

**EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD
PRESSURE LEVEL AMONG CLIENTS WITH STAGE I
HYPERTENSION RESIDING AT SAMAYANALLUR, MADURAI.**

**M.Sc (NURSING) DEGREE EXAMINATION
BRANCH – IV MEDICAL SURGICAL NURSING**

COLLEGE OF NURSING

MADURAI MEDICAL COLLEGE, MADURAI - 20



A dissertation submitted to

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

CHENNAI – 600 032.

In partial fulfillment of requirement for the degree of

MASTER OF SCIENCE IN NURSING

APRIL – 2014

CERTIFICATE

This is to certify that this dissertation titled, “**EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD PRESSURE LEVEL AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT SAMAYANALLUR, MADURAI.**” is a bonafide work done by **MRS.RAJALAKSHMI.N**, College of Nursing, Madurai Medical College, Madurai - 20, submitted to the Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfillment of the university rules and regulations towards the award of the degree of Master of Science in Nursing, Branch IV, Community health Nursing under our guidance and supervision during the academic period from 2012 – 2014.

Mrs. S. POONGUZHALI, M.Sc (N), M.B.A, Ph.D,
PRINCIPAL,
COLEGE OF NURSING,
MADURAI MEDICAL COLLEGE,
MADURAI -20.

DR.B.SANTHAKUMAR, MD(F.M).,
M.Sc, (F.Sc)., PGDMLE, Dip. ND (F.N),
DEAN,
MADURAI MEDICAL COLLEGE,
MADURAI-20.

**EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD PRESSURE LEVEL
AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT
SAMAYANALLUR, MADURAI.**

Approved by Dissertation committee on.....

EXPERT IN NURSING RESEARCH _____

Mrs.S.POONGUZHALI M.Sc., (N), M.A., M.BA., Ph.D
PRINCIPAL,
COLLEGE OF NURSING
MADURAI MEDICAL COLLEGE
MADURAI.

Expert Specialty guide _____

Mrs.R.AMIRTHA GOWRI M.Sc., (N)
LECTURER IN NURSING
COLLEGE OF NURSING
MADURAI MEDICAL COLLEGE
MADURAI.

Medical Expert _____

Dr.M.SALEEM, M.D (Community Medicine),
ASSOCIATE PROFESSOR
INSTITUTE OF COMMUNITY MEDICINE,
MADURAI MEDICAL COLLEGE,
MADURAI.

A dissertation submitted to
THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY,
CHENNAI - 600 032.

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

APRIL – 2014

ACKNOWLEDGEMENT

*There will be no shadows of sorrow if one thinks about God even during his/her
happy moments”*

- *A. Mizbah*

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 **GOD ALMIGHTY** of his marvelous grace shown from the beginning to the end of the study.

My sincere thanks to **Dr.B.Santhakumar, M.Sc (F.Sc), MD(F.M), PGDMLE, Dip. ND (F.N) Dean, Madurai medical college, Madurai**, for granting me permission to conduct the study in this esteemed institution.

I express my heartfelt and faithful thanks to **Mrs.S.Poonguzhali, M.Sc(N), M.A, M.B.A, Ph.D., Principal, College Of Nursing ,Madurai Medical College, Madurai** for her untiring intellectual guidance, her expertise and prompt suggestions concern, patience and keen interest in this study.

My sincere thanks to **Mrs.R.AmirthaGowri M.Sc(N), Lecturer in Nursing, College of nursing, Madurai medical college, Madurai** for rendering her greatest help in sharing her valuable thoughts and guiding me for the completion of the study.

I thank **all faculties of college of Nursing, Madurai medical college, Madurai** for their guidance and support for the completion of my study.

I express my thanks to **Mrs.G.Selvarani, M.Sc(N), Faculty**, Community health nursing dept., College of Nursing, Madurai medical college, Madurai for her valuable guidance, support and reassurance in completing the study.

I express my thanks to **Mr.S.Kalaiselven, M.A, B.I.L.Sc., Librarian**, College of nursing, Madurai Medical College, Madurai, for his cooperation in collecting the related literature for this study.

My deep sense of gratitude to **Dr.S.Senthil Kumar, M.B.B.S., D.P.H, Deputy Director Of Health Services, Madurai**, for giving permissions and also for her valuable suggestions and guidance to complete this study.

I am extremely thankful to **Dr.Suresh M.B.B.S., D.A and Dr.Abdul Syed M.B.B.S , Block Medical Officer, Primary Health centre, Samayanallur, Madurai** for their valuable support and guidance to conduct this study.

I should also thank **Dr.Subramaniam, Department Of Siddha Medicine, Primary Health Centre, Samayanallur, Madurai** for his guidance and support throughout the study.

I wish to express my sincere thanks to **Mr.S.Pandi, BioStatistician**, for extending necessary guidance for statistical analysis.

I also thank **Mrs.R.Jaya, M.A., M.Ed., M.Phil.** and **Mr.K.Soundarapandian M.A., M.Ed., M.Phil** English Literature and Tamil Literature, for their help in editing the tool and dissertation.

I would like to express my deepest thanks to all the **hypertension clients, who residing at Samayanallur**, Madurai, who had participated in the study without them it would have been impossible to complete this study.

I am indebted a lot to the sacrifices of my beloved family members for their immense love, support, prayer and encouragement inspired me to reach at this point in my life.

My grateful thanks to my beloved husband **MR.P.M.Kodeeswaran, M.A., D.PHARM., D.C.A.,** and my ever loving sweetest kids **K.R.Akil, K.R.Ajitha** for their love, care, assistance, support and constant encouragement throughout this study.

I express my heartiest gratitude to my parents **Mr.P.S.Natarajan, Mrs.N.Paranjothi,** for their blessings and encouragement during my career.

My deep Gratitude is extended to my beloved friends Mrs.A.Chellamani, Mrs.R.Mageshwari, Mrs.R.Sujitha and Ms.S.Sharmila and all other friends who studied during this period and who provided encouragement, who listened to, sometimes counselled and always supported me during my studies.

TABLE OF COTENTS

CHAPTER	CONTENTS	PAGE
I	INTRODUCTION	
	1.1 Need for the study	6
	1.2 Statement of the problem	12
	1.3 Objectives	12
	1.4 Research Hypotheses	12
	1.5 Operational definitions	13
	1.6 Assumptions	13
	1.7 Delimitation	14
	1.8 Projected outcome	14
II	REVIEW OF LITERATURE	
	2.1 Review of literature related to prevalence and incidence of hypertension	16
	2.2 Review of literature related to effects of beetroot Juice on health.	23
	2.3 Review of literature related to effect of beetroot juice on reducing blood pressure level in hypertension	28
	2.4 Conceptual framework	37
III	RESEARCH METHODOLOGY	
	3.1 Research Approach	40
	3.2 Research design	40
	3.3 Research Variable	41
	3.4 Research Setting	42
	3.5 Population	42
	3.6 Sample	42
	3.7 Sample size	43
	3.8 Sampling technique	43
	3.9 Sampling criteria	43
	3.10 Method of Sample selection	44

CHAPTER	CONTENTS	PAGE
	3.11 Development and description of the tool	44
	3.12 Content Validity	45
	3.13 Reliability of the tool	45
	3.14 Ethical consideration	45
	3.15 Pilot study Procedure for data collection	46
	3.16 Data collection procedure	47
	3.17 Plan for data analysis	47
	3.18 Ethical consideration	48
	3.19 Schematic representation of research study	49
IV	DATA ANALYSIS AND INTERPRETATION	50-78
V	DISCUSSION	79-84
VI	SUMMARY, CONCLUSION, IMPLICATIONS RECOMMENDATIONS AND LIMITATIONS	
	6.1 Summary of the study	85
	6.2 Major findings of the study	88
	6.3 Conclusion	91
	6.4 Implications	91
	6.5 Recommendations	94
	BIBLIOGRAPHY	95-104
	APPENDICES	

LIST OF TABLES

TABLE. NO	TITLE	PAGE NO
1.	Distribution of the demographic variables	52
2.	Distribution of Clinical variables	59
3.	Distribution of Pretest Systolic blood pressure level of experimental and control group	66
4.	Distribution of Pretest diastolic blood pressure level of experimental and control group	68
5.	The mean, SD score of pre test Blood pressure level between experimental and control group	69
6.	The mean, SD and 't' value of systolic Blood pressure level between pretest and posttest in experimental and control group	70
7.	The mean, SD and 't' value of diastolic Blood pressure level between pretest and posttest in experimental and control group	71
8.	The frequency and percentage distribution of post test Systolic Blood Pressure level for experimental and control group	73
9.	The frequency and percentage distribution of post test Diastolic Blood Pressure level for experimental and control group	74
10.	Comparison of Mean, SD, 't' value of pre and post test Blood Pressure level between experimental and control group	76
11.	Association the post test level of blood pressure in clients with hypertension in experimental group with selected demographic variable.	77
12	Association the post test level of blood pressure in clients with hypertension in experimental group with selected clinical variable	78

LIST OF FIGURES

FIG.NO	TITLE	PAGE NO.
1.	Conceptual frame work based on Modified Calista Roy's Adaptation Theory Model	39
2.	Distribution of samples according to age	55
3.	Distribution of samples according to nature of work	56
4.	Distribution of samples according to family history of hypertension	57
5.	Distribution of samples according to food habit	58
6.	Distribution of samples according to Duration of treatment	63
7.	Distribution of samples according to Average hour of sleeping	64
8.	Distribution of samples according to body mass index	65
9.	Distribution of pretest Blood pressure level for experimental and control group	66
10.	Distribution of mean posttest Blood pressure level in experimental group.	72
11.	Distribution of post test blood pressure level for experimental and control group	75

LIST OF APPENDICES

APPENDIX	TITLE
I(A)	Questoinnaire
I(B)	Tool for biophysiological measurement
I(C)	Record for Pretest and post test blood pressure for both group
II	Ethical committee approval to conduct the study
III	Letter seeking permission to conduct study at Samayanallur, Madurai
IV	Content Validity
V	Consent form
VI	Certificate of content validity
VII	Photograph

ABSTRACT

A study to assess the effectiveness of beet root juice on blood pressure level among clients with Stage I hypertension residing at Samayanallur, Madurai. **Objectives:** The main objective of the study to assess the pre test level of blood pressure level in clients with stage I Hypertension among experimental and control group. To evaluate the effectiveness of beet root juice on blood pressure level on stage I hypertensive clients in the experimental group. To determine the association of post test blood pressure level in clients with stage I Hypertension in experimental group with selected demographic and clinical variables. **Conceptual Frame work:** The study was based on Modified Calista Roy's Adaptation Theory Model(1996). Review of related literature facilitated the investigator to collect relevant information to support the study, to select a problem, to design the methodology and to adopt the tool. **Design:** Quantitative approach and Quasi experimental Nonequivalent control group design was adopted for this study. **Setting:** The study was conducted in Samayanallur, Kattunaikar street and Muthuramalinga thevar street were selected at Samayanallur, Madurai. Pilot study was done on 10 patients and tool was found to be feasible. **Sample Size:** The sample size was 60. In that 30 samples were in control and another 30 in the experimental group. **Sampling Technique:** Non probability sampling-purposive sampling technique was used to assign the subjects. **Intervention:** The intervention applied in this study was consumption of beetroot juice for 30 days. **Data Collection Procedure:** Bio-physiological tool was used to measure the blood pressure level. Suggestions and opinions from experts were obtained to use the tool among hypertensive patients. The data collected were tabulated and analyzed by descriptive and inferential statistics. **Conclusion:** This study shows that the selected Beetroot juice consumption intervention among Stage I hypertension clients had a significant effect on the blood pressure level.

CHAPTER- I

INTRODUCTION

Real life isn't always going to be perfect or go our way, but the recurring acknowledgement of what is working in our lives can help us not only to survive but surmount our difficulties.”

-Bhanaut

Hypertension in a common man's language is called as "High Blood Pressure". The arteries carry blood from the heart to the different parts of the body. These arteries are like express highways that facilitate blood transmission in body. The measure of the force of the blood against the wall of the arteries is called "Blood Pressure (BP)". In some place the arteries become too narrow for the smooth blood flow due to certain reasons. It is in these regions that the pressure goes up for the blood to flow through that part. Hypertension is one of the most common disorders prevalent in the World. Hypertension is further classified into "Essential Hypertension" and the "Secondary hypertension.

Hypertension is a major public health problem in India and world, because of its high frequency and concomitant, risk of cardiovascular and kidney disease. Hypertension is interesting disease entity of its own as it remains silent, being generally asymptomatic during its clinical course. As it is hidden beneath outwardly asymptomatic appearance ,hence WHO named it as silent killer.

Many of us today are leaving a life that leads to high blood pressure as people age advances the situation gets even worse. It contributes to excess of deaths in

women. The disease makes people five times more prone to stroke three times more likely to have heart attacks and two or three times likely to experience heart failure. Medically, it is described as increased pressure in the arterial system that transports blood from heart to rest of the body. . Blood pressure is the force of the blood pushing against the walls of the arteries. Each time the heart beats, it pumps blood into the arteries. Blood pressure is at its maximum at this time; this is known as the systolic blood pressure. When the heart is at rest between beats, blood pressure falls; this is known as the diastolic pressure. systolic above 140mmof hg and diastolic above 90 mm of hg is considered as hypertension.

World Health Day is celebrated on 7th April to mark the anniversary of the founding of World Health Organization (WHO) in 1948. Ever year a theme is selected for World Health Day that highlights a priority area of public health concern all over the world. This year in 2013, the theme for World Health Day is high blood pressure, also known as raised blood pressure or hypertension. It increases the risk of heart attacks, strokes and kidney failure. If left uncontrolled, high blood pressure can also cause blindness, irregular heartbeat and heart failure.

The present accepted definition for hypertension is systolic blood pressure (SBP) which is more than or equal to 140mmHg and diastolic blood pressure (DBP) more than or equal to 90mmHg. Hypertension is an important public health problem in developing countries especially in adults, aged 40-55 years. Case control and community based studies among Indians show a high prevalence of hypertension in both urban and rural areas. Though several reports on the prevalence of hypertension have been extensively carried out in the urban populations, from rural south India very few studies have reported the prevalence and risk factors of hypertension.

Hypertension is fast emerging as a modern epidemic in the world. Developed countries are considering it as a leading cause of death but even developing countries do not lag behind in being affected by it. In early stages of high blood pressure, there are no symptoms. Many who are afflicted feel no discomfort until a medical crisis – a heart attack, the rupture of a blood vessel in the brain or a stroke - strikes. Therefore, high blood pressure is often called the “Silent Killer. Over the past, several decades extensive research, wide spread patient education and a concerted effort on the part of the health care professionals have led to decreased mortality and morbidity rates from the multiple organ damage arising of years of untreated hypertension.

Blood pressure typically goes up as a result of stress or physical activity, but in a person with high blood pressure, is elevated even at rest. Over sixty million Americans have high blood pressure, including more than half of all Americans aged 65-74 years, and almost three-fourths of all African-Americans in the same age group.

Most patients with high blood pressure are in the borderline-to-moderate range, a group in which almost all cases of high blood pressure can be brought under control through changes in diet and lifestyle. In fact, in cases of borderline-to-mild Hypertension, healthful changes in diet and lifestyle (discussed below) have proven superior to drugs in head-to-head comparisons.

The sixth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood pressure produce report on a number of factors increase blood pressure, including obesity, insulin resistance, high alcohol intake, high salt intake, aging and perhaps sedentary lifestyle, stress, low potassium intake, and low calcium intake. Due to urbanization and the associated health risks with a sedentary lifestyle out of every four people at least one of them will be affected

by hypertension in their lives. Adequate control of hypertension is essential and if not done so can culminate into uncontrolled hypertension.

In India, the prevalence of hypertension is reported to be increasing rapidly in the urban areas and the same trend is spreading gradually to rural areas. It is estimated that there were about 66 million hypertensive's in India (32 million rural and 34 million urban). Lack of knowledge about the morbidity, complications and the method of control of hypertension contributes to a large percentage of undetected and untreated hypertensive subjects in the community Therefore, health care professionals must not only identify and treat patients with hypertension but also promote a healthy life style and preventive strategies to decrease prevalence of hypertension in the general population.

Hypertension is a premier risk factor for cardiovascular disease which can be recognized if sought and treated effectively. Effective management of high blood pressure is possible when the magnitude of the problem is identified. So, a cross-sectional community based survey among 1,239 respondents aged ≥ 30 years was designed to estimate the prevalence and the sociodemographic correlates of hypertension among adults aged ≥ 30 years. Data was collected by personal interviews, followed by anthropometric and blood pressure measurements. Analysis was done using Statistical Package for the Social Sciences (SPSS) version 11.5.

The prevalence of hypertension was 43.3%, with the prevalence being more among females (51.6%) as compared to males (38.9%). Of the total prevalence 23.1% (287) were known cases, and 20.2% (250) were newly detected cases. Based on the seventh report of the Joint National Committee (JNC VII) on high blood pressure, pre hypertension was noted among 38.7%. Advancing age, both gender,

current diabetic status, central obesity, overweight and obesity as defined by body mass index, and family history of hypertension were identified as significant correlates for hypertension by multivariate logistic regression.

American Heart Association journal hypertension,(2011) has found that drinking beetroot juice causes blood nitrate levels to rise, and thus reducing blood pressure within three hours of consumption. A reduction in blood pressure is beneficial for the avoidance of cardiovascular disease and stroke. Study says nitrate-rich foods may help in heart attack survival. The high nitrate concentration of beetroots may also act as a protective factor against heart attacks. The nitric oxide gas, that is formed by nitrate rich foods, opens arteries that have been clogged or closed. This has a protective function for the heart muscle as it reduces the amount of permanent damage through injury

Making healthy eating choices can be an important, easy and enjoyable step towards maintaining healthy blood pressure levels. inclusion of dietary nitrates in the form of beetroot-derived foods may be useful in the regulation of normal BP due their high inorganicNO₃ - content. The present contribution is the first study, to the authors' knowledge, to examine the effect of beetroot juice on BP in free-living individuals in the absence of dietary restrictions, such as a low nitrate diet.

1.1 NEED FOR STUDY:

“Tension is who you think you should be, relaxation is who you are”.

Chinese proverb

Prevalence of hypertension in all countries seems to be on the rise. According to WHO, today around 972 million people in the world suffer from hypertension. Approximately 60 million people in the United States have hypertension. In India, the prevalence of hypertension was 11.06 million and the occurrence was 0.50 million per year. Overall prevalence of hypertension has increased over the years in India from 3.57% in 1977 to 20-30% after 1995 and 40% in 2005. The average prevalence of hypertension in India is 25% in urban area and 10% in rural area in year 2011. According to the latest WHO data published in April 2011 hypertension deaths in India reached 1,67,898 or 1.86% of total death rate. With the age adjusted death rate of 24.44 per 1,00,000 population India ranks 107 in the world. Nearly 11% of urban population in Tamilnadu is suffering from hypertension. A house-to-house survey was conducted in the rural areas of Madurai on 1900 subjects residing in rural areas, who were screened for hypertension, of which 349 had hypertension, giving the prevalence rate of 18.3%. The prevalence of hypertension is more in females 19.1% than the males 17.5%.

Hypertension is a major health problem throughout the world because of its high prevalence and its association with increased risk of cardiovascular disease. In many countries, the control rates for high blood pressure have actually slowed in the last few years. It is estimated that by 2020, there will be 1.2 billion people suffer by hypertension worldwide. In the Eastern Mediterranean Region, the prevalence of hypertension averages 26% and it affects approximately 125 million individuals.

Recent data of World health organization suggest that individuals who are normotensive at age 55 years have a 90% lifetime risk for developing hypertension. The relationship between blood pressure and risk of cerebrovascular disease events is continuous, consistent and independent of other risk factors. The higher the blood pressure, the greater the chance of myocardial infarction, heart failure, stroke and kidney disease. For individuals aged 40–70 years, each increment of 20 mmHg in systolic blood pressure or 10 mmHg in diastolic blood pressure doubles the risk of cardiovascular disease. These alarming data support a need for greater emphasis on public awareness of the problem of high blood pressure and for an aggressive approach to antihypertensive treatment.

The World Health Organization (WHO) has estimated that about 62% of cerebrovascular disease and 49% of ischemic heart disease burden worldwide are attributable to suboptimal blood pressure levels (systolic blood pressure, SBP > 115mmHg), an observation consistent across groups defined by sex, age, and ethnicity. High blood pressure is estimated to cause 7.1 million deaths annually accounting for 13% of all deaths globally. Overall 26.4% (972 million) of the adult world population was estimated to have hypertension in the year 2020, a figure that is projected to increase to 29.2% (1.56 billion) by the year 2025.

Oxford University (2009) estimated the worldwide prevalence for hypertension as 1 billion affected individuals and 7.1 million death per Year. The prevalence of hypertension varies widely among populations in Rural Indian the rates are low as 3.4%. In economically developed countries, the prevalence of hypertension is 20% to 50%. At the state level 79.8% above 35 years of age have developed hypertension.

Hypertension (hypertension) is an enormous health problem and is one of the biggest health challenges in the 21st century. Although the condition is common, readily detectable, and easily treatable, it is usually asymptomatic and often leads to lethal complications if left untreated . The Global Burden of Disease study has reported hypertension as the 4th contributor to premature death in developed countries and the 7th in the developing countries . Analysis of worldwide data on global burden of hypertension showed an overall prevalence of 26.4% among the adult population in 2000. In India, the prevalence of hypertension ranges between 20%–40% in urban areas and 12%–17% among rural adults.

In India, a very large, populous and typical developing country, community surveys have documented that between three and six decades, prevalence of hypertension has increased about 10 times among the rural inhabitants. Once hypertension is diagnosed, treatment involves a combination of antihypertensive medication and life style modification. Life style changes in addition to prescribed medication help in better management of BP levels. Good BP for a prolonged period may even help in reducing amount of medication.

The populations based study conducted to assess the levels of awareness about hypertension in north Indian population in Shimla among the 7630 middle aged adults between 30-50 years was screened for the hypertension. The hypertension detected for the 2535 cases of which 22.5 %(559) were aware about the hypertension and related life style risk factors such as salt intake and alcohol intake. The low level of awareness highlights the need for the comprehensive educational program regarding hypertension.

Community based cohort studies from different parts of the world for a period of three to six decades showed an increase in the prevalence of hypertension about 30 times among the urban dwellers and by about 10 times among the rural inhabitants. The high frequency of pre-hypertension and hypertension are very closely associated with the epidemic of cardiovascular and renal diseases. Evidences suggest that control of hypertension not only reduces the risk of cardiovascular diseases, but also slows down the progression of chronic kidney diseases. With this background, the present study was conducted from a rural population of Tamil Nadu to study the prevalence of hypertension as well as to increase the awareness on the importance of food style modifications. Such studies in the nearby villages of our institution indicate a high prevalence of pre-hypertension and hypertension among the rural populations.

Assokar(2009) carried out a study in India and estimated that there are approximately 50 million cases of hypertension in India with a prevalence of 2.3-15.4% of the beginning of the next millennium.

Dr Patricia M Kearney.et.al.,2009, conducted a study on hypertension as a global burden, identified as the leading risk factor for mortality. The prevalence of hypertension has been reported for various regions throughout the world. “Measurement of the global burden of hypertension would allow international public-health policy-makers to assign sufficient priority and resources to its management and prevention”. From 30 regional or local population-based samples involving more than 700 000 people to estimate the overall prevalence and absolute burden of hypertension “in the whole world” and in various regions in 2000 and to estimate the global burden in 2025. Included studies that reported age and sex specific prevalence of hypertension in representative samples. The conclusion of the study was 50 million

of people worldwide are having an elevated blood pressure. In 2008 over all 26.4% of adult population had hypertension 26.6% men and 26.1% of women were projected to have this condition, by 2025, the adult population of 29.2% will have hypertension. The number of men with hypertension was predicted to increase to 20.0% and women up to 29.5% and overall 60% of total population.

As per report of Daily News at Hindu at the State level 79.8% are above 35 years of age have developed hypertension. In Tamilnadu 65.4/1000 males, 47.8/1000 females were exposed to hypertension in urban areas. 22.8/1000 males 17.3/1000 females in rural areas. Madurai total population is affected by Hypertension is 3,041,038 in that male 1,528,308 and 1,512,730 female are affected by Hypertension. In Samayanallur total Hypertension affected population 8718, Males-4177 and female 4541 people are affected by Hypertension.

Dietary nitrate supplementation, a natural means of increasing bodily stores of the vascular protective molecule nitric oxide, has well established blood lowering effects and considerable therapeutic potential for the prevention and treatment of Hypertension and other cardio vascular diseases, the effectiveness of chronic dietary nitrate supplementation as a potential adjunctive cardiovascular de-stiffening therapy in older women and in men.

Health Benefits of Beetroot and its Juice:

- ✓ **Reduces blood pressure-** drinking beetroot juice creates perfusions, or blood flow, to the brain. This is because beets contain a high concentration of nitrates, which allows blood to flow freely in blood vessels. **Anemia and low blood hemoglobin-** Beet juice can cure your anemia because of its high in Iron. Which means it is also good for pre menstrual symptoms.

- ✓ **Cancer- Beets** have also been found to increase the number of CD8 cells in the colon, which are cancer-destroying cells.
- ✓ **Aging-** The anti-oxidants, phytochemicals, vitamins and minerals make beets an excellent Anti Aging Food.
- ✓ **Brain function-** beetroot juice's benefits crossed right through the tricky blood-brain barrier and increased blood flow in key areas of the brain relating executive function.
- ✓ **Antioxidant** properties that is reduce the oxidation of LDL cholesterol Contains folic acid which is essential for normal body growth.
- ✓ **Osteoporosis** reduces risk of osteoporosis through its content of silica which helps body to utilize calcium.

This study was conducted with the objective of finding out the efficacy of beetroot juice intervention on Hypertension clients. In 21st century the attention is focused on alternative and complementary therapies. As a community health Nurse I had chance to visited Both Rural and Urban areas at Madurai. The investigator during the home visit found that more number of hypertensive clients in Samayanallur. Many journals and articles provide generalized statement on the benefits on beetroot juice in various disorders. Therefore the investigator is interested to create empirical evidence on the efficacy of beetroot juice intervention on Hypertension clients. This will also provide a sound scientific base principle for implementing beet root juice administration as a nursing intervention for Hypertension clients.

1.2 STATEMENT OF THE PROBLEM

A study to Assess the Effectiveness Of Beet Root Juice on blood pressure level Among Clients with Stage I Hypertension residing at Samayanallur, Madurai.

1.3 OBJECTIVES:

- ✓ To assess the pre test level of blood pressure level in clients with stage I Hypertension among experimental and control group.
- ✓ To evaluate the effectiveness of beet root juice on blood pressure level among stage I hypertensive clients in the experimental group.
- ✓ To determine the association of post test blood pressure level in clients with stage I Hypertension in experimental group with selected demographic and clinical variables.

1.4 HYPOTHESES:

H₁: There will be a significant difference between the level of blood pressure among Stage I hypertensive client before and after intake of beetroot juice.

H₂: There will be a significant association of the mean blood pressure level with selected demographic and clinical variables.

1.5 OPERATIONAL DEFINITION

EFFECTIVENESS

In this study it refers to the outcome of beet root juice consumption among stage I hypertensive clients. It is measured in terms of difference in pre test and post tests score of blood pressure.

BEETROOT JUICE

Beets are a great source of inorganic nitrate. The nitrate that is present in the juice is converted into nitrite by the bacteria on the tongue, and this nitrite mixes with the saliva in the mouth and travels down to the body. In this study beet root juice will be consumed by the client at morning after food for 30 days. Beetroot juice is prepared by the investigator with 50gms of raw beetroot, 10gms of jaggery, and added 2 to 3 drops of lime juice. (50 ml of concentrated juice is diluted with 200 ml of water and 250 ml of juice given for a person)

HYPERTENSION

In this study Hypertension is defined as Persistent elevated blood pressure in which systolic is above 140 mmHg and diastolic is above 90 mmHg.

STAGE I HYPERTENSION

In this study it refers to the clients diagnosed as Stage I Hypertension, i. e. Systolic blood pressure more than 140 to 159 mmHg and diastolic blood pressure more than 90 to 99 mmHg and taking beta blocker daily.

1.6 ASSUMPTIONS

- It is assumed that the subjects would willingly participate in the study and respond honestly to the items in the questionnaire.
- The study assumes that beet root juice is an accepted intervention on blood pressure level among stage I hypertensive clients who participated in the study.

1.7 DELIMITATIONS

- Data collection period limited to 4 weeks only
- The study was limited to do intervention among Stage I hypertensive clients residing at Samayanallur.

1.8 PROJECTED OUTCOME

1. This study will help the clients with Hypertension to practice and to maintain normal blood pressure level during their life time without any complication.
2. This study will help the health professional to plan for further research.

CHAPTER -II

REVIEW OF LITERATURE

A literature review is a body of text that aims to review the critical points of knowledge on a particular topic of research. (American Nurses Association,2000)

The literature review is used in two ways by the research community. The first refer to the activities involved in identifying and searching for information on a topic and the second one is developing an understanding of the state of knowledge on the topic.

This chapter deals with two parts:

Section -A :Review of literature related to studies.

Section-B : Modified conceptual frame work on calista Roy's Adaptation theory.

SECTION-A

The literature has been organized under following sections.

PART-I : Review of Literature related to prevalence and incidence of
Hypertension

PART-II : Review of Literature related to effects of beetroot juice on health.

PART-II : Review of Literature related to effects of beetroot juice on reducing
Blood pressure level in Stage I hypertension.

2.1 REVIEW OF LITERATURE RELATED TO PREVALANCE AND INCIDENCE OF HYPERTENSION:

Fatima D.silva et al (2012) conducted an evaluative approach with pre experimental design was used for the study.40 hypertensive adults were selected by purposive sampling technique. Knowledge checklist and 5 point rating scale were the instruments used for the study. The study revealed that, 19(47.5%) of the hypertensive adults had average knowledge,18(45%) had poor knowledge and only 3 (7.5%)had good knowledge. 21 (52.5%) of the hypertensive adults faced severe barriers. Among the barriers, the highest perceived barrier was lack of knowledge (82.27%) and least was lack of social support (53.14%). A significant improvement in the knowledge was found after the administration of the structured teaching programme (.t. cal value = 22.22 > tab (39) = 1.68, p<0.05). Conclusion of the study reveals that education is a key component in bringing about changes in health care behavior.

Bunting BA. et al.(2012) conducted a Descriptive, exploratory, non experimental study on accredited community pharmacy in Hat Yai, Thailand ,participants are Individuals with 35 years or older without any previous diagnosis of hypertension and other cardiovascular disease. 263 of 400 people eligible for screening were found to have pre hypertension or hypertension. Of these patients, 57% returned at 3-month follow-up. Mean (\pm SE) systolic (6.5 ± 0.89 mm Hg [95% CI 4.7-8.2], $P < 0.001$) and diastolic (2.2 ± 0.82 [0.54-3.77], $P = 0.009$) blood pressure were lowered. Compared with baseline (39.3%), the percentage of normotensive participants increased significantly at 3-month follow-up (51.8%; $P < 0.001$). The study concluded that clients with hypertension who volunteered for a clinical trial report using a variety of non-pharmacologic methods to control hypertension.

Zachariah MG .et. al(2011) conducted a Cross sectional survey shows the result about the prevalence, awareness, treatment and control of hypertension among middle aged urban population in Kerala. The overall prevalence of hypertension was 54.5%. (Men 56. 3%, women 52.3%).The factors associated with hypertension was increased body mass index (2.33%) and old age 55-60 years 2.65%.Among the hypertensive 39% were aware about their condition and 29% treated with medication .The adequate control achieved for the 30.6%.The study recommended for the current guidelines for the health care providers to detect and treat the hypertension.

Ahlawat.SK.et.al (2011) conducted a cross sectional population survey conducted in the changes in the prevalence of hypertension and associated risk factors over a 30 years period .The age and sex influence in the prevalence of hypertension was 26.9 %and 44.9%. The prevalence of hypertension was doubled past 30 years in Chandigarh. It concluded that Unfavorable change in the prevalence of hypertension, physical activity and body fat makes this population high risk for cardiovascular morbidity and mortality.

Beegom R.et.al (2011) conducted study about diet, central obesity and prevalence of hypertension in the urban population of south India. The prevalence rate of hypertension was 189 / 1000 25-64 years and 335 / 1000 between the 45 -64 years .This rate was high in western in countries. The prevalence of hypertension was high among the persons who are having central obesity. The study finding shows that the hypertension highly associated with diabetes, salt and alcohol intake and dietary fat intake.

Malhotra P.et.al,(2011) conducted a population based survey conducted among the 2559 individuals age between 16 to 70 years about the hypertension and risk factors .The prevalence several risk factors among hypertensive compared with normotensive were alcohol consumption, higher body mass index and higher economic status .The findings shows that hypertension highly associated with the advancing age, sedentary lifestyle, higher alcohol consumption and higher body mass index are the risk factors in the rural un industrialized population of India.

Ifemo.I.et.al.,(2011) conducted a study on high prevalence and Low Awareness of Hypertension in a Market Population. The prevalence of hypertension was 32.8%. Market workers in lead sedentary life style and often depend on salt-lade fast food while at work. An unselected population workers was screened for Hypertension, Hypertension was defined as BP >140 and/or >90mmhg or being on drug therapy. 42% of the screened population was hypertensive. Of this number, 70.6% did not know they were hypertensive before the screening. More Males than female $p=.022$ were hypertensive. Prevalence of hypertension increased with age from 5.4% in the age group <20 years to 80% in the age group >70 years. The conclusion was prevalence of hypertension workers in this study was 42% and the majority of them were unaware of their disease.

Gupta.R.A(2010) conducted a study among the Bhatia community about the high prevalence of multiple coronary risk factors by the Jaipur heart watch-3. The result shows that, there is a high prevalence of High cholesterol, abdominal obesity, hypertension in that community. Among the 600 samples 51.3% suffering with Hypertension. A multiple regression analysis shows that positive correlation between the hypertension and risk factors commonly abdominal obesity, high levels of cholesterol and hypertension highly associated with the coronary risk factors.

JenogJY et.al(2010) conducted study about the awareness, treatment and control rates of hypertension and related factors of awareness among the middle aged adult and elderly in Chuncheon. The awareness was 55.8% treatment taken was 89.6% and control was 34.4%. The hypertension was significantly associated with the family history of hypertension, smoking, alcohol intake education and body mass index. The study concluded that hypertension was significant with the self rated health 2.23% less prevalence among the self care people. (95 confidence interval 1.07-5.3).

Tanu.Midha et.al,(2010) conducted cross-sectional study on 800 samples aged 20 years and above, 400 from urban and 400 from rural area of Luck now. The result revealed the overall prevalence of hypertension was 26% (95% C.I. 23, 29), the prevalence among males (34%) was higher than females (24%). The mean age of participants was 35+14 years, the prevalence of hypertension increased with age. Proportionately there were more cases of hypertension among male participants over 35 years of age as compared to female participants of the same age ($p < 0.001$). Fifty-eight percent of hypertensive's were unaware of their hypertension. None of the hypertensive subjects who were aware of their condition had blood pressure under 140/90 mmHg. . Hypertension was 1.7 (OR 95% C.I. 1.14, 2.42) times more common among males than females. Males were 1.7 (OR 95% C.I. 1.06, 2.6) times less likely to have been aware of their hypertension status. Age analysis revealed that the prevalence of hypertension increased with age and hypertensive subjects were 5.6 (OR 95% C.I. 3.9, 8.1) times more likely to be over 35 years of age.

Hama Siddiqui.et al,(2010) conducted a study to assess the risk factor for hypertension in 327 adults (age more than 15 years) in that 165(50.5%) males and 162 (49.5%) females. BP measured in 63(38%) males and 135(83%) female. Out of which 11(17.5%) males and 19(14%) females were screened hypertensive. Hypertensive

were older as compared to normotensive(22.9 ± 5.0 Kg/m²).Hypertensive were 9.7 times more likely to be diabetic as compared to the normotensive in the study ($p < 0.001$). On the analyzing the relationship of hypertension with other variables, no significant difference was noticed for education ($p = 0.68$) smoking status ($p = 0.46$) family history ($p = 0.31$) and occupation ($p = 0.27$).

Sushil K Bansal, et al.,(2010) conducted a study in Uttarakhand province. The study was conducted in 968 people during the study interviewed and data were was relating to the demographics of the individuals, dietary habits, alcohol consumption, tobacco use, psychosocial stress, past medical history and drug history. Blood pressure (BP) and anthropometric data was recorded and blood samples taken. And the result of the study was the prevalence of hypertension is 30.9% of males and 27.8% of females. Rates of hypertension in the rural community under study are similar to those seen in high-income countries and in urban India.

Sathish T, et al,(2010) has been conducted community-based cohort study for the Incidence of hypertension and its risk factors in rural Kerala, India A sample of 297 individuals (aged 15-64 years has been taken, who were free of hypertension at study enrolment, were followed-up from 2003 to 2010. The rural sample showed a high incidence of hypertension. This underscores the need for primary prevention of hypertension through lifestyle modification strategies targeting individuals with high-normal blood pressure, central obesity and current smoking. The healthcare system needs to improve the level of awareness, treatment and control of hypertension in this population. This rural sample showed a high incidence of hypertension. The healthcare system needs to improve the level of awareness, treatment and control of hypertension in this population.

Ashavaid TF, et al(2010) was conducted a study in Mumbai for to find the percentage of people with coronary artery disease and the associated risk factors and the study was conducted in 39,940 patients who had attended the health check up program in the years 1996 to 2001. And medical record folders of all the patients were screened manually the result of the study was The prevalence of hypertension, diabetes mellitus, and coronary artery disease was found to be 22.5%, 14.2%, and 3.9% respectively and Implementation of reference intervals in case of lipids poses a dilemma. The study finalized Lifestyle and diet modifications would have to be implemented to reduce the burden of coronary artery disease in this population.

Yadav, R.et al (2009) conducted a study in Lucknow to evaluate the prevalence and risk factors for pre-hypertension and hypertension among a north Indian upper socio-economic population. A total of 1112 adults; aged ≥ 30 years, residing in an urban colony of high-income group residents in the city of Lucknow, north India, participated in the study. The result indicated that pre-hypertension was highest (36%) in the group 30-39 yr. Also, there was a high prevalence of cardiovascular risk factors in the general population due to central obesity (86.7%), elevated LDL cholesterol (22.8%), abnormal glucose tolerance (41.6%) and smoking (20.3%) of males. The study concluded that a high prevalence of pre-hypertension and hypertension were noted in affluent urban north Indians. Increasing age, body mass index, central obesity and impaired glucose tolerance/diabetes were significantly associated with both hypertension and pre-hypertension.

Nadir E Bharuha,(2009) Conducted study in 200 clients to determine the prevalence awareness, compliance to medication and control of Hypertension in this community. The researcher used a 1 in 4 random selection of subjects who were

greater than or equal to 20 years of age. 2879 subjects greater than or equal to 20 years of age were randomly selected of which 2415 (84%) participated in the study. Overall prevalence of Hypertension in the community was 36.4%, of whom 48.5% were unaware of their hypertensive status. Prevalence of ISH using the present criteria was 19.5% and 73% of hypertensive greater than or equal to 60 years has ISH.

Hunt J S, Siemienczuk, et al(2009) conducted a study to assess the effectiveness of mailed hypertension educational materials. Prospective, randomized, controlled single-blind trial in primary care practice based research network in which a clinics located in Portland Oregon participated patients from each group were randomly selected for invitation to participate in study. Patients in the intervention arm scored higher on a hypertension knowledge quiz (7.48 ± 1.6 Vs 7.06 ± 1.6 ; $P=0.019$), and reported higher satisfaction with several aspects of their care.

Prince.M.J.et.al,(2010) conducted a study on uncontrolled Hypertension prevalence was higher in urban range 52.6-79.8% than rural sites range 42.6 – 56.9% and lower in men than women. Educational attainment was positively associated with hypertension in rural and least-developed sites. Control was poor in Urban India (12%) and rural India(10%). The proportion controlled, not compositional factors age, sex, education and obesity, explained most of the between-site variation in systolic blood pressure. The study finalized that Uncontrolled hypertension is common among older people in developing countries, and may rise during the demographic and health transitions.

Swami.HM.et.al.(2009) conducted a populations based study to assess the levels of awareness about hypertension in north Indian population in Shimla among the 7630 middle aged adults between 30-50 years was screened for the hypertension.

The hypertension detected for the 2535 cases of which 22.5 % (559) were aware about the hypertension and related life style risk factors such as salt intake and alcohol intake. The low level of awareness highlights the need for the comprehensive educational program regarding hypertension.

Bharucha NE and Kuruvilla.T.(2009) conducted about the hypertension in the Paris community about prevalence, awareness and compliance to treatment aged between 25-49 years. The results reported that the overall prevalence rates were 36.4% of whom 48.5% were unaware of their condition. The control rate was 13.6%. The study concluded that the awareness was very low among the Paris community and 19.5% risk for the ischemic heart diseases among the hypertensive population. The study insists mainly the need for the regular screening along with the educational programs to detect and optimally treat the hypertension and bring the life style modification.

2.2 REVIEW OF LITERATURE RELATED TO EFFECTS OF BEETROOT JUICE ON HEALTH.

Ghosh SM et al.(2013) Conducted a randomized crossover study at William Harvey Research Institute where 30 people receive all of the treatments and are tested in a random order. The average age of participants was 52.9 years and they were all considered to have grade 1 hypertension, Participants were randomly assigned to drink either 250ml of beetroot juice, considered the experimental group, or 250ml of water (containing a small amount of nitrate), which acted as the control group. consumption of the relatively low dose of dietary nitrate caused a significant decrease in blood pressure (systolic and diastolic) compared with participants who drank water

($p < 0.001$) the peak average reduction in blood pressure was 11.2 (± 2.6) mmHg in the group that received nitrate compared with 0.7 (± 1.9) mmHg in the water group after 24 hours. The study concluded that systolic blood pressure remained significantly lower in the group that received nitrate compared with the group that received water, and remained significantly different from values taken at baseline diastolic blood pressure remained lower in the group given nitrate up to measurements taken.

Alex Hutchinson(2013) conducted a interventional study done at the University of Exeter's School of Sport and Health Sciences, done with 8 cyclist using beet juice. 300 ml of regular-strength beet juice in terms of nitrate content, three doses used in the study were 1 shot, 2 shots, or 4 shots -- corresponding to 300 ml, 600 ml, or 1200 ml of regular juice athletes who've used 500 ml of regular juice a few hours before races; based on this study suggests that the amount of oxygen required to maintain a given level of moderate exercise decreased after taking beet juice; in other words, it took less energy to cycle at the same pace. The best results came from the highest dose, which decreased oxygen consumption by about 3%. They did the tests 2.5 hours after ingesting the beet juice, since that seems to be the peak nitrite level.

Rahul Thadani(2012) conducted study and concluded that beetroot is a very healthy and nutritional vegetable, and has many health benefits for human beings. It is this nutritional value of beets that makes it such a healthy vegetable. Apart from being extremely rich in chlorophyll, a beetroot also has a phytochemical known as Betacyani A beetroot is also extremely rich in Vitamin A, Vitamin B1, Vitamin B2, Vitamin B6 and Vitamin C. Along with these, minerals like iron, calcium, copper, magnesium, sodium and phosphorus are present as well. He concluded that nitrate

present in beet give you plenty of reasons to consume beetroot for low blood pressure. Causes of low blood pressure are intricately linked to the deficiency of these minerals from the body.

Miroddi, M. et al. (2011) conducted a study on the use of non conventional medicines, especially herbal medicine, is common in patients with cancer including hematologic malignancies. Diet components may also modify the risk of cancer through the influence on multiple processes. Including DNA repair, cell proliferation and apoptosis. Beetroot considered either food or herbal medicine, possess ant mutagenic or antiproliferative properties that can be used in anticancer interventions effects of beetroot and its compounds. The conclusion is anticancer effects exerted through multiple mechanisms such as inhibition of metabolic carcinogenic activation, arrest of cell cycle, antioxidants and pro-apoptotic action.

Lidder S, Webb et al. (2011) conducted a study on Vascular effects of dietary nitrate (as found in beetroot) via the nitrate-nitrite-nitric oxide pathway. He explains that Beetroot tends to contain, Inorganic Nitrate (NO_3^-), as the main bioactive for cardiovascular and endurance exercise interactions. The pigment class of betalains, predominately betanin and vulgaxanthin. The pomace of beetroot also contains phenolics (45.68mg Gallic acid equivalents) and flavonoids (25.89mg Rutin equivalents) with both betanin (4.09mg/g) and vulgaxanthin (7.32mg/g). The main bioactive in beetroot is nitrate he concluded that many studies use beetroot without nitrate as a placebo intervention and note significant difference in microcirculation and exercise performance.

The Indian practioner A Monthly Journal Devoted to Medicine, Surgery and Public Health published that A cup of beetroot juice a day may help reduce blood pressure, according to a study in the journal Hypertension. People with high blood pressure who drank about 8 ounces of beetroot juice experienced a decrease in blood pressure of about 10 mm Hg immediately after one hour. The beetroot juice contained about 0.2g of dietary nitrate, levels one might find in a lettuce or perhaps beetroots. The conclusion was in the body the nitrate is converted to a chemical called nitrite and then to nitric oxide in the blood. Nitric oxide is a gas that widens blood vessels and aids blood flow.

Daniel Kim-Shapiro (2010) conducted a study and concluded that drinking beet juice can increase blood flow to the brain in older adults -- a finding that could hold great potential for combating the progression of dementia. "There are areas in the brain that become poorly perfused in age, and that's believed to be associated with dementia and poor cognition." In this study, the first to find a link between consumption of nitrate-rich beet juice and increased blood flow to the brain, Translational Science Center researchers looked at how dietary nitrates affected 14 adults age 70 and older over a period of four days. He finalized that The MRIs after eating a high-nitrate diet, the older adults had increased blood flow to the white matter of the frontal lobes -- the areas of the brain commonly associated with degeneration that leads to dementia and other cognitive conditions.

Gary Miller,(2010) conducted a study and concluded that the effects of beetroot juice on blood pressure and athletic performance, studies have evaluated its impact on exercise tolerance in patients with peripheral artery disease, a type of cardiovascular disease in which atherosclerotic occlusions impair blood flow to the

lower extremities and cause intermittent claudication (ischemic leg pain that occurs with walking and improves with rest).

Andy Jones, (2010) conducted a study and concluded that the beet juice group was able to cycle an average of 16 percent longer. The men also had lower resting blood pressure after consuming the beet juice compared to the current juice. "Our study is the first to show that nitrate-rich food can increase exercise endurance. We were amazed by the effect of beet juice on oxygen uptake because these effects cannot be achieved by any other known means, including training."

Kenjale et.al.,(2010) conducted a study that the beetroot juice significantly increased plasma nitrite concentration. Beetroot juice ingestion dramatically reduced diastolic blood pressure at rest and during the maximal cardio respiratory exercise test. In addition, the subjects walked 18% longer before the onset of claudication pain and were able to walk 17% longer following the consumption of beetroot juice compared with those who received the placebo. Thus, the conclusion was beetroot juice ingestion significantly increased exercise tolerance by almost 20%—a statistically and clinically significant increase in functionality for a disease state characterized by reduced physical function and quality of life.

Fritz et al., (2009) conducted an experimental study to assess the effectiveness of beetroot juice in anemia correction in Indonesia 105 school children with iron deficiency anemia were selected, aged from 6-11 years, experimental and control groups were allocated by random sampling method. Beetroot juice (100 ml) was given by oral up to 20 days. Hemoglobin level was checked at pre and post intervention. There was significant improvement in the hemoglobin level (79.72%) of the samples ($p < 0.001$) than the control group ($p < 0.05$). He concluded that the

intake of beetroot juice has significant character in reducing the prevalence of iron deficiency in children.

2.3 REVIEW OF LITERATURE RELATED TO THE EFFECT OF BEETROOT JUICE UPON STAGE I HYPERTENSION

Dr. Leah Coles et al.,(2013) conducted a study in Londoners with hypertension. Their systolic pressure was between 140 and 159, while their diastolic pressure was between 90 and 99. These 15 volunteers were given a cup (250 ml) of beet juice to drink as a dietary source of nitrate. In the placebo arm, the beverage was low-nitrate water. In patients with hypertension SBP \geq 140 mmHg at baseline, systolic blood pressure was on average $p=0.03$. lower in the beetroot juice group compared with control group over the 15 days treatment, He concluded that beet root extract is lowering systolic blood pressure with treated hypertension

David proctor et al.(2013) conducted a experimental study on Acute vaso protective effects of nitrate-rich beetroot juice in Pennsylvania state with 8 healthy men aged 19-35 years and found that the nitrate that is present in the juice is converted into nitrite by the bacteria on the tongue, and this nitrite mixes with the saliva in the mouth and travels down to the body. After the research study the mean systolic and diastolic blood pressure level was reduced than the baseline variable. Regression analysis revealed a significant association between blood pressure at the start of intervention and the level of blood pressure lower Systolic blood pressure $R=0.057$; $P=0.03$; Diastolic blood pressure: $R=0.0315$; $p=0.02$. the study concluded that beetroot juice at any preparation are reducing blood pressure in individuals with uncontrolled hypertension.

Peter Weissberg et al.,(2013) done a study in London University with 15 people, they given a drink of 250 ml (just over 8 ounces) of beetroot juice or water with a small amount of nitrate in it. The beetroot juice contained 0.2 g of dietary nitrate. During the 24 hour period that their blood pressure was monitored, the participants averaged a twenty-point decrease in their systolic blood pressure and ten-point reduction in their diastolic blood pressure levels. The researchers concluded that little nitrate was producing large effect on blood pressure level.

Webb et al.,(2013) conducted a study and evaluated the effects of 0.5 L of beetroot juice (22.5 mmol of nitrate) on blood pressure, plasma nitrite concentrations, and endothelial function. Systolic blood pressure dropped 10.4 mm Hg three hours after ingestion, and diastolic blood pressure fell 8 mm Hg 2 1/2 hours after ingestion. Plasma nitrite increased twofold after beetroot juice ingestion, reached a peak at three hours, and correlated with the decreases in blood pressure. Researchers measured endothelial function by brachial artery flow-mediated vasodilatation after ischemic occlusion of the forearm. Beetroot juice significantly prevented endothelial dysfunction induced by an acute ischemic insult in the forearm and attenuated ex vivo platelet aggregation. Thus, the conclusion was physiological effects of dietary nitrate are due to the production of nitrite from symbiotic anaerobic bacteria on the surface of the tongue rather than from the nitrate itself

Larsen et al. (2013) conducted a study and by showed that dietary nitrate supplementation increased the level of plasma nitrite and nitric oxide. ($\text{NO} + \text{O}_2 \Rightarrow \text{Nitrite}$, $\text{Nitrite} + \text{HbO}_2 \Rightarrow \text{Nitrate}$). However, recent study has suggested the mechanism that nitrites can be recycled to generate bioactive nitric oxide. Based on these results, the authors speculated that nitric oxide can be derived from dietary nitrate supplementation and nitric oxide increased oxidative phosphorylation

efficiency. After nitrate supplementation, ATP production was improved during submaximal exercise while oxygen consumption was reduced. Oxidative phosphorylation efficiency (P/O ratio) was higher by 19% following nitrate supplementation during submaximal exercise (Nitrate: 1.62 ± 0.07 vs Placebo: 1.36 ± 0.06 , $p=0.02$). Authors concluded that oxidative phosphorylation efficiency was improved by oral intake of beetroot juice.

Kapil et al.,(2013) conducted a study and concluded that nitric oxide derived from inorganic nitrate reduces blood pressure and increases blood flow. This reduction in blood pressure is seen in both systolic and diastolic readings. They reported that oral inorganic nitrate ingestion caused an elevation of plasma nitrite which resulted in increased nitric oxide concentration. Since nitrite plays a role in human vasodilatation this may explain which expands blood vessels to increase the blood flow.

British Journal of Nutrition.(2013)Published in the title of “ Beetroot Juice Can Lower Blood Pressure by Seven Percent” By Elijah Wolfson at April 16,2013.” A glass of beetroot juice a day to keep the doctors away” That's what you may start to hear in schools after researchers found that drinking one cup (eight ounces) of beetroot juice every day can lead to a seven percent drop in blood pressure readings. conducted a study, in the American Heart Association's, looked at a small group of eight women and seven men at North America , all of whom had systolic pressure between 140 and 159 mm Hg. The participants were given either beetroot juice or water tested to ensure very low nitrate levels. All the men and women had their blood pressure monitored for 24 hours. Those drinking beetroot juice were able to cut their

systolic pressure by 10 mm Hg; The conclusion was continuous intake of beet root juice an ounce a day will reduce the hypertension and become normotensive.

Vanhatalo et al.,(2013) investigated that the acute (2 1/2 hour) and chronic (up to 15 days) effects of dietary nitrate supplementation on blood pressure and the physiological responses to moderate-intensity. Beetroot juice significantly elevated plasma nitrite concentration throughout the 30-day test period, and this was accompanied by a marked reduction in systolic (40 mm Hg) and diastolic (10-20 mm Hg) blood pressure. These effects tended to be more pronounced after 15 days of dietary nitrate supplementation. He concluded that Compared with placebo, the oxygen cost during moderate exercise was acutely reduced by 4% after 2 1/2 hours and remained similarly lowered after twelfth and 30 days of continual beetroot juice ingestion.

George TW, et al.(2013) conducted a study UK with 30 population and has found more evidence that [beetroot](#) may help lower [blood pressure](#) . The findings come in a small study of 15 men and 15 women with [high blood pressure](#) published in the journal Hypertension.. Early research involved giving very high doses of beetroot juice to healthy volunteers. Having found the juice helped lower blood pressure, they then pinpointed nitrate as the blood pressure lowering ingredient.

Elijah Wolfson, Bushnell,(2013) conducted new study and published in the American Heart Association's Hypertension journal, In an earlier study conducted at Queen Mary University research team first observed that drinking beet juice lowered blood pressure in test subjects within 24 hours on hypertension. Only a small amount of juice is needed –just 250 ml – to have this effect, and that the higher the blood pressure at the start of the study the greater the decrease caused by the nitrate. He

concluded that the research is good news for people suffering from high blood pressure who want to use a natural approach to reduce their risk of cardiovascular disease.

Kim-Shapiro, Milsom AB, (2013) The research was conducted by scientists at London's Queen Mary University on red beets, called beetroot in Britain. Beets have drawn attention from nutritional scientists in recent years because of their health benefits. Specifically, beets have been found to be rich in betaine, a nutrient which reduces the blood concentration of homocysteine, an amino acid linked to heart disease and stroke. They found that nitrate presence in beetroot produce vasodilatation and produce marvelous result.

Bailey SJ, Winyard P, Vanhatalo A, (2012) conducted a follow-up study at Translational Science Center researchers at Wake Forest University to determine the mechanisms by which beetroot juice lowered the oxygen cost of moderate-intensity exercise and improved tolerance of high-intensity exercise.¹⁵ Subjects were consumed 0.5 L of Beet It (5.1 mmol of nitrate) or placebo (the black current cordial) for 15 days and completed a series of low- and high-intensity knee extensor exercises in the prone position on the last three days. Beetroot juice more than doubled plasma nitrite concentration and reduced the oxygen cost and rate of phosphocreatine breakdown during low- and high-intensity exercise. Beetroot juice greatly reduced the oxygen cost of moderate-intensity knee extensor exercise by 25% and increased the time to exhaustion during high-intensity knee extensor exercise by 25%.

Lundberg JO, Larsen FJ, Weitzberg E, Fulford J, Hobbs DA, (2012) In a new study, researchers conducted two separate studies to evaluate the effects of beetroot juice on blood pressure. People with normal blood pressure levels were

randomly assigned to drink 0 grams, 100 grams, 250 grams or 500 grams of beetroot juice; or to eat a control bread product containing no beetroot juice, a bread product containing 100 grams of red beetroot juice or a bread product containing 100 grams white beetroot juice. Blood pressure was measured over 24 hours and nitrate levels in the urine were measured before treatment and again two hours, four hours and 24 hours after treatment. The researchers found that consuming beetroot juice was significantly linked to reduced blood pressure over the 24-hour period. The authors noted that the reduction in blood pressure was almost dependent on the amount of beetroot juice consumed.

Prof Amrita Ahluwalia, Bruce King, Paul J. Laurienti, W (2011) conducted study on randomized controlled trial with free living adults at Queen Mary's university at UK about the consumption of beetroot juice on a low nitrate diet may lower blood pressure (BP) and therefore reduce the risk of cardiovascular events. The aim of the study to investigate if consuming beetroot juice in addition to a normal diet produces a measureable reduction in BP. Fifteen women and fifteen men participated in a double-blind, randomized, placebo-controlled, crossover study. Volunteers were randomized to receive 500 g of beetroot and apple juice (BJ) or a placebo juice (PL). Volunteers had BP measured at baseline and at least hourly for 24-h following juice consumption using an ambulatory blood pressure monitor (ABPM). Volunteers remained at the clinic for 1-h before resuming normal non-strenuous daily activities. The identical procedure was repeated 2-wk later with the drink (BJ or PL) not consumed on the first visit. Overall, there was a trend ($P=0.064$) to lower systolic blood pressure (SBP) at 6-h after drinking BJ relative to PL. Analysis in men only ($n=13$) after adjustment for baseline differences demonstrated a

significant ($P < 0.05$) reduction in SBP of 4 – 5 mmHg at 6-h after drinking Beetroot juice.

Lansley KE, Winyard PG, Fulford J, (2011) conducted a study to determine the physiological effects of beetroot juice where due to high nitrate content. The subjects consumed 0.5 L of Beetroot juice for 6 days. The nitrate-rich beetroot juice significantly raised plasma nitrite concentration and decreased systolic blood pressure by 10 percent (12mmHg) compared with placebo. These results indicate that the positive physiological effects of beetroot juice ingestion on blood pressure and exercise performance are due to the high nitrate content rather than other compounds⁸.

Winson, Ferguson, Scott Kohman (2010) conducted a correlation study on the effectiveness of uncooked beetroot's content and betaine, a nutrient which reduces the blood concentration of homocysteine, an amino acid absorption compared with the synthetic iron content absorption. The study revealed that along with every iron rich food it is essential to take vitamin 'c' for rapid absorption. Hence in beetroot vitamin 'c' components are already present. Compared with synthetic nitrite content absorption ($r = 0.032$), uncooked beetroot has natural source of iron and vitamin 'c' has faster absorption ($r = 0.42$). So the absorption of betine and nitrite in beetroot is easier to get absorbed than the synthetic contents.

Robin W. Dove, Janine M., Fritz (2010) conducted an experimental study to assess the effectiveness of beetroot juice hypertension correction in Indonesia 105 adults working in industrial area with iron increased hypertension were selected, aged from 30-60 years, experimental and control groups were allocated by random sampling method. Beetroot juice (100 ml) was given by oral up to 20 days. Blood

pressure level was checked at pre and post intervention. There was significant improvement in the blood pressure level (79.72%) of the samples ($p < 0.001$) than the control group ($p < 0.05$). He concluded that the intake of beetroot juice has significant character in reducing the prevalence of systolic and diastolic blood pressure level.

David Weir's ,Wylie LJ, (2010) conducted a study by balanced crossover design, with 10 healthy men study on Dietary supplementation with beetroot juice (BR), In ingested 70, 140, or 280 ml concentrated BR (containing 4.2, 8.4, and 16.8 mmol NO_3^-), respectively) or no supplement to establish the effects of BR on resting plasma [NO_3^-] and [NO_2^-] over 24 h. However, 140 and 280 ml BR reduced the steady-state oxygen (O_2) uptake during moderate-intensity exercise by 1.7% ($P = 0.06$) and 3.0% ($P < 0.05$), whereas time-to-task failure was extended by 14% and 12% (both $P < 0.05$), respectively, compared with placebo . These findings have important implications for the use of Beet root juice to enhance cardiovascular health and exercise performance in young adults.

Jeminar, (2009) conducted an experimental study to assess the effectiveness of Beetroot extract upon hypertension in Washington. In which 105 adults were selected as samples by random sampling method and was Blood pressure were measured from them, before and after the intervention. Beetroot extract was given once in a day for 25 days. The result showed that 76% of adults were uncontrolled hypertensive before the treatment. There was significant reduction in the systolic and diastolic (82%) of the study population ($P=0.05$).

Nakul Patel et al.,(2009) conducted Basic research on adults and pilot studies on all group have shown betaine may protect against liver disease, particularly the build up of fatty deposits in the liver caused by alcohol abuse, protein deficiency, or diabetes, among other causes. In preliminary research, beetroot juice lowered blood pressure and thus may help reduce the risk of cardiovascular disease. The study correlated high nitrate concentrations in the blood following ingestion of the beetroot juice and the drop in blood pressure.

Tennille D. Presley, Ashley R. Morgan, Erika Bechtold,Davies (2009) conducted an experimental study on beetroot juice consumption in reducing blood pressure among hypertensive clients in U.S.A. Study was designed to show that beetroot juice increases the blood forming qualities. Due to its higher content of betaine it regenerates and reactivates on arteries. One serving of beetroot juice (100ml) was given for 20 days, to the experimental group. After 20 days of beetroot juice intake, there was a significant improvement in the blood pressure level (82%) for the experimental group ($P < 0.001$).

Andy Jones,Ben Benjamin, Ellen Coleman,(2009) conducted an experimental study in UK with 10 people and concluded that within 3-4 hrs of ingestion of nitrate from the beetroot juice the level of the blood pressure falls significantly. It is due to the chemical formation of nitrite from the dietary nitrate that reduces blood pressure. The nitrate in the juice gets broken down by the bacteria in the saliva into nitrite. It is only after the swallowing of the nitrite-containing saliva that the nitrite gets converted into nitric oxide through the acidic reaction in the stomach or re enters the circulation as nitrite. The peak time of reduction in the blood pressure was correlated with the peak time of nitrite in the blood circulation.

2.4 CONCEPTUAL FRAME WORK

A conceptual frame work can be defined as a set of concepts and that assumption that integrated them in to a meaningful configuration (Fewett 1980).

The conceptual framework is an organized phenomenon which deals with concept that is assembled by virtue of their relevance to a common theme. Conceptual framework can severe to guide research which will further support theory development. The conceptual models attempt to represent reality with minimal use of words.

Theoretical model for this study was derived from Callista Roy's Adaptation Theory Model (1996). Roy employs a feedback cycle of input, through put and output. Input is defined as stimuli, which can come from the environment or form within a person. Stimuli, which can come from the environment or form within a person. Stimuli are classified as focal (immediately confronting the person), contextual (all other stimuli that are present). Input also includes a person's adaptation level (the range of the stimuli to which a person can adapt easily).

Throughput makes use of a person's process and effectors "process" refers to the control mechanism that a person uses an adaptive system, "Effectors" refers to the physiological function, self concept, and role function involved in adaption. The adaptive modes are the ways that a person adapts through physiological needs, self concepts and role function and inter dependant relation. In the adaptive system, system is defined as self parts connected to function as a whole for some purpose and it does by virtue of the inter dependence of its parts. Adaptive means the human system has the capacity to adjust effectively to change environment. The adaptive

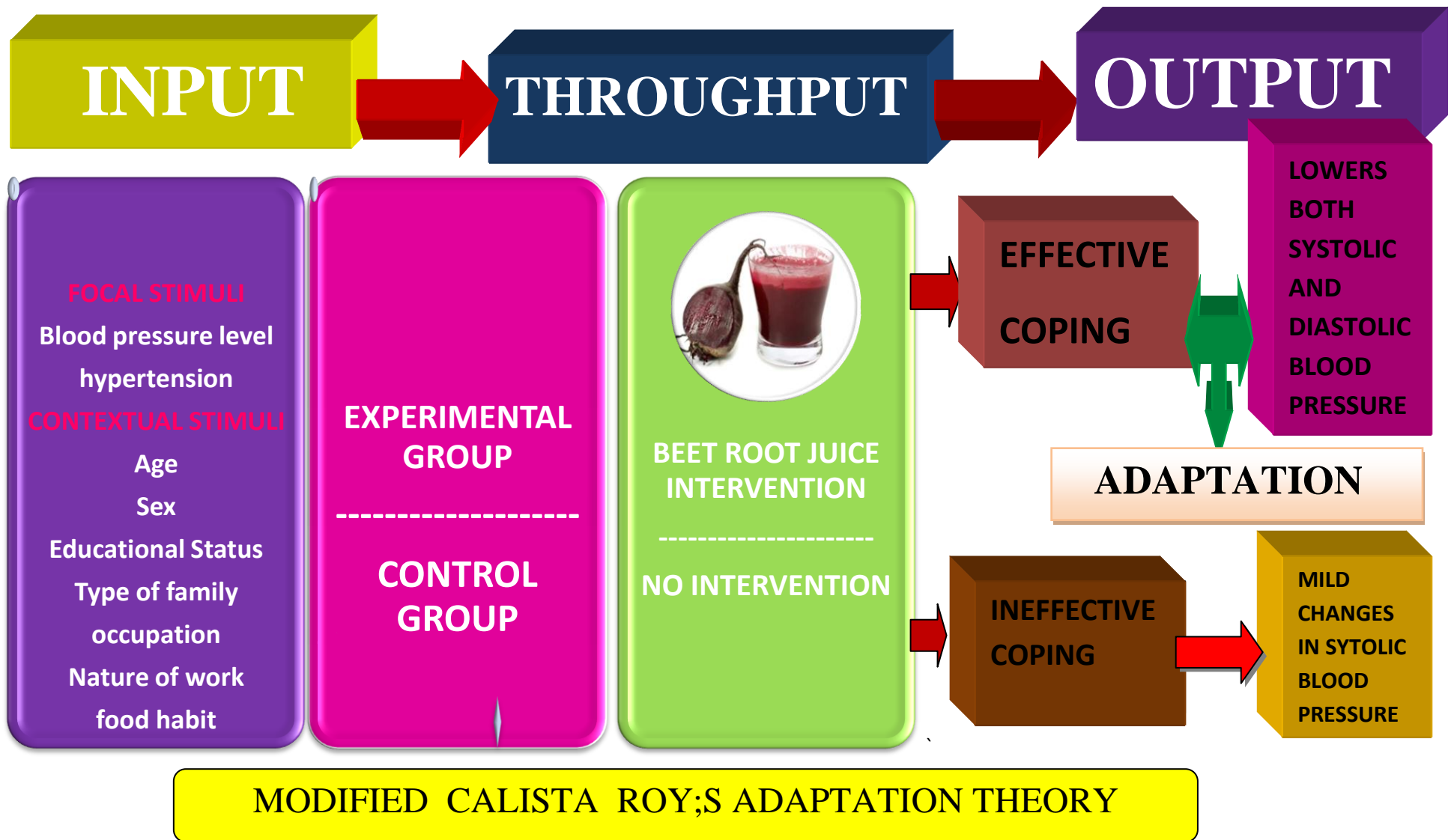
system is regarded as a holistic system. This has two major internal controls process called regulator and cognator sub system.

These system are viewed as innate or acquired copying mechanisms are generally determined and are generally viewed as automatic process. Acquired coping mechanisms are developed through process such as learning.

The regulator sub system responds automatically through neural, chemical and endocrine coping process. The cognator subsystem responds to input from external and internal stimuli that involves physical, physiological , psychological and social factors including regular sub system outputs. The regulator and cognator activity is manifested through the coping behavior in four adaptive mode. That is through the physical needs self concept and role function and interdependence relations.

The modified model in this study explains the output as the

- | | | |
|--------------------|---|--|
| Focal stimuli | : | Hypertension |
| Contextual stimuli | : | Age, sex, educational status, marital status, type of family, occupation, income, nature of work, food habits. |
| Coping mechanism | : | The cognator and regulator subsystem occurs through Oral beetroot juice administration. |
| Adaptive response | : | The experimental group of uncontrolled hypertensive Clients as lower in the blood pressure leve |



CHAPTER-III

RESEARCH METHODOLOGY

Methodology is a systematic way to solve the research problems. The research methodology in values the systematic procedure by which the investigation starts from the initial identification of problem to its final conclusion.

-Leister

This chapter includes research approach, research design, variables, setting, population, sample and sample size, sampling technique, development of the tool, content validity, pilot study, data collection procedure, plan for data analysis, and ethical consideration.

This present study was done to assess the effectiveness of beetroot juice on blood pressure level among clients with hypertension residing at Samayanallur, Madurai.

3.1 RESEARCH APPROACH

Quantitative approach was used for this study to evaluate the effectiveness of beetroot juice on blood pressure level among clients with Stage I hypertension residing at Samayanallur, Madurai.

3.2 RESEARCH DESIGN

The research design selected for the present study was Quasi experimental Non-equivalent control group pretest and post test design. A Quasi experiment involves Manipulation of independent variable, but absence of either randomization or control group. In my study randomization is not done to select sample.

GROUP	PRE TEST	INTERVENTION	POST TEST
Experimental group	01	X	02
Control group	01	-	02

01 - Pretest for both experimental and control group.

X - Intervention to experimental group (Beetroot juice consumption)

02 - Post test for both experimental and control group.

3.3 RESEARCH VARIABLES

Independent variable : Beetroot juice

Dependent variable : Blood pressure level

Demographic variable : Age, sex, education, marital status, occupation, Nature Of work, income, family type, family History, food habits.

Clinical variable : Duration of illness and treatment, Type of medication, Average of sleeping hours, Habits, Restriction in salt and fried items, Exercises, , B.M.I.

3.4 RESEARCH SETTING

The investigator conducted the study at Samayanallur in Madurai.. The Samayanallur PHC consists of six subcentres Samayanallur-1, Samayanallur-2, Thennur, Vilankudi, Paravai and Karisalkulam. Among 6 subcentres 2 subcentres Samayanallur-1 and Paravai was adopted by the department of community health Nursing, College of Nursing to provide preventive and curative care to the population.

In Samayanallur Ist Street of Kattunaikar Street and Muthuramalinga thevar West Street was selected to conduct the present study. This is situated within the radius of 7 kilometers from Government Rajaji Hospital, Madurai. KattuNaikar street consists of four streets, Clients with hypertension belongs in these two streets were 100. The investigator selected West Street of Muthuramalinga street clients as experimental group. Which is near to the Primary Health Centre and for control group Kattunaikar Street was selected.

3.5 POPULATION OF THE STUDY

Target Population:

Clients with hypertension and on treatment.

Accessible Population:

Clients with Stage I hypertension and on treatment and residing at Samayanallur.

3.6 SAMPLE

Clients with Stage I hypertension residing at Samayanallur and who fulfill the inclusion criteria.

3.7SAMPLE SIZE

Sample size of the present study was 60 stage I hypertensive clients.(30 clients from Muthuramalinga thevar west street and 30 clients from Kattunaikar Street)

3.8 SAMPLING TECHNIQUE

The researcher adopted Non probability sampling-Purposive sample technique to select the clients for the study.

3.9 SAMPLING CRITERIA

The following were the criteria for selection of samples for the study.

Inclusion criteria

- Hypertension clients residing at Samayanallur.
- Stage I hypertension clients who were diagnosed and on treatment.
- Hypertension clients who were in the age group of 35 years and above.
- Hypertensive clients who were willing to participate in the study.
- Hypertension client taking treatment at Samayanallur PHC.
- Both genders were included in this study.

Exclusion criteria

- Hypertensive clients who have any other co-morbidities like cardiac diseases.
- Antenatal mothers.
- Postnatal mothers
- Pilot study samples
- Clients with bleeding disorder.

3.10 METHOD OF SAMPLE SELECTION

The sample consists of a total number of 60 Stage I hypertension clients. 30 clients from Muthuramalinga thevar west street selected as experimental clients and 30 clients from Kattunaikar street selected as control group- –first 30 clients who met the inclusion criteria were selected first.

3.11. DEVELOPMENT OF THE TOOL

A structure interview schedule was developed based on the objective of the study through review of literature on related studies , journals and books, opinion from the experts. All these helped in the ultimate development of the tool.

3.11.1 DISCRIPTION OF THE INSTRUMENT

Section 1: Demographic variables includes –Age, sex, marital status, Educational status, occupation, nature of work, monthly income, Type of family, family history and food habits.

Section 2: Clinical variables includes - Duration of illness, duration of treatment Taken, type of medication, Average of sleeping hours, habits, Restriction in salt and fried items, exercises, B,M,I.

Section 3: Record of blood pressure level includes the pre and post test of blood pressure level in experimental and control group.

TESTING OF THE TOOL

3.12 CONTENT VALIDITY

The study was validated by 3 nursing experts. The Associate professor of Preventive and social Medicine, and physician suggestion were considered. All the experts have their consensus, and then the tool was finalized.

3.13 RELIABILITY OF THE TOOL

The reliability of the instrument was established by inter-rater reliability. The instrument was administered to 5 individuals simultaneously by 2 nursing personnel and the tool was found to be reliable for the study. The obtained reliability coefficient $r = 0.83$. Hence the tool was considered reliable for proceeding with main study.

3.14 ETHICAL CONSIDERATION

A formal permission was obtained from Deputy director of health services, Madurai. Ethical consideration was acquired from the Ethical committee, Madurai medical college, Madurai. Written informed consent was obtained from hypertensive clients who involved in the study. The sample had the complete freedom to withdraw the study to their reason. No physical and psychological harm was made to the sample.

3.15 PILOT STUDY

A formal permission obtained from the Block Medical officer of primary health centre, Samayanallur, to conduct the pilot study. Pilot study was conducted in Arundhadiar Street at Samayanallur. The pilot study was undertaken from 15.09.2013 to 21.09.2013. A brief self introduction was given to the clients regarding administration of Beetroot juice. The purpose of the study was explained to the clients and get consent from them. For each experimental and control group 5 clients were assigned. Clients were selected those who come under the inclusion criteria with the use of non probability sampling method and purposive sampling technique . Interview method was used to collect the demographic variable and clinical variables. Blood pressure level was measured for both experimental and control group and the clients who were diagnosed as Stage I hypertension are selected. Then the investigator made juice in front of the clients and make them to drink through their full participation and willingness. The investigator found that the instrument was feasible for use and no further modification were needed before implementation of the main study.

3.16 DATA COLLECTION PROCEDURE

The main study was conducted from 01.10.2013 to 31.10.2013. at Samayanallur. Formal permission was obtained from the Deputy Director of health services, Madurai. The investigator obtained formal permission from the Block medical officer of Samayanallur Primary Health Centre. A brief self introduction was given to the hypertensive clients and established rapport with them. In selected streets of Samayanallur samples were selected by those who fulfill the inclusion criteria. The purpose of study was explained to the clients and assured confidentiality to be

maintained of the data collected. Both verbal and written consent was obtained from the clients. Interview method was used to collect the baseline variables. The researcher allowed the clients in control group to took regular medication they had. Whereas for experimental group Beetroot juice was given along with their regular medications. The investigator visit hypertensive clients daily at home from 8am to 4pm for intervention.. The investigator visited their home every day morning including holidays . The investigator spent approximately 25 to 30 minutes with one client to complete the interview schedule. A pretest blood pressure was assessed for experimental and control group. Under the supervision of investigator beet root juice was made and the clients in experimental group drink 250 ml of juice every morning for 30 days. Post test blood pressure was assessed for both group on 31st day.

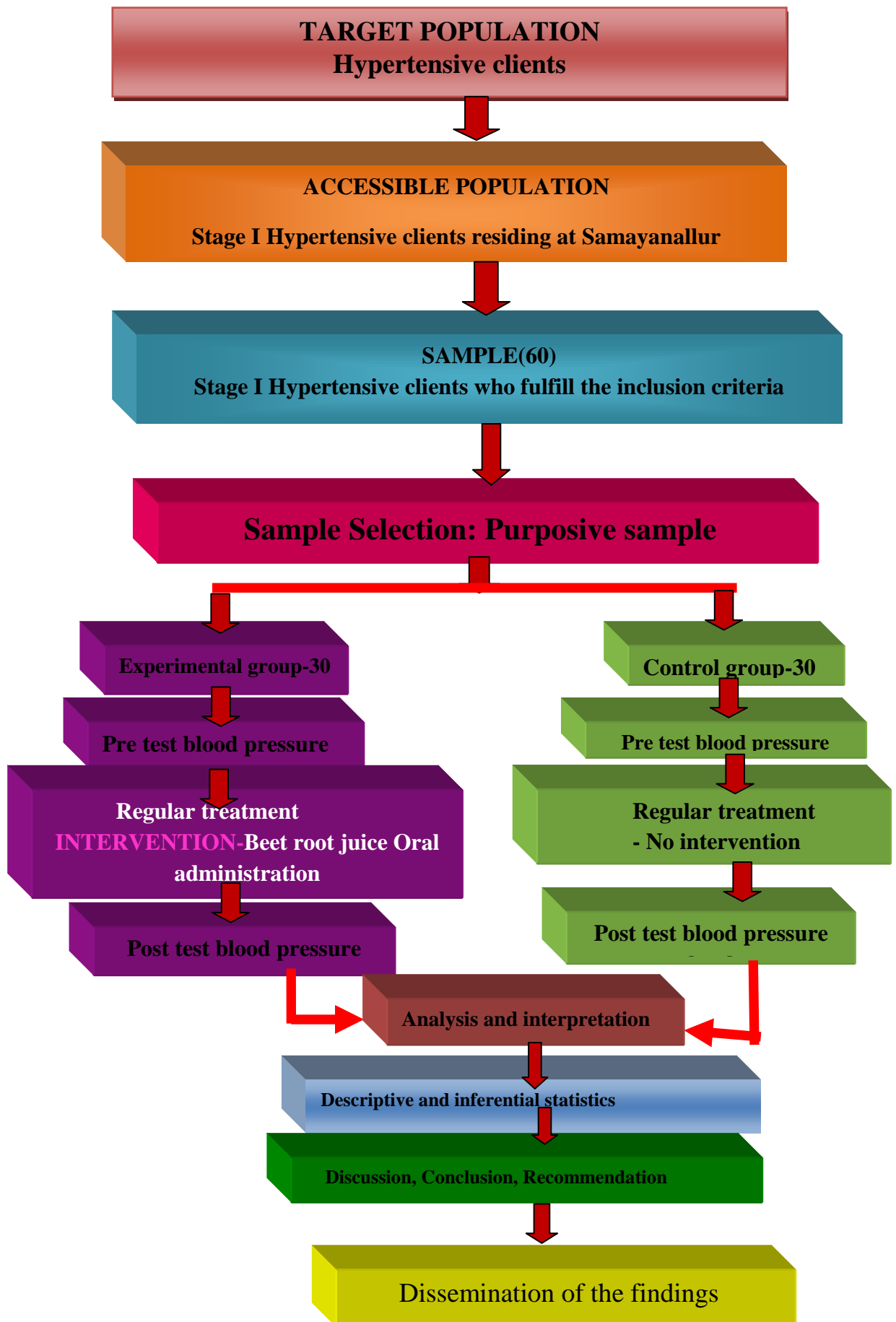
3.17 PLAN FOR DATA ANALYSIS

Data were analyzed using both descriptive and inferential statistics. Test used in this study were frequency and percentage distribution, standard deviation, mean, chi square test, and paired ‘t’ test . Demographic variables were analyzed by frequency and percentage distribution. Mean, standard deviation were used to analyze the blood pressure level of hypertensive clients both in experimental and control group. Paired ‘t’ test was used to evaluate the effectiveness of beetroot juice on reducing blood pressure level. Chi square test was used to find out the association between the blood pressure level of clients in experimental group and demographic variables.

3.18 ETHICAL CONSIDERATION

The proposed study was conducted after the approval of dissertation committee of College of Nursing, Madurai medical college, Madurai. In order to protect the human rights ethical committee approval was obtained on the month of September from Ethical committee, Madurai medical college, Madurai. In addition the permission was obtained from Deputy director of health Services, Madurai. Both verbal and written consent was obtained from all the study subjects and the data collection was kept confidential. The possible benefits of participating in the study samples, that confidentiality and privacy was maintained throughout the study.

3.19 SCHEMATIC REPRESENTATION OF RESEARCH STUDY



CHAPTER – IV

DATA ANALYSIS & INTERPRETATION

Analysis is a method of rendering data in quantitative, meaningful and intelligible manner, so that research problem can be studied and tested and the relationship between the variables can be found. (**Polit and hungler (2006)**).

This chapter deals with analysis and interpretation of data collected from 60 Hypertensive clients in Stage I Hypertension who residing at Samayanallur , Madurai to assess the effectiveness of Beetroot Juice on the level of blood pressure. The data have been analyzed and presented as follows.

SECTION-A

This section deals with frequency and percentage distribution of samples according to their Demographic variables and clinical variables.

SECTION-B

This section deals with the distribution of pretest score of blood pressure level for experimental and control group.

SECTION-C

This section deals with the effectiveness of beetroot juice intervention by mean blood pressure level score between pretest and posttest of the experimental group.

SECTION-D

This section deals with the Comparison of mean blood pressure level score between pretest and posttest among the hypertensive clients of both experimental and control group.

SECTION-E

This section deals with the association of blood pressure level and selected demographic and clinical variables.

SECTION-A

TABLE 1

**DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF THE CLIENTS WITH STAGE I
HYPERTENSION**

DEMOGRAPHIC VARIABLE		GROUP			
		EXPERIMENTAL		CONTROL	
		NO. OF CLIENTS	%	NO. OF CLIENTS	%
AGE	35-45 YEARS	5	16.7%	8	26.7%
	46-55 YEARS	8	26.7%	6	20%
	56-65 YEARS	13	43.3%	14	46.6%
	>65 YEARS	4	13.3%	2	6.7%
SEX	MALE	8	26.7%	12	40%
	FEMALE	22	73.3%	18	60%
EDUCATIONAL STATUS	Primary School	6	20%	8	26.7%
	Middle School	5	16.7%	3	10%
	High School	6	20%	8	26.7%
	Higher Secondary	5	16.7%	6	20%
	Professional	2	6.7%	3	10%
	No formal education	6	20%	2	6.7%
Marital Status	Un Married	2	6.7%	-	0.0%
	Married	28	98.3%	30	100%
	Divorced	0	0.0%	0	0.0%
Occupation	Professional	3	10%	2	6.7%
	Loadwork/ Farmer/mill worker	12	40%	11	36.7%
	Clerical/Shop keeper	4	13.3%	4	13.3%
	Un employed	11	36.7%	13	43.3%
Nature of Work	Sedentary/house wife	15	50.0%	17	56.7%
	Moderate	3	10%	2	6.7%
	Heavy	12	40%	11	36.7%
Income (monthly)	<2000	2	6.7%	0	0.0%
	2001-5000	10	33.3%	10	33.3%
	5001-10,000	18	60%	20	66.7%
Type of family	Nuclear	17	56.6%	16	53.3%
	Joint	11	36.7%	14	46.7%
	Separated	2	6.7%	0	0.0%
Family History of Hypertension	Father	13	43.3%	10	33.3%
	Mother	10	33.3%	10	33.3%
	Paternal	5	16.7%	7	23.4%
	Maternal	2	6.7%	3	10%
Food Habits	Vegetarian	4	13.3%	2	6.7%
	Mixed vegetarian	26	86.7%	28	93.3%

The above table reveals the background data among hypertensive clients for experimental and control group such as age, sex, educational status, marital status, occupation, nature of work and, monthly income, type of family, family history of hypertension and food habits.

In the aspect of **Age**, in the experimental group about 5 (16.7%) belonged to the age group of 35-45 years, 8(26.7%) were in the age group of 46-55 years, 13(43.3%) belonged to the age group 56-65 years and remains 4(13.3%) were more than 65years whereas in the control group 8(26.7%) belongs to 35-45 years of age group, 6 (20%) were between 46-55 years, 14 (46.6%) belonged to 56-65 years age and 2 (6.7%) were more than 65 years of age.

With respect to **sex**, majority of samples were females both in the experimental group 22 (73.3%) and control group 18 (60%). Whereas the male samples in the experimental group were 8 (26.7%) and control group 12 (40%) respectively.

When the **education** is considered, in the experimental group, about 6 (20%) studied primary education, 5 (16.7%) had middle education, 6 (20%) studied high school, 5(16.7%) studied higher secondary, 2 (6.67%) were had professional education and 6(20%) had no formal education. In control group, 8 (26.67%) had primary education, 3(10%) were had middle education, 8 (26.7) studied up to high school 6 (20%) had higher secondary education, 3 (10%) had professional education 2(6.7%) had no formal education.

When **marital status** is considered, in both the experimental 30 (100%) and control group 30 (100%) were married. With regards to the type of family, about 17 (56.7%) belonged to nuclear family, 11 (36.7%) belonged to joint family and 2 (6.66%) were separated in the experimental group. Whereas in the control group, 16

(53.3%) belonged to nuclear family, 14 (46.7%) belonged to joint family and no one was separated.

While considering the **Occupation** of participants of study , in experimental group 3(10%) were doing professional work, 12 (40%) were working as Load carrying work, Farmer, and as mill worker. Among them 4(13.3%) were doing clerical work, and 11(36.7%) members were unemployed. In the control group 2(6.7%)were professional worker,11(36.7%)working as Load carrying work, farmer and millworker, 4(13.3%) clerical work at shop and 13(43.3%) were unemployed. In the experimental group, about 15(50%) had sedentary work, 3(10%) had moderate work, 12(40%) had heavy work . In control group about 17 (56.7%) had sedentary work, 2 (6.7%) had moderate work, 11(36.7%) had heavy work.

Regarding the **family income** per month is considered, in the experimental group about 2 clients (6.7%) had less than Rs.2000 per month ,10 (33.33%) had Rs.2001-5000,client of 18 (60%) had Rs.5001-10000 family income respectively. In the control group, about 10 (33.3%) had earning Rs.2001-5000 per month ,20 (66.7%) had family income between Rs 5001-10,000 respectively.

With the view of **family history of hypertension** , in the experimental group, 13(43.3%) had father with hypertension, 10(33.3%) had mother with hypertension, 2(6.7%) had maternal grandparent with hypertension and 5 (16.7%) had paternal grandparents. Whereas in the control group, 10 (33.3%) had father with hypertension, 10(33.33%) had mother with hypertension, 7(23.4%) had paternal grandparent with hypertension and 3 (10%) had maternal grandparent hypertension.

When considering about the **food habit**, in the experimental group, 4 (13.3%) were vegetarians and 26 (86.7%) were mixed vegetarians. In the control group, 2 (6.7%) were vegetarians and 28(93.3%) were mixed vegetarians respectively.

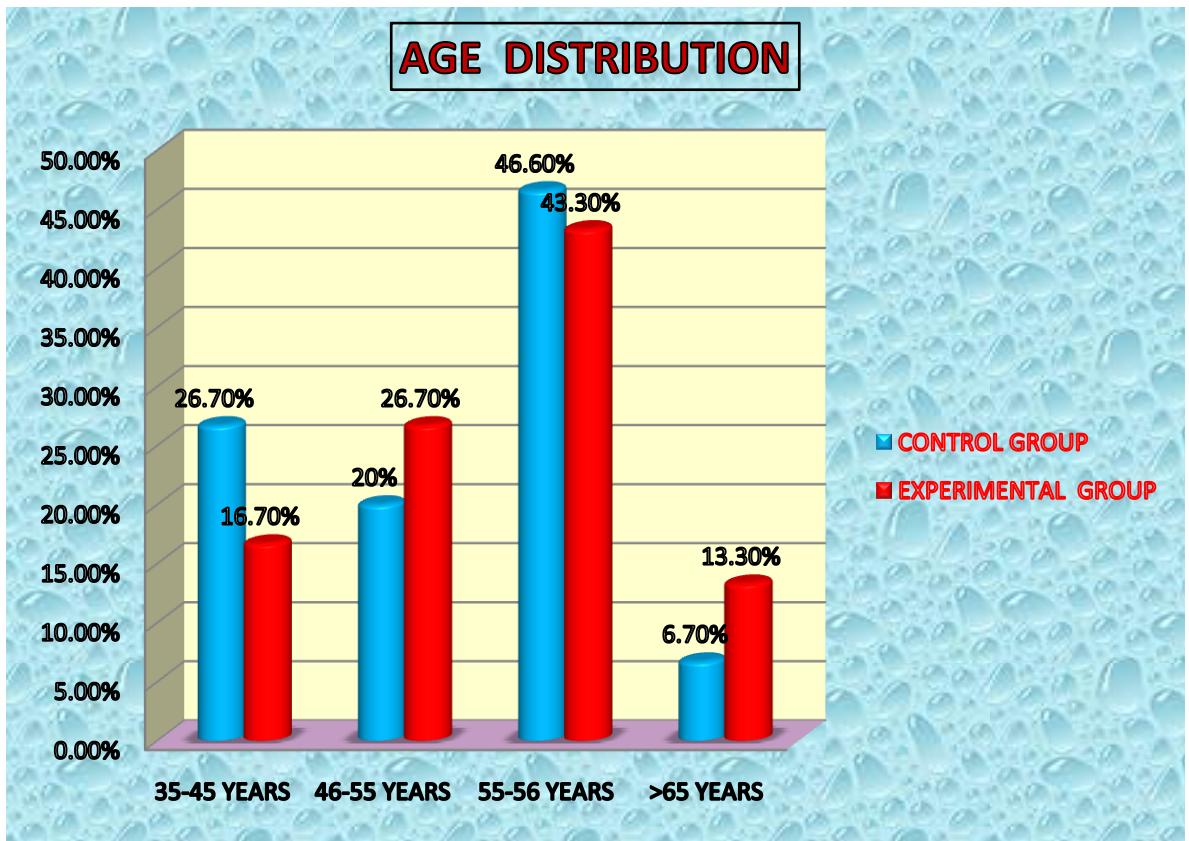


Fig.2. clustered cylinder diagram shows the Percentage wise distribution of age among experimental and control group

- With regard to **Age** Majority of stage I hypertensive clients in experimental group (43.3%) and in control group (46.6%) were in the age group of 56-65 year

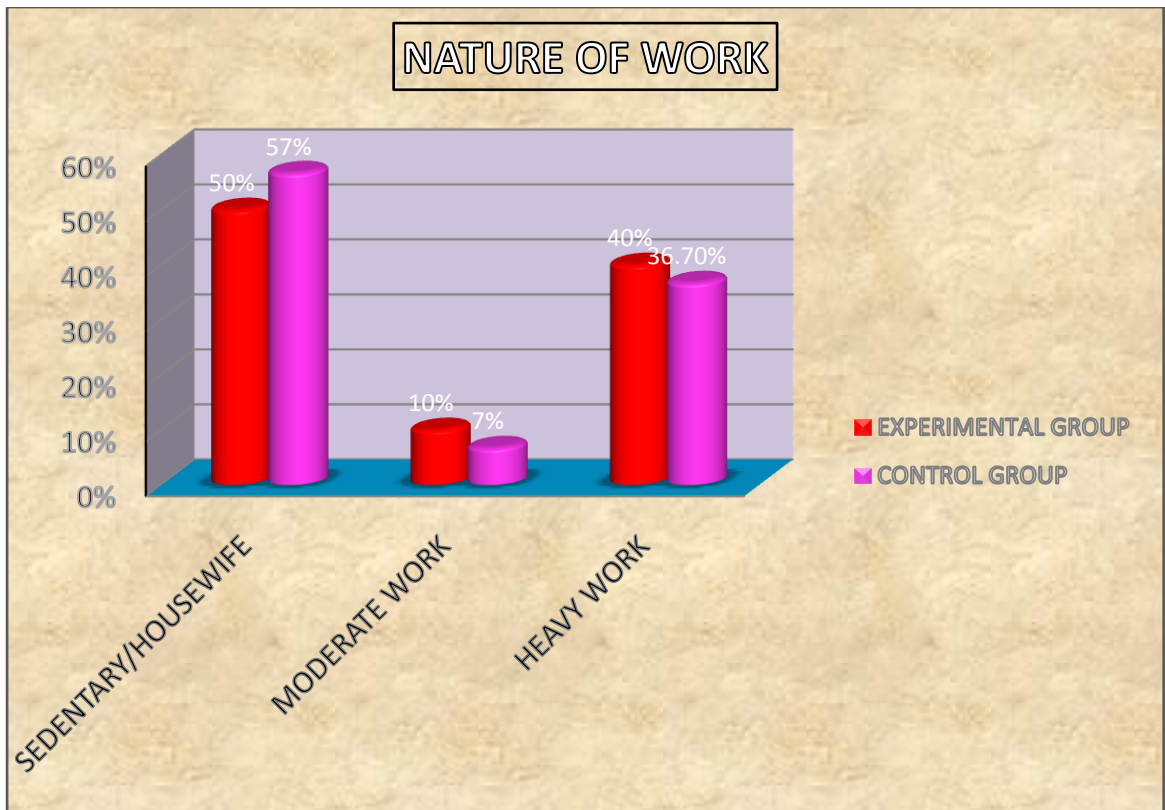


Fig.3. clustered cylinder diagram shows the percentage distribution of Nature of work in experimental and control group.

Higher percentage 50% and 57% were sedentary and heavy work in both groups respectively.

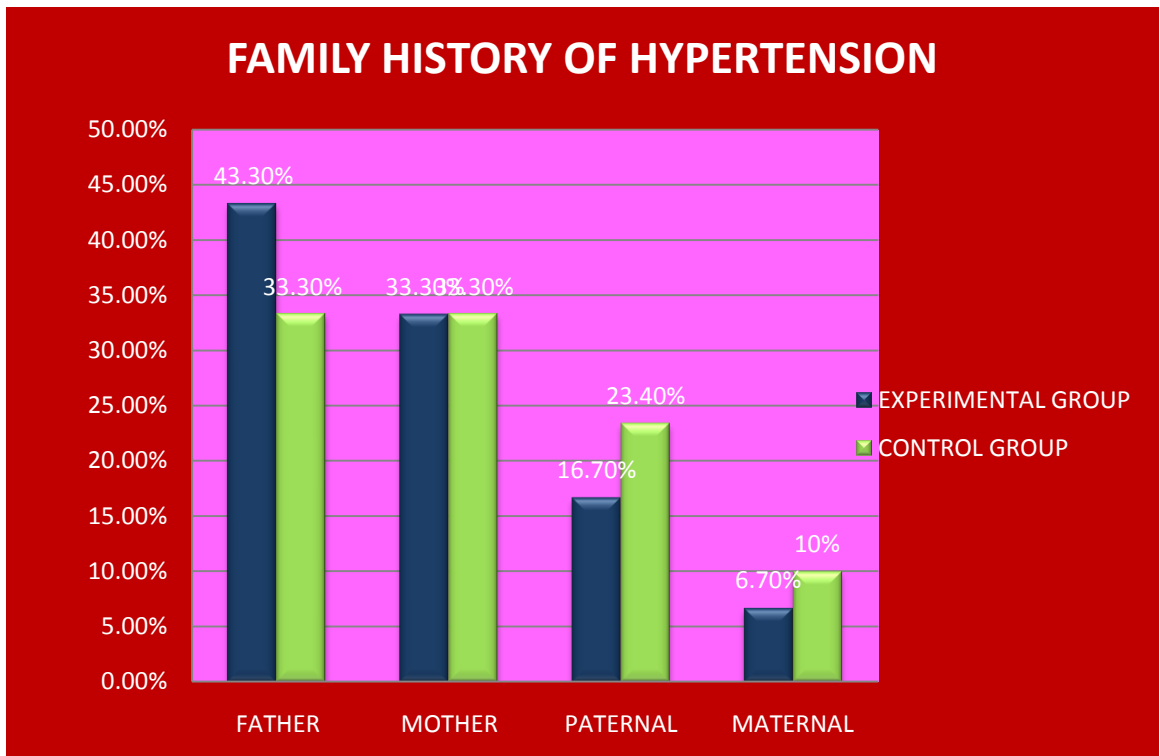


Fig.4. The clustered bar diagram shows the percentage distribution of family history of hypertension in experimental and control group.

In experimental group (43.3 %)and (33.30%) have the history of their parents having hypertension, in control group (66.60%) having the history of parents with hypertension.

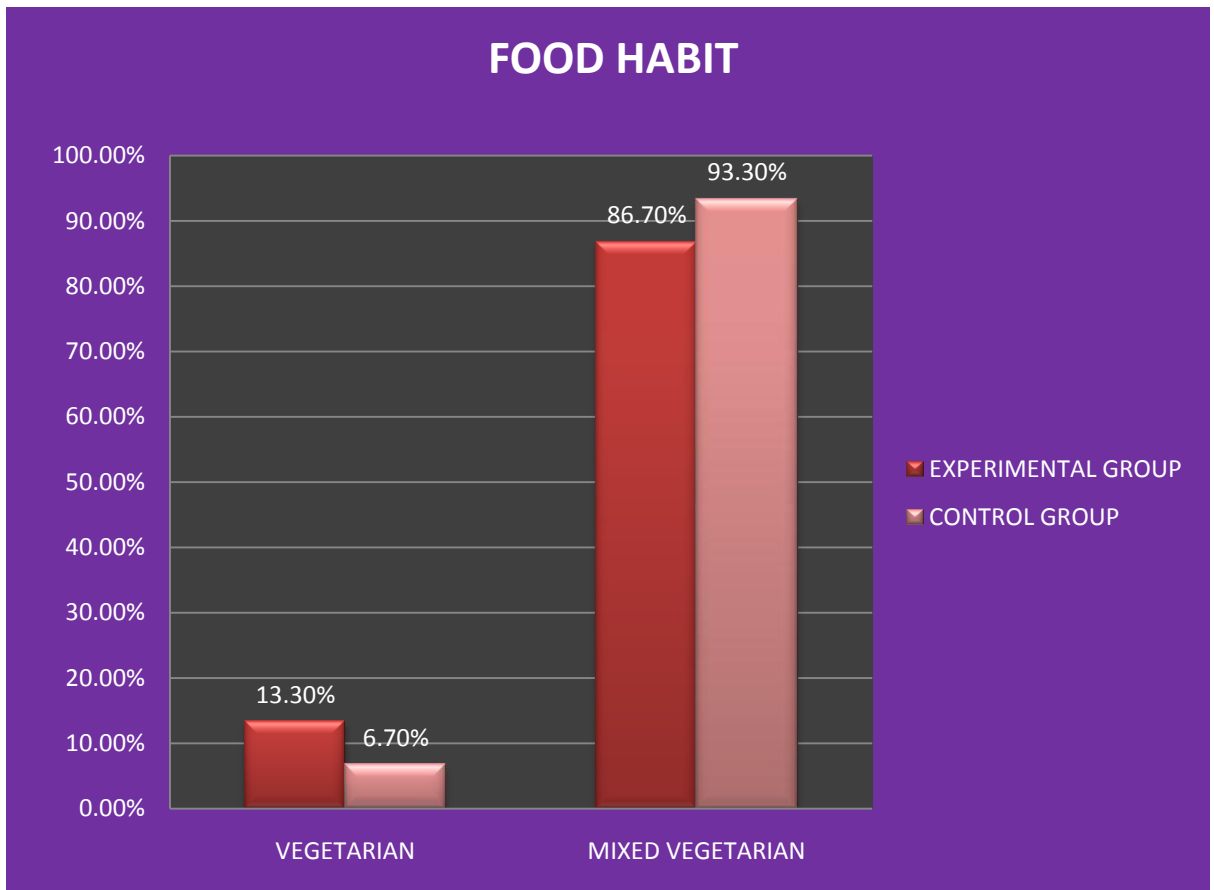


Fig.5. The clustered bar diagram shows the percentage distribution of food habit in experimental and control group.

Majority of the clients were mixed vegetarian in both experimental(86.70%) and control group(93.3%)

TABLE 2

DISTRIBUTION OF CLINICAL VARIABLES OF THE CLIENTS WITH STAGE I HYPERTENSION

CLINICAL VARIABLES		GROUP			
		EXPERIMENTAL		CONTROL	
		NO OF CLIENTS	%	NO OF CLIENTS	%
Duration of illness (hypertension)	<1 year	05	16.7%	03	10%
	1-3 yrs	08	26.7%	10	33.3%
	3-5 years	13	43.3%	15	50.0%
	>5 years	04	13.3%	02	6.7%
Duration of treatment	<1 year	05	16.7%	03	10%
	1-3 yrs	08	26.7%	10	33.3%
	3-5 years	13	43.3%	15	50.0%
	>5 years	04	30.0%	02	6.7%
Specify medication	Allopathy	30	100%	30	100%
checking blood pressure level	Once in a month	05	16.7%	06	20.0%
	weekly once	00	0.00%	00	0.00%
	twice in a month	05	16.7%	04	13.3%
	Only when needed	20	66.6%	20	66.7%
Regular on taking drug	Regular	26	86.7%	25	83.3%
	Irregular	04	13.3%	05	16.7%
Average hours of sleeping per day	<8 hours	10	33.3%	12	40.0%
	8 hours	08	26.7%	10	33.3%
	>8 hours	12	40.0%	08	26.7%
Habits	Smoking	04	13.3%	06	20.0%
	Alcohol	04	13.3%	06	20.0%
	Tobacco	06	20.0%	08	26.7%
	Nothing	16	53.3%	10	33.3%
Taking non vegetarian food	Daily	00	0.00%	00	0.00%
	twice a week	07	23.3%	05	16.7%
	once week	20	66.7%	25	83.3%
	Never	03	10%	00	0.00%

CLINICAL VARIABLES		GROUP			
		EXPERIMENTAL		CONTROL	
		NO OF CLIENTS	%	NO OF CLIENTS	%
Restriction of salt items	Fully restricted	08	26.7%	20	66.7%
	sometimes I eat	20	66.7%	06	20.0%
	I take as I like	02	6.7%	04	13.3%
Restriction of deep fried items	Fully restricted	03	10%	10	33.3%
	sometimes I eat	02	6.7%	12	40.0%
	I take as I like	25	83.3%	08	26.7%
Exercises	Physical exercises	05	16.7%	08	26.7%
	aerobic exercises	10	33.3%	08	26.7%
	Yoga	00	0.00%	00	0.00%
	Nothing	15	50.0%	14	46.7%
Body Mass Index	<18.50	00	0.00%	02	6.7%
	18.50-24.99	05	16.7%	06	20.0%
	25-25.99	10	33.3%	18	60.0%
	>26	15	50.0%	04	13.3%

The above table shows the Hypertension related information of experimental and control group subjects those who were participated in this study

With regard to the **duration of illness** that in the experimental group, 5(16.7 had 1 year of illness, 8(26.7%) had illness 1-3 years , 13 (43.3%) had illness between 3-5 years,and 4(13.3%) had their illness more than 5 years. In the control group 3(10%) had duration of illness less than 1 year, 10 (33.3%) had illness 1-3 years , 15(50%) had illness between 3-5 years and 2(6.7%) had illness more than 5 years

In the aspect of **duration of treatment**, in the experimental group, 5(16.7%) had the duration of treatment less than 1 year, 8(26.7%) had treatment 1-3 years ,13 (43.3%) had treatment between 3-5 years,and 4(13.3%) had their duration of treatment more than 5 years. In the control group 3(10%) had duration of treatment less than 1

year, 10 (33.3%) had treatment of 1-3 years , 15(50%) had duration of treatment between 3-5 years and 2(6.7%) had treatment more than 5 years.

Regarding the **drug compliance** Mostly 26 (86.7%) in the experimental group had adequate drug compliance and about 34(13.3%) had inadequate drug compliance. Also in the control group, 25 (83.3%%) had adequate drug compliance and 5 (16.7%) had inadequate drug compliance. With the view **specified medication** taken, in the experimental group and in the control group all most all of them were taking only Allopathy treatment,

When considered about **average hour of sleeping hours** , in the experimental group 10 (33.3%) had sleep less than 8 hours per day, about 8 (26.7%) had 8 hours of sleep and 12 (40.0%) had more than 8 hours of sleep. In the control group, 12 (40%) had sleep less than 8 hours per day, about 10 (33.3%) had 8 hours of sleep and 8(26.7%) had more than 8 hours of sleep.

In the aspect of **Habits** in experimental group 04(13.3%) had smoking and consumption of alcohol as habit, 6(20%) had habit of tobacco chewing and remaining 16(53.3%) does not have any such habits. In control group 6(20%) had smoking habit and consuming alcohol also.8(26.7%) had habit of chewing tobacco and 10(33.3%) does not had any particular habit.

When considering about the **frequency of non vegetarian diet** intake 7(23.3%) were taking twice a week, 20(66.7%) taking once a week and 4(10%) were vegetarian. In control group 3(10%) were taking twice a week, 25(83.3%) were taking once a week and 2(6.7%) were vegetarian.

In the view of **salt restriction diet** 8(26.7%) were fully restricted as prescribed, 20(66.7%) were sometimes had no restriction and 2(6.7%) were does not have restriction and eat as they like. In control group 20 (66.7%) were fully restricted, 6(20%) were sometimes they does not have restriction and 4 (13.3%) were does not had control over salt diet. In the same aspect of restriction to deep fried items in experimental group 3(10%) were fully restricted to such items 2(6.7%) occasionally and 25(83.3%) were had no control over fried items. Wherein control group 10(33.3%) were fully restricted 12(40%) had occasionally and 8(26.7%) had no restriction.

With regards to **exercise**, in the experimental group about 5 (16.7%) had regular exercise, 10(33.3%) had aerobic exercise like walking and 15 (50%) does not do any exercise. In the control group, 8 (26.67%) had regular exercise, 8 (26.7%) had aerobic exercise and 14 (46.7%) does not practice any exercise.

In the aspect of **Body Mass index** in experimental group 5(16.7%) had in the range of 18.50-24.99, 10(33.3%) in the range of 25-25.99 and 15(50%) were more than 26. In control group 2(6.7%) in less than 18.50, 6(20%) had in the range of 18.50-24.99), 18 (60%) were in the range Of 25-25.99 and 4(13.3) were more than 26.

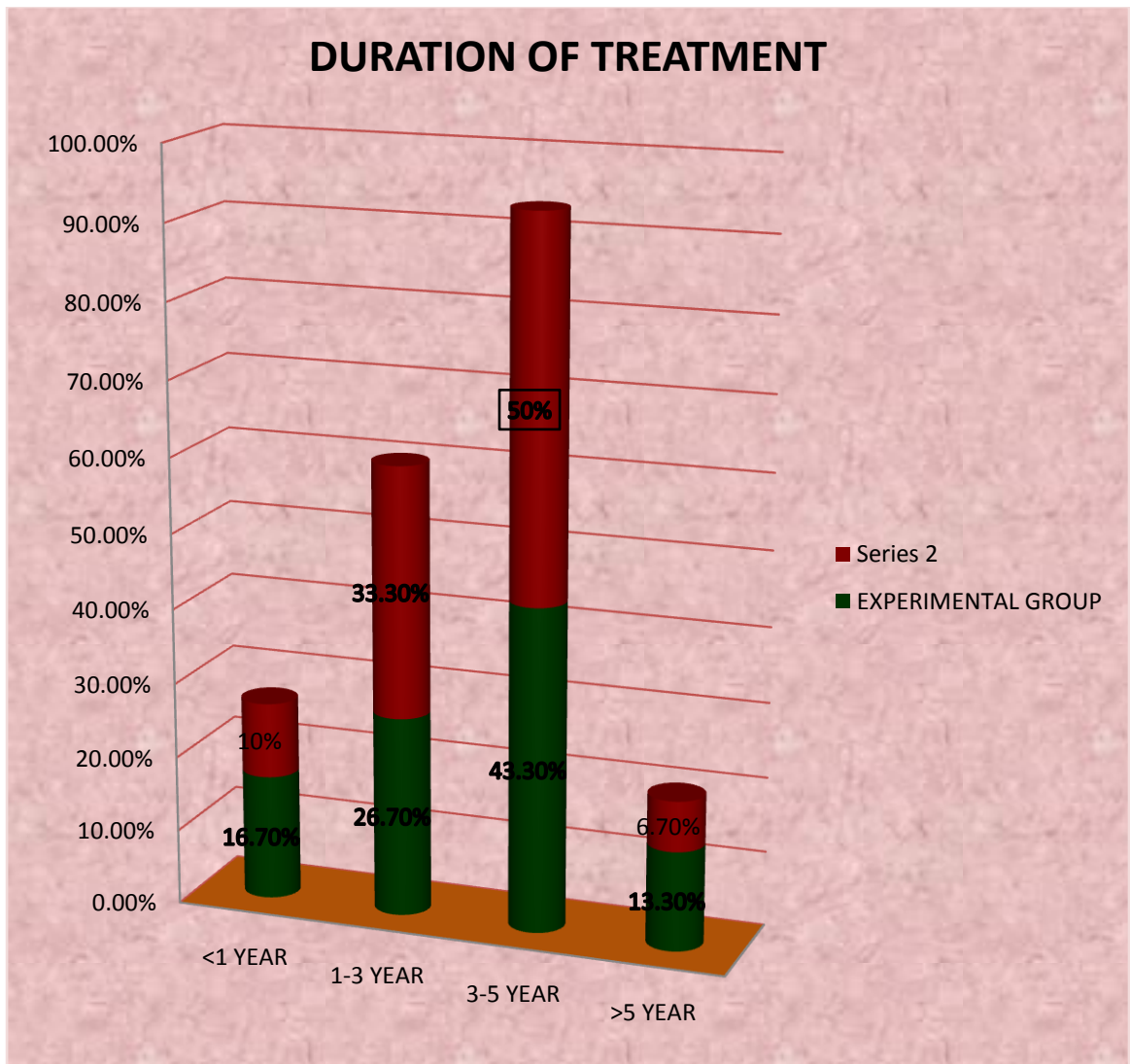


Fig.6. The stacked cylinder diagram shows the percentage distribution of duration of treatment in experimental and control group.

In experimental group (43.30%) had 3-5 years treatment and in control group majority (50%) having the duration of treatment between 3-5 years.

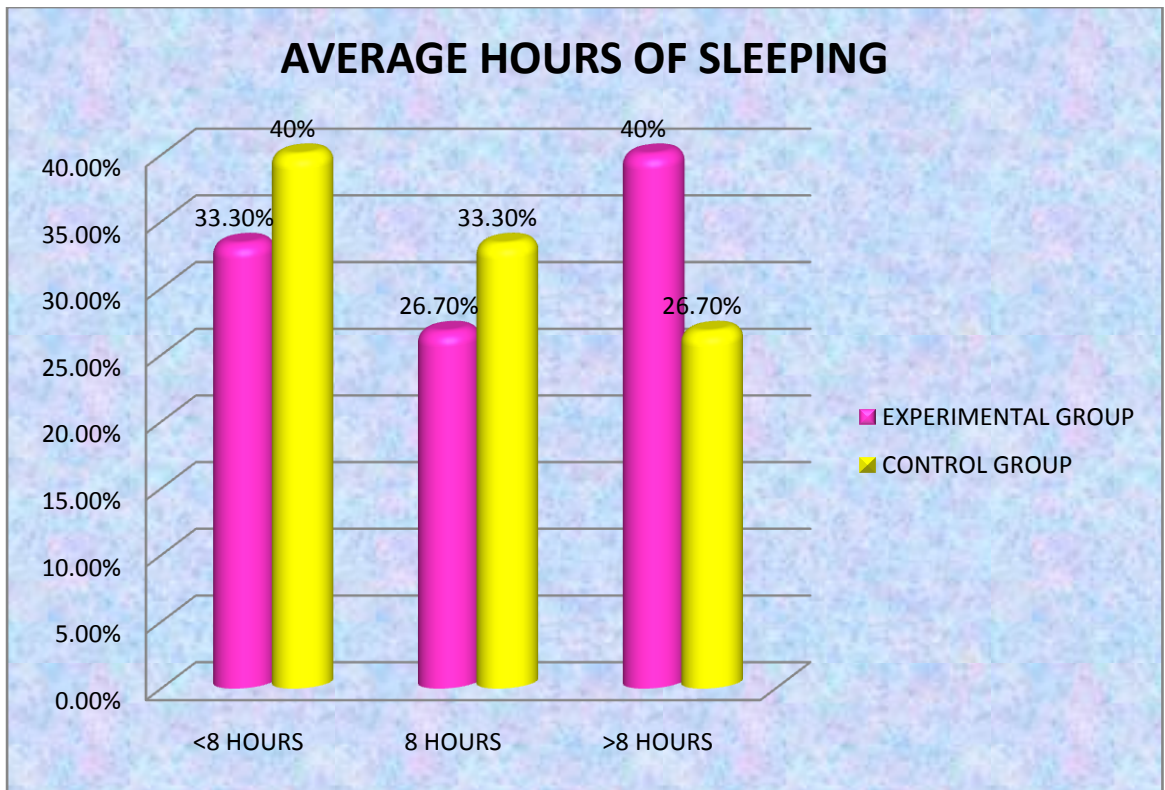


Fig.7. The clustered cylinder diagram shows the percentage distribution Average hours of sleeping in experimental and control group.

Majority of clients in experimental group(40%) have less than 8 hours of sleep and control group (40%)more than 8 hours of sleep.

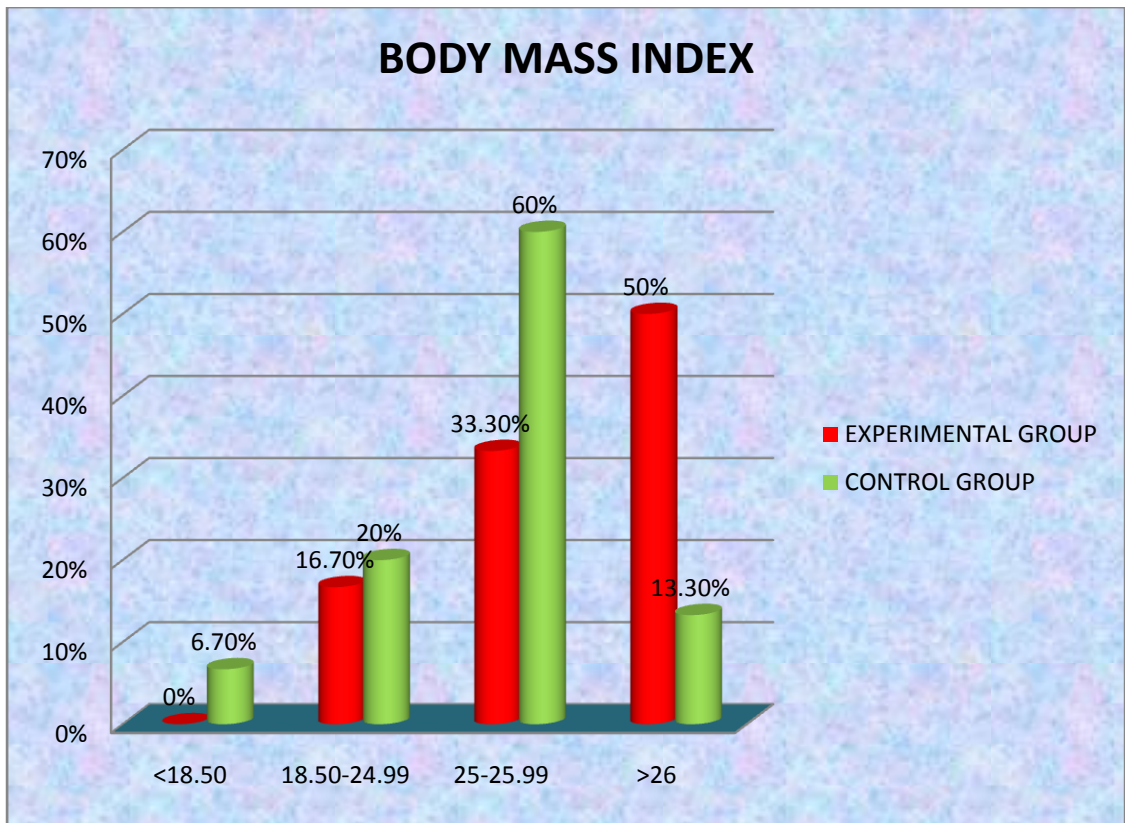


Fig.8. The cluster cylinder Bar diagram shows the percentage distribution of BMI in experimental and control group.

In the experimental group most of clients in the experimental group majority of clients (60%) having body mass Index in the range of 25-25.99, in the control group 50% of clients having the body mass Index >26.

SECTION –B

TABLE-3

DISTRIBUTION OF PRETESST SYSTOLIC BLOOD PRESSURE LEVEL AMONG CLIENTS WITH HYPERTENSION IN EXPERIMETAL AND CONTROL GROUP.

Blood Pressure Level		PRE TEST				
		Experimental		Control		
		N	%	N	%	
SBP	<120mmHg (Normal hypertension)	0	0.00%	0	0.00%	
	120-139mmHg (Pre hypertension)	0	0.00%	0	0.00%	
	140-159 (Stage I hypertension)	140-149 mmHg	14	46.7%	15	50%
		150-159 mmHg	16	53.3%	15	50%
Total		30	100%	30	100%	

The above table represents that the experimental group in the pretest (stage I hypertension) majority of clients (53.3%) were in the range of 150-159 mmHg remaining (.46.7%)were in the range of 140-149mmHg. In the control group , 50% of subjects were in the range of 140-149 mmHg and150-159mmHg in systolic blood pressure.

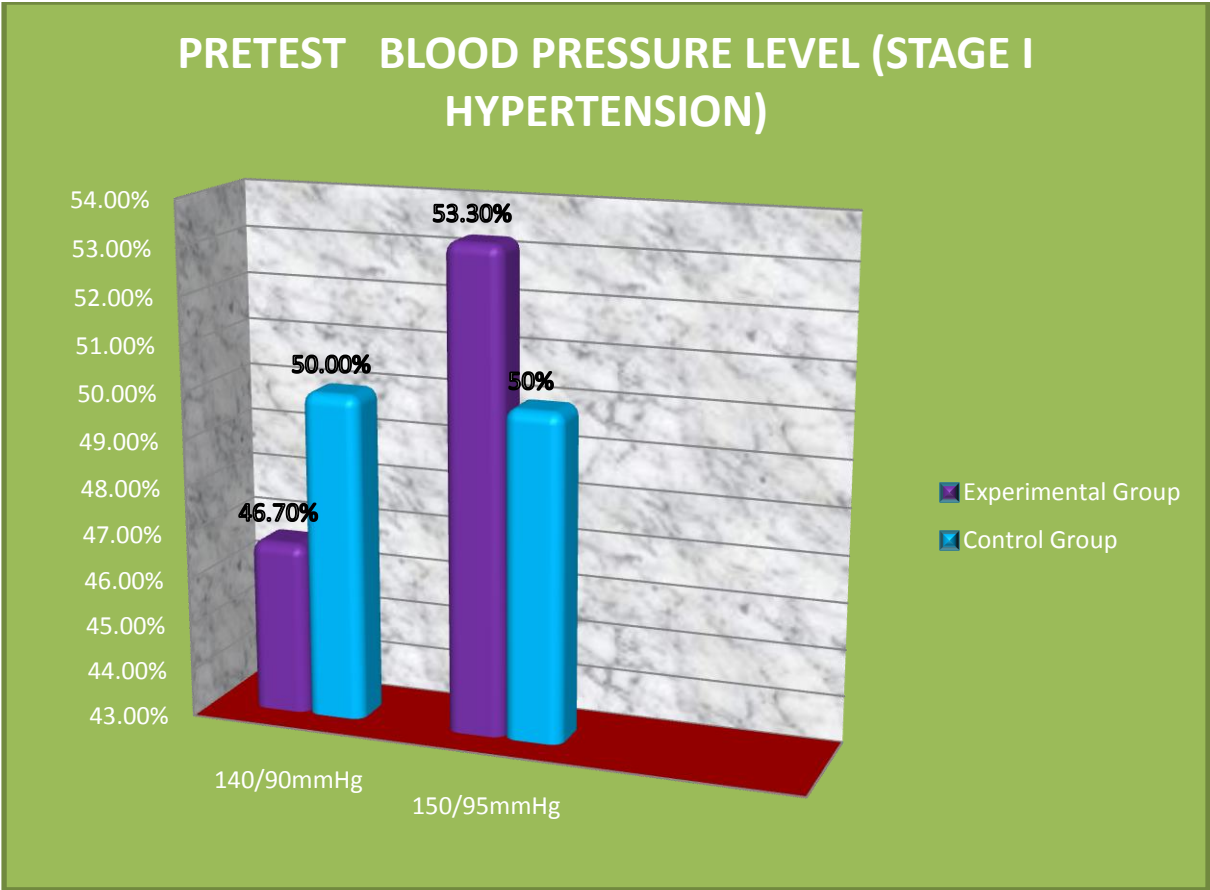


Fig.9. clustered bar diagram shows Percentage distribution of pretest blood pressure level among experimental and control group

In **pre test** among the experimental group (stage I hypertension)majority of subjects (53.3%) were in the range of 150-159 mmHg(.46.7%)were remaining in the range of 140-149mmHg and in the control group , 50% of subjects were in the range of 140-149 mmHg and150-159mmHg in systolic blood pressure.

TABLE 4

DIASTOLIC BLOOD PRESSURE LEVEL IN CLIENTS WITH HYPERTENSION AMONG EXPERIMENTAL AND CONTROL GROUP.

Blood Pressure Level (Stage I hypertension)		PRE TEST			
		Experimental		Control	
		N	%	N	%
DBP	<80mmHg	0	0.00%	0	0.00%
	80-89mmHg	0	0.00%	0	0.00%
	90-99mmHg	30	0.00%	30	100%
Total		30	100%	30	100%

The experimental and control group in the pretest all the subjects were in the range of 90-99 mmHg in diastolic blood pressure.

Table 5

The mean, and SD value of pretest Blood pressure level of experimental and control group

GROUP	Blood pressure	N	Mean	Std. Deviation
Experimental Group	SBP	30	145.33	5.34
	DBP	30	91.5	2.29
Control Group	SBP	30	145.00	5.00
	DBP	30	91.5	2.29

The above table depicts that the mean pretest blood pressure level among the experimental group in Systolic blood pressure was 145.33 with standard deviation of 5.34, in diastolic blood pressure the mean was 91.5 and the SD is 2.29. In control group, the mean Systolic blood pressure level was 145, standard deviation is 5.00, in DBP the mean was 91.5 and SD 2.29..

SECTION: D

EVALUATE THE EFFECTIVENESS OF BEETROOT JUICE ON BLOOD PRESSURE LEVEL AMONG HYPERTENSIVE CLIENTS IN THE EXPERIMENTAL GROUP.

Table 6

The mean, SD, and ‘t’ value of systolic Blood Pressure level between pretest and posttest in experimental group

Test	SYSTOLIC BLOOD PRESSURE							
	Pre Test				Post Test			
	Mean	SD	"t"Value	Significant	Mean	SD	"t"Value	Significant
Experimental Group	145.33	5.34	0.297	p > 0.05	111.67	3.82	29.8	p < 0.05
Control Group	145	5.00			142.67	4.49		

The above table depicts the effectiveness of Beetroot juice among stage I hypertensive clients in the experimental group. The mean pretest systolic blood pressure level was 145.33 with standard deviation of 5.34 and the post test mean was 117.67 with standard deviation of 3.82 respectively. The test of significance was calculated using paired t-test. The obtained t-value is 25.98=0.001 with DF=29(p<0.05), which was statistically significant as the preset level of significant is 0.05.

TABLE- 7

The mean, SD and 't' value of diastolic Blood pressure level between pretest and posttest in experimental and control group

Test	DIASTOLIC BLOOD PRESSURE							
	Pre Test				Post Test			
	Mean	SD	"t" Value	Significant	Mean	SD	"t" Value	Significant
Experimental Group	91.5	2.29	0	p > 0.05	71.3	3.46	25.8	p < 0.05
Control Group	91.5	2.29			90.17	0.91		

The above table represents that in Diastolic blood pressure levels, the pretest mean was 91.5 with standard deviation of 2.29 and post test mean was 71.30 with standard deviation of 3.46 .The obtained t-value was 25.98 (p<0.05)which was statistically significant.

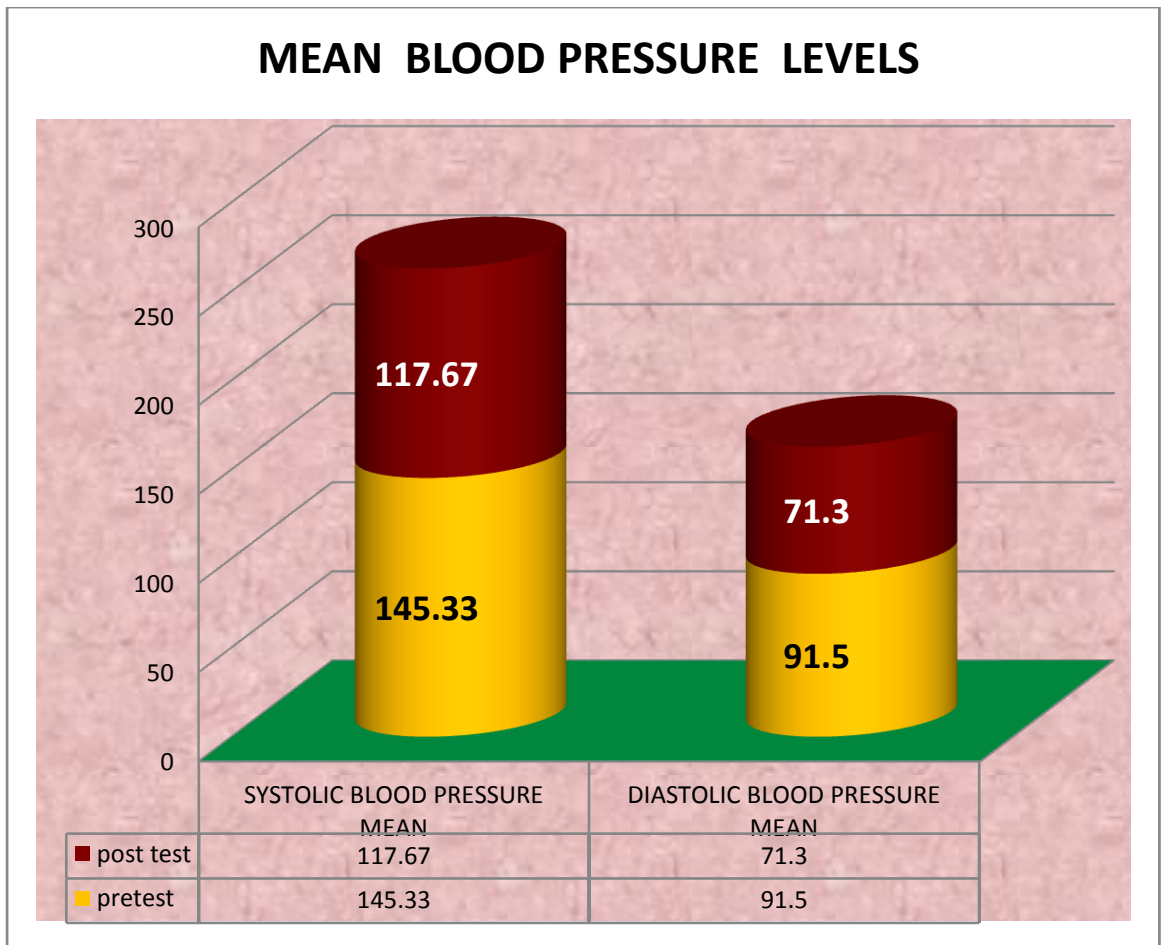


Fig.10. Staked cylindrical diagram shows Distribution of mean pre and post test blood pressure levels in the experimental group

In the pretest, the mean pre test systolic blood pressure was 145.33 which was reduced to 117.67 in the post test, Also the mean post diastolic blood pressure levels were reduced from 91.5 in the pretest to 71.30 in the post test respectively.

Table 8

The frequency and percentage distribution of post test Systolic Blood Pressure level for experimental and control group

Blood Pressure Level		POST TEST			
		Experimental		Control	
		N	%	n	%
SBP	<120mmHg (Normal hypertension)	25	83.3%	0	0.00%
	120-139mmHg (Pre hypertension)	5	16.7%	0	0.00%
	140-159mmHg	0	0.00	30	100%
Total		30	100%	30	100%

The above table depicts that in the **post test**, among the experimental group 83.3% of the stage I hypertension clients were in the range of <120 mmHg(Normal hypertension) of systolic blood pressure,16.7% were in the range of 120-139mmHg(Pre hypertension) of systolic blood pressure level.

Among the control group , 100% were Stage I Hypertensive subjects were remains in the range of 140-159mmHg.

TABLE-9

The frequency and percentage distribution of post test Diastolic Blood Pressure level for experimental and control group

Blood Pressure Level (Stage I hypertension)		POST TEST			
		Experimental		Control	
		N	%	N	%
DBP	<80mmHg	25	83.3%	0	0.00
	80-89mmHg	5	16.7%	0	0.00%
	90-99mmHg	0	0.00%	30	100%
Total		30	100%	30	100%

The above table explains that in the **post test**, among the experimental group 83.3% of the stage I hypertension clients were in the range of <80 mmHg(Normal hypertension) of diastolic blood pressure,16.7% were in the range of 80-89mmHg(Pre hypertension) of diastolic blood pressure level.

Among the control group , 100% of the Stage I Hypertensive subjects were remains in the range of 90-99mmHg.

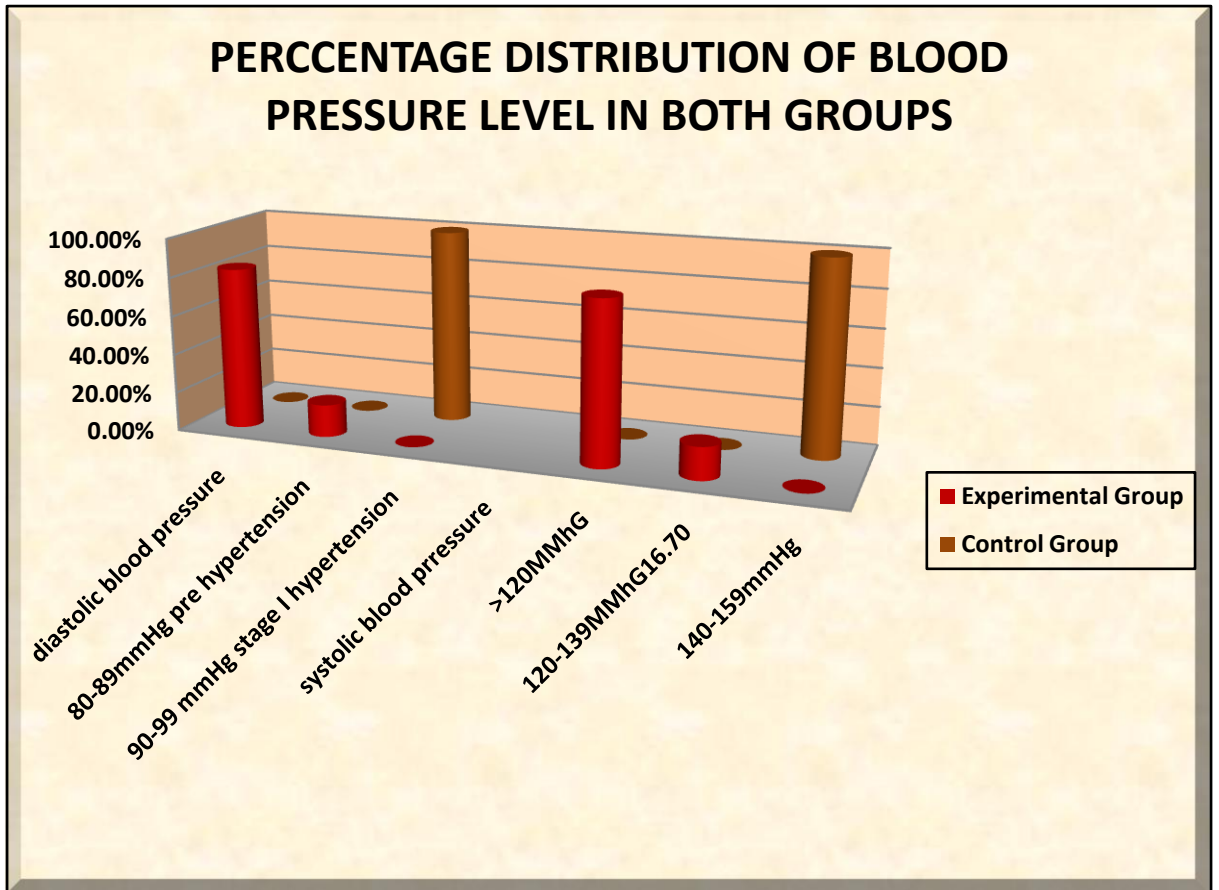


Fig.11. 3d cylindrical diagram depicts the distribution of posttest blood sugar level among experimental and control group

The above table explains that in the **post test**, the experimental group 83.3% of the stage I hypertension clients were in the range of >120/80 mmHg (Normal hypertension) blood pressure level, 16.7% were in the range of systolic blood pressure 120-139mmHg and diastolic blood pressure level in the range of 80-89mmHg (Pre hypertension)

Among the control group, 100% of the Stage I Hypertensive subjects were remains in the range of 90-99mmHg.

SECTION-D

TABLE-10 COMPARE THE PRETEST AND POST TEST LEVEL OF BLOOD PRESSURE IN CLIENTS WITH STAGE I HYPERTENSION IN EXPERIMENTAL AND CONTROL GROUP

S.NO	TEST	NO	SYSTOLIC BLOOD PRESSURE				PAIRED 'T' TEST VALUE MEAN	LEVEL OF SIGNIFICANT	DIASTOLIC BLOOD PRESSURE				PAIRED 'T' TEST VALUE MEAN	LEVEL OF SIGNIFICANT
			EXPERIMENTAL GROUP		CONTROL GROUP				EXPERIMENTAL GROUP		CONTROL GROUP			
			MEAN	SD	MEAN	SD			MEAN	SD	MEAN	SD		
1	PRE TEST	30	145.33	5.1	145	5.09	29.98	0.001 significant	91.5	2.29	91.5	2.29	25.98	0.001 significant
2	POST TEST	30	111.67	3.8	142. 61	4.5			71.3	3.46	90.17	0.923		

In experimental clients the systolic blood pressure lower from 145.33 to 111.67 in post test due to beetroot juice consumption the difference is 33.66 mm of Hg in systolic blood pressure were as in diastolic blood pressure level lower from 91.5 to 71.3 and the difference is 20.2 in post test. This reduction indicates that the intervention is statistically significant

SECTION-E

TABLE-11

ASSOCIATION THE POST TEST LEVEL OF BLOOD PRESSURE IN CLIENTS WITH STAGE I HYPERTENSION IN EXPERIMENTAL GROUP WITH SELECTED DEMOGRAPHIC VARIABLE.

DEMOGRAPHIC VARIABLE		POST TEST LEVEL OF SYSTOLIC BLOOD PRESSURE			TOTAL	CHI-SQUARE TEST	P Value	POST TEST LEVEL OF DIASTOLIC BLOOD PRESSURE			TOTAL	CHI-SQUARE TEST	P Value
		Normal	Pre hyper Tension	Stage I hyper tension				Normal	Pre hyper tension	Stage I hyper Tension			
Age	<55 Years	11	2	0	13	$\chi^2=5.83$	P=0.04 Significant	11	2	0	13	$\chi^2=6.43$	P=0.04 Significant
	>55 Years	14	3	0	17			14	3	0	17		
Food habit	Vegetarian	4	0	0	4	$\chi^2=9.17$	P=0.01 Significant	4	0	0	4	$\chi^2=6.03$	P=0.04 significant
	Mixed food	21	5	0	26			21	5	0	26		
Nature of work	Mild	13	2	0	15	$\chi^2=7.79$	P=0.02 Significant	13	2	0	15	$\chi^2=9.71$	P=0.01 significant
	Moderate	3	0	0	3			3	0	0	3		
	Heavy	9	3	0	12			9	3	0	12		
Family history	Maternal	15	3	0	18	$\chi^2=7.77$	P=0.01 Significant	15	3	0	18	$\chi^2=6.92$	P=0.03 significant
	Paternal	9	3	0	12			9	3	0	12		

The above table depicts that there is significant association between age, food habit, nature of work and family history of hypertension.

SECTION –E

TABLE -12

ASSOCIATION THE POST TEST LEVEL OF BLOOD PRESSURE IN CLIENTS WITH STAGE I HYPERTENSION IN EXPERIMENTAL GROUP WITH SELECTED CLINICAL VARIABLE.

CLINICAL VARIABLES		POST TEST LEVEL OF SYSTOLIC BLOOD PRESSURE			TOTAL	CHI-SQUARE TEST	P Value	POST TEST LEVEL OF DIASTOLIC BLOOD PRESSURE			TOTAL	CHI-SQUARE TEST	P Value
		Normal	Pre hypertension	StageI				Normal	Pre hypertension	StageI			
Duration of treatment	>3Years	15	2	0	17	$\chi^2=9.71$	P=0.03 Significant			0	17	$\chi^2=6.15$	P=0.04 Significant
	<3years	10	3	0	13			10	3	0	13		
Average of Sleeping	>8Years	9	3	0	12	$\chi^2=8.63$	P=0.01 significant	9	3	0	12	$\chi^2=6.63$	P=0.04 Significant
	<8years	15	3	0	18			15	3	0	18		
BMI	>25	20	5	0	25	$\chi^2=5.82$	P=0.05 significant	20	5	0	25	$\chi^2=6.92$	P=0.03 Significant
	<25	5	0	0	5			5	0	0	5		

The above table reveals that there is significant association between clinical variables of duration of treatment, average of hour of sleeping, and Body mass Index.

CHAPTER-V

DISCUSSION

“We cannot change our genes or sex, but we can definitely modify our life style thereby protecting our self from hypertension.”

Robert C Schlant

Hypertension is major problem faced by the health care providers due to the urbanization and the associated health risk with sedentary life style. As per the WHO report (2012) Out of four people at least one of them will be affected by hypertension. Adequate control on hypertension is essential and if not done so can culminate into uncontrolled hypertension.

The study was focused to evaluate the effectiveness of on Beetroot juice effectiveness on blood pressure level among clients with hypertension (Stage I hypertension) who residing at Samayanallur, Madurai. The study findings are discussed with regard to the objectives, framework and hypotheses.

The identification of factor influencing hypertension is really a challenging one in this dynamic world. The area of research aim to find out the factors that affects the clients among in selected rural area hypertensive clients. It has been postulated that the inclusion of dietary nitrates in the form of beetroot-derived foods may be useful in the regulation of normal BP due their high inorganic NO₃ - content.

The researchers conclude that dietary intake of nitrate in the form of beetroot juice at an easily achievable dose sufficiently reduces blood pressure among people with high blood pressure.

This Research Study has been discussed was based on the objectives and the following supported studies.

DEMOGRAPHIC VARIABLES FINDINGS

The present study shows that high percentage age 13(43.3%) of clients in between 56-65 years in experimental group and 14(46.6%) clients were in between 46-56 years in control group. Among the clients sex female clients were mostly on hypertension in both experimental and control group as the highest value of 73.3% and 60% in both group.

The present study reveals that both in experimental and control group highest value were married client, it was 100% in both group.

The present study shows that highest value of 50% had sedentary work in experimental work and 56.7% were had sedentary work in control group. The present study exhibits that highest value of 43.3% had family history of hypertension that their father had and 33.3% results that their mother had hypertension in experimental group, in control group 33.3% of mother and father had hypertension which related to family history of hypertension.

When consider about the food habit the highest value of 86.7% in experimental group and 93.3% in control group were mixed vegetarian respectively.

CLINICAL VARIABLES FINDINGS

The present study express that highest value in both experimental and control group duration of illness was between 3-5 years as 43.3% and 50% respectively. Another findings reveals that allopathic medicine taken in experimental and control group highest value of 100%. Another findings reveals that highest value of 66.7% sometimes they had salt restriction in experimental group and in restriction of deep fried items 83.3% had sometimes restriction on diet. The present study shows that in both experimental and control group the highest value is 66.7% and 83.3% respectively.

THE FIRST OBJECTIVE OF THE STUDY IS TO ASSESS PRE TEST LEVEL BLOOD PRESSURE LEVEL IN CLIENTS WITH HYPERTENSION AMONG EXPERIMENTAL AND CONTROL GROUP.

The present study shows that the age groups of 46 to 55 years of females are mostly affected by hypertension. This study was consistent with Prince M.J et al(2009)conducted and find out the age, sex, education correlated with systolic blood pressure uncontrolled hypertension is common among people the age group of 56 to 65 years in developing country. The prevalence was higher in urban (range 52.6:79.8%) than rural site (range 42.6: 56.9%) and lower in men than women.

The present study also consistent with the study by Ifeoma et al (2011) conducted the study on high prevalence and low awareness of hypertension in marked population in his study the prevalence of hypertension increases with the age from 5.4% in the age group of less than 20 years and 80% in the age group of >70 years.

THE SECOND OBJECTIVE OF THE PRESENT STUDY IS TO EVALUATE THE EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD PRESSURE LEVEL ON HYPERTENSIVE CLIENTS IN THE EXPERIMENTAL GROUP.

The present study shows that beetroot juice administration given to the experimental for 30 days treatment period is act on blood vessels and reducing the blood pressure level both in systolic and diastolic value ($p < 0.005$) is significant. The obtained the mean post test systolic blood pressure measurement score was 117.67 which were lower than the mean pretest systolic blood pressure of 145.33 ,in the experimental group. The obtained 't' value was 29.98 which was statistically significant by using the student dependent 't' test.

The obtained the mean post test diastolic blood pressure measurement score was 91.5 which were lower than the mean pretest diastolic blood pressure of 71.30, in the experimental group. The obtained 't' value was 25.98 which was statistically significant by using the student dependent 't' test. This reduction indicated effectiveness of beetroot juice was given on blood pressure level in experimental group among hypertensive clients.

Study findings was consistent with Ghosh SM, et al (2013) who investigated a randomly allocated study to evaluate the effectiveness of beetroot juice on blood pressure among 30 clients underwent beetroot juice consumption daily for 15 days into an two interventional groups. The results showed that uncontrolled hypertension clients that both systolic and diastolic blood pressure level was $20.2 \pm 4.2 \text{ mmHg}$ ($p=0.03$) lower in the experimental group who had beetroot juice, on the 15th day of intervention from its base line value.

This findings also consistent with Bruce King, (2011) who conducted a study on randomized controlled trial at Queen Mary's university at UK about the consumption of beetroot juice on a low nitrate diet may lower blood pressure (BP). Fifteen women and fifteen men participated in a double-blind, randomized, placebo-controlled, crossover study. Volunteers were randomized to receive 500 g of beetroot and apple juice (BJ) or a placebo juice (PL). The identical procedure was repeated 2-wk later with the drink (BJ or PL). Overall, there was a trend ($P=0.064$) to lower systolic blood pressure (SBP) at 6-h after drinking beet root juice relative to placebo. Analysis in men only ($n=13$) after adjustment for baseline differences demonstrated a significant ($P<0.05$) reduction in systolic blood pressure of $14 \pm 1.5 \text{ mmHg}$. at 2 weeks after drinking Beetroot juice.

TO COMPARE THE PRETEST AND POST TEST LEVEL OF BLOOD PRESSURE LEVEL IN CLIENTS WITH HYPERTENSION AMONG EXPERIMENTAL AND CONTROL GROUP.

The present study is systolic blood pressure reduced to 20-30mmHg. The reduction of systolic blood pressure shows the effectiveness of beetroot juice on blood pressure in hypertensive clients.

This findings was consistent with Bailey (2012) who conducted an experimental study to evaluate effects of beetroot juice in reducing hypertension. 250 ml of beetroot juice is given to the subjects of experimental group and placebo was given to other group for 1 week, the result indicate that was significant reduce in systolic blood pressure 10+/-12 from basal among experimental group .

Thus H1: There will be significant differences between the level of blood pressure readings among hypertensive clients before and after intake of beetroot juice.

THE THIRD OBJECTIVE OF THE STUDY IS TO TEST LEVEL OF TO DETERMINE THE ASSOACIATION POST TEST BLOOD PRESSURE LEVEL IN CLIENTS WITH HYPERTENSION IN EXPERIMENTAL AND CONTROL GROUP WITH SELECTED DEMOGRAPHIC VARIABLES.

The findings in the age ($\chi^2=5.83, p<0.04$) nature of work ($\chi^2=7.79, p<0.02$) Family history of hypertension ($\chi^2=7.77, p<0.01$) food Habit ($\chi^2=9.17, p<0.01$) duration of treatment ($\chi^2=9.71, p<0.03$) BMI ($\chi^2=5.82, p<0.05$) were significantly reduced more blood pressure level in experimental group . Apart from this variables were not significantly associated in the experimental group. Statistical significance was calculated by chi-square test and independent 't' test.

This study is findings that female age of 46-55 years drunk beetroot juice for 30 days reducing systolic blood pressure value is ($p=0.001$) the highly significant. The present study findings was consistent with Ahluwalia (2011) finding that the study exhibits clients receiving a standard antihypertensive pharmacotherapy they took 250 ml of juice preparation for 30 days. Females (mean age 42 ± 8.3 years) the obtained 't' value $t=0.55(p=0.58)$ between experimental and control group. The study showed that Beetroot juice preparation used as an adjunct in treatment for adults beyond 45 - 50 years uncontrolled hypertension.

The present study findings that age, , duration of treatment, income, nature of work, family history, and BMI. had significant association with the intervention. The study findings was consistent with Ifemo (2011) findings on high prevalence and Low Awareness of Hypertension among hypertensive clients. The prevalence of hypertension was 32.8%. Market workers in lead sedentary life style and often depend on salt-lade fast food while at work. 42% of the screened population was hypertensive. Of this number, 70.6% did not know they were hypertensive before the screening . More Males than female $p=.022$ were hypertensive. Prevalence of hypertension increased with age form 5.4% in the age group <20 years to 80% in the age group >70 years, nature of work, BMI also have the prevalence of hypertension among the 45-56 years population . The obtained 't' value is $t=0.58(p=0.60)$ The conclusion was prevalence of hypertension workers in this study was 42% and the majority of them were unaware of their disease.

Thus the H2: There will be a significant association between post test blood pressure level and selected demographic and clinical variables. This hypothesis was accepted for some variables such as age, nature of work, family history of hypertension, food habit, duration of illness and treatment, regularity on drug .

CHAPTER-VI

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter dealt about the summary of the study findings, conclusion, Implication and recommendations.

6.1 SUMMARY OF THE STUDY

"Life is not living, but living in health."

~ Martial

Hypertension is a major public health problem in India and world, because of its high frequency and concomitant, risk of cardiovascular and kidney disease. Hypertension is interesting disease entity of its own as it remains silent, being generally asymptomatic during its clinical course. As it is hidden beneath outwardly asymptomatic appearance, hence WHO named it as silent killer.

Many of us today are leaving a life that leads to high blood pressure as people age advances the situation gets even worse. It contributes to excess of deaths in women. The disease makes people five times more prone to stroke three times more likely to have heart attacks and two or three times likely to experience heart failure. The health care provider play vital role to educate the population about the importance of treatment and prevention of its complication. This study was carried out to determine the effectiveness of beetroot juice on blood pressure level in clients with hypertension residing at Samayanallur, Madurai.

OBJECTIVES:

- To assess the pre test level blood pressure level in clients with Stage I hypertension among experimental and control group.

- To evaluate the effectiveness of beet root juice on blood pressure level on Stage I hypertensive clients in the experimental group.
- To determine the association between post test blood pressure level in clients with Stage I hypertension in experimental group with selected demographic and clinical variables.

The following hypotheses were tested:

H₁: There will be a significant difference between the level of blood pressure readings among stage –I hypertensive client before and after intake of beetroot juice.

H₂: There will be a significant association of the mean blood pressure reading with selected demographic variables.

A formal permission was obtained from the Block medical officer, at samayanallur PHC to conduct the study. The investigator found out that so many things like cost, healthcare facilities, family system, and knowledge that influence the treatment among the hypertensive group. A survey was done in selected streets to identify the hypertensive clients particularly stage I hypertensive clients were selected for this study. The sample consists of sixty hypertensive clients age from 35 years to more than 65 years. The structured questionnaire tool was developed and used for the data collection. Five experts did content validity and the tool was found reliable. The pilot study was conducted at Samayanallur in other street 5 km away from the present settings to find out the feasibility to conduct the final study and to determine the methods for statistical analysis. For final study 30 hypertensive clients were collected over a period of 4 weeks as experimental group and control group for each group.

The data was collected with help of structured questionnaire method for a period of four weeks from 1st October 2013 to 31st October 2013. On day 1 data was collected and , blood pressure level was measured by sphygmomanometer. On day 2 itself Beetroot juice was given to the experimental group. Beetroot juice is prepared by the investigator with 50gms of raw beetroot, 10gms of jaggery, and added 2 to 3 drops of lime juice.(50 ml of concentrated juice is diluted with 200 ml of water and 250 ml of juice given for a person) along with the prescribed antihypertensive drug. The conceptual frame work adapted for the study was modified Roy's adaptation model. The model helped the investigator in approaching the hypertensive clients. Review of related research material helped the investigator in the preparation of the conceptual model, tool and sampling method by non probability purposive sampling method. The research design was quasi experimental Non equivalent control group pretest and post test design. The sample were selected by purposive sample technique based on inclusion criteria it took about 30 minutes for each sample to collect the data. After the posttest blood pressure was measured for both group, the collected data were enter in a master sheet and interpreted I turn of the objectives using descriptive and inferential statistics.

The data collection tools used were

1. Demographic variables
2. Clinical variables
3. Biophysiological measurement

6.2 MAJOR FINDINGS OF THE STUDY

- In the aspect of **Age** Majority of stage I hypertensive clients in experimental group (43.3%) and in control group (46.6%) were in 56-65 years.
- In the view of **Sex** Female subjects were higher in proportion than (73.3%) Male subjects in both the groups.
- With regard to **Marital life** Majority of them in both the groups 98.3% in experimental and (100%) were in control group was married.
- As per the **occupation**, the majority of (40%) subjects in experimental group and (36.7%) subjects in control group were doing load carrying work and the (36.7%) were sedandary work in experimental group and (43.3%) subjects were in the control group were in the sedentary workers.
- With the view of **family history of hypertension** , in the experimental group, (43.3%) had father with hypertension, 10(33.3%) had mother, Whereas in the control group, (33.3%) had father with hypertension, 10(33.33%) had mother with history of hypertension.
- When considering the **food habit**, majority of clients in the experimental group, (86.7%) were mixed vegetarians and In the control group, (93.3%) were mixed vegetarians respectively.
- With regard to the **duration of illness** the majority of (43.3%) subjects in the experimental group and (50%) of subjects in the control group had the hypertension in the duration of 3-5 years
- All the subjects in the both the groups (100%) **were taking medication** for hypertension . In that the maximum (63.3%) subjects in the experimental

group and (63.3%) subjects in the control group were taking beta blocker T.Atenelol only.

- With regard to frequency of **nonveg intake** majority of (66.7%) subjects in the experimental group, (83.3%) subjects in the control group were taking non-vegetarian diet twice a week.
- In the view of **salt restriction** majority of clients (66.7%) sometimes had and in control (20%) had sometimes had control.
- Most of the subjects in the groups 50.0% subjects had **BMI** more than 26 in the experimental group, 60% subjects in the control group were in the range of 25-25.99 BMI.
- In the **pretest** the majority of percentage 53.3% in the experimental and 50% in the control group had systolic blood pressure in stage I hypertension between 150- 159mmHg and the least of subjects 46.7% in the experimental and 50% in the control group had systolic blood pressure in stage I hypertension between 150- 159mmHg.
- In the pretest the majority of the clients were had diastolic blood pressure in the range of 90-99mmHg.
- The **mean pretest** measures of systolic blood pressure was 145.33 and 145 in experimental and control group. The standard deviation among experimental group is 5.1 and in the control group is 5.09. The 't' test for the mean difference of systolic blood pressure was 0.297 at df (2) which was not significant
- The **mean post test** measures of systolic blood pressure was 111.67 and 142.67 in experimental and in control group. The 't.'test for the mean

difference between systolic blood pressure is 29.8 at difference (58) which was significant at $p < 0.05$ level.

- The **mean pretest measures of diastolic blood pressure** was 91.5 in both experimental and control group. The standard deviation in experimental group is 2.29 and in control group is 2.33. The 't' test for the mean difference of diastolic blood pressure was 0.29 at df (58) which was not significant.
- The **mean post test measures of diastolic blood pressure** was 71.3 and 90.7 in experimental and control group. The 't' test for the mean difference of diastolic blood pressure is 25.98 at difference (58) which was significant at $p < 0.05$ level.
- The obtained 't' value was 17.81 is statistically very highly significant by using the student dependent 't' test. The obtained 't' value 0.19 ($P=0.84$, $DF=29$) is statistically no significant.
- In the pre test the obtained 't' value ($t=0.297$, $P=0.58$, $DF=58$) between experimental and the control group were not statistically significant. But in the post test there was a difference in 't' value ($t=29.98$, $P=0.01$, $DF=58$) between the experimental and the control group which was statistically highly significant.
- Paired 't' test showed that there was no significant difference in pretest and post test level in control group.
- Paired 't' test showed that there was a significant difference in pretest and post test blood pressure level in experimental group.
- Independent 't' test showed that there was no significant difference in pretest and post test level between control and experimental group.

- Independent ‘t’ test showed that there was very highly significant difference in post blood pressure level in experimental group.
- There was significant association found in post test measure of blood pressure level and selected demographic variables and clinical variables in experimental group.

6.3 CONCLUSION:

“Healthy Lifestyle-Healthy Blood Pressure”

- World Hypertension Day May 17th 2011.

Consuming beetroot juice is very effective and feasible drink to all. It is low cost and locally available vegetable which can affordable by all set of people. Hypertensive clients is influenced by the demographic variables. Based on the method of sample selection, the findings may be generalized to individual with hypertension. There was association between post test blood pressure level and age ,sex, family history, food habits, occupation and BMI. The study findings provides the statistical evidence which indicates that beetroot juice is one of the best alternative therapy which may be used to lower the blood pressure level.

6.4 IMPLICATIONS:

The investigator had drawn several implications from this study for various areas such as nursing practice, nursing education, nursing administration and nursing research. Nurse can incorporate the beetroot juice as one of the excellent alternative therapies for effective management of hypertension.

IMPLICATIONS FOR NURSING PRACTICE

- ❖ The nurse working in the community setting should practice the one of low cost, locally available effective and particularly it should be acceptable therapy as an internal part of their profession.
- ❖ Nurses should take initiative in introducing the practice of cost effectiveness of beetroot juice in the community setting.
- ❖ The study enabled to gain knowledge in assessment of blood pressure level in hypertensive clients.
- ❖ Nurses should encourage the client through the health education to whomever she can able to meet in community to practices.

IMPLICATIONS FOR NURSING EDUCATION

- ❖ As a nurse educator, we must strengthen the concept of non-pharmacological method for management of hypertension.
- ❖ Nurse educator can create awareness about the therapeutic benefits of beetroot juice.
- ❖ The study will enable the students to compare alternative therapy with other therapies for reducing the blood pressure level.
- ❖ The study will enhance the nursing students to acquire knowledge about alternative natural therapy and its uses in maintaining blood pressure level.
- ❖ Nurse educator may include beetroot juice therapy as means of Alternative remedy in the curriculum, its effect in health and illness which can adopted by the students and the nursing personnel too.

IMPLICATIONS FOR NURSING RESEARCH

- ❖ This study can be a baseline for future studies to build upon and motivate the investigators to conduct further studies.
- ❖ The findings of the study would help to expand the scientific body of professional knowledge from which further research can be conducted.
- ❖ A study can be done with large samples
- ❖ A study can be done with all stages of hypertension.
- ❖ A study can be done for long duration and other biochemical parameters (lipid profile) can be monitored along with b level blood pressure level

IMPLICATIONS FOR NURSING ADMINISTRATION

- ❖ Leaders in nursing should practice and take part in recommending the low cost complementary and alternative medicine and illuminate the effectiveness of it to the policy makers to introduce in the community and large scale.
- ❖ These findings will be very helpful to the administrators for conducting continuing education programme for nurses regarding alternative therapy in treating hypertension.
- ❖ Public health policy-makers to assign sufficient priority and resources to hypertension management and prevention.
- ❖ The nurse administrators have to undertake the health needs of the most vulnerably by effective organization and management.

6.5 RECOMMENDATIONS

The study recommends the following further research

- ❖ The study can be conducted with large samples to generalize the findings.
- ❖ Similar study can be conducted with different dose and different way of supplement to reduce blood pressure level.
- ❖ A similar study can be conducted by using true experimental design in broader and briefly.
- ❖ Comparative studies can be conducted between various alternative modalities.
- ❖ The same study can be as a comparative study between medicated and non medicated hypertensive clients.

BIBLIOGRAPHY:

BOOKS:

1. Brunner and suddharth.S.(2004) *Medical Surgical Nursing* (11th ed.) Philadelphia. Lippincott Company.
2. Basavanthappa, B. T. (2008). *Nursing research* (1st ed). New Delhi. Jaypee Brothers Publications.
3. Basavanthappa, B. T.(2008). *Community health nursing* (1st ed.) New Delhi. Jaypee Brothers Publications.
4. Beare, P.G., et al.,(1998). *Adult Health Nursing* (3rd ed.) Philadelphia. Mosby Publications.
5. Berkantz et.al., (1996) *Essential in community Health Practice*, New Delhi. W.B.Saunders Company.
6. Black, J.M. & Hawks J.H.(2009) *Medical –Surgical Nursing Clinical Management for PositiveOutcomes* (8thed.) Philadelphia. Elsevier/saunders Publications.
7. Cheryl tatano beck. (2004). *Nursing Research Principles and Methods* (7th ed.) Philadelphia. Lippincott Williams ad Wilkins Publications.
8. Cladia & smith. (2000) *Community Health Nursing Theory and practice* (2nd edition) Philadelphia W.B.Saunders Company.
9. Clark.M.J. (1996) *Nursing in the Community* (2nd ed) Standford. Appleton and Lange Publications.
10. Diana W.(2002). *Nursing Management of Hypertension* (5th ed). New York Springer Publications.

11. Gupta.(2000). *Statistical Methods* (5th ed.) New Delhi. Sulthan Chand Publications.
12. Gupta.(2007). *Preventive and Social Medicine* (3rd ed) New Delhi.Jaypee Brothers Publications.
13. Hirmath D.A. (2004). *Essentials of Community Medicine a practical approach* New Delhi, JP Brothers.
14. Hungler B.P.(1999) *nursing Research Principles and Methods* (6th ed.) Philadelphia. Lippincott company.
15. Ignatavivius, D.D. (2010). *Medical-Surgical Nursing: Patient-Centred Collaborative Care* (6th ed.) Philadelphia.Elsevier/Saunders Publications.
16. Joyce,M.Black.(2003). *Medical Surgical Nursing*, (7th ed,) Philadelphia Saunders Company.
17. Judith and Allender Barbara Walton Spready.(2002) *Community Health Nursing concept and practice*, Philadelphia, Lippincott publication.
18. Koziar.B.(1995).*Fundamentals of Nursing Concept and Practices*. 5th ed, California, Addison-Wesley nursing.
19. kulani.K.K.(2008). *Community Health Nursing Principles and Practice* 2nd ed.New Delhi, Kumar Publishing practice.
20. Lewis, S.M .(2010). *Medical Surgical Nursing Assesment and Management of Clinical Problem* (7th ed). St. Louis. Mosby Publications.
21. Lippincott. (1982). *Manual of nursing Practices*. (5th ed.). United States of America. Lippincott Publications.
22. Mahajan, B.K.(1991). *Methods in Statistics* (5th ed.) New Delhi, JP Brothers.
23. Marutha,R.A.(1997).*NursingTheoryUtilizationandapplication*.(1sted) St.Louis.Mosby.

24. McMurray, A..(2006).*Community Health and wellness* (3rd ed) Philadelphia. Elsevier Publications.
25. Munro, B.H. (1997). *Statistical Method for Health Care research.* (3rd ed) Philadelphia.Lippincott Company.
26. Nies, M.(2006). *Community/Public health Nursing* (4th ed). Philadelphia Elsevier Publications.
27. Park J.E. (2009). *Text Book of preventive and social medicine* (19th ed). India.Banaridas Publications.
28. Patricia, P.(2005), *Basic Nursing Theory and Practice* (5th ed). U.S.A.:Mosby Publications.
29. Peggy.(1994). *Theory and Nursing* (3rd ed). New Delhi. St. Louis publications.
30. Piyush.(2007). *Text book of preventive and social medicine* (1st ed). CBs publication.
31. Prabhara, G.N.(2002). *Short Text Book of Preventive and Social Medicine.* (9th ed.) New Delhi. Jaypee Brothers Publications.
32. Rao,K.S.(2005). *An Introduction to community Health Nursing* (3rd ed). Chennai. B.I. Publications.
33. Rao.(2004). *Methods of Biostatistics* (2nd ed).Hyderabad. para Medical publications.
34. Smeltzer,s. *Textbook of Medical-Surgical Nursing* (12th ed). Philadelphia.Lippincott Williams & Wilkins publications.
35. Stanhope.(2008). *Community Health Nursing* (7th ed). Philadelphia.Elsevier publications.

36. Sumathi,R.(2004). *Fundamentals of Food Nutrition Research and Diet Therapy* (5th ed).Chennai. B.I Publications
37. Suresh Gopalini.(2008). *Diet and Nutrition Research* (1st ed). New Delhi. Cyber Tech Publications.
38. Swaminathan,M.(2002).*Food and Nutrition Research* (2nd ed). Bangalore. Bangalore Publishers.
39. Tomey Ann Marrinner.(2002). *Nursing Theories and their work* (5th ed). St.Louis. Mosby
40. Vidya Ratan.(2005).*Hand Book of preventive and social medicine*.(2nd edition)Jaypee brothers,
41. Wilson,H.S.(1993). *Introduction research in nursing* (2nd ed). California. Adison Wesley Nursing.

JOURNALS:

1. Webb AJ, Patel N, Loukogeorgakis S, et al., (2008). Acute blood pressure lowering, *Hypertension*. 51(3), pp.784-790.
2. Kenjale AA, Ham KL, Stabler T, et al.,(2011). Dietary nitrate supplementation enhances *Applied Physiology*. 109(1), pp. 135-148.
3. Lundberg JO, Larsen FJ, Weitzberg E.(2011).Supplementation with nitrate and nitrite110(6), pp. 1582-1591.
4. Bailey SJ, Winyard P, Vanhatalo A, et al., (2009). Dietary nitrate supplementation reduces *Hypertension*. 51(3), pp.784-790.
5. Vanhatalo A, Bailey SJ, Blackwell JR, et al.,(2010). Acute and chronic effects of dietary beetroot reduces hypertension American Heart Association, (2001), 3:305-312.

6. Larsen FJ, Weitzberg E, Lundberg JO, Ekblom B.(2007). Effects of dietary nitrate on hypertension *Journal of Hypertension*, 7, 1-50.
7. Bailey SJ, Fulford J, Vanhatalo A, et al.,(2010). Dietary nitrate supplementation enhances 585-586.
8. Larsen FJ, Schiffer TA, Borniquel S, et al.,(2011) Dietary inorganic nitrate improves hypertension *Journal of Hypertension*, 5, 1-58.
9. Ferreira LF, Behnke BJ. (2011). A toast to health and performance! Beetroot juice lowers *and Complete Physiology*. 299(4), pp.R1121-R113
10. Lansley KE, Winyard PG, Fulford J, et al.,(2011). Dietary nitrate supplementation reduces hypertension *Journal of Applied Physiology*. 110(3), pp.
11. Lansley KE, Winyard PG, Bailey SJ, et al.,(2011) Acute dietary nitrate supplementation *Journal of Hypertension*, 4, 1-40.
12. Ahlawat.SK.et.al.,(2012 September)Time trends in the prevalence of hypertension and associated risk factors in Chandigarh. *Journal of Indian medical association*. 100(9):546*and Complete Physiology*. 299(4), pp.R1121-R113
13. Beegom R.(2001) diet, central obesity and prevalence of hypertension in the urban population of south India. *Indian journal of cardiology*.
14. Bharucha NE and Kuruvilla.T. (2003. January) hypertension in the Parsi community of Bombay: a study on prevalence, awareness and compliance to treatment. *Public Health* 6; 3:18.
15. Blood pressure and the O₂ cost of exercise. *Journal of Applied Physiology*. 110(3), pp.
16. Brinde,P.,(2008,January) Prevalence awareness treatment and control hypertension in the elderly. *Journal of Hypertension*, 5, 1-58.

17. British hypertension society management guidelines Health Publications(2007, September),5,254-257.
18. Chen, Z.Y.(2009, July) Anti hypertensive nutraceuticals and functional foods American Chennai Society. 57, 4485-4499.
19. Chobamian, A.V.(2003, February) The Seventh report of National Committee on Hypertension. Journal of American Medical Association,289,2560-2574,
20. Chua.B.(2005 September) Temporal changes in the control of blood pressure in an older Australian population .Journal of human Hypertension19(9) :691-693
21. Cihangir.(2009, August) Prevalence of uncontrolled hypertension and hypertension and associated risk factors among Turkish adults. Journal of Public Health, 31, 47-58.
22. Colin. Fighting heart disease and stroke (2001 October) American Heart Association, (2001), 3:305-312.
23. Damodharan,A.,et.al., (2002, April) Therapeutic potential of yoga practices in modifying cardiovascular risk profile middle aged men and women. Journal of Association of Physicians, 50,33-40.
24. Deep.R.(2003,July) Rules of halves' in hypertension, Indian Journal of Medical Research,, 32,256-267.
25. Denver.(2008, March) Home health monitoring may significantly improve blood pressure control, American Heart Association, 15, 425-428.
26. Exercise performance in peripheral arterial disease. *Journal of Applied Physiology* 107, pp.1144-1155.
27. Feldstein.CA. (2005 August). A comparative study conducted about the body mass index and waist hip ratio as indicators of hypertension risk in argentine population: a hospital based study. www.google.com.

28. Ferguson.(2013,October) Prevalence of uncontrolled hypertension and its relationship to risk factors for cardiovascular disease in Jamaica.(cardiovascular disorder Journal.8,20-24.
29. FraminghamCohort.(2005,February). High normal BP on the risk of cardiovascular disease. American Journal of Epidemiology, 38,136-140.
30. Gupta .R. (2009 march).Trends in hypertension epidemiology in India. Journal of Human Hypertension 18, 73–78.
31. Gupta.R.(2009 November- December). High prevalence of multiple coronary risk factors in Punjab Bhatia community: Jaipur heart watch-3 .Indian Heart Journal 56(6) :646-52
32. Hariharan, S.(2009,August) Prevalence of uncontrolled hypertension in adult outpatients in Trinidad. West Indian medical Journal, 55:5
33. Heather, et al.(2008,December) Blood pressure reactivity to psychological stress predicts hypertension Circulation, Journal of Hypertension,1,10:74.
34. Hong. K.S.(2008,September) uncontrolled hypertension prevalence. The society of cardiology Korean,38,1738-5520.
35. Hsia.(2009,December) Disease risk in the women's health initiative, American Journal of Epidemiology, 115,855-860.
36. Hud,E.Gossman.(2009,June) Prevalence of Uncontrolled hypertension and hypertension. National Committee, 298:2450-2462.
37. improves cycling time trial performance. *Medical Science, Sports and Exercise*. 3(6),
38. Isezuo,S.A.(2010, September) Prevalence, associated factors and relationship between uncontrolled hypertension and hypertension. Journal of Hypertension.62,253-259.

39. Jenog JY. (2007 July) Awareness, treatment and control rates of hypertension and related factors of awareness among the middle aged adult and elderly in chuncheon: Hallym aging study. *Journal of medical public health*. 40(4) : 305-1
40. Joint National Committee., (2008,May).Hypertension.
41. Malhotra P.(2003 July) Prevalence and determinants of hypertension in the elderly population of the Mexican institute of social security .*Journal Human Hypertension*. 13(7) :467-72
42. Marshall S. International Conference on Bioscience, Biochemistry and Bioformaties. IPCBEE Vol: 5(2011)c (2011). Singapore: ACSIT Press.
43. Maualik, B.(2005, August) Blood pressure lowering effect. *Biomedical Research Journal*. 14, 325-335.
44. Mercola Dark.(2007) chocolate reduce BP. *Journal of American Medical Association*, 34,245-248.
45. Miller et al., (2009,June) effect of anti-oxidant vitamine supplementation on tradition cardiovascular risk factors. *Journals of current hypertension reports* 1:27-30.
46. Moyer A.S.(2009,November) Research of massage therapy on blood pressure. *American Journal* 30,3-18.
47. Murray, C.L.(2009July) Effectiveness and costs of interventions to lower systolic BP and cholesterol, A global and regression analysis on reduction of cardiovascular disease risk, 36, 717-731.
48. Shanthirani.et.al.,(2009) Prevalence and its risk factors for uncontrolled hypertension *Journal of Epidemiology*,68,254-278.

49. Shyamal Kumar Das et.al., (2009). Study of urban community survey in India: growing trend of high prevalence of hypertension in a developing country. *International Journal of Medical Sciences*. 2(2): 70–78
50. Swami.HM.et.al., (2004 January) Population Based study of hypertension in an elderly in northern India. *Public Health*. 116(1):45-9.
51. the O₂ cost of low-intensity exercise and enhances tolerance to high-intensity exercise in the O₂ cost of walking and running: a placebo-controlled study. *Journal of Applied*
52. Wissen.V.K.(2008 October).Living with high Blood pressure. *Journal of advanced nursing* 27,567-574.
53. Yradeepa.r.(2009). Hypertension and uncontrolled hypertension. *Indian Journal of Medical Research*, 1,153-157.
54. Zachariah MG .et. al., (2008 May – June) prevalence, awareness, treatment and control of hypertension middle aged urban population in Kerala. *Indian Heart Journal*. 55(3): 245-51.

NET REFERENCES

Retrieved from

- enzobonora@virgilio.it
- <http://bccentrefordisesecontrol.org>
- <http://hyper.ahajournal.org>
- <http://mohfw.org/nhp>
- <http://tnhsp.org>
- <http://www.altmedicine.about.com>
- <http://altmedicine.about.com>
- <http://www.biomedcentral.com>
- <http://www.cardiologychannel.com>
- <http://www.ccn.aacnourals.org>
- <http://www.clinicaltrials.gov>
- <http://www.currentnursing.com>
- <http://www.exinearticles.com>
- <http://www.konjacfoods.com/fiber.htm>
- <http://www.medscape.com>
- <http://www.ncbi.nlm.nih.gov>
- <http://www.nursingtimesnet>
- <http://www.wikipedia.com><http://who.int/wer>
 - Nutritional properties of beetroot. Available from: URL:
<http://sgbrown.hubpages.com>
 - Remedy: beetroot for hypertension. [online]. Available from:
URL:<http://hypertension blurtit>.

APPENDIX-1

INTERVIEW SCHEDULE ON BLOOD PRESSURE AMONG HYPERTENSIVE CLIENTS

SECTION A

DEMOGRAPHIC VARIABLES

INSTRUCTION:

The following sections seek information about yourself and hypertension. There is no right or wrong response. So mark (✓) the most appropriate response which suits you best. The information you share will kept confidential.

SAMPLE NO: -----

1. Age (in years)

- a) 35-45 years
- b) 46-55years
- c) 56-65years
- d) >66 years

2. Sex

- a) male
- b) female

3. Educational Status

- a) primary
- b) Middle school
- c) High school
- d) higher secondary school

- e) Graduate or postgraduate
- f) Professional
- a) Non formal education

4. Marital status

- a) Single
- b) Married
- c) divorce

5. Occupation

- a) Professional
- b) Load work
- c) clerical, shopkeeper, Farmer
- d) unemployed

6. Nature of work

- a) sedentary worker
- b) Moderate worker
- c) Heavy worker
- d) None of the above

7. Income(Monthly)

- a) <2000
- b) 2001-5000
- c) 5001-10,000
- d) >10,000**

8. Type of family

- a) Nuclear
- b) joint

9. Family History of Hypertension

- a) Father
- b) Mother.
- c) Paternal grand parents
- d) Maternal Grand Parent
- e) Not applicable

10. Food habits

- a) Vegetarian
- b) Mixed vegetarian

SECTION –B

CLINICAL VARIABLE

1. Duration of illness (hypertension)

- a) <1 year
- b) 1-3 yrs
- c) 3-5 years
- d) >5 years

2. Duration of treatment

- a) <1 year
- b) 1-3 years
- c) 3-5 years
- d) >5 years

3. Specify the medication taken

- a) Allopathy
- b) Naturopathy
- c) Siddha
- d) Homeopathy

4) How often do you check your blood pressure level?

- a) Once in a month
- b) weekly once
- c) twice in a month
- d) only when needed

5) How regular are you taking hypertensive's drug

- a) Regular
- b) Irregular

6) State the average hours of sleeping per day?

- a) <8 hours
- b) 8 hours
- c) >8 hours

7) Habits

- a) Smoking
- b) Alcohol
- c) Tobacco
- d) None of the above

8) How often do you take non vegetarian food?

- a) Daily
- b) Twice a week
- c) Once week
- d) Never

9) How strict are you restricting salt items?

- a) Fully restricted
- b) sometimes I eat
- c) I take as I like

10) How strict are you restricting deep fried items?

- a) Fully restricted
- b) sometimes I eat
- c) I take as I like

11) Exercises

- a) Physical exercises
- b) aerobic exercises
- c) Yoga
- d) Nothing

12)Body Mass Index

- a) <18.50
- b) 18.50-24.99
- c) 25-25.99
- d) >30

SECTION-B

SCORING KEY

BLOOD PRESSURE LEVEL

The classification is based on the average of two or more properly measured, seated blood pressure readings on each of two or more office visits.

BP Classification	SBP* MmHg	DBP* mmHg	Lifestyle Modification	Initial drug therapy	
				Without Compelling Indication	With Compelling Indications
Normal	<120	and <80	Encourage	No antihypertensive drug indicated.	Drug(s) for compelling indications.
Pre Hypertension	120-139	or 80-89	Yes		
Stage 1 Hypertension	140-159	or 90-99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications. Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	>=160	or >=100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	

DBP, diastolic blood pressure; SBP, systolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

APPENDIX-III

RECORD FOR PRETEST AND POSTTEST BLOOD PRESSURE

LEVEL IN EXPERIMENTAL GROUP

SAMPLE	DATE/TIME	PRETEST	DATE/TIME	POST TEST
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

RECORD FOR PRETEST AND POST TEST BLOOD PRESSURE

LEVEL IN CONTROL GROUP

SAMPLE	DATE/TIME	PRETEST	DATE/TIME	POST TEST
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

நேர்முகக் காணல் படிவம்

கீழே கொடுக்கப்பட்டுள்ள பகுதியில் உங்களை பற்றியும், இரத்த அழுத்தத்தை பற்றியும் கேள்விகள் உள்ளது. பொருத்தமான விடையை (✓) குறிப்பிடவும் நீங்கள் அளிக்கும் எல்லா விபரங்களும் ரகசியமாக பாதுகாக்கப்படும்.

பிரிவு -அ

தனிவிபரப்பட்டியல்

1. வயது

- அ) 35-45 வயது வரை
- ஆ) 46-55 வயது வரை
- இ) 56-65 வயது வரை
- ஈ) 65- வயதிற்க்குமேல்

2. பாலினம்

- அ) ஆண்
- ஆ) பெண்

3. படிப்புத்தகுதி

- அ) ஆரம்ப நிலைக்கல்வி
- ஆ) நடுநிலைக் கல்வி
- இ) உயர்கல்வி
- ஈ) உயர்நிலைக் கல்வி
- உ) பட்டப்படிப்பு
- ஊ) பட்டயப்படிப்பு
- எ) படிக்கவில்லை

4. திருமண நிலை

- அ) தனித்திருப்பவர்
- ஆ) திருமணமானவர்
- இ) விவாகரத்து ஆனவர்

5. பணியின் நிலை

- அ) பட்டயப்படிப்பு சார்ந்ததொழில்
- ஆ) சுமை தொழில்
- இ) அலுவலக உதவியாளர், கடை வைத்திருப்பவர், விவசாயி
- ஈ) வேலை செய்யாதவர்

6. வேலையின் தன்மை

- அ) உட்கார்ந்த நிலை வேலை
- ஆ) மிதமான வேலை
- இ) கடினமான வேலை
- ஈ) வேலை எதுவும் இல்லை

7. குடும்பத்தின் மாத வருமானம்

- அ) ரூ<2000க்கும் கீழ்
- ஆ) ரூ.2001-ரூ5000 வரை
- இ) ரூ.5001-ரூ10,000 வரை
- ஈ) ரூ10,000கும் மேல்

8. குடும்ப வகை

- அ) தனிக்குடும்பம்
- ஆ) கூட்டுக் குடும்பம்

9. குடும்பத்தில் இரத்த அழுத்தத்தால் பாதிக்கப்பட்டவர்கள்

- அ) தந்தை
- ஆ) தாய்ள
- இ) தந்தை வழி பெற்றோர்கள்
- ஈ) தாய் வழி பெற்றோர்கள்
- உ.) எதுவும் இல்லை

10. உணவு பழக்கம்

- அ) சைவம்
- ஆ) சைவம் அசைவம் இரண்டும் கலந்தது

பிரிவு -ஆ

இரத்த அழுத்த நிலையின் விவரக்குறிப்பு

1. இரத்த அழுத்த நோயின் கால நிலை
 - அ) ஒரு வருடத்திற்கு குறைவு
 - ஆ) 1வருடம் முதல் 3 வருடம் வரை
 - இ) 3வருடம் முதல் 5 வருடம் வரை
 - ஈ) 5 வருடத்திற்கும் மேல்
2. சிகிச்சை மேற்கொள்ளும் கால அளவு
 - அ) ஒரு வருடத்திற்கு குறைவு
 - ஆ) 1வருடம் முதல் 3 வருடம் வரை
 - இ) 3வருடம் முதல் 5 வருடம் வரை
 - ஈ) 5 வருடத்திற்கும் மேல்
3. இரத்த அழுத்தத்தை எத்தனை நாட்களுக்கு ஓர முறை பரிசோதிப்பீர்கள்?
 - அ) மாதம் ஒரு முறை
 - ஆ) வாரம் ஒரு முறை
 - இ) மாதம் இரு முறை
 - ஈ) தேவைப்படும் போது மட்டும்
4. உட்கொள்ளும் மருந்தின் வகை
 - அ) ஆங்கில மருத்துவம்
 - ஆ) இயற்கை மருத்துவம்
 - இ) சித்த மருத்துவம்
 - ஈ) ஹோமியோபதி
5. இரத்த அழுத்த மாத்திரைகள் உட்கொள்ளும் விவரம்
 - அ) தொடர்ச்சியாக
 - ஆ) தொடர்ச்சியில்லாமல்
6. ஒரு நாள் சராசரி தூக்கத்தின் அளவு
 - அ) 8 மணி நேரத்திற்கும் குறைவாக
 - ஆ) 8 மணி நேரம்
 - இ) 8 மணி நேரத்திற்கு அதிகமாக
7. பழக்கம்
 - அ) புகை பிடித்தல்
 - ஆ) மது அருந்துதல்
 - இ) புகையிலை போடுதல்
 - ஈ) இவை எதுவுமில்லை
8. உப்பு சேர்ந்த உணவு கட்டுப்பாடு
 - அ) முற்றிலுமாக தவிர்ப்பேன்
 - ஆ) எப்பொழுதாவது சாப்பிடுவேன்
 - இ) விரும்பும்போதெல்லாம் சாப்பிடுவேன்

9. பொரித்த உணவுகளில் கட்டுப்பாடு

- அ) முற்றிலுமாக தவிர்ப்பேன்
- ஆ) எப்பொழுதாவது சாப்பிடுவேன்
- இ) விரும்பும் போதெல்லாம் சாப்பிடுவேன்
- அ) முற்றிலும் தவிர்க்கிறேன்

10. அசைவ உணவுகளை எத்தனை முறை எடுத்து கொள்கிறீர்கள்?

- அ) தினமும்
- ஆ) வாரம் இருமுறை
- இ) வாரத்தில் ஒருமுறை
- ஈ) விரும்பும் போதெல்லாம் சாப்பிடுவேன்

11. உடற்பயிற்சி மேற்கொள்ளுதல்

- அ) உடம்பு சார் உடற்பயிற்சி
- ஆ) காற்றோட்டமான உடற்பயிற்சி
- இ) யோகா
- ஈ) எதுவுமில்லை

12. பி.எம்.ஐ

- அ) 18.50க்கும் குறைவாக
- ஆ) 18.50 – 24.99
- இ) 25 – 29.99
- ஈ) 30க்கும் அதிகமாக

ஓப்புதல் படிவம்

பெயர் :

தேதி :

வயது :

ஆராய்ச்சி சேர்க்கை எண்.

மதுரை மாவட்டம், சமயநல்லூரில் வசிக்கும் உயர்இரத்த அழுத்த நோயாளியான எனக்கு இரத்த அழுத்தத்தை குறைக்கும் அளவில் பூட்ரூட் சாறின் திறன் பற்றிய மதிப்பீட்டு ஆய்வின் முன் விபரம் எனக்கு விளக்கமாக எடுத்துரைக்கப்பட்டது. பூட்ரூட் சாறு 250 மிலி தினமும் தொடர்ச்சியாக 30 நாட்களுக்கு உட்கொண்டு உயர் ரத்த அளவு குறைகிறதா என்பதை அறிய எனக்கு பூரண சம்மதம்.

இந்த ஆய்வில் பங்கு பெறுவதில் உள்ள நன்மையான இரத்த அழுத்தத்தை குறைவு பற்றி எனக்கு எடுத்துரைக்கப்பட்டது. நான் இந்த ஆய்வில் தானகவே முன்வந்து பங்கு பெறுகிறேன். மேலும் எனக்கு இந்த ஆய்வில் இருந்து எந்த நேரமும் விலகிக்கொள்ள முன் அனுமதி வழங்கப்பட்டுள்ளது. ஏன்னுடைய சீகிச்சை ஆவணங்களை பார்வையிட்டு அதில் உள்ள விவரங்களை ஆய்வில் பயன்படுத்திக் கொள்ள அனுமதி அளிக்கின்றேன். என்னுடைய பெயர் மற்றும் அடையாளங்களை ரகசியமாக வைத்துக்கொள்ளப்படும் என்று எனக்கு உறுதி அளிக்கப்பட்டுள்ளது.

இப்படிக்கு,

PERMISSION LETTER

From Rajalakshmi.N

Rajalakshmi.N

M.Sc (N) II year student

College of nur

College of Nursing

Madurai medi

Madurai Medical College,

Madurai.

Madurai.

To

The Deputy Director of Health Services & family welfare officer,

Viswanathapuram,

Madurai

Through

The Principal,

College of Nursing,

Madurai Medical college Madurai.

Respected Sir,

Sub: Requesting permission to conduct dissertation

Samayanallur primary health centre area.

This is for your kind information that for the fulfillment of curriculum, I have to do dissertation on the topic **A study to Assess Effectiveness of Beet Root Juice on blood pressure level among clients with Hypertension residing at Samayanallur, Madurai.** I kindly request you to permit me to do the dissertation in rural primary health centre, Samayanallur at Madurai.

Thanking you,

Madurai

30.08.2013

Yours faithfully

Forwarded
S.P.
30/8/13
Principal
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

3882/12
4975
6/9/13

DEPUTY DIR
HEALTH S
MADU

CERTIFICATE OF TAMIL EDITING
TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation by **RAJALAKSHMI.N** II year M.Sc., (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken by study field on Dissertation entitled **“A STUDY TO ASSESS THE EFFECTIVENESS OF BEETROOT JUICE ON BLOOD PRESSURE LEVEL AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT SAMAYANALLUR, MADURAI.”** has been edited for Tamil language appropriateness.

NAME: K.SOUNDARAPANDIAN

DESIGNATION:

P.G. ASST IN TAMIL

INSTITUTION:

A.A. Govt. Hr SEC. SCHOOL
MAYANPETTAI.



SIGNATURE

அறிஞர் அண்ணா
அரசினர் மேல் நிலைப் பள்ளி,
அய்யம்பேட்டை.



CERTIFICATE OF ENGLISH EDITING
TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation by **SUJITHA.R** II year M.Sc., (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken by study field on Dissertation entitled **“A STUDY TO ASSESS THE EFFECTIVENESS OF BEETROOT JUICE ON BLOOD PRESSURE LEVEL AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT SAMAYANALLUR, MADURAI.”** has been edited for English language appropriateness.

NAME: R. JAYA


SIGNATURE
அண்ணா அரசினர் மேல்நிலைப்பள்ளி
அய்யம்பட்டை.

DESIGNATION: P.G. Assistant (ENGLISH)

INSTITUTION:



QUALITY CONCEPTS

67, 1st Floor, P&T Nagar Main Road,
P&T Nagar, Madurai - 625 017.
Tel : 91-452-4231644
E-mail : qualityconcepts@in.com

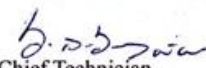
CALIBRATION CERTIFICATE

01. Certificate No. & Date : 20131712 19.11.2013
02. Page no. : 01 of 01
03. Name of the Client : **N.Rajalakshmi,
Madurai.**
04. Name of the Instrument : Sphygmomanometer (BP Apparatus)
05. Identification No. of the instrument : 09D5013
06. Range of the instrument : 0-300 mm Hg
07. Least Count : 2 mm Hg
08. Make : MCP
09. Calibrated on : 16.11.2013
10. Next Calibration due on : 16.11.2014 (User defined)
11. Standards Followed : IS 3390

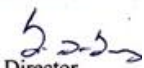
12. Calibration Results

Sl. No.	Indicated Value mm Hg	Standard Value mm Hg	Error mm Hg
01	280	280	0
02	200	200	0
03	160	160	0
04	140	140	0
05	120	120	0
06	100	100	0
07	80	80	0
08	60	60	0
09	0	0	0

13. Calibration Traceable to : NATIONAL STANDARDS (Digital Pressure Transducer certified by Si'Tarc vides Cert. No. 060884)
14. Allowable Tolerance as per IS 3390 : + 2 mm Hg or - 3 mm Hg
15. Instrument status : Deviations are within specified limits
**Note: Calibrated and certified for ISO and other Quality System Standards' requirement.
The results were observed at the time of calibration.**

Calibrated by
Signature : 
Designation : Chief Technician



Approved by
Signature : 
Designation : Director

CERTIFICATE OF VALIDATION

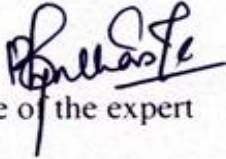
This is to certify that the tool

SECTION A – Demographic data

SECTION B – Assessment of patient's Blood pressure level by

Biophysiological Measurement.

prepared for data collection by RAJALAKSHMI.N, II year M.Sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis **“TO ASSESS THE EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD PRESSURE LEVEL AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT SAMAYANALLURMADURAI.”** has been validated by me.


Signature of the expert

Name : Mrs. BHARATHASORUBA
RANI S

Designation : ASSO. PROFESSOR

Date : 27.9.13.

CERTIFICATE OF VALIDATION

This is to certify that the tool

SECTION A – Demographic data

SECTION B – Assessment of patient’s Blood pressure level by
Biophysiological Measurement.

prepared for data collection by RAJALAKSHMI.N, II year M.Sc (N) student, College of Nursing, Madurai Medical College, Madurai, who has undertaken the study field on thesis **“TO ASSESS THE EFFECTIVENESS OF BEET ROOT JUICE ON BLOOD PRESSURE LEVEL AMONG CLIENTS WITH STAGE I HYPERTENSION RESIDING AT SAMAYANALLURMADURAI.”** has been validated by me.

SIGNATURE OF THE EXERT

NAME:

L. Saleem
11/9/13.

DESIGNATION:

Dr - M - SALEEM .

DATE:

ASSOCIATE PROFESSOR
Institute Of Community Medicine
Madurai Medical College
Madurai

PERMISSION LETTER

From

RAJALAKSHMI.N,
II year M.sc(N) student,
College of nursing,
Madurai medical college,
Madurai.

To

Dr.S.SUBRAMANIYAM,
Department of Siddha medicine,
Samayanallur primary Health Centre,
Madurai.

Through

THE PRINCIPAL,
College of Nursing,
Madurai Medical college, Madurai.

Respected Sir,

Sub: Requesting permission to conduct dissertation in Samayanallur
primary health centre area.

This is for your kind information that as a part of my curriculum requirement and planning to conduct a study on “to assess the effectiveness of beet root juice in control on blood pressure level among clients with stage I hypertension residing at samayanallur , Madurai”. I kindly request you to provide your valuable opinion on beet root juice in the control of blood pressure for stage I hypertensive clients. Kindly provide permission and guidance to conduct

health centre, Samayanallur at Madurai.

Thanking you

Yours faithfully

(RAJALAKSHMI.N)

Forwarded &
Permitted
by.

செ. தவி சித்த மருத்துவ அலுவலர்
அரசு ஆரம்ப சுகாதார
சமயநல்லூர் - 625 402.
Date: 30.08.2013.
மதுரை மருத்துவ

Forwarded
S-P-T
30/8/13

Principal I/c
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

Permitted
30/8/13
BLOCK MEDICAL OFFICER
Govt. Primary Health Centre.
Samayanallur
Madurai Dist

PERMISSION LETTER

RAJALAKSHMI.N.

II year M.sc(N) student,
College of nursing,
Madurai medical college,
Madurai.

To
THE BLOCK MEDICAL OFFICER,
Primary health centre,
Samayanallur,
Madurai.

Through
Proper channel

Respected Sir,

Sub: Requesting permission to conduct dissertation in Samayanallur
primary health centre area.

This is for your kind information that as a part of my curriculum requirement and planning to conduct a study on “to assess the effectiveness of beet root juice in control on blood pressure level among clients with stage I hypertension residing at Samayanallur , Madurai”. I kindly request you to provide your valuable opinion on beet root juice in the control of blood pressure for stage I hypertensive clients. Kindly provide permission and guidance to conduct

Thanking you

Place: Madurai

Date: 30.8.2013.

Yours faithfully
Rajalakshmi N
(RAJALAKSHMI.N)

Forwarded
S.P. I/c
30/8/13
Principal I/c
COLLEGE OF NURSING
Madurai Medical College
Madurai-20.

PHOTOGRAPHS

THE RESEARCHER CHECKING PRE TEST BLOOD PRESSURE LEVEL FOR THE CLIENT



**THE RESEARCHER PREPARING THE BEET ROOT JUICE IN
THE CLIENT'S HOME**



THE CLIENT DRINKING BEET ROOT JUICE



THE RESEARCHER CHECKING POST TEST BLOOD PRESSURE

