

**EFFECTIVENESS OF GARLIC INTAKE ON BLOOD
PRESSURE AMONG THE HYPERTENSIVE
PATIENTS IN SELECTED COMMUNITY
MARAPPADI AT KULASEKHARAM**



**A DISSERTATION SUBMITTED TO THE TAMILNADU
DR.M.G.R. MEDICAL UNIVERSITY CHENNAI, IN
PARTIAL FULFILMENT FOR THE DEGREE OF
MASTER OF SCIENCE IN NURSING
OCTOBER 2015**

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Internal Examiner

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BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled “**A study to assess the effectiveness of garlic intake on blood pressure among the hypertensive patients in selected community Marappadi, at Kulasekharam**” is a bonafide research work done by **C. Mini Mol II year M.Sc [N]**, Sree Mookambika College Of Nursing, Kulasekharam under the guidance of **Mrs. Adlin Sujitha M.Sc [N]** Reader, Medical Surgical Nursing in partial fulfilment of the requirements for the Degree of Master Of Science in nursing under Tamilnadu Dr .M.G.R Medical university.

Principal

Place : Kulasekharam

Sree Mookambika College of Nursing,

Date : 10.08.2015

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Place : Kulasekharam

Date : 10.08.2015

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Sree Mookambika College of Nursing,
Kulasekharam.

DECLARATION

I hereby declare that the present dissertation titled “**A study to assess the effectiveness of garlic intake on blood pressure among the hypertensive patients in selected community Marappadi, at Kulasekharam**” is the outcome of the original research undertaken and carried out by me under the guidance of **Mrs. Adlin Sujitha**, M.Sc(N), Professor Medical surgical Nursing, Sree Mookambika College of Nursing, Kulasekharam. I also declare that the material of this has not formed in anyway, the basis for the award of any degree or diploma in this university or any universities.

Place : Kulasekharam

Date : 10.08.2015

Mrs. C. Mini Mol,

II year MSc (N)

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Investigator

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Abstract

World Hypertension Day is celebrated every year on 17th of May to raise the public awareness about the hypertension, its preventive measures and complications. It was first celebrated on 14th of May in the year 2005 organized by the World Hypertension League. The theme for 2015 is ‘‘Know your blood pressure’’. Hypertension is called the ‘‘silent killer’’, because most patients with high blood pressure have no symptoms to alert them to elevated pressure. But over time, high blood pressure increases the risk of serious problems such as stroke, congestive heart failure, heart attack, and kidney failure. Garlic is an herb. It is the best known as a flavouring food. But over the years garlic has been used as a medicine to prevent or treat a wide range of diseases and condition. Garlic [*Allium sativum*] has played an important dietary as well as medicinal role in human history. Blood pressure reducing properties of garlic have been linked to its hydrogen sulphide production and allicin content -liberated from allin and the enzyme allinase which has angiotensin II inhibiting and vasodilating effects, as shown in animal and human studies.. Traditionally, it has been employed to treat high blood pressure, infections, high cholesterol, fungal skin infections wounds, rheumatism heart disease, diabetes, and many other disorders. Garlic is used for many other conditions related to the heart and blood system. Garlic may be effective in the development of atherosclerosis and moderately to reduce blood pressure. The objectives of the study is to determine the effect of garlic intake in experimental group than in control group

The researcher adopted a quasi experimental research design with multiple time series design. The clients were selected in Marappadi village, based on inclusion criteria using purposive sampling techniques. Thirty samples were allotted to experimental group and thirty allotted to the control group. Garlic 30gms are given experimental group to reduce for hypertension. Whereas control group was receiving regular anti hypertensive treatments, post test was conducted in experimental and control group using Vaughn's blood pressure chart. The study identified that the blood pressure was reduced in experimental group, after garlic administration. The 't' value of difference of mean reduction of blood pressure tabulated was found to be $t=34.8, df=59, p<0.05$. The study findings indicate that the garlic is effective non pharmacologic measure to reduce blood pressure. Garlic was found to have no side effects when compared with other treatments. There is an association between family history and hypertension.

Key Words : Garlic, Hypertension.

CHAPTER I

Introduction

“The best thing to do with garlic of course

-SYLVIA RUBIN

World Hypertension Day is celebrated every year on 17th May to raise the public awareness about the hypertension, its preventive measures and complications. It was first celebrated on 14th May in the year 2005 organized by the World Hypertension League. The theme for 2015 is ‘Know your blood pressure’.

[World health organization 2015]

Hypertension is called the ‘silent killer’, because most patients with high blood pressure have no symptoms to alert them to elevated pressure. But over time, high blood pressure increases the risk of serious problems such as stroke, congestive heart failure, heart attack, and kidney failure.

[Joseph H.Henderson -2015]

Hypertension awareness, treatment and control status is low, with only half of the urban and a quarter of the rural hypertensive individuals being aware of its presence. It has been seen that only one in five persons is on treatment and less than 5% are controlled. Rural location is an important determinant of poor hypertension awareness, treatment, and control. It has been said that in India the rule of halves is not valid and only a quarter to a third of subjects are aware of hypertension.

[Epidemiology of Hypertension-2013]

It is easy to get prevented from the primary hypertension however secondary hypertension is severe condition which can be managed and cured if treated well. It needs to change some life styles and following healthy living habits [avoid smoking and alcohol, low sodium intake of 1.5 to 2.5g, low fat and high fibre diet, fruits and green leaf vegetables, proper physical exercise, aerobics, healthy weight, regular pulse and Bp check, reduce stress, low bad cholesterol level, healthy family history etc.] to well treat the condition.

[World health organization 2015]

Hypertensive medications can produce troublesome side effects such as insomnia, sedation, dry mouth, drowsiness and headaches. Due to difficulty altering, side effects and prescription, drug costs, hypertensive individuals may desire a non pharmacologic intervention to avoid or complement their antihypertensive medication regimen. Therefore continued improvement in pharmacologic treatments is necessary, these advancements must be complemented by non-pharmacological approaches to control blood pressure. The good news is that there are a number of natural ways to lower high blood pressure. Complimentary therapy is commercial as a corner stone in non pharmacological approaches complementary therapy is considered to have definite improvement in clients condition. It is considered as a adjunct therapy in improving the effectiveness of medical treatment and enhance patients comfort.

[World Health Organization -2013]

Garlic is an herb. It is the best known as a flavouring agent in food. But over the years garlic has been used as a medicine to prevent or

treat a wide range of diseases and condition. Garlic [*Allium sativum*] has played an important dietary as well as medicinal role in human history. Blood pressure reducing properties of garlic have been linked to its hydrogen sulphide production and allicin content -liberated from allin and the enzyme allinase which has angiotensin II inhibiting and vasodilating effects , as shown in animal and human cell studies.

[Karien Ried -2008]

Garlic is one of the best-researched, best- selling herbal remedies and is also commonly used as a food. Traditionally, it has been employed to treat high blood pressure, infections, high cholesterol, fungal skin infections wounds, rheumatism heart disease, diabetes, and many other disorders. Experimentally, it has been shown to exert antilipidemic, antihypertensive, antineoplastic, antibacterial, immunostimulant and hypoglycaemic actions. Clinically, garlic has been evaluated for a number of conditions, including diabetes, rheumatoid arthritis, common cold, as an insect repellent, and for the prevention of atherosclerosis and cancer. Garlic appears to be generally safe although allergic reactions may occur.

[Chia –wen Tsai-2012]

Garlic supplements are thought to reduce blood pressure. Hai peng wang et al (2015) performed a meta analysis to investigate garlic effect on blood pressure. Ovid Medline, Cochrane library and Pub Med [1946 to november2013] were used for search for randomized controlled trails, .The analysis showed that garlic intake caused a 3.75-mm Hg reduction [95% confidence interval CI =-5.04 to -2.45.I =30.7%;p<0.001] in systolic blood pressure and a 3.39-mmHg reduction [95% CI=-4.14 to -2.65,I=67%;p<0.001] in diastolic compared with controls.

Meta analysis of subgroups showed a significant in systolic blood pressure in hypertensive [-4.4mmHg;95%CI,-7.37 to-1.42,I =0.0%;p=0.04] but not in normotensive patient. After sensitivity analysis, heterogeneity disappeared and significant diastolic blood pressure reduction [-2.68mm Hg,CI,-4.93 to-0.42,I=0.0%;p=.020] was shown in hypertensive patients .Thus they suggested that garlic supplements are superior to controls in reducing blood pressure, especially in hypertensive patients. [Hai peng Wang-2015]

Garlic and its preparations have been widely recognized as agent for prevention and treatment of cardiovascular and other metabolic diseases, atherosclerosis, hyperlipidemia, thrombosis, hypertension and diabetes. Effectiveness of garlic in cardiovascular diseases was more encouraging in experimental studies, which promoted several clinical trails. The clinical trails showed a positive effect of garlic on almost all cardiovascular conditions .It is a great challenges all over the world to make a proper use of garlic and get maximum beneficial effects of garlic to prevent the cardiovascular diseases.

[Sanjay K Banerjee 2002]

Back Ground of The Study

Arterial hypertension simply put in high blood pressure. It is defined as persistent elevation of the systolic blood pressure [SBP] at the level of 140mmHg or higher and diastolic blood pressure [DBP]at a level of 90mmHg or higher. According to joint national committee on prevention, detection, evaluation and treatment. Hypertension is classified in to stage 1 hypertension, as blood pressure ranging from 140 to 159mm Hgs systolic or 90to 99 mm Hg

diastolic, stage 2 hypertension as pressures of from 160 to 179 mm Hg systolic or 100 to 109 mm Hg diastolic and stage 3 hypertension as pressures 180mmHg or greater systolic and 110mmHg or greater diastolic .

[Joint National committee-2014]

According to Stanler (2004), hypertension is classified into primary and secondary hypertension. Primary hypertension has an unknown cause and accounts for ninety per cent to ninety five per cent of all hypertension. Secondary hypertension has a known cause and for five per cent to ten per cent of all hypertension cases. Chris (2009) maintained that the most common cause of secondary hypertension is an abnormality in the arteries supplying blood to the kidneys.

[Onyekwere Ogechi Kate-2013]

Garlic is used for many other conditions related to the heart and blood system. These conditions include high blood pressure , high cholesterol, coronary heart disease, heart attack and hardening of the arteries . Some of these uses are supported by sciences. [Stativm 2005]

A study was conducted in the University Adelaide, Snout [1994] Australia, regarding the effect of garlic on blood pressure. Randomized controlled trials with true placebo groups, using garlic-only preparations, and reporting mean systolic and or diastolic blood pressure (SBP/DBP) and standard deviations were included. The result shows a significant association between blood pressure at the start of the intervention and the level of blood pressure reduction. The study concluded that garlic preparations are superior to placebo in reducing blood pressure in individuals with hypertension. [C A Silagy 1994]

The investigator during her undergraduate programme observed many people in the community having hypertension. Because of the low economical status the people refused to take regular medicine. Thus the investigator felt that the use of garlic would be economical to the people in the reduction of blood pressure.

Need For the Study

The World Health Statistics 2012 estimated 57 million global deaths in 2008, of which 36 million (63%) were due to non communicable diseases (NCDs). The largest proportion of NCD deaths is caused by cardiovascular diseases (48%). In terms of attributable deaths, raised blood pressure is one of the leading behavioural and physiological risk factor to which 13% of global deaths are attributed. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries.

[Epidemiology of hypertension-2013]

Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS. Raised blood pressure is a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke. Blood pressure levels have been shown to be positively and continuously related to the risk for stroke and coronary heart disease. In some age groups, the risk of cardiovascular disease doubles for each increment of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg. In addition to coronary heart diseases and stroke, complications of raised blood pressure include heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage and visual impairment. Treating systolic blood

pressure and diastolic blood pressure until they are less than 140/90 mm Hg is associated with a reduction in cardiovascular complications.

[World wide organizations -2015]

Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. The proportion of the world's population with high blood pressure, or uncontrolled hypertension, fell modestly between 1980 and 2008. However, because of population growth and ageing, the number of people with uncontrolled hypertension rose from 600 million in 1980 to nearly 1 billion in 2008.

[World Wide Hypertension -2015]

According to the statistics, it is noted that around 3 out of people are suffering from hypertension world wide. Approximately 1.8 million of the people globally are suffering from hypertension and the most surprise thing is 50% Of them are totally unaware of their condition and some of them who are aware of their condition do not take any medical action for their blood pressure.

[World health organization 2015]

The overall prevalence of hypertension has not changed appreciably since 2009–2010. The age-adjusted prevalence of hypertension among U.S. adults was 29.1% in 2011–2012. Among adults with hypertension in 2011–2012, 82.8% were aware of their hypertension, 75.7% were currently taking medication to lower their blood pressure, and 51.9% had their blood pressure controlled to less than 140/90 mm Hg. Men and women had similar prevalence and awareness of hypertension, but more women than men were treating their hypertension and had it under control. Young adults aged 18–39 continued to have lower awareness, treatment, and control of their

hypertension compared with older adults. Based on recent national data from 2011–2012, treatment of hypertension exceeded the Healthy People 2020 target goal of 69.5%. However, the control of hypertension has neither met the goal of the Healthy People 2020 (61.2% by 2020) nor the Million Hearts Initiative (65% by 2017). These results provide evidence for continued efforts to improve the management of hypertension in order to attain these goals.

[Centres for Control Diseases and Prevention-2013]

Preventive measures are required so as to reduce obesity, increasing physical activity, decreasing the salt intake of the population and a concerted effort to promote awareness about hypertension and related risk behaviours. Two upcoming studies for identification of regional differences of CVD risk factors in India are the India Heart Watch and PURE studies. PURE 26 is a prospective study localized to five urban and five rural locations while India Heart Watch 27 has centres all over the country. These studies shall further highlight the prevalence and regional variations of hypertension as a CVD risk factor.

[Epidemiology of hypertension-2013]

George, Gregory, et al [2015] conducted a study to investigate the age specific incidence of hypertension by ethnicity among middle aged and other blacks and whites including Hispanics and Asians on the united states. Among 3146 participants of the age group 45-84 years at baseline were followed for a median of 48yrs for hypertension. The crude incidence rate of hypertension per 1000 person years were 568 per whites , 84.9for blacks, 65,7 for Hispanics and 52.2 for Chinese . After adjustment per age, Hispanics and black participants

showed a higher incidence of hypertension compared with white and Chinese of the age group 45-74 years but not after age 75 years.

In India the prevalence rate of hypertension is 59.9 to 69.9 per 1000 in males and females, respectively in the urban population, and 35.5 to 35.9 per 1000 in males and females respectively in the rural population. Approximately 60 million people in the UK have hypertension [30% of adults], approximately 62000 preventable deaths occur each year in England due to hypertension and one third of people with hypertension are unaware of it. A high incidence of elevated blood pressure is recorded in Australia and New Zealand.

[Journal of Nursing Times -2015]

Statement Of The Problem

A study to assess the effectiveness of garlic intake on blood pressure among the hypertensive patients in selected community Marappadi, at Kulasekharam.

Objectives

1. To assess the blood pressure of both experimental and control group before garlic intake.
2. To determine the effect of garlic on blood pressure in experimental group and control group after intake of heated garlic.
3. To compare the mean difference in the blood pressure in experimental and control group.
4. To find association between the hypertension and selected demographic variables such as age, sex, education ,occupation marital status, family history of hypertension ,habits , duration of disease.

Hypothesis

There will be significant reduction in the blood pressure with the garlic intake among the patients in the experimental group than in control group.

There will be significant association between the mean blood pressure reading and selected demographic variables such as age, sex, education, occupation, habits, family history of hypertension, duration of illness.

Operational definitions

Effectiveness In this study effectiveness refers to the extent to which garlic intake has achieved the desired effect by significantly reducing blood pressure of hypertensive clients as measured by Vaughns blood pressure assessment tool

Garlic Garlic is a member of the family Alliaceous, a vegetable of the onion family with a very strong taste and smell. Used in cooking to give flavour to food. In this study, garlic refers 30 gms of heated garlic given to hypertensive patients in morning empty stomach for thirty days

Hypertensive patients Hypertensive patients refers to the clients having blood pressure readings systolic pressure ≥ 140 mm Hg and diastolic pressure greater than 90 mm Hg as measured by sphygmomanometer.

Variables

Dependent variable – Hypertension

Independent variable – Garlic

Assumptions

The study assumes that the garlic is an accepted mode of intervention for the hypertensive clients.

The intake of garlic may reduce blood pressure.

Delimitations

Study is delimited to the clients with hypertensive patients. The intervention is delimited to one month duration of time.

Ethical Consideration

The study was conducted after getting approval from research and ethical clearance committee of sree Mookambika Medical College and written consent from director of sree Mookambika Institute of Medical Sciences. Oral consent was obtained from each sample before the intervention. Assurance was given to the samples and privacy was maintained.

Conceptual Frame Work

The conceptual frame work is a global idea about concepts in relation to specific discipline [i.e.] it is a visual diagram by which the researcher explains the specific area of interest. It is the over all purpose is to make research findings meaningful and generalisable.

The conceptual frame work of this study is based upon Betty Neumann's [1980] system model which focuses person is a complete system the sub part of which are inter related physiological , psychological, socio cultural, spiritual and developments factors are inter related. In this model, the person maintains balance harmony between internal and external environments by garlic.

The primary goal of nursing is to assist in the attainment and maintenance of client system stability. Nursing Intervention include activities to strengthen flexible line of defence and blood pressure level is maintained

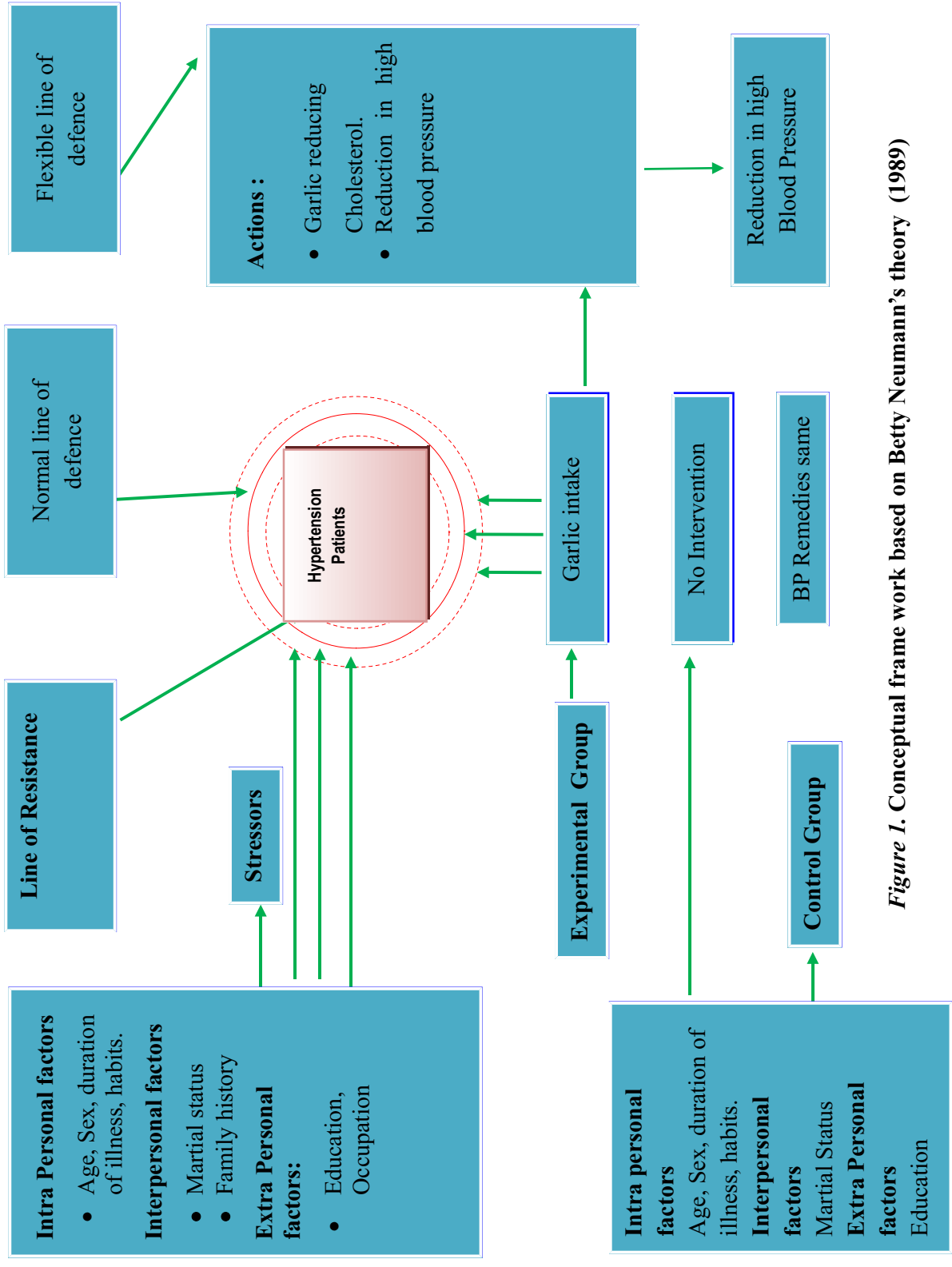


Figure 1. Conceptual frame work based on Betty Neumann's theory (1989)

CHAPTER II

Review of Literature

Review of Literature is a key step in research process. It is an account of what is already known about a particular phenomenon. The main purpose of the literature reviews is to convey to the readers about the work already done and the knowledge and ideas that have been already established on a particular topic of research. It refers to an extensive, exhaustive and systemic examination of publication relevant to the research project.

A literature review is an evaluation report of information found in the literature related to selected area of study. The review describes summaries, evaluates and clarifies the literature. It gives a theoretical base for the research and helps to determine the nature of research [queens land university 1998]. Research literature was reviewed and organized under the following heading.

1. Studies related to incidence and prevalence of hypertension
2. Studies related to effect of garlic reduction in hypertension
3. studies related to non pharmacological management in reduction of hypertension

1. Studies related to incidence and prevalence of hypertension

Kearney PM, Whelton m, et al [2004] conducted a systemic review on world wide prevalence of hypertension. The reviews search was restricted to studies published from January 1980 through July 2003 . All data from the reviews were extracted independently by two investigator using a standardized protocol and data collection form. The results shows that the prevalence of

hypertension varied around the world, with the lowest prevalence in rural India [3.4% in men and 6.8% in women.] and the highest prevalence in Poland [68.9% in men and 72.5% in women.]. Awareness hypertension was reported for 46% of the studies. Thus they concluded that hypertension is an important public health challenge in both economically in developing countries, and also significant numbers of individuals with hypertension are unaware of their condition.

Reynolds's k , Munther p, et al[2005] conducted a systemic review on global burden of hypertension. The reviews were searched from the published literature from January1, 1980 to Dec 31, 2002, using MEDLINE, supplemented by a manual search of bibliographic of retrieved articles. All data were obtained independently by two investigators with a standarandized protocol and data collection form, the results shows that over all,26.4% of the adult population in 2000 had hypertension and 29.2% were projected to have hypertension by 2025. The number of adults with hypertension in 2025 was predicted to increase by about 60% to a total of 1.56 billion. Thus they concluded that hypertension is an important public health challenge world wide prevention, detection, treatment, and control of this condition should receive high priority.

TU Krahne, Zhgnogliang, LipsCombe Lorraine et al [2008] conducted a population based cohort study to assess the prevalence and incidence of hypertension from 1995 to 2005 in Ontario. The population used in the study was adult aged 20 yrs and older in Ontario, Canada. The self report survey method was used for data collection. The results shows that the number of adults with hypertension more than double from 1995 to 153.1 per 1000 adults

in 1995 to 244.8 per 1000 in 2005, which was relative increase of 60.0% $[p<0.001]$. The age and sex adjusted incidence of hypertension increased from 25.5 per 1000 adults in 1997 to 32.1 per 1000 in 2004. Which was relative increase of 25.7% $[p<0.001]$. Thus they concluded that the prevalence of hypertension steadily increasing and in fewer than 10 yrs it will likely exceed the prevalence projected for 2025 and also these study highlights the need for strategies to improve the prevention of hypertension.

MidhaTanu, Nath Bholu, et al [2013] conducted a meta analysis on prevalence of hypertension in India. The reviews searched and taken from January 2000 to June 2012. Relevant studies were identified through computer based and manual searches. Estimates of prevalence were calculated using the random effect model for analysis. Twelve studies including 125333 subjects were analyzed to assess the prevalence of hypertension in the urban and rural population. The result shows that the prevalence of hypertension in the urban population was estimated to be 40.8% and that of hypertension in the rural population was 17.9%. It is evident that the prevalence of hypertension was significantly higher in the urban population of India compared to the rural. Thus they suggests policies and interventions should be prioritized for reduction of hypertension.

Devi P, Rao M, et al [2013] conducted a systematic review on prevalence, risk factors and awareness of hypertension in India. The authors were searched MEDLINE from January 1969 to July 2011 using re - specified medical subject heading terms of 3372 studies, 206 were included for data extraction and 174 were observational studies. The result shows that the awareness and control of

hypertension [11 studies] ranged from 20 to 54% and 7.5 to 25% respectively, Increasing Body mass index, smoking, diabetes and extra salt intake were common risk factors. Thus they concluded that this systemic review recorded an increasing trend in prevalence of hypertension in India by region and gender.

Moliner. D, Artero e.g. et al [2013] conducted a longitudinal study to find out the association between body adiposity incidence hypertension. The aim of the study was to evaluate the ability of body adiposity Index to predict hypertension in males and females compared with traditional body adiposity measures. The follow-up analyse compressed 1030 individuals free of hypertension from the aerobics centre longitudinal studies, who completed a baseline examination during 1998-2003. Incident hypertension was ascertained from responses to mail-back surveys between 1990 and 2004. The results shows that during the average of 9.1 years of follow up 872 subjects become hypertensive, the highest categories of all body adiposity measures showed a higher incident risk of hypertension.

RAO, R.Chythras, Kamth G, Veena et al [2012] conducted a cross sectional community based study on high blood pressure prevalence and significant correlates. A cross sectional community based survey among 1,239 ,respondents age > 30 years designed to estimate the prevalence and the socio demographic correlates of hypertension. The data was collected by personal interviews followed by anthropometric and blood pressure measurements. The results shows that the prevalence of hypertension was 43.3% males 51.6 as compared to females 38.9%. Advancing age, male, gender, current diabetic

status, central obesity, and family history of hypertension were identified as a significant correlates for hypertension. Thus they concluded that the stressing need to initiate screening strategies at an earlier age and promote opportunities screening for hypertension.

2. Studies related to effect of garlic reduction in hypertension

Silagy, Christopher A, W.Neli, Andrew et al [1994] conducted a meta analysis of the effect of garlic on blood pressure. The systemic review randomized controlled trails of garlic preparations to determine the effect of garlic on blood pressure to placebo, and other antihypertensive agents. The studies identified by a search Medline and the alternative medicine electronic data base. The one randomized controlled trails of garlic preparations at least 4 weeks duration. The data were extracted from the published reports by the two authors indecently. The results shows that eight trails were identified [all using the same garlic powder preparation] with data from 415 subjects included in the analyse. The seven trails the compared the effect of garlic with that of placebo three showed a significant reduction systolic blood pressure and four in diastolic blood pressure. Thus the result suggests that these garlic powder preparations may be of some clinical use subjects with mild hypertension.

K K Khan, Alnaqeeb Ma et al[2003] conducted study experimental study to find out the mechanism of garlic induced reduction of hypertension 2k-1c rats a possible medication Ne/H exchanger is form. In these study the effect of an established done of garlic extract was investigated in the expression NHE-1 and -3 sodium pump activity in 2k-1c model of hypertension in rats.

The results shows that the antihypertensive , actions of garlic is associated with reversed of NHE-1 in the unclipped kidneys, activation of garlic sodium pump by garlic extracts in the kidneys should reduced intracellular NA concentration and normalized blood pressure. Thus they concluded that these findings signify the use of garlic in the treatment of hypertension.

Karin Ried, et.al [2008], conducted a study on effect of garlic on blood pressure a systematic review and meta-analysis. They found that Non-pharmacological treatment options for hypertension have the potential to reduce the risk of cardiovascular disease at a population level. They searched the Medline and embase databases for studies published between 1955 and October 2007. Randomised controlled trials with true placebo groups, using garlic-only preparations, and reporting mean systolic and /or diastolic blood pressure (SBP/DBP) and standard deviations were included in the meta-analysis. They also conducted subgroup meta-analysis by baseline blood pressure (hypertensive/normotensive), for the first time. Meta-regression analysis was performed to test the associations between blood pressure outcomes and duration of treatment, dosage, and blood pressure at start of treatment. The results shown that Meta-analysis of all studies showed a mean decrease of 4.6 ± 2.8 mm Hg for SBP in the garlic group compared to placebo ($n = 10$; $p = 0.001$), while the mean decrease in the hypertensive subgroup was 8.4 ± 2.8 mm Hg for SBP ($n = 4$; $p < 0.001$), and 7.3 ± 1.5 mm Hg for DBP ($n = 3$; $p < 0.001$). Regression analysis revealed a significant association between blood pressure at the start of the intervention and the level of blood pressure reduction mean (SBP: $R = 0.057$; $p = 0.03$; DBP: $R = -0.315$; $p = 0.02$). In conclusion they found that the garlic preparations

were superior to placebo in reducing blood pressure in individuals with hypertension.

Oliver R Frank, Nigel P Stocks, et al [2010] conducted randomized trials on aged garlic extract lower blood pressure in patients with treated but uncontrolled hypertension. The aim of the study to assess the effect, tolerability and acceptability, of aged garlic extract as an adjunct treatment to existing anti hypertensive medication in Patients with treated, but uncontrolled hypertension. The double blind parallel randomized placebo controlled trial involving 50 patients routine clinical records in general practice documented treated but uncontrolled hypertension. The active treatment group received four capsules of aged garlic extract [960mg containing 2.4mg] daily for 12 weeks and the received matching placebo. The primary outcomes measures were systolic and diastolic blood pressure at base line, 4,8 and 12 weeks, and change over time. Thus they suggest that aged garlic extract is superior placebo in lowering systolic blood pressure similarly to current with first line medications in patient with treated but uncontrolled hypertension.

Stabler sn,,tejani am, et al [2012] conducted a meta analysis to study to determine the impact of garlic on cardiovascular events and mortality patients with hypertension. The objectives was the use of garlic as monotherapy ,in hypertensive patients, lowers the risk of cardiovascular morbidity and mortality compared to placebo. A systemic search for trails was conducted in the Cochrane, MEDLINE, EMBASE, AGRICOLA,AMED and CINAHL up to November 2011. Randomized, placebo- controlled trails of

any garlic preparation versus placebo for the treatment of hypertension were included the two reviews independently extracted data assessed trial quality using the risk of bias tool. The identified two randomized controlled trials for inclusion. One trial included 47 hypertensive patients and showed that garlic significantly reduces mean supine systolic blood pressure by 12mmHg [95%CI0.56 to 23.44mmHg,p==0.004] and mean supine systolic blood pressure by 9mmHg [95% CI2.49 to15.51mmHg,p==0.007] versus placebo. The authors state that garlic was free from side effects'' and that no serious side effects were reported. The second trial meta analysed as they did not report the number of people randomized to each treatment group. They reported that 200mg of garlic powder given three times daily, produced a mean reduction of systolic blood pressure by 10-11mmHg and diastolic blood pressure by 6-8mmHg versus placebo. Pressure by 12 mmHg and mean supine diastolic blood pressure by 9 mm Hg versus placebo. Thus they concluded that there is insufficient evidence to determine if garlic provides a therapeutic advantage verses placebo in terms of reducing the risk of mortality and cardiovascular morbidity in patients diagnosed with hypertension.

Rohner Andres, Karin Ride et al[2014]conducted a systemic review and meta analysis on the effects of garlic preparations on blood pressure individuals with hypertension. They searched electronic data bases through march 2014 to identify all randomized controlled trails that compared a garlic preparations to placebo in hypertensive patients. The nine double blind trails with 482 individuals fulfilled the inclusion criteria. Follow up ranged from 8 to 24 weeks .All trails reported blood pressure measurements systolic blood pressure and diastolic blood

pressure were placebo. The heterogeneity interval [CI], -12.7 to -5.4; p for heterogeneity = 0.0006; and $I^2=71\%$ weighted mean difference for blood pressure was -3.8 mmHg; CI, -6.7 to -1.0; p for heterogeneity = 0.00001; $I^2=80\%$] when analyses were restricted to higher quality trials using intention to treat analysis with concealed treatment allocation and standardized and blinded blood pressure measurement, effect sizes for systolic blood pressure but not for diastolic blood pressure were lower and heterogeneity disappeared. They suggest that garlic preparations may lower blood pressure in hypertensive individuals.

Wang Hai-peng, Yang Jing et al [2015] conducted a meta-analysis to investigate garlic effect on blood pressure. OVID MEDLINE, Cochrane library and published [1946 to November 2013] were used to search for randomized controlled trials. Seventeen trials were included. The analysis showed that garlic intake caused 3.75-mmHg reduction [95% confidence interval CI = -5.04 to -2.45, $I^2=30.7\%$; $p<0.001$] in systolic blood pressure and a 3.39-mmHg reduction [95% CI = -4.14 to -2.65, $I^2=67\%$; $p<0.001$] in diastolic compared with controls. Meta-analysis of subgroups showed a significant in systolic blood pressure in hypertensive [-4.4 mmHg; 95% CI, -7.37 to -1.42, $I^2=0.0\%$; $p=0.04$] but not normotensive patients. No significant reduction in diastolic blood pressure was seen. After sensitivity analysis, heterogeneity disappeared and significant diastolic blood pressure reduction [-2.68 mmHg, CI, -4.93 to -0.42, $I^2=0.0\%$; $p=0.020$] was shown in hypertensive patients. Thus they suggest that garlic supplements are superior to controls in reducing blood pressure, especially hypertensive patients.

3. Studies related to non pharmacological management in reduction on hypertension

Yate, Lamping dt, et al [1988] conducted a randomized controlled trail on effects of chiropractic treatment on blood pressure and anxiety. This study examined the effects of chiropractic adjustments of the thoracic spine [T1-T5] on blood pressure and state anxiety in 21 patients with elevated blood pressure. Subjects were randomly assigned to one of three treatment active treatment , placebo treatment, or no treatment control. They were by a mechanical chiropractic device dependent measures pre and post treatment included systolic and diastolic blood pressure and state anxiety. The results shows that systolic and diastolic blood pressure decreased significantly in the active treatment condition ,no significant changes occurred in the placebo and control conditions. The state anxiety significantly decreased in the active and control conditions. Thus they concluded that blood pressure is reduced long term effects of chiropractic treatment on blood pressure.

Deno,J.Daniet et al [2007] conducted a controled study to find the chiropractic adjustment cuts blood pressure 50 samples were selected,25 in the control group and 25 in the experimental group. The results shows that the average 14 mm Hg greater drop in systolic blood pressure, and an average 8mm Hg greater drop in diastolic blood pressure. Thus they concluded that a special chiropractic adjustment can significantly lower high blood pressure.

Anderson Jw, Liu C Kryscio R.J [2008] done a meta analysis to assess the blood pressure response to transcendental meditation. Randomized, controlled trials comparing blood pressure responses to the Transcendental Meditation technique

with a control group were evaluated. Primary outcome measures were changes in systolic and diastolic blood pressure after practicing Transcendental Meditation or following control procedures. A specific rating system (0-20 points) was used to evaluate studies and random-effects models were used for meta-analyses. The results shows that nine randomized, controlled trials met eligibility criteria. Study-quality scores ranged from low (score, 7) to high (16) with three studies of high quality (15 or 16) and three of acceptable quality (11 or 12). The random-effects meta-analysis model for systolic and diastolic blood pressure, respectively, indicated that Transcendental Meditation, compared to control, was associated with the following changes: -4.7 mm Hg (95% confidence interval (CI), -7.4 to -1.9 mm Hg) and -3.2 mm Hg (95% CI, -5.4 to -1.3 mm Hg). Subgroup analyses of hypertensive groups and high-quality studies showed similar reductions. They concluded that the regular practice of Transcendental Meditation may have the potential to reduce systolic and diastolic blood pressure by approximately 4.7 and 3.2 mm Hg, respectively. These are clinically meaningful changes.

Higgins Marshall, States Rebecca et al [2012] conducted a systemic review and meta analysis on effectiveness of yoga for reducing blood pressure in adults with hypertension and also to assess the modifying influence of type and length of yoga intervention and type of comparison group. The authors were screened for controlled studies from 1966 to march 2013. Two authors independently assessed risk of bias tool 17 studies were included. The result shows that yoga had a modest but significant effect on systolic blood pressure [-4.17, p=0.002] and diastolic blood pressure [-3.62, p=0.0001]. Thus they concluded that yoga can be preliminarily recommended as an effective intervention for reducing blood pressure.

Lennart Nord [2012] conducted a effects of slow breathing exercises and music in patients with hypertension 15 months follow up. The aim of the study to evaluate a person directed intervention slow breathing exercises, and listening to music reduce blood pressure over a period of 15 months in patients with hypertension. The systemic review randomized controled trails. The study was conducted for 15 months,48 patients using device guided slow breathing exercises and 42 patients in a CD group listening to music from a CD player ,for 15 minutes three times a week in boths groups. Then the results shows that the systolic blood pressure[SBP] reduction was $-9.8\text{mmHg}[p<0.0001]$ in the DGBE group and $-7.7\text{mmHg}[p<0.01]$ in the CD group, diastolic blood pressure [DBP]reduction was $-4.1\text{mm Hg}[p<0.05]$ in the DGBE group and -2.5mm Hg in the CD group. No significant differences were found in median blood pressure between the groups neither at inclusion after 15 months. Thus they concluded that breathing exercises and listening music for 15 minutes three times a week can reduce blood pressure in patients with hypertension over a period of 15 months.

OkanPoya , Igoh Spencer et al [2014] conducted a systemic review and meta analysis on the effect of green tea on blood pressure and lipid profile. The aims of the systemic reviews was to evaluate the evidence against the effectiveness of green tea on blood pressure lipid Para meter. The electronic searches as conducted in MEDLINE ,EMBASE, AMED, CINAHAL.The reporting quality of included study was assessed using checklist adopted from the CONSORT statement. The results shows that significant reduction in systolic blood pressure favouring green tea. $[\text{MD}=1.94\text{mmHg},95\%,\text{CI}]$. Thus they

concluded that green tea intake results in significant reduction in systolic blood pressure.

Xing, Xingjiang, *Li* xiaoke, et al [2014] conducted a randomized control trial on the effect of Chinese herbal medicine for resistant hypertension. This study aimed to summarise the current evidence from the randomized control trails concerning treatment of patients with resistant hypertension with Chinese herbal medicines. The 7 data bases included the Cochrane library pub med, Embase CNKI.VIP.CBM and wan fang were systematically searched from their inception to march 2014 for RCTS investigating treatment of resistant hypertension in Chinese herbal medicine was used as a monotherapy or in combination with conventional medicine versus placebo, no intervention or conventional medicine. Five trails containing 446 hypertensive patients were identified. The methodological quality of most trails was evaluated as generally low. All included trails compared CHM plus antihypertensive drugs alone for resistant hypertension. Formulations of CHM include tablet, decoction and injection. It was found that, compared with antihypertensive drugs alone, CHM [tablet] plus antihypertensive drugs resulted in clinically., But not statistically non significant reduction in systolic blood pressure weighted mean difference = -10.32 mmHg_{95%}, CI=21.10 to 0.46; p=0.06] and diastolic blood pressure [DBP=3.30 mmHg,_{95%}CI=-7.66 to 1.06;p=0.14] antihypertensive drugs also produced a clinically meaningful, but not statistically significant reduction in systolic blood pressure [WMD=-12.56mm Hg;_{95%} CI-26.83 to 1.72;p=0.08] and significantly decrease diastolic blood pressure [WMD=-7.89 mmHg _{95%};CI=-11.74 to-4.04;p<0.001] There were significant difference in systolic blood pressure [WMD=-3.50mm Hg;_{95%}CI-8.95 to 1.95;p=0.21] and diastolic blood pressure [WMD=1.00 mm Hg;_{95%} CI-1.39 to 3.39;p=0.41] between antihypertensive group and antihypertensive drugs alone. Thus they concluded that there was no definite conclusion about the effectiveness and safety of Chinese herbal medicine for resistant hypertension.

CHAPTER III

Methodology

Research methodology is the way to systematically solve the research problem. Methodology occupies a key position as far as research documentation is concerned. It may be understood as a science of studying how research is done. It involves the systematic procedure by which the researcher starts from the initial identification of the problem to its final conclusion.

Research Approach

This study meant to assess the effectiveness of garlic intake on blood pressure among hypertensive patients. The research approach used for the study was quantitative approach.

Research Design

The design used in this study was Quasi experimental research design, with multiple time series design.

E = O₁ O₂ O₃ O₄ X O₅ O₆ O₇ O₈

C = O₁ O₂ O₃ O₄ - O₅ O₆ O₇ O₈

E = Experimental group

C = Control group

O₁ = Pre test

X = Intervention

O₂ = Post test

Settings of the Study

The study was conducted in the Marappadi (Arumanai Panchyat) village at Kanyakumari district. This is a Rural area situated 3.5 kilometers away from Sree Mookambika College of Nursing. The population of Arumanai village 16250. The area is subdivided into 12 subdivisions, among that Chenbakathottam, Kulzhichal, were selected for the study.

Variables

Dependent variable - Hypertension

Independent variable - Garlic

Population

Target Population

The target population of the study was hypertensive patients in selected Marappadi village at Kuleskharam.

Sample Size

The sample size consists of 60 patients with hypertension, who satisfied the criteria for sample selection out of 60 patients 30 were allotted for experimental group and 30 were allotted for control group.

Sampling Technique

Purposive sampling technique was adopted for this study. The sample was selected based on the inclusion and exclusion criteria.

Sample Selection Criteria

Inclusion Criteria

1. Hypertensive clients who are in marappadi village.
2. The clients who are hypertensive and on medication for hypertension.
3. Hypertensive clients in the age group of 41-60 years male and female clients.
4. Clients willing to participate in this study.

Exclusion Criteria

1. Clients who are refused to take garlic.
2. Clients with malignant hypertension.

Data Collection Tool

Data collection tool used for this study was demographic variables and Vaughn's blood pressure chart.

Description of the Tool

The data collection tool consists of 2 parts. It consists of section A and section B.

Section A

Demographic Variables

This section deals with demographic variables such as age, sex, education, occupation, habits, and duration of illness.

Section B

Blood Pressure Chart

The blood pressure chart adopted for this study is made by Vaughn data analyse. The blood pressure chart consists of two separate scales for measuring blood pressure.

1. Systolic blood pressure ranging from 50 to 220mm Hg and
2. Diastolic blood pressure ranging from 10 to 140mm Hg. The blood pressure chart is used to make the reading of blood pressure of the patient on day 1 and 7th day.

Pre test was conducted for both the experimental and control group for 4 days at with one day interval. After pre test 30 gms of heated garlic was given to the experimental group for 30 days on empty stomach. Then post test was conducted the experimental and control group after 30 days.

Content Validity and Reliability

Content validity of tool was established from five experts, 4 experts from the field of medical surgical nursing and one expert from

medical field. The necessary suggestions and modifications were incorporated in the final preparation of the tool. Inter – rater reliability was done $r=0.88$.

Pilot Study

Pilot study was conducted on similar population to find out the feasibility and practicability of the study. Permission was obtained from the concerned authorities of selected kolvali village for conducting the pilot study. Also oral consent from patients was obtained before the study.

6 patients receiving garlic were selected by purposive sampling. 3 samples were assigned for experimental group and 3 were assigned for control group alternatively. Blood pressure chart was used for data collection and the analysis of the study proved that the study was feasible.

Data Collection Procedure

Data collection period was 1 month. The study was conducted in Marrapadi village at Kulasekharam among 60 samples, 30 patients were in the experimental group and 30 patients were in the control group. Before starting the study, the investigator obtained permission from health centre for conducting the study. The subjects were explained about the study and oral consent was taken.

Pre test was conducted for both the experimental and control group. After pre test the experimental group was given a small introduction about garlic and patients in reduction of blood pressure. The investigator gave 30gms heated garlic daily in the morning at empty stomach. Post test

was conducted daily morning after intake heated garlic. Day 7th blood pressure measurement was taken for both experimental and control group.

Plat for Data Analysis

The data analysis was done by using inferential and Descriptive statistics. Descriptive statistical methods like percentage ,mean and standard deviation were used, Inferential statistical methods un paired 't' test was used to find out the effectiveness of garlic on reduction of blood pressure and chi-square test was used to find out the association between variables.

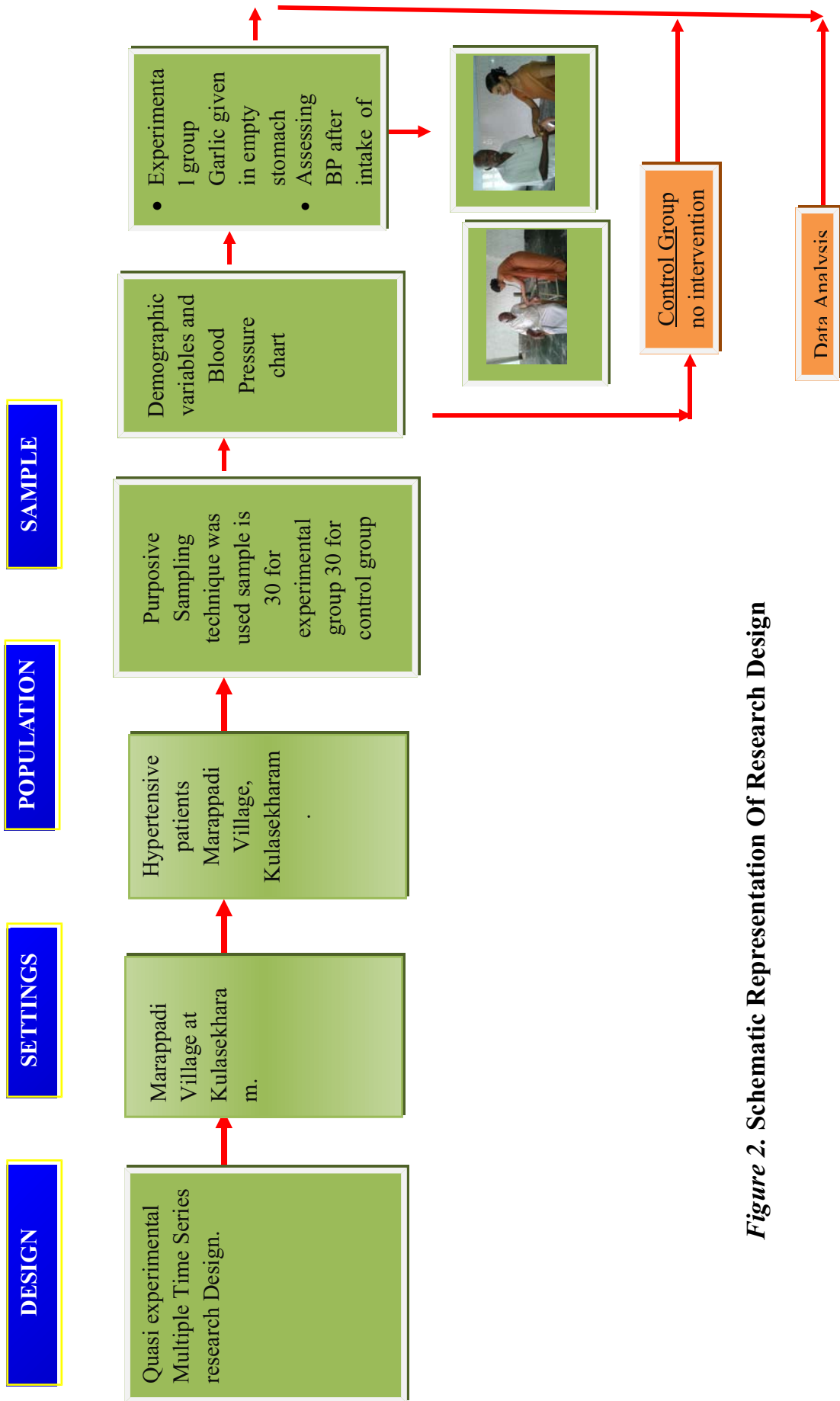


Figure 2. Schematic Representation Of Research Design

CHAPTER IV

Data Analysis

This chapter deals with the analysis and interpretation of data collected in accordance with the objectives stated for the study. The data collected were analyzed by using descriptive and inferential statistics. The test score was analyzed by statistical mean and standard deviation the significance difference of mean scores were interpreted by unpaired 't' test.

The difference in experimental and control group was assessed by 't' test. The association between demographic variables and hypertension was studied by chi-square test.

Objectives of the study

1. To assess the blood pressure of both experimental and control group before garlic intake.
2. To determine the effect of garlic on blood pressure in experimental group and control group after intake of heated garlic.
3. To compare the mean difference in the blood pressure in experimental and control group.
4. To find association between the hypertension and demographic variables such as age, sex, education, occupation, marital status, family history of hypertension, habits, duration of disease.

Section: A

This section displays the demographic variables of the subjects selected by the investigator.

Section : B

This section deals with both

1. Effect on Garlic in reducing hypertension in the Experimental and control group.
2. The mean reduction in Blood pressure in the experimental group with control group.

Section: C

This section deals with association between hypertension and the selected demographic variables.

SECTION: A

Table: 1

This section displays the demographic variables of the subjects selected by the Investigator

N = 60

Sl. No	Demographic Variables	Experimental Group		Control Group	
		Frequency	%	Frequency	%
1.	Age				
	(a) 40- 45	6	20%	7	23%
	(b) 46 – 50	9	30%	9	30%
	(c) 51 – 55	7	23%	8	27%
	(d) 56 – 60	8	27%	6	20%
2.	Sex				
	(a) Male	17	56%	19	63%
	(b) Female	13	44%	11	37%
3.	Education				
	(a) Primary	7	23%	9	30%
	(b) Middle	9	30%	8	27%
	(c) Higher Secondary	8	27%	6	20%
	(d) Nil	6	20%	7	23%

4.	Occupation				
	(a) Sedentary work	12	40%	12	40%
	(b) Non Sedentary work	10	33%	11	37%
	(c) Nil Occupied	8	27%	7	23%
5	Marital Status				
	(a) Married	19	63%	15	50%
	(b) Unmarried	3	10%	4	13%
	(c) Divorce	3	10%	4	13%
	(d) Widow	5	17%	7	24%
6.	Family History of Hypertension				
	(a) Present	15	50%	14	47%
	(b) Absent	15	50%	16	53%
7.	Habits				
	(a) Smoking	6	20%	6	20%
	(b) Alcoholism	2	6%	3	10%
	(c) Smoking & Alcoholism	5	17%	4	13%
	(d) Nil	17	57%	17	57%
8.	Duration of disease				
	(a) 1-3 yrs	7	23%	8	27%
	(b) 4-6 yrs	9	30%	10	33%
	(c) 7-10 yrs	8	27%	7	23%
	(d) 11 – 14 yrs	6	20%	6	20%

Note - The above table describes the frequency and percentage distribution of study subjects according to their demographic variables. About 30% of the samples

within the age group of 46-50 years. About 60% of the samples are males. While considering the family history of hypertension, about 48% of samples had the family history of hypertension.

The above findings are presented as figure:

1. Frequency and percentage distribution of Demographic variables according to age as component bar diagram in figure 1.
2. Frequency and percentage distribution of demographic variables according to sex as component bar diagram is figure 2.
3. Frequency and percentage distribution of demographic variables according to education as component bar diagram in figure 3.
4. Frequency and percentage distribution of demographic variables according to Occupation as component bar diagram in figure 4.
5. Frequency and percentage distribution of demographic variables according to Marital status as component bar diagram in figure 5.
6. Frequency and percentage distribution of demographic variables according to Family history of hypertension as component bar diagram in figure 6.
7. Frequency and percentage distribution of demographic variables according to Habits as component bar diagram in figure 7.
8. Frequency and percentage distribution of demographic variables according to duration of disease as component bar diagram in figure 8.

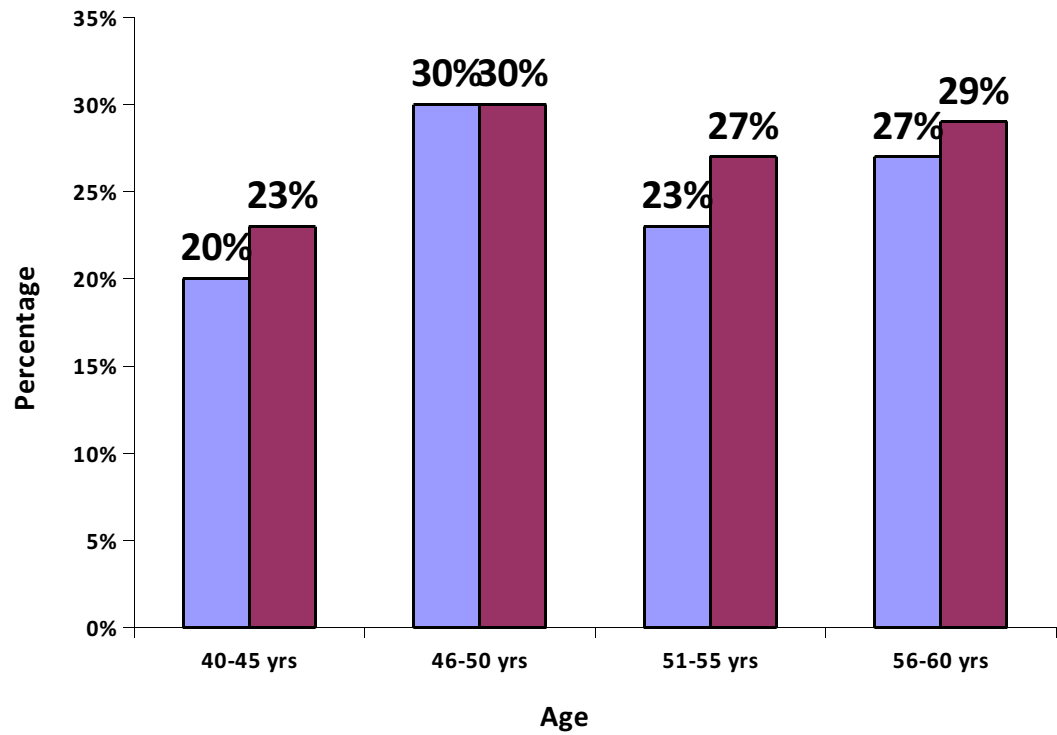


Figure 1. Frequency and percentage distribution of demographic variables according to age

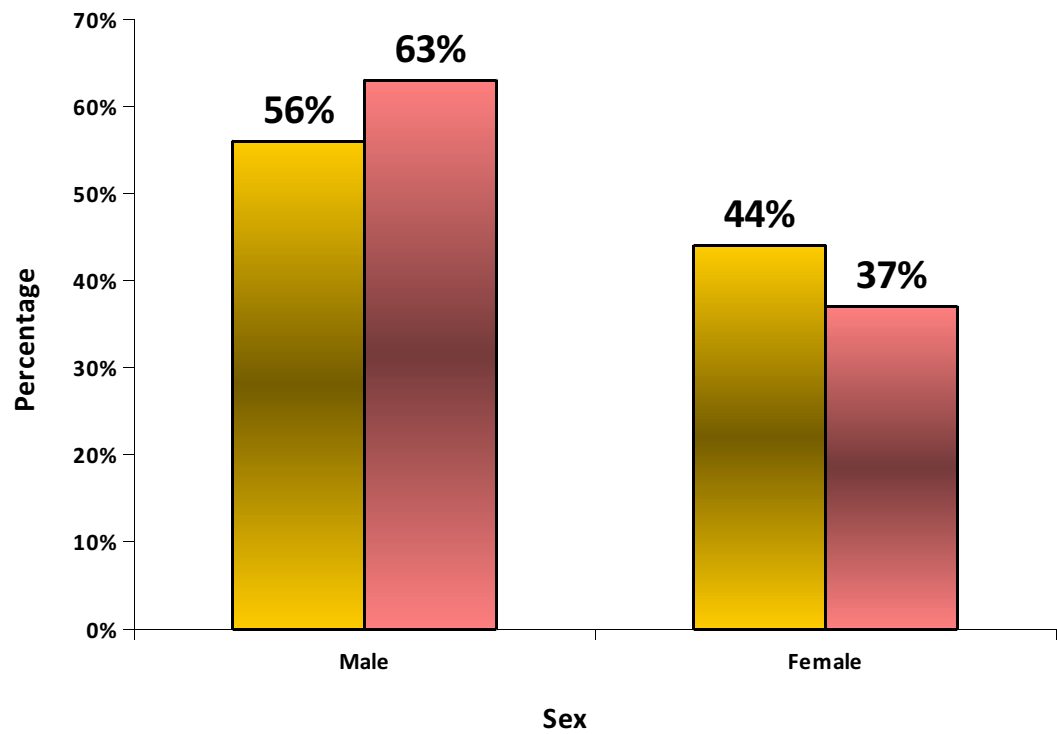


Figure 2. Frequency and percentage distribution of demographic variables according to Sex.

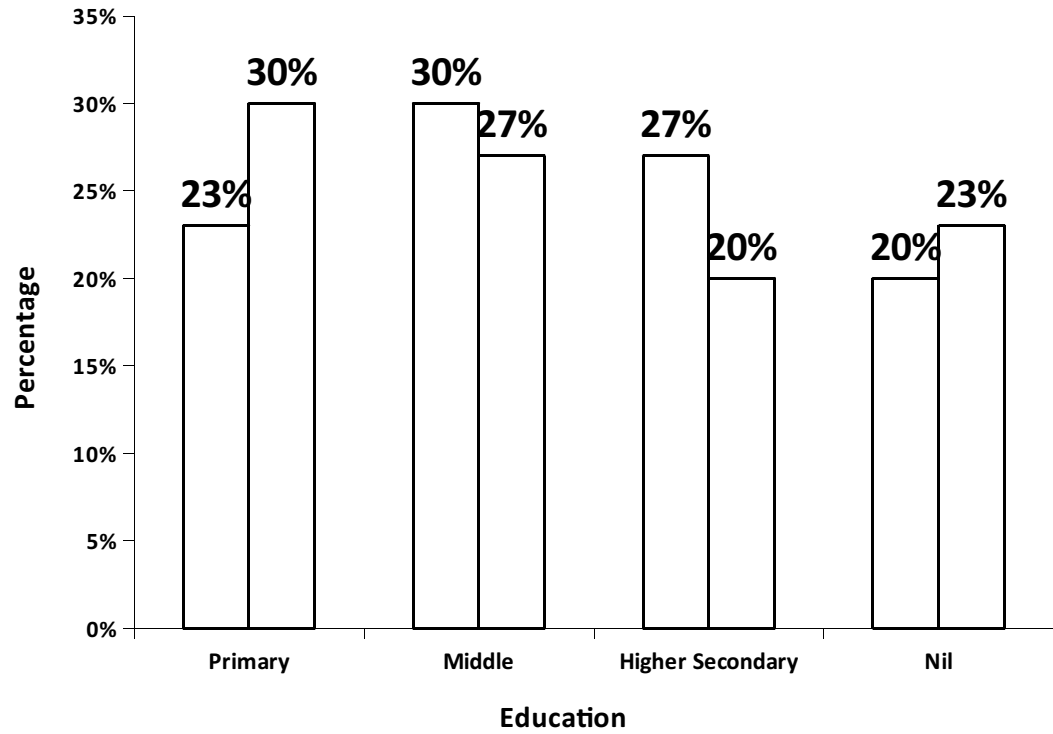


Figure 3. Frequency and percentage distribution of demographic variables according to Education.

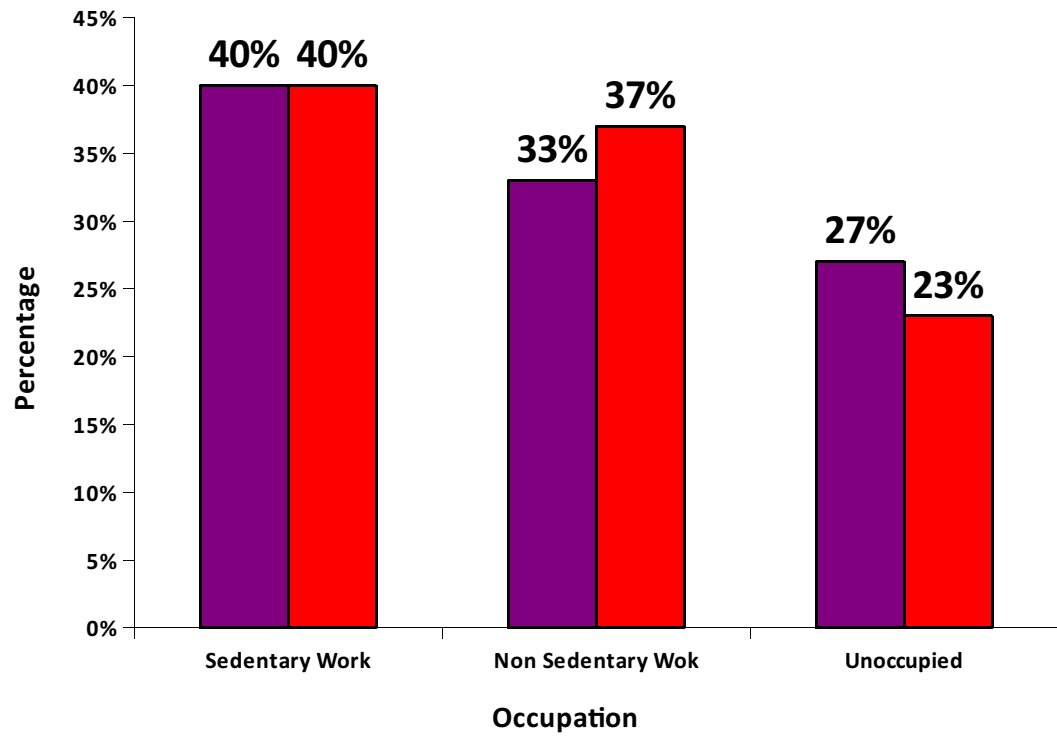


Figure 4. Frequency and percentage distribution of demographic variables according to Occupation.

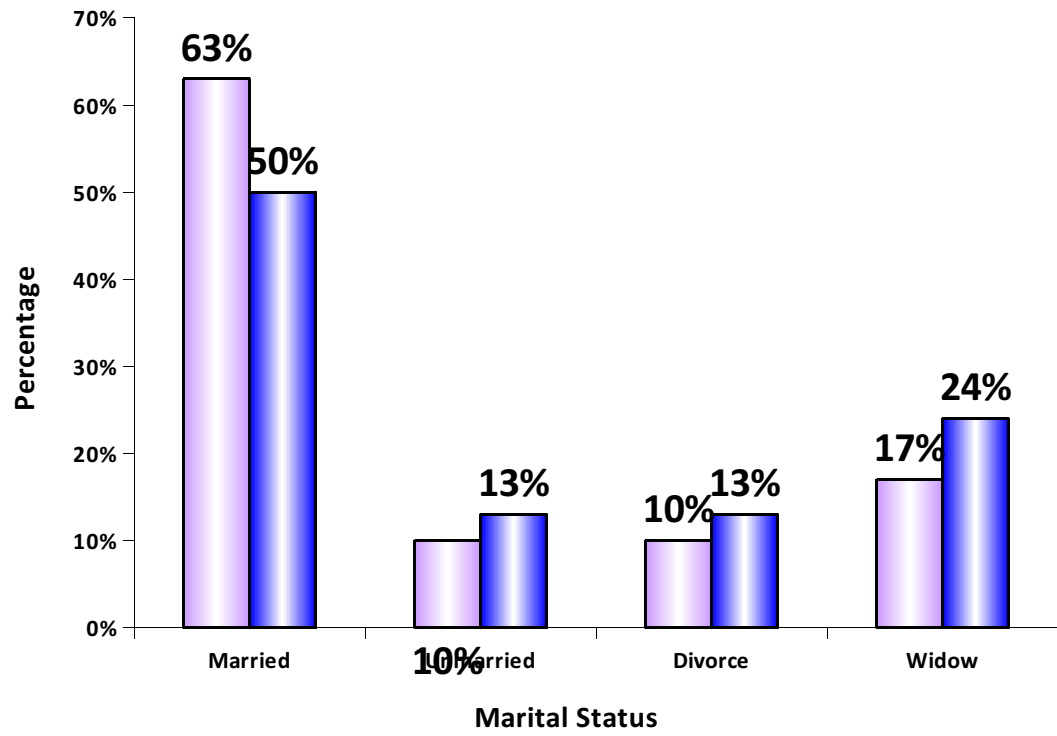


Figure 5. Frequency and percentage distribution of demographic variables according to Marital Status.

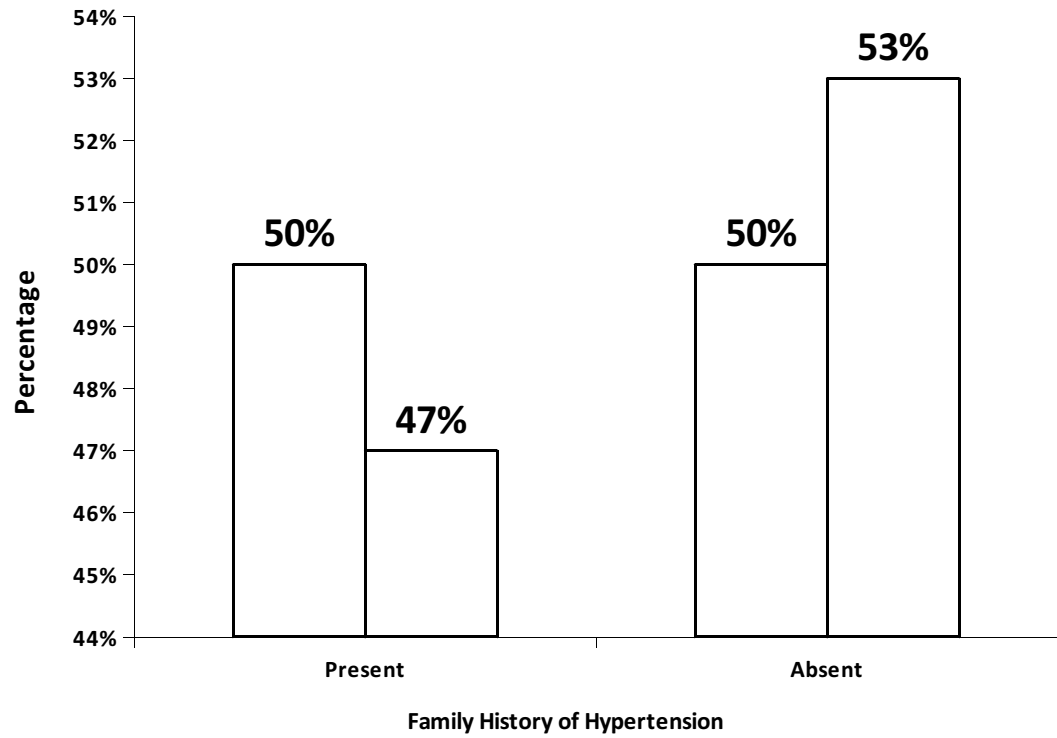


Figure 6. Frequency and percentage distribution of demographic variables according to Family history of Hypertension

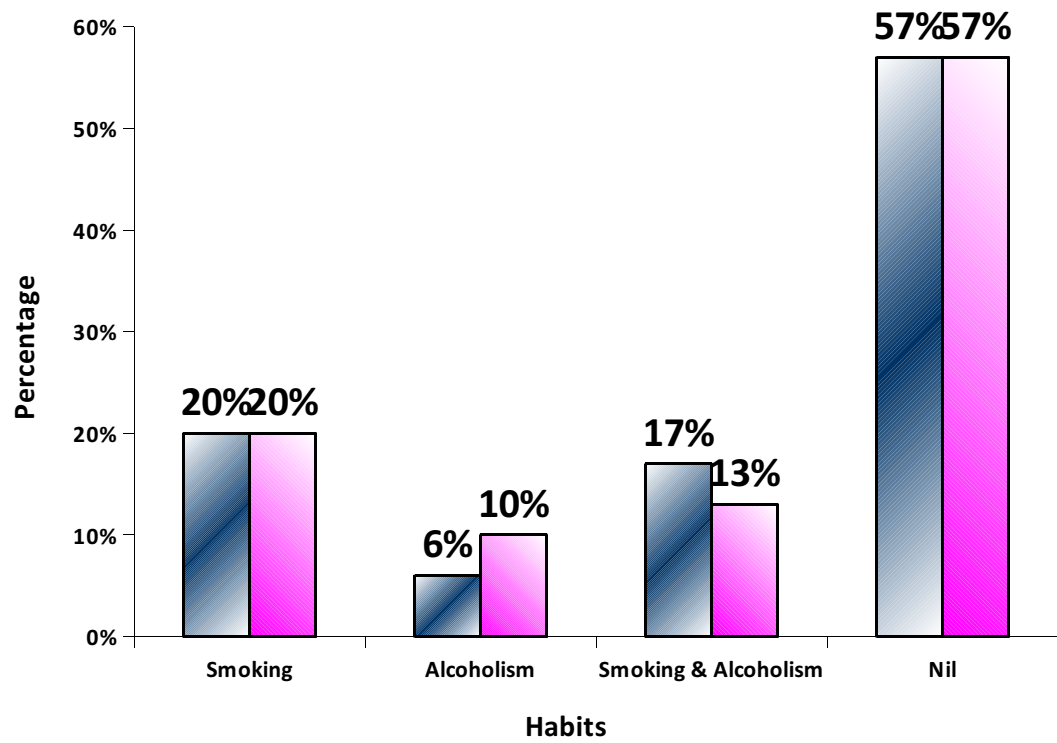


Figure 7. Frequency and percentage distribution of demographic variables according to Habits.

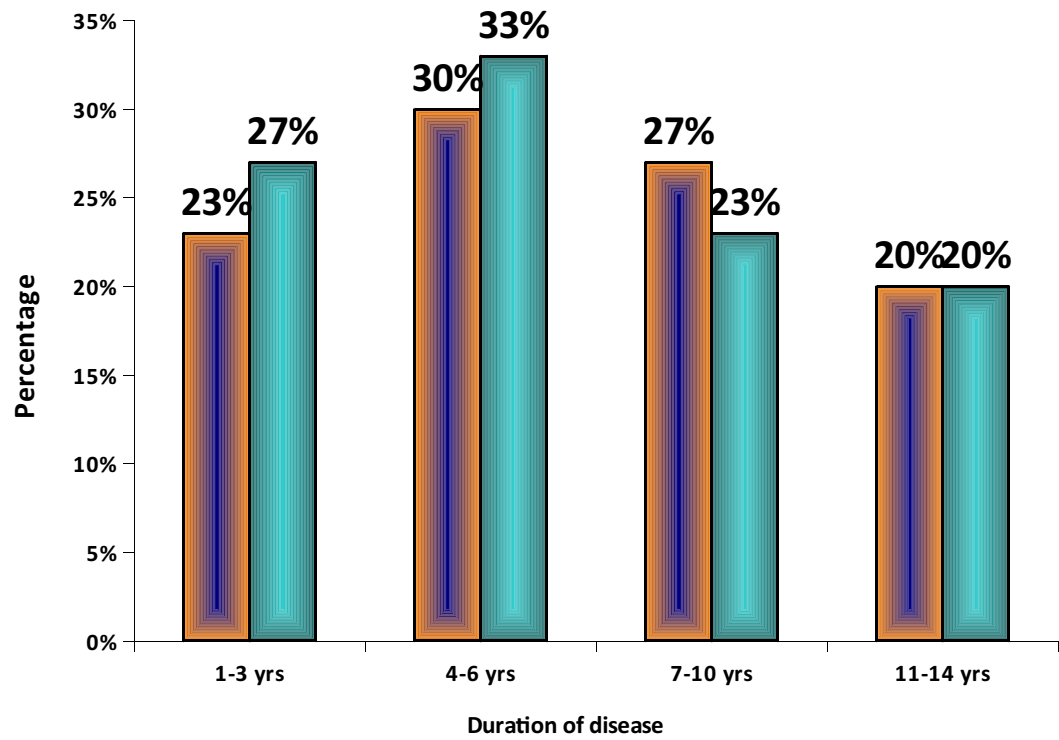


Figure 8. Frequency and percentage distribution of demographic variables according to duration of disease.

Section : B

This section deals with both

1. Effect of garlic in reducing hypertension in the Experimental group and control group.
2. Mean reduction in the Blood pressure in the Experimental group with control group.

Table: 2

Effectiveness of garlic in reducing hypertension.

N = 60

Study group	Pre test		Post test		Reduction in Blood pressure		't' test	Df
	Mean	SD	Mean	SD	Mean	SD		
Experimental group	122.1	4.77	109	6.48	16.3	4.6	34.88	59
Control group	122.3	4.89	122.2	4.14	4.16	2.68		

The table shows that the pre test mean blood pressure in the experimental group $[122.1 \pm 4.77]$ and than in control group $[122.3 \pm 4.89]$ and in the post test mean blood pressure of the experimental group was $[109 \pm 6.48]$, and the control group was $[122.2 \pm 4.14]$.

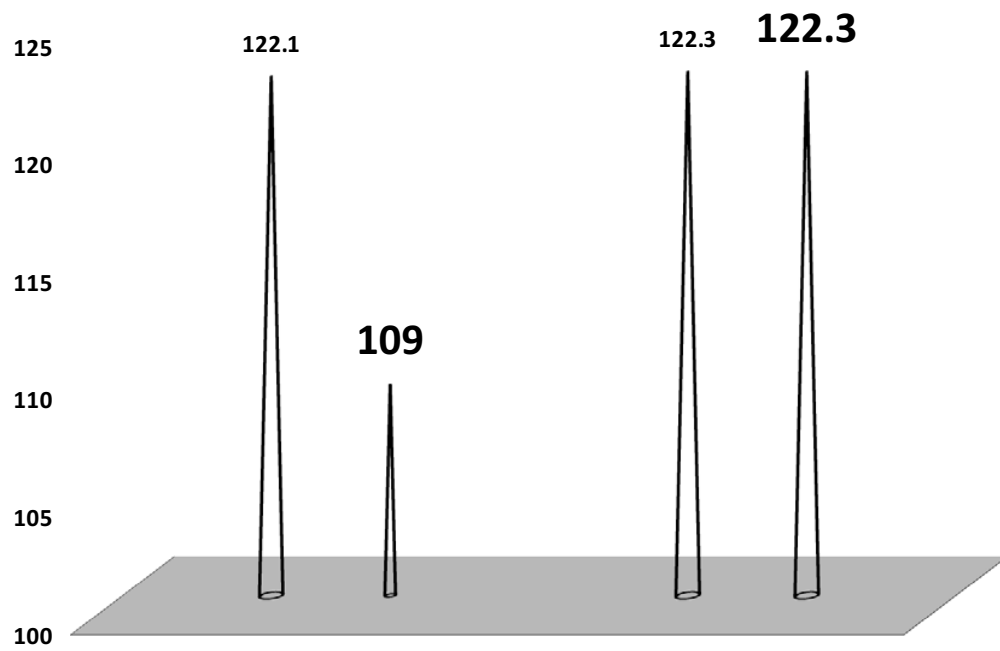


Figure 9. Effectiveness of Garlic in reducing hypertension

Table: 3

Comparison of Mean reduction in blood pressure level in the Experimental group and control group.

N = 60

Group	Mean reduction	Mean difference	't'	df
Experimental Group	16.3			
		12.14	34.88	59
Control group	4.16			

The table shows that mean reduction was greater in experimental group, with a difference of mean reduction of 12.14 between the two groups. The difference was statistically significant ($t= 34.88, df=59, p<0.05$). This shows that the experimental group had significant reduction in Blood pressure level compared to the control group. Hence the research hypothesis H1 is accepted.

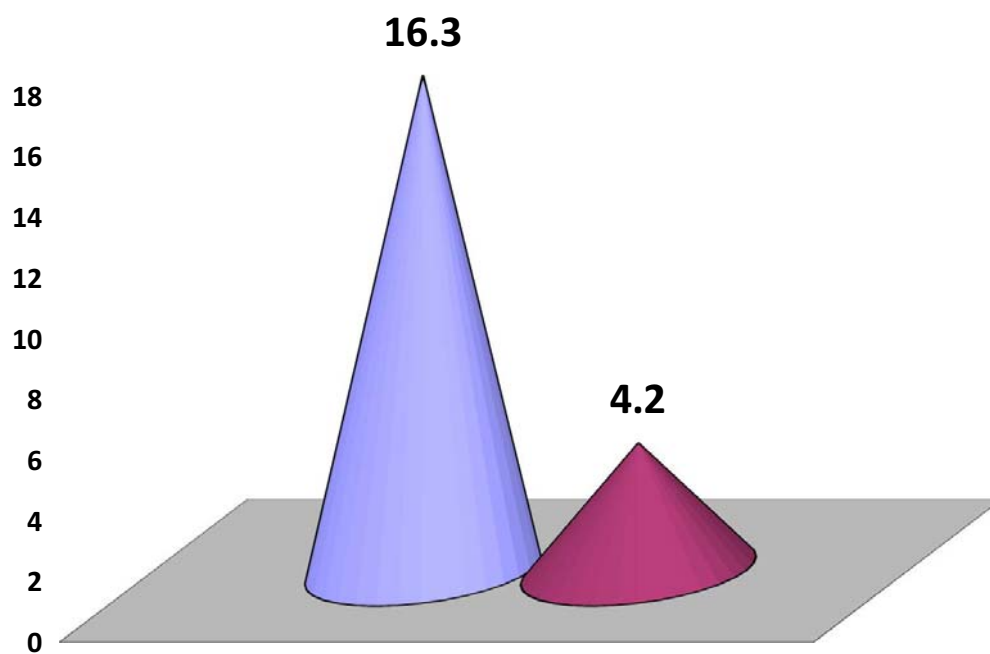


Figure 10. Comparison of mean score of Blood pressure in experimental group after garlic intake with control group.

SECTION C

This section deals with association between blood pressure and selected demographic variables such as.

Table: 3

Association between the Hypertension and selected demographic variables.

Sl. No	Demographic Variables	Experimental Group f	Control Group f	χ^2	df	Table value
1.	Age					
	(e) 40- 45	6	7			
	(f) 46 – 50	9	9	1.56	3	7.82
	(g) 51 – 55	7	8			
	(h) 56 – 60	8	6			
2.	Sex					
	(c) Male	17	19	0.71	1	3.84
	(d) Female	13	11			
3.	Education					
	(e) Primary	7	9			
	(f) Middle	9	8	5.38	3	7.82
	(g) Higher Secondary	8	6			
	(h) Nil	6	7			

4.	Occupation					
	(d) Sedentary work	12	12			
	(e) Non Sedentary work	10	11	18	2	5.99
	(f) Nil Occupied	8	7			
5	Marital Status					
	(e) Married	19	15			
	(f) Unmarried	3	4	0.04	3	7.82
	(g) Divorce	3	4			
	(h) Widow	5	7			
6.	Family History of Hypertension					
	(c) Present	15	14	16.01*	1	3.84
	(d) Absent	15	16			
7.	Habits					
	(e) Smoking	6	6			
	(f) Alcoholism	2	3	2.26	3	7.82
	(g) Smoking & Alcoholism	5	4			
	(h) Nil	17	17			
8.	Duration of disease					
	(e) 1-3 yrs	7	8			
	(f) 4-6 yrs	9	10	2.73	3	7.82
	(g) 7-10 yrs	8	7			
	(h) 11 – 14 yrs	6	6			

The above table shows 4 describes the association between the hypertension with selected demographic variables. The result shows that there is an association between the hypertension and family history of hypertension.

CHAPTER V

Discussion

The numerical analysis is provided with meaning in this chapter. The study findings are discussed with reference to the objectives of the study. The result and discussion of the study is based on the findings obtained by statistical analysis. The major findings of the study are as follows

Objectives Of The Study

1. To assess the blood pressure of both experimental and control group before garlic intake.
2. To determine the effect of garlic on blood pressure in experimental group and control group after intake of heated garlic.
3. To compare the mean difference in the blood pressure in experimental and control group.
4. To find association between the hypertension and demographic variables such as age ,sex, education, occupation ,marital status, family history of hypertension, habits, duration of disease.

Distribution of the study subjects according to selected Demographic variables

The table I describes the distribution in number and percentage of the study subjects according to their demographic variables. About 30% of the samples within the age group of 46-50yrs .About 60% of the samples are males while considering the family history of hypertension, about 48% of samples had the family history of hypertension.

Distribution of the study subjects according to the objectives are

The first objective of the study was to assess the level of blood pressure of both experimental and control group before garlic intake.

The frequency, percentage distribution of samples according to the demographic variables such as age, sex, education, marital status, family history of hypertension, duration of disease. About 30% of samples within the age group 46-50 yrs, 60% of samples are males. In occupation, 40% of the peoples are doing sedentary workers. While considering the family history of hypertension, about 50% of the samples had the family history of hypertension, 20% samples having the habits of smoking.

The blood pressure was assessed in subjects with hypertension, on day 1 and 7 day. The results shows that the mean blood pressure of experimental group [122.1 ± 4.77] and in the day 7, mean blood pressure of the experimental group was 109 ± 6.48 and in the control group was 122.2 ± 4.14 .

The second objective of the study was to determine the effect of garlic intake in experimental group.

The reduction of blood pressure before and after administration of garlic. In this study the reduction of mean blood pressure from pre test in the experimental group was [16.3 ± 4.6] and in the control group was [4.16 ± 2.68]. The effectiveness of garlic intake was statistically significant in reducing blood pressure. [$t=34.88$] $df=59$, $p<0.05$.

The study findings is congruent with the study conducted by Nigel, P Stocks, Folker peter et al [2010] regarding the effect of garlic on

blood pressure. The results shows that a mean decrease of 4.6 ± 2.8 mmHg for systolic blood pressure in the garlic group compared to placebo.

The third objective of the study is the mean difference in the blood pressure in experimental and control group.

In this study, mean blood pressure of both groups were compared and found that reduction of blood pressure of experimental group was significantly greater than in the control group. The reduction in mean blood pressure in the experimental group was $[16.3 \pm 4.6]$ and the control group was $[4.16 \pm 2.68]$.

Thus the research hypothesis H1 was accepted. Garlic intake was found to be very effective in reduction of blood pressure among patients with hypertension.

The study findings is congruent with the study conducted by Karien Ried, Oliver R. Frank et al [2010] regarding the effect of aged garlic extract on lowering blood pressure. The results shows that in patients with uncontrolled hypertension, systolic blood pressure on average 10.2 ± 4.3 mmHg lower in the garlic group compared with controls over the 12 weeks treatment period.

The fourth objective of the study was to find out association between the hypertension and the selected demographic variables such as age, sex, education, occupation ,marital status, family history of hypertension, habits, duration of disease.

There was association between the hypertension and other selected demographic variables family history of hypertension.

The study is consistent with the study conducted by Rao, Chythra et al [2012] regarding the high blood pressure prevalence and significant co-relates the result shows that the prevalence of hypertension was 43.3%. Advancing age, male, gender, current diabetic status, obesity and family history of hypertension were identified as significant correlates.

CHAPTER VI

Summary, Conclusion, Nursing Implication, Limitation and Recommendation

Summary of the study

The study was undertaken to assess the effectiveness of garlic intake on blood pressure among the hypertensive patients in selected community Marappadi, at Kulasekharam.

Objectives of the Study

1. To assess the blood pressure of both experimental and control group before garlic intake.
2. To determine the effect of garlic on blood pressure in experimental group and control group after intake of heated garlic.
3. To compare the mean difference in the blood pressure in experimental and control group.
4. To find association between the hypertension and demographic variables such as age, sex, education, occupation, marital status, family history of hypertension, habits, duration of disease.

Hypotheses

H1- There is a significant reduction in the blood pressure readings with the intake of garlic among the patients in the experimental than in control group.

H2 - There is a significant association between the mean blood pressure reading and selected demographic variables such as age, sex, education, duration of diseases.

The researcher adopted a Quasi experimental research design with multiple time series design. The study was done among 60 patients they were in Chenbathotam, Kulichal, in Marappadi village. In this study, independent variable is garlic and dependent variable is hypertension. The subjects were selected by purposive sampling technique 30 were allotted in experimental group and 30 in control group.

The tool used for the study was adopted from Vaughn's blood pressure chart. Garlic was given to the experimental group and no intervention was given to control group. Post-test was conducted to the experimental and control group. The collected data were analyzed based on descriptive and inferential statistics according to the above mentioned objectives.

The study identifies that the level of hypertension was reduced in the experimental group while comparing with control group. It was found that there was a significantly high reduction in the level of hypertension of experimental group after garlic than in the control group. The t value of effectiveness of garlic reduction on blood pressure tabulated was found to be $t=34.88$, $df=59$, $p\leq 0.05$.

Study findings

The pre-test of experimental and control group revealed that there was no significant difference. Both experimental and control group were similar in

respect of demographic variables and thus it was observed that they were identical.

The study identified that the blood pressure was reduced in experimental group. It was found that there was a significant reduction in the blood pressure of experimental group, after garlic administration. The 't' value of difference of mean reduction of blood pressure tabulated was found to be $t=34.8, df=59, p<0.05$.

The study also shows that there was an association between the family history of hypertension and blood pressure.

Conclusion

The conclusion drawn from the findings of the study are as follows;

1. Garlic found to be an effective nursing intervention in reducing hypertension among adult patients .
2. There is no side effects of garlic when comparing with other pharmacological treatment.
3. Patients satisfaction is very much higher in this intervention.
4. The finding of the study enlighten the fact that garlic can be used as a cost effective nursing intervention in reducing the hypertension among the hypertensive clients.

Nursing implications

Hypertension is the leading cause of death due to cardiac diseases. Hypertension to be controlled by medication. But there is always a risk of developing hypertension, when medications are stopped or even with the continuation of medications. The drugs which are used for hypertension also

have many side effects. This emphasizes the need of a nursing intervention which has no side effects.

Garlic reduces the hypertension, prevent or delay the incidence of hypertension, enhance antihypertensive drug efficacy and decrease cardiovascular risk as evidenced by several studies. Present study proves the effect of garlic in reducing hypertension. Therefore the findings of the study has considerable implications on nursing administration, nursing education, nursing practice, nursing research.

Implications to nursing Administration

1. Nurse administrator can prepare the protocol for garlic in reducing hypertension.
2. The nurse administrator should encourage the peoples to actively participate in conducting health programmes regarding life style modifications in hypertension.
3. The nurse administrator can help in getting funds from higher authorities for conducting seminars, workshop, and conferences regarding the importance of garlic in hypertension.
4. The nurse administrator can act as a change agent in utilizing the research findings.
5. Nurse administrator should promote the acceptance of changes.

Implications to nursing Education

1. Nurse educator can train and encourage the students nurses to implement garlic as a management for hypertension.
2. This study can motivate student nurses to explore new strategies for effective reduction of blood pressure.
3. This research report can be kept in library for reference of nursing personnel and other health professionals.
4. The result of the study encourages the nurse educator to conduct in-service education program on garlic in reducing hypertension among patients with hypertension.

Implication to nursing practice

The study findings can assist nurses in making more informed decisions and in taking actions that have a solid research based rationale.

1. Garlic is a safe and better modality which has no side effects.
2. It is one of the cost effective nursing intervention that can add benefits to patients who are on pharmacological therapy.
3. Research can fruitfully be used by nurses in planning care by integrating nursing intervention [garlic] that are especially beneficial for patients with hypertension in any setting.

Implications to Nursing Research

The nurse research implications of the study lies in the scope for expanding the quality of nursing service. In this era the evidence based practice publication of these studies will take nursing to a new horizon.

1. Nurse researcher can do various studies related to other beneficial effects of garlic on hypertensive clients in reducing blood pressure.
2. A comparative study can be done to determine the effectiveness of garlic with other alternative therapies.

3. Similar study can be conducted on a large sample. So it could be generalized.

Limitation

The sample size of patients for the experimental and related control group was only 30 and hence generalization not possible.

1. The data collection period was only one month.
2. The study is limited only to the samples in Marrapadi village.

Recommendations

1. The study may be replicated with randomization in selection of a larger sample.
2. Nurse researcher can do studies related to garlic on reducing hypertension.
3. Nurse researcher can do studies comparing the immediate and long term effects of garlic in reducing hypertension.
4. Studies can be done to determine the other therapeutic benefits of garlic among patients with hypertension.
5. A study can be conducted by including more number of variables.
6. Nurse researcher can do studies related to effect of garlic to improve quality care.

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APPENDIX A

Ethical clearance certificate



SREE MOOKAMBIKA COLLEGE OF NURSING

(Approved by the Government of Tamil Nadu & Recognised by Indian Nursing Council,
New Delhi, Tamil Nadu state Nurses & Midwives Council, Chennai.)
Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai.

PADANILAM WELFARE TRUST, V.P.M.HOSPITAL COMPLEX, PADANILAM,
KULASEKHARAM, K.K.DIST., TAMIL NADU, PIN : 629 161.
Phone : 04651 - 280743, 280866, 280742, 280745

ETHICAL COMMITTEE CLEARANCE

To

Date :

Lr. No. **11.01.2014**

Mrs. Minimol .C

I Yr. M.Sc (N),

Sree Mookambika College of Nursing,

Kulasekharam.

Ref : Research Topic: A Study to assess the effectiveness of garlic intake on blood pressure, among the hypertensive patient in Marappadi village at kulasekharam, Kanyakumari District.

Sub : Approval of the above reference study and its related documents

Dear Minimol .C

Ethics committee of Sree Mookambika College of Nursing , Kulasekharam reviewed and discussed the study proposal documents submitted by you related to the conduct of the above referenced study and its meeting held on 11.01.2014

The Following ethical committee Members were present at the meeting held on 11.01.2014

NAME	PROFESSION	POSITION IN THE COMMITTEE
Prof. Mrs. Shanthi Letha	Nursing	Chair Person
Dr. Kani Raj Peter	Medical	Basic Medical Scientist
Dr. T.C. Suguna	Nursing	Clinicians
Adv. Mohanan	Legal	Legal Expert
Prof. Mrs. Ajitha Rethnam	Nursing	Member Secretary
Dr. Preetha P.Nair	Management	Philosopher
Mr. Natarajan	Social	Medical Social Worker
Mrs. Latha	Lay Person	Community Person

After due ethical and scientific consideration, the Ethics committee has approved the above presentation submitted by you.

Regards,


Mrs. SANTHI LETHA PhD (N)

Date : 11.01.2014

Ethics Committee – Chairperson,

Place : Kulasekharam.

Sree Mookambika College of Nursing,

V.P.M. Complex, Padanilam, Kulasekharam.

APPENDIX B

Letter seeking permission for tool and content validity



SREE MOOKAMBIKA COLLEGE OF NURSING

PADANILAM WELFARE TRUST, V.P.M.HOSPITAL COMPLEX, PADANILAM,
KULASEKHARAM, K.K.DIST., TAMILNADU, PIN: 629 161.

Phone : 04651 - 280745, 280742, 278250

(Approved by Govt. of The Tamil Nadu & Recognised by Indian Nursing Council, New Delhi)

Date :

Lr. No :

LETTER SEEKING EXPERT OPINION FOR TOOL VALIDITY

Date :

To

Madam / Sir

Sub : M.Sc Nursing Programme – dissertation – Validation of study tool request –reg:

Ms/Mrs. **Minimol. C** a bonafide if II Year M.Sc Nursing student of Sree Mookambika College of Nursing is approaching you to obtain validation of study tool pertaining to her dissertation in practical fulfillment of the requirement for the degree of Master of Science in Nursing. The selected topics is **A study to assess the effectiveness of garlic intake on reduction of Blood Pressure among the hypertensive patients in selected community Marappadi.** In this regard I request you to kindly extent possible technical guidance and support for successful completion of dissertation.

I enclosed here with a check list for your evaluation.

Thanking You

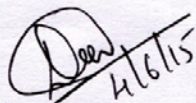
Yours Sincerely

Sumi
PRINCIPAL

Sree Mookambika College of Nursing
Kulasekharam-629 161

CERTIFICATE

This is to Certify that **Ms. Mini Mol** II year MSc Nursing Student of Sree Mookambika College of Nursing has done her data collection regarding the **effectiveness of Garlic intake on reduction of Blood Pressure among the hypertensive patients in selected community** in Marappadi.


Signature

APPENDIX D**Certificate for Tool Reliability**

From

C. MINIMOL
IInd Year M.Sc., Nursing,
Sree Mookambika College of Nursing,
Kulasekharam.

To

THE BIO - MEDICAL ENGINEER
Sree Mookambika Medical Institute,
Kulasekharam.

Respected Sir,

As a part of my research study I'am in a need of doing reliability for my Spgmomanometer. I kindly request you to accept it and do the needful.

Thanking you

Kulasekharam
13.08.2014

Your's Faithfully,
C. Minimol

*Spgmomanometer is
tested and calibrated*

Vinod
BME
13/08/14



APPENDIX E

List of experts for tool and content validation

- 1. Dr. Mrs. Sharmila M. Sc(N), Ph.D**
Professor,
CSI College of Nursing,
Neyyoor.
- 2. Mrs. SheebaM.Sc (N)**
Professor,
CSI College of Nursing,
Neyyoor.
- 3. Mrs. AmuthuM.Sc(N)**
Vice principal,
P.S College of Nursing,
Thalikulam.
- 4. Mrs. Joseph Merlin M.Sc(N),**
Professor,
Saraswathycollege of nursing,
Parassalai.
- 5. Dr. Dr. Thilakar, MD**
Asst. Professor, Department of Medicine
Sree Mookambika medical college hospital,
Kulasekharam.

APPENDIX F**EVALUATION TOOL CHECK LIST**

Name of the expert :

Designation :

College :

Respected Madam / Sir,

Kindly go through the content and place the right (✓) marks against the check list in the following columns ranking from relevant to non-relevant. Where ever there is a need for modification, kindly give your opinion in the remarks column.

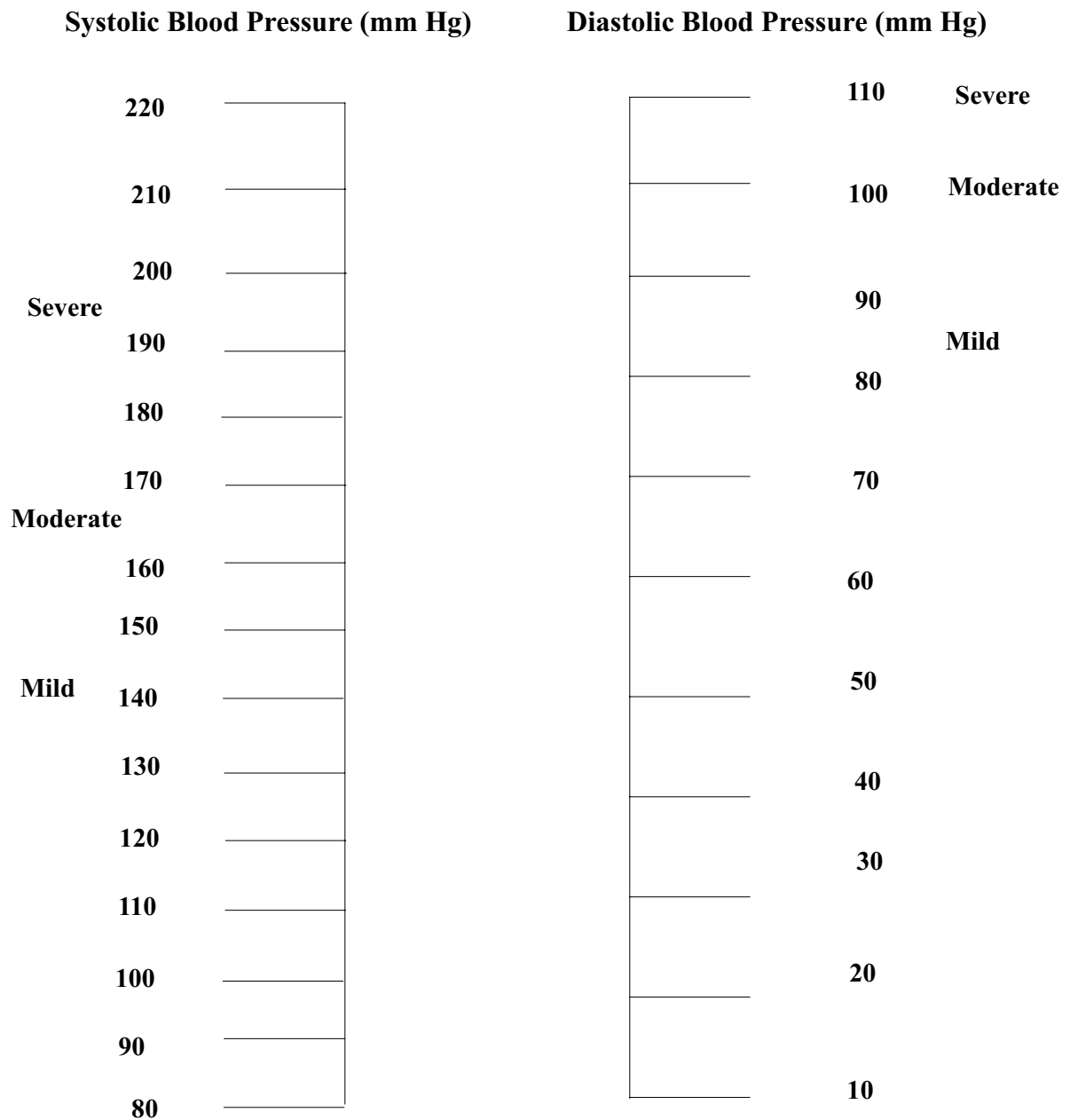
APPENDIX G**DATA COLLECTION TOOL****SECTION A****Demographic variables**

- 1 Age
 - (a) 40-45yrs
 - (b) 46-50yrs
 - (c) 51-55yrs
 - (d) 56-60yrs
2. Sex
 - (a) Male
 - (b) Female
3. Education
 - (a) Primary
 - (b) Middle
 - (c) Higher secondary
 - (d) Nil
4. Occupation
 - (a) Sedeantary worker
 - (b) Non sedeantary worker
 - (c) Un occupied

5. Marital status
 - (a) Married
 - (b) unmarried
 - (c) divorce
 - (d) widow
6. Family history of hypertension
 - (a) Present
 - (b) Absent
7. Habits
 - (a) Smoking
 - (b) Alcoholism
 - (c) Smoking and alcoholism
 - (d) Nil
8. Duration of disease
 - (a) 1-3 years
 - (b) 4-6 years
 - (c) 7-10 years
 - (d) 11-14 years

SECTION : B

BLOOD PRESSURE CHART



This consists of two separate scales for measuring systolic Blood Pressure ranging from 80 to 220 mmg Hg and diastolic blood pressure ranging from 10 to 140mm Hg (adopated from vaughn's Blood Pressure chart)

APPENDIX H

Data Collection procedure

Pre test was conducted for both the experimental and control group. After pre test the experimental group was given a small introduction about garlic and patients in reduction of blood pressure. The investigator gave 30gms heated garlic daily in the morning at empty stomach. Post test was conducted daily morning after intake heated garlic. Day 7th blood pressure measurement was taken for both experimental and control group.



Step 1

Pretest for Blood Pressure Checking

**Step 2**

Post test of Administration of Garlic



Step 3

Post test of Administration of Garlic

