental group.

TABLE: 2 Frequency and percentage distribution of pre test and post test level of blood glucose among clients with hyperglycemia in experimental and control group.

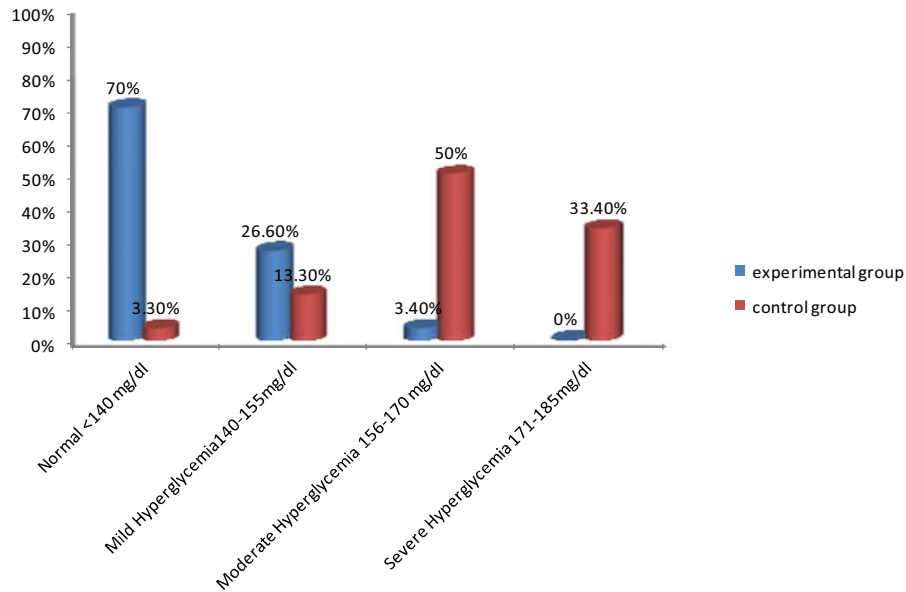
S.NO	LEVEL OF BLOOD GLUCOSE	EXPERIMENTAL GROUP				CONTROL GROUP			
		PRE TEST		POSTTEST		PRE TEST		POST TEST	
		F	%	F	%	F	%	F	%
1.	NORMAL (<140mg/dl)	0	0%	21	70.0%	0	0%	1	3.3%
2.	MILD HYPERLYCEMIA (140 – 155 mg/dl)	7	23.4%	8	26.6%	6	20.0%	4	13.3%
3.	MODERATE HYPERGLYCEMIA (156 – 170mg/dl)	12	40.0%	1	3.4%	15	50.0%	15	50.0%
4.	SEVERE HYPERGLYCEMIA (171-185mg/dl)	11	36.6%	0	0%	9	30.0%	10	33.4%



LEVELS OF HYPERGLYCEMIA

Fig: 12: pre test Percentage distribution among clients with hyperglycemia according to their levels of hyperglycemia.

In pre test majority 12(40%) had marked to Moderate hyperglycemia, 11 (36.6%) had Severe hyperglycemia and 7(23.4%) had Mild hyperglycemia in the experimental group. 15(50%) had moderate hyperglycemia, 9(30%) had marked to severe Hyperglycemia, and 6(20%) had Mild Hyperglycemia in the control group.



LEVELS OF HYPERGLYCEMIA

Fig: 13: Post test Percentage distribution among clients with hyperglycemia according to their levels of hyperglycemia.

In post test majority 21(70%) had Normal, 8 (26.6%) had Mild Hyperglycemia, 1(3.3%) had moderate Hyperglycemia in the experimental group. 15(50%) had moderate hyperglycemia, 10 (33.4%) had severe hyperglycemia, 4(13.3%) had Mild hyperglycemia, 1(3.3%) had Normal in the control group.

SECTION C: Comparison between the pre test and post test level of blood glucose among clients with hyperglycemia in experimental group.

Comparison of mean, standard deviation, mean difference and paired 't' value of pre test and post test level of Blood glucose among clients with Hyperglycemia in experimental group.

n=30

VARIABLE	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	PAIRED 't' VALUE	TABLE VALUE	INFERENCES
PRE TEST	166.36	10.3	34	21.93	2.0452	S
POST TEST	132.5	13.42				

df=29

p<0.05

Table 3 depicts the mean pre test scores of level of Blood Glucose was 166.36 (SD ± 10.3) and post test mean score was 132.5 (SD ± 13.42) respectively. The post test mean score was lower than the pre test mean score. The mean difference was 34. The paired 't' value was 21.93 which was significant at P <0.05 level, which showed that Drumstick leaves powder was effective in reducing Blood Glucose.

SECTION D: Comparison between the pre test and post test level of blood glucose among clients with hyperglycemia in control group.

Comparison of mean, standard deviation, mean difference and paired't' value of pre test and post test level of Blood glucose among clients with Hyperglycemia in Control Group.

n=30

VARIABLE	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	PAIRED 't' VALUE	TABLE VALUE	INFERENCES
PRE TEST	164.36	9.9	0.47	0.43	2.0452	NS
POST TEST	164.83	11.93				

df =29

p<0.05

Table 4 depicts the mean pre test mean scores of level of Blood Glucose was 164.36 (SD ± 9.9) and post test mean score was 164.83 (SD ± 11.93) respectively. The post test mean score was higher than the pre test mean score. The mean difference was 0.47. The paired't' value was 0.43 which was significant at P <0.05 level.

SECTION E: Comparison between the post test level of blood glucose among clients with hyperglycemia in experimental group and control group.

Comparison of mean, standard deviation, mean difference and independent 't' value of post test level of Blood Glucose among clients with hyperglycemia in experimental and control group.

$n_1 = 30, n_2 = 30$

GROUPS	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	INDEPENDENT 't' VALUE	TABLE VALUE	INFERENCES
EXPERIMENTAL GROUP	164.36	9.9	0.47	3.038	2.001	S
CONTROL GROUP	164.83	11.93				

df =58

p<0.05

Table 5 depicts the mean pre test scores of level of Blood Glucose was 164.36 (SD \pm 9.9) and post test mean score was 164.83 (SD \pm 11.93) respectively. The post test mean score was lower than the pre test mean score. The mean difference was 0.47. The Independent 't' value was 3.038 which was significant at P <0.05 level, which showed that Drumstick Leaves Powder was effective in reducing depression.

SECTION E: Association between the post test levels of blood glucose among clients with hyperglycemia with their selected demographic variables in experimental group.

S.NO	DEMOGRAPHIC VARIABLES	LEVEL OF BLOOD GLUCOSE						χ^2	TABLE VALUE	INFERENCES
		NORMAL		MILD LEVEL OF BLOOD GLUCOSE		MODERATE LEVEL OF BLOOD GLUCOSE				
		F	%	F	%	F	%			
1	AGE									
1.1	31 – 40 YEARS	2	6.66%	2	6.66%	1	3.4%	7.867	0.049 DF:3	S
1.2	41 – 50 YEARS	7	23.4%	2	6.66%					
1.3	51 – 60 YEARS	9	30%	4	13.4%					
1.4	>60 YEARS	3	10%							
2	MARITAL STATUS									
2.1		15	50%	6	20%	1	3.3%	32.667	0.000 DF:3	S
2.2	MARRIED	3	10%	1	3.3%					
2.3	UNMARRIED	3	10%	1						
2.4	DIVORCE WIDOW OR WIDOWER				3.3%					
3	EDUCATION									
3.1	ILLITRATE	5	16.7%	4	13.3%	1	3.3%	6.533	0.088 Df:3	S
3.2	PRIMARY	10	33.3%	3	10%					
3.3	HIGHER	4	13.3%	1	3.3%					
3.4	SECONDARY GRADUATE	2	6.7%							
4	OCCUPATION									
4.1	SEDENTARY	3	10%	6	20%	1	3.3%	10.400	0.006 DF:2	S
4.2	WORKER									
4.3	MODERATE WORKER HEAVY WORKER									

5	INCOME PER MONTH									
5.1	<5000	6 13 2	20% 43.3% 6.7%	3 5	10% 16.7%	1	3.3%	5.600	0.061 DF:2	S
5.2	5001-10000									
5.3	10001 – 15001									
5.4	15001 – 20000									
5.5	>20001									
6	FAMILY HISTORY OF DIABETES MELLITUS									
6.1	FATHER	1 3	3.3% 10%	2 4	6.7% 13.3%			4.667	0.198 DF:3	S
6.2	MOTHER	9	30%	1	3.3%	1	3.3%			
6.3	BOTH PARENTS	8	26.7%	1	3.3%					
6.4	OTHERS (GRAND PARENTS)									
6.5	NONE									
7	BMI									
7.1	UNDER WEIGHT <18.5	2 8	6.7% 26.7%	1 3	3.3% 10%				0.141 DF:3	S
7.2	NORMAL 18.5 – 24.9	7	23.3%	3	10%	1	3.3%	5.467		
7.3	OVER WEIGHT 25.0 – 29.9	4	13.3%	1	3.3%					
7.4	OBESE 30.0 – 39.9									
7.5	EXTREME OBESE >40.0									
8	HABITS									
8.1	SMOKING	2 4	6.7% 13.3%	4 1	13.3% 3.3%					

8.2	ALCOHOLISM	2	6.7%	3	10%			16.667	0.001 DF:3	S
8.3	SMOKING & ALCOHOLISM	13	43.3%			1	3.3%			
8.4	TOBACCO USE									
8.5	OTHERS									
9	FOOD HABITS									
9.1	VEGETAIAN	5	16.7%	8	26.7%			13.33	0.00 DF:1	S
9.2	MIXED	16	53.3%			1	3.3%			
10	DO YOU EXERCISE REGULARLY?									
10.1	REGULAR	3	10%	3	10%			26.600	0.000 DF:2	S
10.2	IRREGULAR	18	60%	5	16.7%					
10.3	OCCASSIONA					1	3.3%			
10.4	NEVER									

Table 6 depicts the Chi square values calculated to find out the association between post test levels of Blood Glucose scores with their demographic variables. The findings revealed that there is association with age, gender, marital status, education, occupation, income, family history, body mass index, habits, food habits, exercise pattern.

CHAPTER - V

DISCUSSION

The discussion chapter deals with sample characteristics and objectives of the study. The aim of this present study was to assess the effectiveness of drumstick leaves powder on reduction of blood glucose among clients with hyperglycemia in selected community area at Trichy.

Distribution of sample characteristics:

- Regarding to age, in experimental group majority 13 (43.3%) belonged to age group of 51-60 years, 9(30%) belonged to age group of 41-50 years, 5(16.6%) belonged to 31-40 years, 3(10%) belonged to above 60 years. In control group majority 13(43.3%) belonged to age group of 51-60 years, 12(40%) belonged to age group of 41- 50 years, 5(16.6%) belonged to 31 - 40 years, 4(13.3%).
- With regard to Marital status, in experimental group majority 21(70%) were married, 4(13.33%) were widow or widower, 3(10%) were divorce, 2(6.6%) were unmarried. In control group majority 17(56.6%) were married, 6(20%) were widow or widower, 5(16.6%) were unmarried, and 2(6.6%) were divorce.
- With regard to education, in experimental group majority 13 (43.3%) had primary education, 8 (26.6%) had secondary education, 5(16.6%) had illiterate, 4(13.3%) had higher secondary education. In control group majority 12(40%) had primary, 11(36.6%) had illiterate, 7(23.3%) had secondary education
- With regard to occupation, in experimental group majority 18(60%) were moderate worker, 7(23.4%) were heavy worker, 4(13.3%) were sedentary worker. In control group majority 13(43.3%) were moderate worker, 10(33.3%) were sedentary worker, 7(23.3%) were heavy worker

- With regard to income, in experimental group majority 16(53.3%) had income between Rs.5001 – Rs.10, 000, 8(26.7%) had income between Rs.10, 001 – Rs.15, 000, 6(20%) had income below Rs5000. In control group 11(36.6%) had income between Rs. 5001 – Rs.10, 000, 9(30%) had income between Rs. 10,001 – Rs.15, 000, and 7(23.3%) had income below 5000, 3(10%) had income between Rs. 15,001 – Rs.20, 000.
- With regard to family history of Diabetes Mellitus, in experimental group majority 11(36.6%) were both parents, 9(30%) were none, 7(13.3%) were Mother, and 3 (10%) were Father. In control group majority 13(43.3%) were both parents, 7(23.3%) were none, 4(13.3%) were Father. 3(10%) were Mother, and 3(10%) Others.
- With regard to BMI, in experimental group majority 11(36.6%) were Normal 18.5-24.9, 10(33.3%) were Overweight 25.0-29.9,6(20%) were Obese 30.0 –39.9, 3(10%) were under weight <18.5. In control group majority 19(63.4%) were Normal 18.5-24.9, 8(26.6%) were Overweight 25.0-29.9, 2(6.6%) were Underweight <18.5, and 1(3.3%) were Obese 30.0-39.9.
- With regard to Habits, in experimental group majority 17(56.6%) were none, and 6(20%) were Alcoholism, 4(13.3%) were Smoking and Alcoholism, and 3(10%) were use Tobacco. In control group majority 12(40%) were none, 8(26.6%) were use tobacco, 4(13.3%) were Alcoholism, 5(16.6%) were Smoking and Alcoholism, 1(3.3%) were Smoking
- With regard to Food habits, in experimental group majority 25(83.3%) were Mixed, and 5(16.6%) were Vegetarian. In control group majority 27(90%) were Mixed and 3(10%) were Vegetarian.
- With regard to Exercise Pattern, in experimental group majority 23(76.6%) were Never, and 6(20%) were occasionally, and 1(3.3%) were irregularly. In control group majority 12(40%) were never, 10(33.3%) were occasionally, 4(13.3%) were irregularly, and 4(13.3%) were regularly.

The findings of the study as per the objectives were discussed under the following headings.

1. To assess the levels of blood glucose before and after the administration of drumstick leaves powder among clients with Hyperglycemia.
2. To compare the levels of blood glucose before and after the administration of Drumstick Leaves Powder among clients with Hyperglycemia.
3. To find the association between the posttest levels of blood glucose among clients with hyperglycemia with their selected demographic variables.

OBJECTIVE I: Assess the levels of blood glucose before and after the administration of drumstick Leaves Powder among clients with hyperglycemia in experimental group.

In pre test majority 12(40%) had marked to Moderate hyperglycemia, 11 (36.6%) had Severe hyperglycemia and 7(23.3%) had Mild hyperglycemia in the experimental group and 15(50%) had moderate hyperglycemia, 9(30%) had marked to severe Hyperglycemia, and 6(20%) had Mild Hyperglycemia in the control group. In post test majority 21(70%) had Normal, 8 (26.6%) had Mild Hyperglycemia, 1(3.3%) had moderate Hyperglycemia in the experimental group and 15(76.7%) had moderate hyperglycemia, 10 (23.3%) had severe hyperglycemia, 4(16.6%) had Mild hyperglycemia, 1(3.3%) had Normal in the control group.

OBJECTIVE II: Comparison between the pre test and post test level of blood glucose among clients with hyperglycemia in experimental group and control group.

In experimental group the mean pre test scores of level of Blood Glucose was 166.36 (SD \pm 10.3) and post test mean score was 132.5 (SD \pm 13.42) respectively. The post test mean score was lower than the pre test mean score. The mean difference was 34. The paired 't' value was 21.93 which was

significant at $P < 0.05$ level, which showed that Drumstick leaves powder was effective in reducing Blood Glucose.

In control group the mean pre test mean scores of level of Blood Glucose was 164.36 (SD \pm 9.9) and post test mean score was 164.83 (SD \pm 11.93) respectively. The post test mean score was higher than the pre test mean score. The mean difference was 0.47. The paired 't' value was 0.43 which was significant at $P < 0.05$ level.

OBJECTIVE III: Comparison between the post test level of blood glucose among clients with hyperglycemia in experimental group and control group.

The mean pre test scores of level of Blood Glucose was 164.36 (SD \pm 9.9) and post test mean score was 164.83 (SD \pm 11.93) respectively. The post test mean score was lower than the pre test mean score. The mean difference was 0.47. The Independent 't' value was 3.038 which was significant at $P < 0.05$ level, which showed that Drumstick Leaves Powder was effective in reducing blood glucose.

This objective is supported by Francis Maria (2013), conducted study regarding effectiveness of drumstick leaves in reducing the blood glucose level among increased blood glucose samples.

OBJECTIVE IV: To find the association between the post test level of blood glucose among clients with hyperglycemia with their selected demographic variables in experimental group.

The chi square values calculated to find out the association between the post tests levels of Blood glucose scores with their demographic variables. The findings revealed that there was a significant association with age, gender, marital status, education, occupation, income, family history, body mass index, habits, food habits and exercise pattern.

CHAPTER - VI

SUMMARY, CONCLUSION, IMPLICATION, AND RECOMMENDATIONS

SUMMARY OF THE STUDY

The focus of the study was to assess the effectiveness of drumstick leaves powder on reduction of blood glucose among clients with hyperglycemia in selected community area at Trichy.

The design of the study was quasi experimental non equivalent pretest and post test control group design. Conceptual frame work was based on modified Rosenstock's health belief model (1950). Samples were selected by purposive sampling technique. 60 samples (30 for control group, 30 for experimental group) were selected for the study. Demographic variable was collected for all the 60 samples.

Blood Glucose was assessed by using Electronic glucometer. 10 minutes was spent for each sample. After the data collection drumstick leaves powder was given to the samples in the experimental group and made to consume it under the supervision and guidance of the investigator for 2 times in the morning and in the evening for 30 days. 31st day post test was conducted both experimental and control group by using the same instrument. The collected data were analyzed and tabulated by using descriptive and inferential statistics.

MAJOR FINDINGS OF THE STUDY:

Regarding to age, in experimental group majority 13 (43.3%) belonged to age group of 51-60 years, in control group majority 13(43.3%) belonged to age group of 51-60 years.

Regarding to Marital status, in experimental group majority 21(70%) were married, in control group majority 17(56.6%) were married.

Regarding to education, in experimental group majority 13 (43.3%) had primary education, in control group majority 12(40%) had primary.

Regarding to occupation, in experimental group majority 18(60%) were moderate worker, in control group majority 13(43.3%) were moderate worker.

Regarding to income, in experimental group majority 16(53.3%) had income Between Rs.5001 – Rs.10, 000, in control group 11(36.6%) had income between Rs. 5001 – Rs.10, 000.

Regarding to family history of Diabetes Mellitus, in experimental group majority 11(36.6%) were both parents, in control group majority 13(43.3%) were both parents.

Regarding to BMI, in experimental group majority 11(36.6%) were Normal 18.5-24.9, in control group majority 19(63.4%) were Normal 18.5-24.9.

Regarding to Habits, in experimental group majority 17(56.6%) were none, in control group majority 12(40%) were none.

Regarding to Food habits, in experimental group majority 25(83.3%) were Mixed, in control group majority 27(90%) were Mixed.

Regarding to Exercise Pattern, in experimental group majority 23(76.6%) were Never, in control group majority 12(40%) were never.

CONCLUSION

The present study was conducted to evaluate the effectiveness of drumstick leaves powder on blood glucose among clients with hyperglycemia in selected community area, Trichy. The independent 't' value of blood glucose was 3.038 which was significant at $P < 0.05$. The results of the study concluded that drumstick leaves powder were effective in reducing blood glucose among clients with hyperglycemia.

IMPLICATIONS OF NURSING

The findings of the study have certain implications for nursing service, education, administration, and nursing research.

Nursing service

- Community health nurses educate the clients to practice to maintain proper nutritious balanced diet.
- Community health nurses can conduct the screening and awareness programme regarding hyperglycemia.
- Learning materials like posters, self instructional module, can be made available in the community health centers regarding maintain the level of blood sugar with using home remedies.
- Conduct in service education programme for the teachers regarding hyperglycemia.

Nursing Education

- Nurse educator can encourage the nursing students to conduct health education programme in community area regarding the effects of hyperglycemia to promote their health status.

Nursing Administration

- Nurse administrator can organize awareness of hyperglycemia in community health centre.
- Nurse administrator have more responsibility as supervisors in creating awareness among various age group especially in adult by providing handouts, pamphlets, booklets regularly in various schools, colleges.
- Nurse administrator can conduct mass education programme by using variety of audio visual aids like television, computer, which would benefit to the community.

Nursing Research

- The study findings can be effectively utilized by the emerging nurse researchers to conduct further studies and improving the body of knowledge in nursing.
- Students can do the mini project on other aspects of hyperglycemia such as using other home remedies, exercise, and dietary pattern.

Recommendations

- A longitudinal study can be conducted to assess the prevalence rate of hyperglycemia.
- The similar study can be conducted on large samples for generalization of findings.
- The similar study can be done for male clients.
- The similar study can be done among hypertension clients.

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APPENDIX - A
LETTER SEEKING PERMISSION TO THE
PRESIDENT

From

K.Anu M.sc (N) II year
Indira College of nursing
Konalai
Trichy.

To:

The president,
Konalai Panchayat
Trichy.

Respected sir,

REF: M.sc (N) student from Indira College of nursing, Trichy – Chennai Main road, konalai, Trichy- project work regarding.

I would like to inform you that Mrs. K. Anu is a Bonafide student from Indira College of nursing, Trichy doing her II year M.sc (N) at this college. Our college is affiliated to the Tamil Nadu Dr. MGR University, Chennai. As a partial fulfillment of the M.Sc (N) degree programme. She is required to do the research project. I kindly request your esteemed self to go through her proposal and permit her to complete the same at your esteemed community. I assure you that she will abide by the rules and regulation laid down by the community during the period of study. Kindly to do the needful.

Thanking you,

Yours faithfully,

APPENDIX-B

LETTER SEEKING EXPERT'S OPINION FOR CONTENT VALIDITY

From

K.ANU

M.sc (Nursing) II Year,
Indira College of nursing,
Trichy.

To

Respected Madam/sir,

Sub: Requisition for content validity of tool.

I am doing M.Sc. (Nursing) II year in Indira College of Nursing, Trichy under The Tamil Nadu Dr.M.G.R. Medical university, Guindy, Chennai. As a partial fulfillment of my M.Sc.(nursing) Degree Programme, I am conducting a research on, **“A study to assess the effectiveness of drumstick leaves powder on blood glucose levels among clients with hyperglycemia in selected community at Trichy”**. A tool has been developed for the research study. I am sending the above stated for your expert and valuable opinion. I will be thankful for your kind consideration. Kindly return it to the undersigned.

Thanking you,

Yours sincerely,

(K.ANU)

APPENDIX-C
COMMUNITY HEALTH NURSING
LIST OF EXPERTS OF VALIDATION

1. **Mr.N.MADHIVANAN M.D., PG,DIP.Diab.**
Woraiyur,
Trichy.
2. **MR.A.Y.JOHN SAM ARUN PRABHU, M.Sc(N)., phd Professor,**
CSI. Jay raj Annapakiyam College of Nursing,
Madurai.
3. **Mrs. HEMAMALINI, M.Sc (N)**
Associate Professor,
SRM College of Nursing
Chennai.
4. **Mrs.CHANDRAKALA,M.Sc(N)**
Associate Professor,
JJ College of Nursing,
Pudhukottai.
5. **Mrs.ESWARI,M.Sc(N)**
Assistant Professor,
Aurobindo College of Nursing,
Karur.

APPENDIX-D
CONTENT VALIDITY CERTIFICATE

Hereby, I certify that I have validated the tool of Ms. K. Anu studying II year MSc nursing course (Community Health Nursing Speciality) at Indira College of Nursing, Trichy. Working on the dissertation of **“A study to assess the effectiveness of drumstick leaves powder on blood glucose levels among clients with hyperglycemia in selected community at Trichy”**.

Signature of the expert

Date:

Place:

APPENDIX-E
CERTIFICATE FOR ENGLISH EDITION
TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Ms. K. Anu II Year M.Sc. Nursing Student of Indira College of Nursing for dissertation “**A study to assess the effectiveness of drumstick leaves powder on blood glucose levels among clients with hyperglycemia in selected community at Trichy**”. edited for English language appropriateness by **Mrs. Amutha M.A,B.Ed.,M.Phil.,**

Signature

APPENDIX-F
CERTIFICATE FOR TAMIL EDITION
TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Ms. K. Anu II Year M.Sc. Nursing Student of Indira College of Nursing for dissertation “**A study to assess the effectiveness of drumstick leaves powder on blood glucose levels among clients with hyperglycemia in selected community at Trichy**”. edited for Tamil language appropriateness by **Mrs. Hema M.A,M.Phil.,**

Signature

APPENDIX-G
TOOLS
DEMOGRAPHIC VARIABLES

Instruction

Read the following item carefully and choose appropriate one

- 1. Age**
 - A. 31 -40 yrs.
 - B. 41 – 50
 - C. 51 -60
 - D. > 60

- 2. Marital status**
 - A. Married
 - B. Unmarried
 - C. Divorce
 - D. Widow or Widower

- 3. Education**
 - A. Illiterate
 - B. Primary
 - C. Higher Secondary
 - D. Graduate

- 4. Occupation**
 - A. Sedentary worker
 - B. Moderate worker
 - C. Heavy worker

- 5. Income per Month (Rupees)**
 - A. <5000
 - B. 5001 – 10000
 - C. 10001 – 15000
 - D. 15001 – 20000
 - E. > 20001

6. Family History of Diabetes Mellitus and hypertension

- A. Father
- B. Mother
- C. Both Parents
- D. Others (Grand Parents)
- E. None

7. BMI

- A. underweight <18.5
- B. Normal 18.5 – 24.9
- C. Overweight 25.0 – 29.9
- D. Obese 30.0 – 39.9
- E. Extreme obese >40

8. Habits

- A. Smoking
- B. Alcoholism
- C. Smoking & Alcoholism
- D. Tobacco use
- E. Others

9. Food habits

- A. Vegetarian
- B. Mixed

10. Do you exercise regularly?

- A. Regularly
- B. Irregular
- C. Occasionally
- D. Never

APPENDIX-H

புகுதி- I

வினாத்தாள்

குறிப்பு:

கீழ்க்கண்டவற்றுள் சரியானவற்றை தேர்ந்தெடுத்து (✓)

குறிக்கவும் :-

1. வயது

- 31-40 வயதிற்குள்
- 41-50 வயதிற்குள்
- 51-60 வயதிற்குள்
- 60 க்கு மேல்

2. திருமண நிலை

- மணமானவர்
- மணமாகாதவர்
- விவாகரத்தானவர்
- விதவை

3. கல்வித்தகுதி

- படிப்பறிவு இல்லாதவர்
- தொடக்கக்கல்வி
- இடைநிலைக்கல்வி
- மேல்நிலைக்கல்வி
- பட்டப்படிப்பு.

2. தொழில்

- சரீரஉழைப்பில்லாதவர்
- மிதமானஉழைப்பாளர்
- கடினஉழைப்பாளர்

5. மாதவருமானம்

- 5000க்கும் கீழ்
- 5,001-10,000
- 10,001 – 15,000

- d. 15இ001 – 20இ000
- e. 20இ000 க்கும் மேல்
6. **சர்க்கரை நோய் பற்றிய குடும்ப வரலாறு**
- a. அம்மா
- b. அப்பா
- c. இருவருக்கும்
- d. வேறு யாருக்கேனும் (தாத்தா,பாட்டி)
- e. ஒருவருக்கும் இல்லை.
7. **அடித்தள வளர்ச்சிதை மாற்ற விகிதம்**
- a. குறைந்த எடை 18.5 க்கும் கீழ்
- b. சரியான எடை 18.5 – 24.9
- c. ஆதிக எடை 25.0 – 29.9
- d. உடல் பருமன் 30.0– 39.9
- e. மிக அதிக பருமன் 40 க்கும் மேல்
8. **பழக்கவழக்கங்கள்**
- a. புகைபிடித்தல்
- b. மது அருந்துதல்
- c. புகைபிடித்தல் மற்றும் மதுஅருந்துதல்
- d. புகையிலை உபயோகித்தல்
- e. மற்றவை
- f. எதுவுமில்லை
9. **உணவு பழக்கவழக்கம்**
- a. சைவம்
- b. சைவம், அசைவம்
10. **நீங்கள் தினசரி உடற்பயிற்சி செய்பவரா ?**
- a. தினசரி
- b. ஒழுங்கற்ற
- c. அவ்வப்போது
- d. 'எப்போதுமில்லை.



