

**“EFFECTIVENESS OF LIFE STYLE MODIFICATION
STRATEGIES IN LOWERING BLOOD PRESSURE AMONG
NEWLY DIAGNOSED HYPERTENSIVE PATIENTS”**

A Thesis

Submitted to The Tamil Nadu Dr. M.G.R Medical University,

Chennai, for the award of degree of

DOCTOR OF PHILOSOPHY IN NURSING

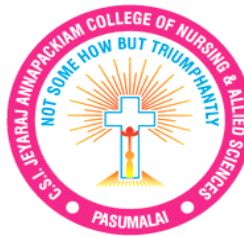


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MADURAI

APRIL 2017

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CERTIFICATE BY GUIDE

This is to certify that the thesis entitled “**Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients**”, submitted by **K.THAMARAISELVI**, who registered for Ph.D in 2010 is a bonafide record of the research done by her during the period of study under my supervision and guidance and that it is not formed on any basis for the award of any other Degree, or Diploma, Associate ship, Fellowship or any other similar title or any other Universities.

I also certify that this thesis is her original independent work. I recommend this thesis should be placed before the examiners for the award of Ph.D degree.

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CERTIFICATE BY CO-GUIDE

This is to certify that the work embodied in the thesis entitled “**Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients**”, submitted by **K.THAMARAISELVI**, for the award of the Degree of Doctor of Philosophy in Nursing is a bonafide record of research done by her during the period of study under my supervision and guidance that it has not formed the basis for the award of any Degree, Diploma, Associate ship, Fellowship or any other similar title in this university or any other university or institution of higher learning.

I also certify that this thesis is her original independent work. I recommend this thesis should be placed before the examiners for the award of Ph.D degree.

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DECLARATION BY THE CANDIDATE

I hereby declare that this thesis entitled **“Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients”** is an original work done by me under the guidance of **PROF.Dr. R. RAJKUMAR, MD., Ph.D.**, and has not been submitted elsewhere, either partially or fully for the award of any other Degree, or Diploma. Associate ship, Fellowship or any other similar title.

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PRINCIPAL

E.S.COLLEGE OF NURSING, VILLUPURAM

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“Gratitude Unlocks the Fullness of Life”

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ABSTRACT

The purpose of this study was to assess the effectiveness of life style modification strategies in lowering Blood Pressure among newly diagnosed hypertensive patients at sample areas of Villupuram district, Tamil Nadu, India.

Objectives:

- To assess the pre and post test Blood Pressure (BP) of newly diagnosed hypertensive patients in control and experimental groups.
- To evaluate the effectiveness of Life Style Modification Strategies (LSMS) in lowering BP by comparing the pre and post test BP within and between the control and experimental groups among newly diagnosed hypertensive patients.
- To find out the association between the blood pressure level and selected socio demographic and clinical variables among newly diagnosed hypertensive patients.

Methods

The research design used for the study was quasi experimental pretest/ posttest control group design. Conceptual framework of this current research was based upon the Wiedenbach's prescriptive theory (1964). The study was conducted among 275 newly diagnosed hypertensive patients in the age group of 31 to 60 years of both genders, residing in two community areas, namely, Vazuthareddy and Vikkaravandi of Villupuram district, Tamil Nadu. These areas were selected conveniently and randomly assigned for the control group and the experimental group using lottery method respectively. The patients were selected through purposive sampling technique.

The instruments used for the study consisted of proforma to assess socio demographic and clinical data, assessment of BP, teaching module on Life Style Modification Strategies (LSMS) and Observational checklist to assess the practice on Life Style Modification Strategies.

Descriptive (frequency, percentage, mean, standard deviation and range) and inferential statistics (Chi square, paired and independent t-test, RMANOVA, were used for summarizing the data and to test the study hypotheses.

Major Findings of the Study

- A majority of the patient's participants were, in the age group of 31-40 years (38%) in experimental group and 51-60 years (39%) in the control group with the mean age of 50 years. Predominant among were women (72%,64%), had higher secondary education (36,34%), were married (96,98%), homemakers44% and laborers 47%, had income up to Rs.10000/month(51%, 58%), non vegetarian(92%,99%), Hindus (93,97%), living in nuclear families(81%,77%), no history of smoking in the past (93%,92%) and present (96%,94%), had no history of alcoholism in the past (92%,94%) and present (91%,92%), had no family history of paternal and maternal hypertension (92%,94%), had been diagnosed through master health check(60%,40%), got prescribed lifestyle modification strategies (68%,57%) and compliant to drugs(32%, 43%) respectively in the experimental and the control groups.
- There is a significant difference between the pretest and the posttest II mean systolic BP in the experimental group with the mean difference of 23.19 mmHg and 't'-value being 19.68 which is statistically significant at 0.001 level.

- Similarly the mean difference between the pretest and the posttest II mean diastolic BP in the experimental group was 10mmHg and the t-value was 9.45 which is significant at 0.001 level of significance.
- The F value of RMANOVA was 47.05 and 25.11 respectively for systolic and diastolic BP which reveals the effectiveness of LSMS in lowering BP across the periods.

Key Words: Life Style Modification Strategies (LSMS), newly diagnosed hypertensive patients, Blood pressure.

Conclusion:

LSMS is an effective and easy method to practice and it can be incorporated in day today life not only to lower BP but also to improve general health.

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LIST OF ABBREVIATIONS

1. < : Less than
2. > : More than
3. χ^2 : Chi-square
4. % : percentage
5. d f : degree of freedom
6. SBP : Systolic Blood Pressure
7. DBP : Diastolic Blood Pressure
8. SBP-I : Pretest
9. SBP-II : Post Test I
10. SBP-III : Post Test II
11. DBP-I : Pretest
12. DBP-II : Post Test I
13. DBP-III : Post Test II
14. LSMS : Life Style Modification Strategies
15. WHO : World Health Organization
16. ICMR : Indian Council of Medical Research
17. NCD : Non communicable Disease
18. DPH : Directorate Of Public Health
19. JNC 7 : The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure

CHAPTER-I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

“Your life style –how to live, eat, emote, and think-determines your health.

To prevent disease, you may have to change how you live.”

Brain Carter

The incidence of hypertension has been remaining unabated, in developing countries. The primary reasons behind this are transformation in politics, economics and society. The resultant changes in life style, and desultory habits, lack of physical activity, smoking and mounting stress at work etc., have been causing hypertension.

WHO in 2013¹ reported the prevalence of hypertension was 40% in persons above 25 and causing 7.5 million deaths contributing one eighth of deaths in the year 2008. It is not surprising that 3.7% of the total Disability Adjusted Years (DHY) is seen due to hypertension. The report also indicates that hypertension gives raise to cardiac problems, renal diseases and Paralysis. But, the silver lining is that bringing down blood pressure to 140/90 mmHg can bring down complications.

Polit and Back² indicate that health promotion together with prevention of preventable diseases means expense of a smaller magnitude compared to that for treatment of diseases. . Being a choric disease the authorities cannot have control over this disease. Hence, every human being in the society along with the concern organizations should take their due responsibility to practice right way of life.

WHO 2009³ indicates disorders leading to mortality in the case of non-communicable diseases are namely as : raised blood glucose 6% , rise in B.P. 13% , physical inactivity and obesity 5% and use of tobacco and related products 9% .

Several studies lay stress on adherence to regular habits as important. in day to day life is very important. Chintamani⁴ and Brunner⁵ indicate lifestyle modification leading to changes in blood pressure. About 10 kg weight reductions can bring in five to twenty mm Hg of BP. DASH (Dietary Approaches to Stop Hypertension) food decreases 8-14 mm Hg. Restricted usage of sodium lowers BP of 2--8 mmHg. Physical activity can help reduction in BP to 2-8 mm Hg. Physical activity and DASH diet are the basic prescription for lowering BP.

AYUSH⁶ (Ayurveda, Unani, Siddha and Homeopathy) refers to the universal realization of Yoga as capable of getting BP under control. United Nation General Assembly (UNGA) has endorsed 21st June as “International Day of Yoga” with approval from member countries.

WHO report 2005⁷ indicates, chronic systemic diseases such as cardiac problems, oncologic disorder, diabetes and protracted respiratory problem as the significant reasons for approximately 50% of total diseases during 2005 with projection at 60% by 2015.

Diana Rodriguez⁸ estimates that, by 2030, cardiovascular disorders would be responsible for 85% of deaths in under developed countries.

Maheer⁹ advocates greater emphasize on the continuance of regular habits to avoid hypertension. WHO 's 2010 report predicted 1.5 billion cases of fatality due to hypertension by 2025 compared to 972 million in 2000 and among 65% in developing countries. Figures of mortality arising from hypertension and related disorders have proved this effect.

Arthur et al¹⁰ insist that increased arterial pressure is a disorder of the modern era extensive seen and that suboptimal blood pressure i.e. systolic blood pressure above 115 mmHg is responsible for approximately, 49% of IHD and 62% of cerebral vascular disease as universal irrespective of age, sex and ethnicity. Thirteen percent of all deaths of, 7.1 million deaths were shown as due to hypertension.

Ezzatiet.al¹¹ states that hypertension is considered as chronic problem lasting throughout life. Obesity, physical inactivity and poor diet are considered as factors responsible for this disorder which can be corrected easily.

An incisive study made by Owusu¹² at a teaching hospital at Kumasi , Ghana (Africa) points out to knowledge of hypertension with sedentary life as corollary for hypertension, with indication of 13% of cardiac arrest problems caused by hypertension.

Cheung et al¹³ say about 65 million Americans have hypertension and go through related problems . Saha et.al¹⁴ report hypertension as one of the ten leading causes of death, 4% of mortality in Bangladesh arose from hypertensive complications.

AbriadoLanza¹⁵ avers hypertension affecting 50 million persons in America. Franco OH⁷ says that longevity is getting reduced by about 5 years in cases of untreated hypertension.

Smeltzer et al in their book on Medical Surgical Nursing¹⁶ disclose the prevalence of high blood pressure in U.S adults was 31% with increasing rate with advancing age and consistent heart and phlebitis disorders with deviation in terms of ethnicity, peaking of high blood pressure among African and Americans (37%). More than 90% among the proposed hypertensive patients were seen with hypertension of unknown etiology while the rest was caused by secondary hypertension.

Urden and Stacy¹⁷ authors of a book, indicate that one third of Americans having hypertension. Among those with awareness of hypertension, 34% had medication with BP under control. 25% were on medication but blood pressure was not maintained within optimum level. One fourth of them had medication but their BP was abnormal; 11% in the age group of 45 to 54 were hypertensive but are not under any medication.

Harrison TR¹⁸ predicted hypertension as 33.5%, 28.9% and 20.7% among non Spanish-speaking blacks, whites and Persons of mixed Spanish Indian descent, Americans respectively. Hypertension emerges as the persons grow beyond 60 years with the prevalence of 65.4%. About 60 million Americans are known to have hypertension. This would grow with advancement in age.

Hence, periodical monitoring of patients for blood pressure is necessary, once the presence of hypertension is seen. This helps keeping hypertension under control and initiating necessary action, say Black and Hawks , Smeltzer and Bare¹⁹

Professionals²⁰ have teamed up for an investigation on the effect of yoga together with regular care among ninety pre hypertensive patients. Yoga cum DASH group indicated a 6 mmHg reduction of SBP, 13 pre hypertensive patients turned to possess normal BP, indicated superiority over practicing DASH alone.

Hypertension is seen as the most common cardiovascular problem and as a predominant chronic disorder which should be scrupulously kept at bay. Promotion of self-management abilities among the patients with hypertension is a significant challenge to healthcare providers. Patients should be taught self management when seen with hypertension.

Neupane D et al²¹ have made investigation of the prevalence of arterial hypertension, pre hypertension in SAARC countries. Variance from 27% was seen as

hypertension and 29.6% as pre hypertension with difference among studies made by others from 13.6% to 47.9% with larger incidence in urban areas. A recent report points out to the distribution of silent killer as 17.9, 23.9 31.4, 31.5, 33.8, 25, 20.9 percentage in Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka respectively. A startling fact is that the incidence is high among women. Abdominal obesity and interval obesity conditions have association with hypertension. Some member countries of SAARC were noted for the prevalence of more than the average BP with wide variations.

“Hypertension was one of the ten leading reported causes of death and approximately 4% deaths were due to hypertensive complications in Bangladesh” says Khandaker²² who points out that around 15 million adults in Bangladesh have been affected with hypertension.

Vaidya A²³ has to his credit, a project on BP in Eastern Nepalese town of Dharan in 2005. He reports 23% prevalence of hypertension on the basis of guidelines laid down by Jet Navigation Chart VII. The silent killer was seen in 33.9% of the partakers in a study conducted in Eastern Nepal. A national representative survey made in 2007/8, showed gender differences with hypertension among 36.0% of men and 26.2% of women of 15 to 64 years.

With focus on issues of deep concern and the prevalence of hypertension, the objective of 2013 World Health Day²⁴ was to minimize the incidence of cardiac problems and stroke. In commemoration of that day, India set a goal to improve knowledge among decision makers, project leaders and concerned authorities for stabilizing the health care pattern of India to face the challenges from hypertension with the status as second most populous nation, and with 17% of the global population, India gets a major impact to any estimation of diseases statistics.

Midha T et al²⁵ have accomplished a study from rural areas of Lucknow. The sample size was 800 persons. Their age was more than 20 years. The figure numbered both from urban and rural each 400. The study showed the distribution of high Blood Pressure as 0.26 with mean age as 35 years (SD14). Masculine gender predominance (34%) and prevalence getting higher with advancing age with the rate of 5.6 times for age above 35 was observed. More than half of the persons observed had no knowledge of developments of hypertension in them. All hypertensive patients were seen having BP above 140/90 mmHg.

National Cardiovascular Disease Database 2012²⁶ discloses hypertension in India as posing great danger progressing to greater problems during 1990. Among the 9.4 million total fatalities, hypertension contributed 2.3, CVD give rise to 1.2, and coronary heart illness and stroke caused 0.5 million deaths.

A study was performed by Mohan et al²⁷ in the southern part of India. It is surprising to note that hypertension prevails among one fifth of men and 17% of women. The sample size was 26,000 adults. 67% among them were ignorant of the hypertension status. Cases of undetected as well as having inadequate control were reported. This makes it mandatory to tide over hypertensive situation by adopting appropriate techniques to curb its menace.

A survey made in 2007 relating to risk factors associated with non communicable diseases²⁸ indicated the distribution of hypertension in Tamil Nadu as 18%, growing with advancement in age, irrespective of gender. Among the affected persons, 23% were illiterates, while the figure was 18% among school going persons. 24% was the figure for men, 15% for women.

1.2. NEED FOR THE STUDY

Health problem forms an integral part of study for any health care team. It is therefore imperative for nurses to have knowledge of effective intervention for rendering patient care. Proper diagnosis enhances the quality of care and provides uniqueness to the role of nurses at every stage in health care. There is need today for creating awareness of the problem more than what is seen in the available care modules, On the one hand there is growth in life expectancy but there is also the growing risk from hypertension.

A government report of India on (COPD) Chronic obstructive pulmonary disease indicates that CVD tops the list of five causes of death in India²⁹ in rural and urban population.

Iyer U³⁰ in his study of the industrial population of the industrial town of Vadodara reports prevalence of 24% in Vadodara and a further 35% in Godhra, which certainly indicate a continuous increase in hypertension figures in India.

Imparting awareness of hypertension among persons and developing a positive attitude may help nurses, in applying related intervention to promote developing a healthy lifestyle.

Gupta and Guptha³¹ point out that non pharmacological therapy using altering patterns of day to day activities as the requirement to bring down the incidence of hypertension. Changes in dietary and physical activity patterns grow along with major demographic changes and changes in health status, as seen from growing incidence of non communicable diseases.

ProCor³² points out to the common man's inability to meet the cost involved in the management of hypertension in developing countries like Ghana. It costs about

7.5 to 12 % of the monthly earning. There is, therefore, need to find viable alternatives. This point forms the core of this research study.

The treatment taken up, once hypertension is diagnosed is an amalgam of two factors; medication known for hypertensive and, more than even that, suitable changes in lifestyle, which goes a long way for management of hypertension.

The individual's attitude alone can help modification of his lifestyle. This calls for adequate, appropriate knowledge. This subject has been dealt by Doris, Samuel and Stephen³³ who observed 591 hypertensive patients who had non pharmacological treatment. The tested samples indicated the factors that could bring down hypertension namely physical activity (49%), reduced salt intake (54%) and relaxation techniques (17%).

Ike et.al³⁴ conducted a study for evaluation of awareness, understanding and application of activities going by instructions on a daily basis at a University Teaching Hospital in Enugu, Nigeria. A sample of 260 patients attending a clinic taken up for study was selected and response to a prepared questionnaire was obtained. 50% participants indicated stress as the cause for hypertension .They had been following life style strategies after understanding its significance. Despite their readiness to adopt promotional techniques, the suggestions regarding this were not being enforced on them through mass media.

A study conducted by Edgar, Thomas, Donna et al³⁵ revealed a reduction in mean systolic blood pressure as 9.5 mmHg in the lifestyle group. The mean diastolic BP was 5.3mmHg. The conclusion was that, among obese adults, who had already hypertensive medications, a comprehensive lifestyle intervention brought down BP and got it under control.

Mohammad Irfan MH et.al³⁶ conducted a study to comprehend the effect of practice on risk factors of known lifestyle on hypertension among bank employees in Surat, India. The samples consisted of participants numbering 1493 working in a bank. Clinical observations revealed 122 (28.7%) of them were leading sedentary life and had increased presence of hypertension. This brings up the importance of the use of right therapy.

An explorative study was conducted by Sweden Drivenhorn³⁷ on the outcome, of behavior change among clients with hypertension living in Goteborg, An awareness program on high blood pressure was provided for 175 participants. The end result showed a substantial decline in systolic BP with behavior change is significant at the level of $P < 0.01$.

Jane et al³⁸ conducted a study to assess the reflection of lifestyle modification on hypertensive patients in America. 36 patients attended a 12 week project. Talks regarding therapies and walking were included in the intervention. Exposure to the techniques saw changes in BP after the intervention.

Svetkey et al³⁹ and Hedayati⁴⁰ have done evaluation of a group of interventions in normalizing BP. Clients figuring 810 patients were divided into 3 batches, namely, instruction only group, conventional group and conventional plus DASH Diet. Systolic Blood pressure was observed for 6 months. It was 3.7mmHg and 4.3 mmHg for established and established plus group respectively. This reduction was significant compared to the control group.

A similar study was conducted by Srinath Reddy K⁴¹, Omni Heart⁴² and Maher J⁴³ in New Delhi on hypertension friendly diet close to DASH diet. It brought about a noticeable improvement in health status more particularly towards stabilizing blood pressure

Health care providers have touch with community on an, on-going basis creating awareness of the causal factors as also preventive and rehabilitative measures for hypertension. Adequate knowledge is necessary for persons to enable getting motivated on their own and take up modification of life style as defensive action⁴⁴.

Creating awareness regarding hypertension is important measure for bringing down the prevalence of hypertension. A study made by Maliuye, Hazarika and et al⁴⁵ reports only 13.6% of hypertensive patients had knowledge of high blood pressure in them. Only 8.7% were taking regular treatment. Increased level of knowledge regarding changes in lifestyle would be of great help in getting desired goal of intervention in motivated persons.

A cross sectional study made by Syed.et.al⁴⁶ on 440 persons (220 normotensives and 220 hypertensive) in karachi Pakistan on the subject of the knowledge regarding hypertension showed increased mean score of knowledge compared to the other groups, while those who were age < 30 years had a good information on hypertension.

Tanu.Midha et.al²⁵ did a project on the awareness of happenings in hypertension. The samples chosen were of Seychelles Islanders figuring 1067 persons from 25 to 64 years of age. The group with hypertension had no knowledge of the symptoms of hypertension. They had gone through regular checkups and carefully followed a salt intake reduction compared to other groups.

Paul Munter et.al⁴⁷ explored the knowledge and practice of hypertension among 15,540 adults native to China. 44.7% were aware of having high blood pressure, 71.8% were on medication and 91.9% patients had not achieved control ($P < 0.001$) over hypertension. The report disclosed total absence of association between

hypertension and variables such as education, smoking and family history and occupation.

A study was conducted by Ike⁴⁸ to evaluate the facts, understanding and practice of alternative measures dealing with control of high blood pressure among elderly persons at a public hospital. There were 50 participants bearing 66.7 as the mean age of both genders. 76% of the subjects were of walking as an intervention; while only 67% samples put it into practice. Fifteen had knowledge of customary BP values, attentiveness on body weight, fruit consumption.

Melinda Sue darling⁴⁹, in her study, made analysis of the extent of physical activity assisting reduction in blood pressure. The venue was Ishitawaka, Takata . The work was done in 2003 among subjects of stage I and II hypertension patients, 203 patients taken up for study were divided in to 5 groups on the basis of time spent on exercises / week (ranging from half an hour to more than two hours). The study established marked bringing down in blood pressure among the experimental group than in the control group.

Kanchana G A⁵⁰carried out a teaching program on the subject of life style modification among 50 patients attached to a cardiology day care clinic. It was found that 84% of hypertensive patients had poor knowledge while 16% had a moderate knowledge, mean score bearing 13.02. 42% had moderate knowledge, mean score bearing 25.32 in pre and post test respectively. This is significant at $P < 0.01$.

The food guidelines 2010⁵¹ of American specifies food items for use, modus operandi of uses and quantity for vegetables, fruits, milk and milk products, grains, nuts, etc. considered minimal in fat and sodium. This produced a beneficial effect of lowering blood pressure.

Eskridge⁵² has done work on hypertension giving rise to kidney diseases and the relationship between life style modification and medication application. One in three adults were found having hypertension. One among three had expected blood pressure. The reasons behind non-adherence were inadequate information, deficiency in comprehension, non-compliance, inadequacy in health care facility and negligence on the part of attending professionals. Relationship between hypertension and knowledge was clearly seen despite the pathology behind. Action was required in areas of drug compliance, Changes in day routine as also individual differences.

A study by Udupa⁵³, Patel⁵⁴ and Van Moutfranset⁵⁵ has shown the Yoga having beneficial effect in lowering hypertension.

Kearney, Whelton et al⁵⁶ did a survey on the subject of the effectiveness of life style intervention in reducing blood pressure among 105 subjects. Dietary changes, practice of outdoor physical activity, hot drinks and reduction in salt consumption, consumption of fish oil were seen lowering blood pressure by 5mmHg and 6mm Hg in systolic and diastolic pressure respectively.

A study was made by Ghosh Arnab⁵⁷ on the subject of the role of brisk walking in blood pressure reduction, also in blood sugar and weight reduction. The subjects were 45 Asian Indian men, in age group 55 to 64 who did brisk walking for 20 weeks. They were divided into 5 groups on the basis of the duration of the exercise. All those who had a 5 week practice had a better outcome in terms of reduction in the parameters, compared to the group who had practice of less than 5 weeks. The direct relationship between blood pressure and obesity was also observed.

Chanudet et al⁵⁸ had taken up a study to ascertain the benefits of a daily brisk walking for 30 minutes. The result was more than just a reduction in blood pressure,

included others to bring down obesity and metabolic disorder apart from promoting endothelial function, platelet activation etc.

Mendes, Sousa and Barat⁵⁹ collected secondary data belonging to from their studies on brisk walking conducted from 1960 to 2000s. Open air walking for a duration of 150 minutes/week, either cumulative or interrupted into small installments with intermittent intensity was noted to afford advantage in getting anticipated blood pressure.

Byron⁶⁰ gave his comments on studies related to brisk walking for commending the role of brisk walking in bringing down BP at the event of yearly conference at Indianapolis.

Rugh McCaffer⁶¹ investigated the role of yoga in arterial pressure in Thailand among high BP clients. Measurements taken at 8 weeks showed trimming down in the BP to the level of $P < 0.05$ level with values normalized at 8 weeks.

Falguni Desai's ⁶² study was on the effectiveness of yoga biofeedback and music therapy in the management of hypertension. The study was undertaken at Mumbai in 2003. Asanas like shavasana were taught to participants. 20 clients, 75% men and 25% women had a relaxation therapy program for 28 days. The 't' test was used for understanding changes in cardiovascular response to initial and follow up measures. Mean reduction was of 10 mm Hg in diastolic BP and 15mm Hg in systolic blood pressure in post test.

In a study by Murthy⁶³, alternative therapies like naturopathy including yoga in the management of hypertension was examined. The research was conducted at Jindal Nature Institute located at Bangalore. Subjects were 104 cases known to have hypertension under meditation. They did Yoga and were in naturopathy. Blood pressure following the test showed a significant reduction from 139.66 to 129.6 and

91.2 to 86.1 respectively. Duration of the study was a year. Only 57 patients came for the follow-up. 14 patients had need for drugs and their BP was within the acceptable limits.

Grace⁶⁴ has strengthened the concept of yoga that yoga is the most excellent measure to assure maintenance of normal weight and mitigate problems of obesity.

An article by Miles⁶⁵ affirms yoga is superior in tissue contraction, breathing techniques, relaxation and stretching exercises. The yoga position which involves systemic isometric contraction could lower the mean BP.

Chandrababu⁶⁶ administered a SIM about the knowledge of lifestyle modification in hypertensive patients in Mediscope Hospital, Bangalore. The sample consisted of 30 patients (both men and women) known to have hypertension. A structured questionnaire organized on the basis of lifestyle modification aspects that included general health, stress reduction and psychosocial well being was used for data collection. 25 patients (83.3%) were observed with adequate knowledge, 5 (16.7%) were seen having knowledge of the pretest. A majority 21 (70%) whose posttest knowledge score was checked had only a moderate knowledge. The study concluded the posttest knowledge score exceeding the pretest score indicating statistical significance. Hence SIM was found to be effective in imparting knowledge on life style modification in hypertension patients.

The above mentioned studies showed hypertension and its prevalence have imposing its foot prints into the Indian population. These consequences increase the mortality and morbidity rate in the country. But many studies proved that appropriate teaching and lifestyle modification on hypertension can prevent further burden of hypertension and its complications. Hypertension, being a silent killer, the victims does not seek preventive services due to cost and problems with transportation.

Emphasis is made on lifestyle modification for all patients with hypertension, irrespective of any pharmacological prescription. It may reduce or even eliminate antihypertensive drugs. Keeping such facts in mind and based on the review of literature and the researcher's experience, the investigator is interested to conduct a study to determine the efficacy of life style modification approaches in lessening Blood Pressure among newly diagnosed hypertensive patients at selected urban areas of Villupuram district, Tamil Nadu, India.

1.3. STATEMENT OF THE PROBLEM

A study to assess the effectiveness of life style modification strategies in lowering Blood Pressure among newly diagnosed hypertensive patients at sample areas of Villupuram district, Tamil Nadu, India.

1.4. AIMS AND OBJECTIVES

- To assess pre and post test Blood Pressure (BP) among newly diagnosed hypertensive patients in control and experimental groups.
- To evaluate the effectiveness of Life Style Modification Strategies (LSMS) in lowering BP by comparing the pre test and post test BP among the control and experimental groups of newly diagnosed hypertensive patients.
- To find out the association between the blood pressure level and selected socio demographic and clinical variables among newly diagnosed hypertensive patients.

1.5. HYPOTHESES

H₁ A significant difference exists between the pre and post test blood pressure among the control and the experimental groups.

H₂ A significant difference exists in blood pressure after the Life Style Modification Strategies (LSMS) between the control and the experimental groups.

H₃ There is a significant association between the blood pressure and selected socio demographic clinical variables among newly diagnosed hypertensive patients in the control and experimental groups.

1.6. OPERATIONAL DEFINITIONS

Effectiveness

This refers to differences between the values of pre and post test I & II findings on blood pressure measured at first, 12 and 24 weeks of intervention respectively among the experimental and control group.

Life Style Modification Strategies (LSMS) in lowering Blood pressure

It refers to those interventions intended to reduce blood pressure, namely, LSMS. It has three aspects, viz., brisk walking, yoga and Dietary Approaches to Stop Hypertension (DASH) diet. This approach is anticipated to give the outcome of lowered BP at the post test weighed against pre test among the experimental group. It was introduced individually, face to face through lecture, 1 demonstration and return demonstration and the patients were monitored for a period of 24 weeks among the experimental group for the daily practice followed by pre test. The lecture part took 15 minutes and demonstration and return demonstration took about another 45 minutes to teach this LSMS.

These interventions are indented to reduce the blood pressure. It has three aspects, viz., brisk walking, yoga and dietary approaches to stop hypertension (DASH) diet.

This test holds out chances of bringing down reduction in BP at the post test in comparison with the pre test in the experimental group.

It was introduced on individual study basis, on one-to-one lecture, demonstration and return demonstration. Monitoring of patients among experimental groups was done for 24 weeks among the experimental groups for a daily practice for a period 24 weeks followed by a pretest. The lecture was of 15 minute duration, while it was 45 minutes for demonstration and return demonstration.

The three components of LSMS are explained herewith;

➤ **Brisk Walking**

This study refers to smart walking on the basis of criteria and carried out in the dawn of each day for six months for a period of half an hour and demonstrated by the investigator. Duration: 10 minutes.

➤ **Yoga**

This study includes two components of yoga, namely, an asana and a breathing exercise. A breathing technique called NadiSudhi Pranayama and an asana called Savasan, (a body and mind relaxation technique) were taught in the present study. Demonstration by investigator was part of LSMS for the patients to be practiced on a daily basis, on the basis of criteria for 24 weeks. Duration: 10 minutes.

➤ **DASH diet (Dietary Approaches to Stop Hypertension)**

It refers to food items used by patients including grains (210 to 240gm of / day),vegetables and fruits each (400-500 g/ day), fat free milk (250ml), skinless poultry, fish or meat (2 or less servings / day), legumes, nuts and seeds (4-5 servings / week), vegetable oil (2-3 teaspoons / day), sugar (5g / day), salt (5g/day) as per instructions given by the investigator on DASH diet. They were also advised to

restrict all oil fried items including ghee, vanaspathi, coconut oil, dry fish, pickles and sweets. The time duration to teach the DASH diet was 25 minutes.

Newly diagnosed hypertensive patients

This study refers to patients aged between 31 and 60 years of both genders, who were newly diagnosed to have primary hypertension within the last six months (1 to 180 days) by a qualified physician. Samples were collected by the investigator by reference to a register relating to non communicable diseases maintained at PHC. Patients residing at Vazhureddy from urban PHC Villupuram and Vikkiravandi from Vikkiravandi PHC for control and experimental group respectively were chosen for the study. The patients' houses were identified and their addresses together with eligibility to be considered as samples were assessed using a checklist to screen for hypertensive patients.

Sample areas

The study undertaken here relates to residents in two areas in Villupuram District, namely, Vikravandi, a town panchayat and Vazhuthareddy, a municipal area situated 20 km distance from each other.

1.7 ASSUMPTIONS

- The study is based on the assumption that persons need information on health matters to take necessary action.
- The effort put forth to practice the techniques taught varies between individuals.
- Residential ambience has a positive impact to impart and implement appropriate strategies.

- LSMS administered for newly diagnosed hypertensive patients is likely to have a positive effect on lowering BP.

1.8. DELIMITATIONS OF THE STUDY

Delimitations of this study are:

- Only the residents of Vikravandi and Vazhudareddy have been taken up for the study.
- Newly diagnosed hypertensive patients alone were chosen as sample aged between 31-60 years.

1.9. PROJECTED OUTCOME

- The findings are expected throw light on the effect of lifestyle modification strategies in lowering blood pressure among the newly hypertensive patients.
- The proposed intervention may lower blood pressure among hypertensive patients and also can obviate complications like stroke, kidney disease, and peripheral vascular and cardiac disorders.
- It can create awareness among patients to sustain healthy lifestyle practices throughout their future life.
- The quality and quantity of reinforcement given to patients may alert the health care team to take up scrutiny of the measures to overcome the difficulties experienced in compliance.
- It can also offer guidance to the investigator to plan a mass health education program with accent emphasizing the importance of lifestyle modifications on the wellbeing of patients/client.

CHAPTER II

REVIEW OF LITERATURE

This chapter deals with supportive evidence flowing from objectives of the study. The researcher has done extensive study of the relevant literature including books, articles and electronic data base. The chapter has two main sections:

Section A 2.1 Review of relevant literature on hypertension.

Section B 2.2 Conceptual frame work.

Section A is presented as follows

2.1.1 Literature on hypertension- An overview

2.1.2 Literature and Studies related to brisk walking vis-a-vis hypertension

2.1.3 Literature and studies related to Yoga vis-a-vis hypertension

2.1.4 Literature and studies related to DASH diet vis-à-vis hypertension

2.1.5 Literature and Studies related to Comprehensive intervention package
And hypertension

2.1.6 Literature on BMI, WHR and Blood pressure

2.1.7 Literature on knowledge and practice relates to hypertension.

2.1.1 LITERATURE ON HYPERTENSION- AN OVERVIEW

Zemedkun⁶⁷ in his study indicates a high burden of pre hypertension and hypertension stages in Sub-Saharan African countries, Ghana and South Africa. The incidence of hypertension (including both stages 1 and 2) was found to be higher in South Africa (46%) compared to Ghana (42.4%), mostly due to higher age distribution of participants. More than 85% of respondents in Ghana and around 90% South Africans were in the age group more than 50, as part of the WHO SAGE study.

With advancement in age, chances of getting into hypertension are 90%. Comparison between two countries shows a higher prevalence in South Africa. This could be attributed to the higher proportion of urban residents (69.7% in South Africa and 44.4% in Ghana) and increased number of obese persons (30.5% in South Africa and 12.1% Ghana). A lower degree of physical activity and fruit intake per day was also reported in South Africa.

Yadav et al⁶⁸ made a study of 1746 adults at Lucknow (India) aged above 30 years on the distribution of arterial pressure based on severity. 32.2% of patients were seen with hypertension and 32.3% had pre hypertension. Persons 60-69 years were en-route to have hypertension. Persons in the age group of 30-39 years had pre hypertension already. Central obesity, elevated LDL cholesterol and abnormal glucose tolerance were seen as risk factors. Hypertensive patients and pre hypertensive's were known to have additional risk factors compared to normotensive patients. The elevated the BMI and WHR, a higher the level of blood pressure were seen among normal, pre and hypertensive patients. The independent risk factors were age, BMI, WHR for both hypertensive and pre hypertensive individuals.

Some studies ⁶⁹ certify women having high pulse rate and minimal vascular opposition apart from protective effect of estrogen. Lower complication risks are seen in them than in men. But the risk factors were the same in both cases. A Meta-analysis of Observational Studies by professionals⁷⁰ showed positive association between the nature of the job and the development of hypertension.

Wang⁷¹ conducted a study for assessment of the relationship between marital status and hypertension. The setting was area comprising nine states in China. The author reported establishment of an active role in getting blood pressure to normal level. Compared to married women, the unmarried were exposed to a high risk of

development of hypertension. Persons with broken marriage were likely develop higher arterial pressure.

Data seen from a WHO study from six countries, namely ,China, Ghana, India, Mexico, the Russian Federation and South Africa was taken up for analysis of the role of income as cause of hypertension by Peter Lloyd S et al⁷². Linkage of arterial pressure with abnormal BMI, advance in age and non compliance to treatment was observed.

Alexander Logan ⁷³ in his article on hypertension in aging patients refers to the immediate, direct relationship between age and hypertension. Advancing age has the consequence of a gradual loss of elastic nature of blood vessels, enhanced formation of plaque inside the walls of vessels, enlargement and stiffening of all sizes of arteries resulting in quicker come back of reflected waves from peripheral circulation. This increase in systolic pressure seen with each contraction, in turn leading to increase in systolic pressure and decrease in diastolic pressure.

2.1.2 LITERATURE AND STUDIES RELATED TO BRISK WALKING VIS- A - VIS HYPERTENSION

Robert⁷⁴ refers to the steps in brisk walking as: stand straight with arms by sides without crossing centre line and pull your navel towards spine to ensure core working of muscles. Let eyes be focused five to six meters ahead and keep shoulders in a relaxed position. Elbows to be bent at a 90 degrees and hands to be cupped lightly, no clenching of fists. With the heel leading, take a step forward with foot and move arms in opposite directions. Body weight to be transferred through heels.

Current European and American hypertension guidelines for hypertension strongly recommend regular physical exercises. Dimeo F⁷⁵ has done investigation on exercise and hypertension. Fifty persons with persistent hypertension were placed in

in control and experimental groups on a random basis and observed for 8- to 12 weeks. Regular exercises were seen to reducing blood pressure with enhanced physical performance on the basis of assessment done through maximal oxygen uptake and lactate curves. No change in arterial compliance and cardiac index. Decreased blood pressure was seen resulting from physical exercises even for clients whose response to therapy was rather low.

Tommy Boone⁷⁶ refers to the importance of brisk walking as beneficial for BP return to normal within a week as much as regular exercise. Continued and protracted practice of a mild physical activity is better than a long, vigorous walk but intermittent.

Leosco et al ⁷⁷ refers to brisk walking producing hypertension reduction. He attributes hypertension to a sympathetic system over activity and a distortion between sympathetic and para sympathetic modulation among patients with hypertension. Findings on the basis of evidence report normalizing SNS activity as the main reason for non drug life style measures especially aerobic exercise, bringing down BP to be within normal limits.

Petriz, Franco⁷⁸ place emphasis on the role played by non drug therapies. He does this in his article on exercise training and cardiac function. .He says that the cardiac hypertrophy caused by exercise training is seen in the enhancement in the function of the heart and tolerance against ischemic attack.

Gliemann, Nyberg , Hellsten⁷⁹ avers the occurrence of cardiovascular disorder has been foretold with occurrence with scarce bioavailability of Nitrous Oxide (NO) and an increased level of ROS. The higher amount of ROS bring down the bioavailability of NO together with cellular damage in the heart and the arterial system. Proof of high enhancement of cardiovascular function through physical

activity has been established by steps that include checking for greater pressure of NO, improved endogenous antioxidant protection and reduction of the manifestation of ROS producing enzymes. This leads to the conclusion that regular physical activity is a significant component in the management of cardiac disorders.

Tschentscher, Niederseer, Niebauer⁸⁰ have collected data from 16 RCTs and 11 observational studies from 1062 and 831 patients respectively at the Medical University of Salzburg, Australia, done between April 2011 and May 2012. Nordic walking was found effective judged by heart rate, oxygen consumption, quality of life, and other measures.

A walking assessment was utilized at the work spot for 24 weeks for validating walking as an intervention on modification in latent blood pressure and cardiac and pulmonary fitness. This was a study by Soroush et al.⁸¹. Evaluation was made at the end of 6 months, through a working intervention based on pedometer. The finding revealed the performance of participants at 12,256(SD 3,180) steps/day as average result during the initial months. It tapered slowly down till 6 months at a later stage. Age had a positive correlation to systole and diastole to start with, and later on changes in cardiac contraction alone were seen to have relationship with efflux of time. Systolic BP was based on the number of steps taken per day expressing a linear relationship.

Lee et al ⁸² conducted a study with the objective of finding the effect of walking on BP control. Among the 27 RCTs, walking appeared effective with a larger sample and moderate to high intensity performance and longer intervention period.

Improvements in the heart and vascular diseases issues in sound inactive adults by regular brisk walking were seen by Maddison⁸³. The participants were 1128 in number. The mean age was 52 years. 83% among them were women. The

participants went through a performance for a month. Parameters measured after four weeks showed systolic pressure, BMI, body fat composition were saw a significant reduction. But the reduction was not noticeable.

A comparative study was conducted by Miyashita et al⁸⁴, to find the effects of accumulated ten 3 minute bouts of brisk walking Vs one 30 minute bout of brisk walking on post prandial plasma triacylglycerol concentration followed by rest of BP. Participants were 15 young healthy individuals. Repeated measures on a design have proposed both interrupted and continuous 30 minutes walk as equal in bringing down the post prandial lipemia and systolic BP in a significant manner at of $P < 0.05$ level. Physical exercise for 45 minutes was recommended. They include brisk walking at 3.5 miles (5.6 Km) / hour meant for reducing the risk of chronic disease such as high BP, DM type 2 and heart diseases.

Lenz et al ⁸⁵ also suggest 45 minutes of physical activity that include brisk walking, at least 3.5 miles per/hour to lower the risk of chronic disease such as high BP, DM type 2 and heart disease.

Wu RZ, Zheng⁸⁶ have conducted a study for determining the role of brisk walking on hypertension. The sample size handled by them was 175 who were patients in the intervention and the control groups.

2.1.3 LITERATURE AND STUDIES RELATED TO YOGA VIS- A -VIS

HYPERTENSION

Yoga consists of three components, namely, meditation, breathing technique and asana. This researcher adopted a breathing technique called NadiSuddhi pranayama and an asana called Shavasana. Nadi means an artery or vein for the inflow of wind or vigor. Suddhi means cleaning⁸⁷. The origin of pranayama consists of two Sanskrit words 'Prana' and 'ayama'. 'Prana' means energy 'ayama' means

elongation. So, pranayama is elongation of energy or life. The Sanskrit word 'shava' means 'corpse'. This pose gives the appearance of sleeping. It is very simple and can be easily done. But it needs concentration of a high order. The concentration should be on each part of the body.

Awdish et al ⁸⁸ in their study have recommended a modified yoga for evaluation of benefits and safety. This was done with 3 hypertension patients of varying functional abilities. The three yoga programs, were: yoga performed sitting in a chair, halfway yoga in a chair, and one with the assistance and instruction from an expert. A DVD was given to participants with 'you tube'. It carried details about yoga and a retrievable proforma. Participants were asked to write their performance details and a self note on their wellbeing. The modified yoga program was seen as feasible, secure and efficient. Feedback from patients showed reduction in fear and pain.

Sharma, Sharma, Sood⁸⁹ took up the examination of role of shavasana in lowering the parameters related to heart and lungs. 60 normotensive students were the subject for the examination. There was creation of artificial stress by Cold Pressor Test (CPT). Treatment of all parameters including blood pressure, pulse rate, respiratory rate and rate pressure product was done before and after doing the shavasana. Reduction was seen in all physiological values after 10 minutes of shavasana. There was a further slow down after 4 weeks of continuous practice. This led to the inference that shavasana is an efficient technique in lowering BP.

A critical evaluation of studies was done on yoga conducted by Paul⁹⁰. There were 17 trials including studies conducted from January 2014. Eleven among them declared that yoga resulted in decreased systolic BP compared to other alternative therapies such as dietary modification, enhanced UC, passive relaxation (PR), or

physical exercises etc. About eight studies stated that yoga reduces DBP. Yoga was seen as useful for reducing DBP through 8 RCTs and hence an effective treatment.

A country based study was conducted by Baby and Chavan⁹¹ on the effectiveness of yoga among 60 hypertensive clients at Mangalore between the age of 30 and 60 years using a quasi experimental design. The post test mean BP level was lowered in the experimental group than in the control group as depicted in 'F' ratio of repeated measure ANOVA.

Moa et al⁹² have made a careful study of the extent of influence of yoga on BP and quality of life in individuals with elevated BP. The sample consisted of 83 mature patients, in age group ranging from 20 to 80 years. They were divided into three groups on the basis of the method of teaching, namely, yoga by a teacher, home based yoga practice, and a non experimental group. Among the three, home based yoga practice demonstrated use in bringing the desired effect in BP (-4.4 mmHg DBP) matching with other two batches.

Cohen et al⁹³ have made a study on the usefulness of yoga in a high blood pressure situation. The sample size of their study was 102 patients getting treatment at University of Pennsylvania. The study was done in 24 weeks. The end result demonstrated the positive effect of the multi component life style changes in the reduction of BP. Medication was minimal and enhanced lipid, glucose levels were seen.

Okonta⁹⁴ has made an in depth study of the resources and websites in order for a clear understanding of the facts about hypertension and yoga. The study was an aggregation of ten studies including pilot versions, RCTs and quasi experimental were included. There was consensus of the decisive role of yoga providing infinite benefits. The benefits seen included reduction in BP, glucose and cholesterol and body weight

which are the major problems seen in American society. This analysis has provided norms for implementation of a nursing program as a supplementary therapy for high BP.

Chung et al⁹⁵ have done a project on the effect of Sahaja yoga on the quality of living, nervousness and blood pressure. Two groups were chosen for the study. The first group, called meditation group, was given treatment from the International Sahaja Yoga Research and Health Centre. Members of the second group called, controls from Mahatma Gandhi Mission Hospital. The former, viz., the meditation group showed significant improvement between pre and post test values of blood pressure along with better quality of life and decline in anxiety. But no improvement was seen in the control group in the said parameters.

Ramesh et al⁹⁶ have done investigation on the immediate effect of a brief life style therapy comprising yoga, asanas and pranayama. A significant reduction in the level of fasting sugar, and fat level was seen. This was followed by BP reduction.

Bhavanani⁹⁷ observed the action of 27 rounds of Chandra Nadi Pranayama (CNP), which is a yoga technique on pranayama relating to parameters connected with heart and blood vessels. This was for those who had arterial hypertension. The sample size was 22 patients. The findings showed immediate lowering of pulse rate, SBP, pulse pressure etc which were significant at $P < 0.05$ level.

The study made by Jie⁹⁸ was on the benefit of yoga as a testimony for the arterial hypertension. He collected data from reliable resources including MEDLINE, EMBASE etc available until 2013. Analysis of the effect of yoga was done through comparison with conventional therapies in combination with breath awareness and other techniques. Yoga, among all, was found to be effective in a significant reduction of BP at the level of $P < 0.05$.

A systematic review was made by Marshall⁹⁹ for assessment of the factors that steer selection of yoga with factors including category of yoga, duration and length of yoga and the nature of comparison group included in obtaining the desired result over hypertension. A total of 17 studies formed the search anchor. Lowering of systolic blood pressure (SBP) and diastolic blood pressure (DBP) of about -4.17 and -3.62 mmHg respectively were seen. The study made a strong recommendation of yoga as a therapeutic measure for ensuring normal BP on a continuous basis. No supportive evidence is needed for proving the result.

Yet another systematic review of the entire gamut of published studies on yoga and hypertension has come from Tyagi et al¹⁰⁰ in an attempt to identify the effect of yoga on hypertension. There were 39 cohorts, 30 NRCTs, 48 RCTs and 3 case reports in the meta analysis. Duration of the study varied from 1 week to 4 years. The sample size comprised 6693 clients. Most of the studies revealed effective reduction in BP in both normotensive and hypertensive individuals at 0.05 level of significance. The difficulty in devising a standard and uniform yoga technique was responsible for hesitation in prescribing yoga as a therapy.

Cade et al¹⁰¹ have made an investigation on the role of yoga vis-a-vis blood pressure as a life style therapy. They adopted an experimental design. Reduction in relaxed systolic blood pressure 5 mm Hg (SD=2) and diastolic blood pressure 3mm Hg (SD=1) in yoga group were found compared to the standard care group. But, changes in BMI, QOL and blood parameters like glucose tolerance did not necessarily follow yoga.

A study undertaken by Dhameja et al¹⁰² to examine the relation between genetic changes with oxidative stress in hypertension clients and the consequence of yoga among them, with hypertensive individuals above 30 and below 60 were

administered yoga practices for 30-60 minutes, daily for 42 days. There was decrease in the level of oxidative stress in clients with high BP as the effect of yoga in addition to BP reduction.

A booklet on pranayama¹⁰³ details the steps in nadisuthi pranayama. These include holding head and spine straight, with eyes closed. Left hand to be in gnanamudhra, right nostril to be closed using the right thumb, inhalation through left nostril, followed by closure of the left nostril using ring finger of the right hand, exhaling through right nostril, then through left nostril by closing the right nostril. All these were the steps contributing one complete cycle of nadishudi pranayama.

Yogam¹⁰⁴, in his textbook has detailed the steps of shavasana, these are: lie down on the back in ground with the legs distance of one foot between the hands should be a little further from the thighs and should be open upwards. Eyes should be closed, the neck should be straight and the entire body must be relaxed. Four or five deep breath and slow exhaling. All these make shavasana.

2.1.4 LITERATURE AND STUDIES RELATED TO DASH DIET VIS- A -VIS HYPERTENSION

John. Maher¹⁰⁵ in his study on fruit and vegetable mix in lieu of DASH diet maintains salt intake, obesity, race, physical activity level, heredity, diet and stress are not the only causes of hypertension. There are others like Endothelial Dysfunction (ED), oxidative stress from reactive oxygen species (ROS) and vascular smooth muscle dysfunction (VSM) with its hypertrophy, hyperplasia and remodeling.

Mridul Chaturvedi., Sourabh Jindal., Rajeev Kumar¹⁰⁶, discuss lifestyle modification in hypertension in the Indian context. They point out that the Indian equivalent of the DASH diet includes grains and grain products with 7-8 daily servings each including 1 slice bread preferably whole-wheat, 1 cup dry cereal, ½ cup

cooked rice; for vegetables, the serving size was 1 cup raw leafy vegetables, ½ cup cooked vegetables or ½ cup vegetable juice in about 4-5 daily servings.

Patience TekourTetteh¹⁰⁷ declare DASH as a diet rich in fruits , vegetables, whole grains, low fat dairy products, tea, garlic and nuts as low in sodium and providing potassium, magnesium, calcium, dietary fiber, antioxidants and significant quantity of mono polyunsaturated fatty acid. Such essential elements provide improvement in endothelial function through nitric oxide-induced endothelial vasodilatation. Omega-3 fatty acids such as Eicosa Pentaenoic Acid (EPA) and Docosa Hexaenoic Acid (DHA) present in fish oil brings down blood pressure through enrichment of cellular membrane phospholipids. Inflammation and blood cholesterol are also brought under control.

An experimental study conducted by Satterfield¹⁰⁸, Anderson Moore on elderly persons on self management of the prevention of stroke, involved administration of DASH teaching program using a planned video teleconference technique. The conclusion drawn from the study was that the DASH diet was of great help to people in warding off stroke. Obese hypertensive persons experienced loss of weight of about 3-9% and reduction in BP was about 3 millimeter of mercury. With loss of weight, the required strength of medication also got lowered.

A study made by Kim et al ¹⁰⁹ was meant for evaluation of the result of DASH diet on blood pressure. The Participants were Korean adults; the sample size was 28 nos. The intervention which was carried out for 10 weeks, included dietary education in groups and also one-to-one participants were provided counseling. BP was assessed using an ambulating monitor. BP got reduced by 4.5 and 2.6 in systolic and diastolic pressure respectively. There was also enhancement in the level of Serum potassium and ascorbic acid level. Additional intake of fruits and vegetables confirmed presence

of elevated urine potassium value (138-139). This type of diet can down the level of BP and also minimize the risk of cardiovascular presence.

The DASH dietary pattern not only demonstrated effectiveness in lowering blood pressure but also indicated the beneficial effect on other cardio metabolic risk factors^{110, 111} and cancer risk factors^{112, 113}. This brought recognition for it as a benchmark for a dietary pattern for an overall healthy lifestyle.

Harnden et al ¹¹⁴ support the view of DASH diet providing the desired results in hypertensive and in normotensive persons. The utility of DASH was the subject matter of study in a few centers in UK. Imparting of benefits of DASH was done, following monitoring of the food daily for two weeks, at the end of which the beneficial effect of significant lowering of BP with the systolic and diastolic BP among persons with normal BP was seen. They were very receptive to DASH diet.

Blumenthal et al ¹¹⁵ are known for the comparative study meant for determination the influence of DASH diet versus DASH diet plus a weight reduction program with routine controls. The respondents were patients with pre, stage I hypertension at a medical college hospital. Post test was done at the end of 16 weeks. The sample comprised 144 patients beyond BMI 25. They had no prescription of any drug for elevated BP. Reduction in BP 16.1/9.9, 11.2/7.5, and 3.4/3.8 mm Hg was seen among the DASH plus weight reduction, with DASH and usual diet control respectively. This was also demonstrated by an ambulatory BP. Among the three, DASH plus weight management program was more effective than others, as supported by $P < 0.05$.

Mulrow¹¹⁶ undertook a study to ascertain the impact of a weight reduction programme on BP. Participants were divided into two groups, namely weight reduction group and control group. The 361 participants went through six trials. The

findings showed 4 to 8 percentage of weight reduction with a reduction of 3 mm Hg in both systolic and diastolic BP. Stepped care technique with drugs for BP reduction produced good result than a weight loss diet. Patients who were given diet therapy require smaller doses of medication.

Couch¹¹⁷ has made an incisive of study of the role of behavioral diet therapy as against a standard outpatient food care vis-to-vis blood pressure. The sample comprised adolescents with high BP. The therapy comprised a diet rich in fruits, vegetables and low fat dairy products. The experimental group had a significant ($P<0.05$) reduction in systolic, diastolic BP and total fat as well as higher intake of fruits, potassium and magnesium and low fat dairy significantly ($P<0.05$).

Sacks et al¹¹⁸ made a thorough study of the impact of sodium among hypertensive and normotensive blacks and other races of both genders. BP was seen getting lower when sodium was stepped down from high to intermediate level followed by intermediate to lower level.

Feig¹¹⁹ has done a study using data already collected from a premier trial by Chen et al. Participants were three groups namely, advice only, comprehensive life style modification aimed at weight loss, and consumption of sugar-sweetened beverages, total being 810 adults. A 24 hour recall was conducted through any time telephone for collecting data on intake of sweetened soft drinks. Calls were made at the start and then at the end of 6 and 18 months. Reduction in intake of soft drinks to 360 ml per day was seen producing an average BP reduction of 1.8mm Hg and 1.1mm Hg of systolic and diastolic pressure respectively.

Michael A. B¹²⁰ has conducted a study on the effect of DASH diet in African American and white adults experiencing hypertension. He proved that DASH diet

reduced SBP 11.2 mmHg and DBP 7.5 mm Hg reflecting the effectiveness of DASH diet in lowering blood pressure.

A study by Rankins et al¹²¹ among 82 African American adults with poorly controlled BP, were exposed to DASH dinner for a period of 8 weeks, showed a definite reduction in BP among respondents who were active in at least six sessions out of eight at the level of $P < 0.05$.

Scisney et al¹²², made a study of the efficiency of dietary compliance in lowering BP among hypertensive patients. The sample size was 53 hypertensive women from different background. Tailored messages were given to patients to enhance compliance with DASH diet. The result revealed lower BP for the experimental group with greater compliance to DASH diet, a marked change ($p < 0.05$).

Lopes Oliveira et al¹²³ verified the impact of imparting knowledge of compliance to complementary therapies in the management of essential hypertension. The sample comprised 216 persons with high BP. Persons who started taking large quantities of legumes, engaged in physical activity, had reduced body mass index, abdominal circumference experienced reduction in BP as a result of health education.

Dede Lima Lopes¹²⁴ is known for a qualitative study meant for comprehending the experience among seniors and their families who had the arterial hypertension. The findings of the study demonstrated importance attributed to the adoption of healthy practices together with medicinal treatment helped in the control of hypertension. The author has studied the presence of habits, attitudes and beliefs that have positive or negative interplay in the care of hypertension.

Annelita et al ¹²⁵ in their study on compliance to non-pharmacologic and pharmacologic treatment of hypertensive patients in a unit of Family Health Strategy program in the city of Cuiaba at Brazil between 35 and 65 years of age showed that none among the 54 users surveyed, demonstrated implicit obedience to antihypertensive treatment, while it was partial with 50% and 50% with no adherence.

Shimbo et al ¹²⁶ have comprehended the importance of bringing about behavioral changes in term of daily living activities. They considered the concepts and practices of obesity, sedentary life, history of smoking, intake of alcohol more than advised, non DASH diet and elevated sodium to potassium intake as life style factors among 2602 patients. The said items were found to have a unique association in causing hike in blood pressure as well as persistent hypertension.

Obarzanek et al ¹²⁷ have carried out investigation on the effectiveness of lifestyle behavior changes among 782 respondents in a premier trial. Assessment was made for 6 and 18 months for changes in behavior and SBP. The results showed reduction in SBP ranging from 0.5 to 1.5 mmHg for reduced urinary sodium, improved fitness and adherence to DASH diet.

Lin et al ¹²⁸ undertook a study of the link between adherence to DASH foods and BP among Taiwanese adults. The samples numbered 1420 and 2061 conducted from 1989 and 2002 respectively. Dairy products and calcium intake were significantly and inversely associated with systolic BP. The more they adhered to DASH, the higher was the consistency in reduction in SBP. The univariate analysis established universe relation between DASH adoption and SBP but no other factors had any relationship with DBP.

2.1.5 LITERATURE AND STUDIES RELATED TO COMPREHENSIVE INTERVENTION PACKAGE VIZ- A- VIZ HYPERTENSION

Aram. Chobanian¹²⁹, in his article, explains the effectiveness of certain lifestyle modification in lowering blood pressure. He confirms reduction in systolic pressure, averaging 5 to 10 mm Hg achieved along with a weight reduction of 10 kg. Certain LSMS have seen a weight decrease of 10 kg, 8 to 14 mm Hg for the DASH eating plan, 2 to 8 mm Hg for dietary sodium reduction, 4 to 9 mm Hg for increased physical activity and 2 to 4 mm Hg for moderation of alcohol consumption.

Baena¹³⁰ has identified 621 references among whom, 52 data bases were meta analyzed in a systematic review. An attempt was made to demonstrate the impact of Lifestyle modification on BP. There were four therapies, namely, behavioral counseling, dietary changes, physical exercises and mixed intervention with sample size ranging between 1014-2013. All four therapies demonstrated reduction in systolic blood pressure measuring -5.4, -3.5, -11.4 and -6.0 mm Hg respectively among counseling, diet, exercise and mixed therapy group.

Ziv et al¹³¹ have made a comparative study for evaluation of a new holistic approach called Comprehensive Approach to Lowering Measured Blood Pressure (CALM-BP), on the basis of principles of medicine combined with DASH diet. The sample consisted of 113 hypertensive patients on drugs. BP was measured for 16 weeks followed by a free period of 6 months with no changes in dose of medication. Taking CALM BP group showed lower BMI/cholesterol and enhanced quality of life significantly ($P < 0.0001$).

An experimental study was conducted by Huang et al¹³² at Hubli district in Karnataka state, India in rural areas. Samples of sizes of 826 and 806 were selected from each area respectively and assigned as experimental and control groups. Facts on

blood pressure, Diet and life style guidance were the interventions for the study which lasted three years. Improvement in knowledge and practice (diet, behavior, fat/salt intake, alcohol consumption) was seen among the respondents in experimental group significantly ($P < 0.05$) along with reduction of prevalence of hypertension.

Subramanian et al¹³³ took up a project with the objective of finding the impact of a non drug measure for lowering high BP at Puducherry. A cross over randomized design was used. Four groups namely, control, physical activity, salt intake reduction and yoga groups formed the sample. Among the groups, those who were given intervention, saw reduction in, to the extent of systolic BP 5.3, 2.5, 2.3 mm Hg and Diastolic BP reduction of 6.5, 2.00 and 2.4 mm Hg among the experimental groups respectively which was significant. But the control group did not show such significance. It was found that physical exercises were more effective than salt reduction or yoga.

Mdel et al¹³⁴ assessed the efficacy of a culture oriented behavioral intervention. A six week session was done among adults of Hispanic/Latin as sessions that included encouragement to interview techniques. They were asked to self monitoring of behavior for 42 days. The systolic blood pressure was reduced to 10.4 mm Hg. The weight and BMI reduction were 1.5 lbs and 0.3 respectively. There was also improvement in physical activity of 40 minutes per day.

Fujii, et al¹³⁵ have done investigation on the cardiac disorder and its prevention through community based behavior techniques in Japan. It was conducted for a period of 27 months. 549 participants with hypertension were enrolled. The assessment was conducted at 15 months and 27 months. Individual counseling was administered to the experimental group with group session as a unique therapy whereas 7 newsletters were provided to the control group on facts relating to health

and findings of health results. The result showed the effectiveness of intervention in lowering dyslipidemia and weight which in turn could lower BP.

Fan et al¹³⁶ were involved in a study for finding the type of life adopted and extent of preventive health care service utilized by persons in America. Participants were 45 years and above with hypertension. Details of their drug history were collected. The number enrolled was 218228. The findings revealed that the behavior such as not performed physical exercise and possessing BMI beyond normal, consume <5 serving of fruits and vegetable/ day. Current smokers and binge drinkers were noted as hypertensive. Attending review ops and get routine health and fat check up was done by hypertensive, who were on drugs

Lopez, et al¹³⁷ have done scrutiny of 3,497 adult hypertensive participants with data available from, the National Health and Nutrition Examination Survey (NHANES) conducted from 1999-2004. The samples were 3,497 adult hypertensive patients, drawn from 42 million Americans. The demographic and clinical factors of participants who reported received counselling on lifestyle to be adopted and their adherence was analyzed. Non-Hispanic blacks received counselling more ($P < 0.001$) than whites. Men were received counselling more often than women apart from those with Medicare insurance ($P = 0.02$) compared to the privately insured. Participants who were hyper cholesterolemic (OR, 1.7; $P < 0.001$), diabetic ($P < 0.001$), overweight ($P < 0.001$), or obese ($P < 0.001$) reported receiving lifestyle counselling more often than those without these conditions. Of those receiving counselling, 88% reported adherence to those recommendations. After making adjustments for demographic and clinical characteristics, only non-Hispanic blacks ($P < 0.001$) and those aged >60 ($P = 0.04$) were more likely to report adhering when advised.

Fernandez et al ¹³⁸ have undertaken a research that involved testing of efficiency of life style intervention over systolic blood pressure. The setting was 6 old age homes function at the community level. The participants were between 60 to 80 years. 65 members were participants. The intervention comprised weekly group counseling sessions on diet ,exercises and drug compliance six in number and monthly session 2 in number as booster. The result of the study showed a change in SBP of 13 mm hg in intervention group , as well as there was enhanced drug compliance (26%) and vegetable intake (23%) which were statistically significant and such a kind of study was feasible to carry on in a senior center where as the control group the finding were not satisfactory.

A study was undertaken by Neutel, Campbell¹³⁹ for evaluation of the behavior modification among the currently known persons with high BP residing at Canada. Transformation was seen in their behavior, such as quit smoking with 8.6% relative risk reduction and improved physical activity with 6.2% RRR and persons on drug were tend to modify their behavior towards positive way.

Scala D et al ¹⁴⁰ conducted tests for the impact of a holistic life style therapy with the objective of achieving lowered BP. The participants were Italians with hypertensive indications. The sample size was 92 newly diagnosed patients without any co morbidity. The behavior therapy consisted of focus group discussion and role play at two and four months and followed up for twelve months. Significant improvement in lifestyle was seen in both groups in selected aspects. A significant reduction of SBP was noticed in the experimental group only at the level of $P < 0.05$.

Viera¹⁴¹ has done investigation of life style modification for lowering BP and associated actions. He correlated suggestions and daily practice. The response for changing eating habits was 70.1%, reduced salt intake was 78.7%, reported exercise

was 67.1% and decreased alcohol intake was 57.9%. The patients who recalled the advice were changing their food pattern and taking less salt, exercising more and decreased alcohol intake.

Lien, et al ¹⁴² have carried out a study to understand the influence of life style therapy comprising of standard advices as well as DASH food. This study compared the outcome of intervention in terms of cardio metabolic variables among patients with and without metabolic syndrome. The major result was lowered systolic blood pressure after six months. Participants were 796 patients of whom 399 patients had metabolic syndrome. The patients were allotted to an advice only control group, a 24 weeks consistent behavior therapy group of standard advices or a standard advice plus DASH group. The output was reduction in the standard advice group and standard advice plus DASH diet causing reduction in the primary outcome parameter of systolic pressure.

Miura et al ¹⁴³ have conducted a study for demonstrating the effectiveness of life style modification program for lowering BP. The sample size was 518 of both genders aged between 20 and 69 years with stage I hypertension. The samples were assigned into four groups namely 1) personal counseling (n=134), team counseling (n=79) 3) letter correspondence (n=127) and 4) non experimental group (n =178). The reduction of SBP was significant in all 3 interventional groups significant at the level of $p < 0.05$.

Ohta et al ¹⁴⁴ have conducted investigation to ascertain the benefits from the lifestyle modification programmes. It was a 12-week program and the components are mild exercise and food in causing altering blood pressure. After 12 weeks it was found that BP was lowered along with elevated serum nitrous oxide (NO).

Pajak&Kawalec¹⁴⁵ have conducted a study with the objective of assessing the behavior of patients vis-a-vis hypertension at the residents of Krakow. The number of participants was 1157, 1153 of both genders aged above 45 and below 64 years. The method of data collection was home intervention, followed by a clinical visit. The history of alcoholism was found as the chief factor for hypertension. Limited smoking had lower chances of hypertension in women. The study revealed weight as an important factor for maintaining BP at the normal level. However physical exercise and keeping away alcoholism have got stronger role in checking hypertension.

Dickinson et al¹⁴⁶ did meta-analysis of the effect of changes in daily routine to lessen high blood pressure among one hundred and five studies randomizing 6805 participants at university of Newcastle at least 8 weeks. The samples were exposed to intervention with improvement in their food habits including fish oil consumption, physical activity, alcohol and salt reduction. The findings were reduction in systolic 5.0 mmHg, 4.6 mmHg, 3.8 mmHg and 2.3 mmHg respectively with corresponding decrease in diastolic blood pressure.

A comparative study conducted by Dusek et al¹⁴⁷, had 122 patients on the effect of relaxation response training (n=61) versus life style modification (control n=61). Both SBP (9.4 mmHg and 8.8 mmHg) DBP (1.5 and 2.4 mmHg) decreased significantly without any distinction between intervention and non experimental groups. Among them forty four in intervention and 36 in the casual care group had done away with anti hypertensive drugs under supervision. But a number of participants in the relaxation group had eliminated an anti hypertension medication while maintaining BP control which is significant at $p < 0.05$.

The effect of lifestyle intervention on controlling hypertension among older adults was determined by Adel et al¹⁴⁸ using quasi intervention research design. The

study was carried out on 84 hypertensive elderly patients attending outpatient clinics of the specialized medical hospital, Mansoura University Hospital, and New Mansoura General Hospital. The patients got assigned as equal batches of control and experimental alternatively. The first study batch of 42 samples, received lifestyle intervention regarding control over blood pressure. The second was the control group, comprising 42 patients exposed to routine outpatient care only. Data was collected using 3 tools, viz., socio-demographic and bio physiological data structured interview sheet, hypertension knowledge, and health promoting lifestyle profile II. The findings revealed that modifying the behavior of day to day activities was fruitful in the maintenance of blood pressure within normal limits.

Svetkey et al ¹⁴⁹ subjected 722 patients with stage I hypertension to multi component life style intervention for control of BP. The samples were randomly assigned to 3 groups namely first group performing behavioral life style, second group perform the former said along with DASH diet group, the third group was non experimental group. Both the groups I & II of interventional group were given individual and group counseling session for 18 months. The outcome was measured at 24 weeks and 72 weeks. The BP was lessened remarkably at the level of $P < 0.05$ in the post test.

Nowson et al ¹⁵⁰ have conducted a study to examine the role of two weight reduction diets in blood pressure reduction among 63 men with the mean age of 47.9 years. They were assigned to either low fat (LF) diet or a WELL diet (moderate sodium, high potassium, high calcium, low fat DASH diet). Both groups did half an hour of reasonable physical exercise during almost all days of the week. Only 54 men completed study up to 12 weeks. They found greater weight reduction (4.9 kg) and SBP (5.5 mmHg) and DBP (4.4 mmHg) in the WELL group than the LF diet group.

Leon¹⁵¹ investigated compliance of DASH among the patients of Spanish origin with hypertension. The investigation was carried out during the year 2008-2010 among 12, 948 individuals aged above 18 years. The results revealed , 17.3% was DASH compliant, and 17.2% as of Mediterranean compliance. DASH accordance was witnessed higher with advancing age, among women and patients with high cholesterol. The present smokers were non adherent to DASH.

Elmeret al¹⁵² have conducted a study to examine the extent to which two compound therapies lower blood pressure compared to non experimental group. The sample size was 810 adult volunteers with pre hypertension or stage I hypertension. Both the groups significantly augmented the intake of fruit, vegetable, dairy, fiber, and mineral intakes. The difference in BP reduction at 18 months for both the experimental groups was not significant but then the advice only group.

Hyerang¹⁵³ has made a study with the motto of finding out the impact of a dietary intervention among adults. The sample consisted of 28 patients of Korea with high BP. The intervention comprised multiple group education and face to face counseling for a period of ten weeks. Compared to pre test, both systolic blood pressure and diastolic blood pressure, were significantly decreased in post observation with reduction of 4.5 mm Hg of systolic blood pressure and 2.6 mm Hg diastolic blood pressure, at the level of $P < 0.05$.

2.1.6 LITERATURE ON BMI, WHR AND BLOOD PRESSURE

Premalatha¹⁵⁴ has carried out a study in Chennai to understand the occurrence of hypertension and the associated variables among 200 school children of either gender aged between 10 and 12 years. Among them, 23 children had systolic hypertension and 15 had diastolic hypertension, 14 % had systolic free hypertension and 15 % had diastolic free hypertension. There was association between younger age

and BMI >23 with diastolic hypertension. The girls measuring BMI >23 had association with systolic hypertension. Both SBP and DBP positively correlated with BMI.

Teena Ann John ¹⁵⁵ discovered the value of WHR among patients with managed and unmanaged high blood pressure at Kerala. She found that the mean waist circumference 93(SD=10.57), hip circumference 98.6(SD=9.69) and waist- hip ratio 0.94(SD=.094) were higher among uncontrolled hypertensive patients compared to controlled hypertensive patients.

The relationship between hypertension, BMI, age and gender was the subject matter of investigation for Anjum Humayun¹⁵⁶, Arbab Sher Shah and Riffat Sultana ¹⁶² in Pakistan. The sample size was 351 655 1006 with the range of age from 20 to 60 years and above. The study established that the lower the BMI the lesser the distribution of hypertension. As the BMI raises, the risk of getting high BP also multifold. Hence BMI and hypertension is directly associated.

Damirchi, Mehrabani¹⁵⁷ instituted a study to usher in the subject relating to prevalence of obesity, high blood pressure (high BP) along with other factors at Tehran. The sample size was 1218 Public Transport Taxi drivers. The mean weight was 78.9 kg. The result revealed that the obesity and high blood pressure was associated (P<0.0001) irrespective of age.

Breen in his article ¹⁵⁸ on hypertension, confirms the presence of a direct relationship between BMI and hypertension. The central obesity measured by WHR is an indication of undesirable cardiovascular insult.

A team led by Tesfaye et al ¹⁵⁹ conducted a study in Ethiopia, Vietnam and Indonesia. The sample size was 8014 persons aged above 25 and less than 64. The

overall finding showed positive relationship between the BMI and hypertension among persons of Africa and Asia.

Moore¹⁶⁰ has conducted a study at Oklahoma irrespective of race and ethnicity. The study was performed among students of Anadarko public schools. The sample size was 2053 of primary to higher secondary students. It was established that as the BMI raises, the BP also tend to hike.

Gupta et al ¹⁶¹ had undertaken a epidemiological study, made a random selection of 1800 samples comprising 960 male and 840 female adults aged 20 years and above in an urban Indian population and measured BMI and waist hip ratio. The study provided proof of association between BMI, WHR and BP.

Sanya and Ogwumike¹⁶² had the objective of finding out the association between BMI, WHR with BP in Nigeria. The sample consisted of 404 men and women between 15 and 85 years. BMI, WHR & BP were measured along with a study of lifestyle, occupation and family hypertension. The author determined that waist hip ratio was the stronger risk factor for hypertension than BMI.

Mausumie¹⁶³ , in his study on clinico social profile of women, hypertensive in a tertiary care hospital, found the mean systolic blood pressure of the samples as 144.1 ± 24.6 mmHg and mean diastolic pressure was 79.9 ± 12.4 mm Hg. This study helped the researcher in identifying 39.1% of his samples as in stage I hypertensive, 60.9% in stage II hypertension and 21.4% newly detected as hypertensive. His conclusion was that though hypertension was common among men, a significant number of women had hypertension too. Possibility of prevention of hypertension was seen through modification of lifestyles, dietary pattern, and regular periodical exercises and use of appropriate drugs.

Wilkins et al ¹⁶⁴ have conducted a study to assess the prevalence of hypertension among 3,514 clients in Canada. The findings show the average values of SBP and DBP differed by age and sex. In the age group 20 to 39, and 40 to 59, the mean SBP were 101.4 and 111.1 mm Hg respectively in women, with 109.9 and 116.5mm Hg among men. The prevalence rate of hypertension in Canadian adults aged 20 – 79 yrs was identified as 19% which is almost the same in both genders. The prevalence has witnessed increase with age and is 2% in the age group of 20 - 39years, 18% in 40 -59 yrs and 53 % in 60 -79 yrs. The likelihood of pre hypertension was seen as higher in men (25%) than in women (15%).

Tripathi¹⁶⁵et al found that non vegetarian subjects from plains showed significantly high SBP, DBP and MBP (129 and 133 and 81 and 85 mmHg in systolic and diastolic BP respectively.) as compared to vegetarian subjects, whereas no distinction was seen in subjects from plain between vegetarian and non vegetarian. The high BP in non vegetarian vis-a-vis vegetarian subjects may be attributed to increased intake of salt seen in sea food and the consumption of spices and salt.

Wexler¹⁶⁶ has attempted identification of the barriers to treatment of hypertension among African Americans. Focus group discussion was used as a method for data collection. There were three groups and the sample size was 26. Most of them were women. The mean age was 49 years. The person, the family, community and the health care system were identified as factors for enhancing adherence to therapeutic regimen.

Lipowicz.Lopuszanska¹⁶⁷ have done identification of the difference in BP vis-a-vis marital status. Unmarried men were found to have a high risk of hypertension compared to married men. The unmarried men had lower BMI than married men.

They suggested that difference is influenced by some of the factors, dietary intake and economic aspects of living.

Pajak and Kawalce¹⁴⁵ have completed a study to identify the relationship between alcohol consumption, smoking and hypertension. A random sample consisting 1157 women and 1153 men in the age group of 45 – 64 years was chosen. The participants were permanent citizens of Krakow. 66% among them were men and 56% women with hypertension. Men who were binge drinkers had higher chances of hypertension and in women who were moderate alcoholic ($P=0.057$) had lower chance of hypertension ($OR = 0.72$). Women who were smokers had a lower chance of hypertension ($OR = 0.67$). There was no relationship seen among smoking and hypertension. The researcher has suggested that weight reduction, increased physical activity and refraining from binge drinking can reduce the incidence of Hypertension.

A Longitudinal Study by Haijiang¹⁶⁸ among Chinese women brought to light the relationship between the marital status and hypertension. Married women were prone to smaller risk for hypertension. The women of disrupted marital relation have greater risk for hypertension.

Holland et. al¹⁶⁹, (2006) did an explorative study to identify the role of clinical inertia in the treatment of patients with hypertension at Forsyth Medical Group in North Carolina among Physicians & support staff. A questionnaire with 29 items for physicians and 15 items for support staff was administered by trained interviewers. During the interview, they found that no physician documented patient's hypertension management as a matter of routine. One in three physicians referred to inability to find enough time for discussion on hypertension management with patients. Most of the physicians informed that patient and support staff related factors were the most important variable in reducing BP. The study concluded that patient's life style

modification (89%), education (67 %) and medication compliance (56 %) was most important reason for uncontrolled BP.

2.1.7 LITERATURES ON KNOWLEDGE AND PRACTICE RELATED TO HYPERTENSION

Prathiba¹⁷⁰ conducted a study to ascertain knowledge of lifestyle modifications regarding hypertension among patients with high BP at Mangalore. The samples comprised 60 patients with hypertension. Most of them were men between 51-60 years had primary to secondary education and were on daily wages, did not have history of hypertension and or smoking, were non-vegetarians and on regular treatment. The post test knowledge score had significantly improved as indicated by the 't' value of 31, 29 which is more than the table value infers that the instruction on knowledge about hypertension greatly enhanced the awareness and attitude about hypertension in the patients.

Siva kiran¹⁷¹ made a study with the objective of analyzing the health behavior of hypertensive patients among controlled and uncontrolled blood pressure. A greater part of them were aged 51-60 years 27(54%), women's 30(60%), married 43(86%), Hindus 45(90%), had no job 20(40%), had low income less than 10,000 per month 26(52%). There was a significant association between Waist Hip Ratio (WHR) and health behavior among controlled and uncontrolled hypertensive patients. It is interpreted as waist hip ratio has got direct association with the behavior and development of hypertension.

Jemi Jeba Malar¹⁷² has conducted a study on the expenditure involved in the treatment among patients with hypertension in private and government hospitals at Erode of Tamil Nadu. She found the cost of hypertensive treatment in private hospital

was Rs. 4364.19(SD=1936.45) while it was Rs. 2163.79(SD=648.64) in government hospitals. The mean difference was Rs. 2200.40 and it was significant at $P<0.001$.

Girija and Kokilavani¹⁷³ advocate a study on the usefulness of structured teaching program among patients with hypertension in Tamil Nadu and found the structured teaching program very effective in improving the knowledge, attitude and practice on hypertension with mean scores of 88, 85, 85.5 respectively in the post test among the participants, significant at $p<0.005$ level. Demographic variables revealed a majority of them 30 (30%) among 100 hypertensive patients, with even distribution between 41-50 years and 51-60 years, 54 (54%) were women patients. 76(76%) were Hindus, 34(34%) were illiterate, 32(32%) 36(36%) were unemployed.

Sathya Shenbegapriya¹⁷⁴ conducted a study to explore the knowledge, perception and awareness of yoga among hypertensive patients in K.S. Hedge Medical Academy, Deralakatte, and Mangalore. Thirty four individuals were chosen as samples and randomly assigned to yoga and control groups. Yoga was administered to therapy group for six weeks. The reduction of BP in experimental group is 17/16 mmHg whereas in the control group it was 9/7 mm Hg in systole and diastole respectively. The difference was statically remarkable.

A study was conducted by Ramesh¹⁷⁵ for assessment of the knowledge on prevention of high blood pressure among urban adults at Manipal. He found that predominantly 35(70%) had inadequate knowledge which declares the need of the hour to introduce the right behavior techniques.

A study was undertaken by Ponchitra¹⁷⁶ with the aim to assess the success of awareness program regarding life style modifications in post myocardial infarction patients among a sample size of 60 patients in a multi specialty hospital at Chennai. She conducted the post test after a period of 7 days. The pre test knowledge of all 60

(100%) patients was found inadequate. In post test, 96.7% has gained adequate knowledge. There was no statistical significant relationship between post observation awareness and baseline data.

Damayanthi¹⁷⁷ conducted a descriptive study in selected hospitals of Bangaluru for assessment of the acquaintance and practice on the prevalence of coronary artery disease (CAD) among the clients with hypertension. The participants were 50 patients. The findings revealed a 40.4% score in the overall mean knowledge of practice (KOP) and a 42.2% mean knowledge score.

In a study made by Ramesh chandrababu¹⁷⁸, the assessment of the level of awareness on lifestyle modifications of patients with hypertension was done in Mediscope hospital located at Bangaluru. The sample comprised 30 patients above forty and below sixty years. He found, majority 25(83.3%) had inadequate knowledge, 5(16.7%) of them had moderately adequate knowledge and none of them had adequate knowledge in the pre- test. Post test knowledge scores revealed that most of them acquired adequate knowledge.

Sanne, Muntner, Kawasaki, Hyre, DeSalvo¹⁷⁹ have carried out a study with the intention of assessing the knowledge of hypertension in an urban clinic. The sample size was 296 patients with hypertension. Out of 10 items, 39% of participants provided correct answers for nine items. Those aged >60 years with primary education, known as hypertensive for the past nine years were seen to possess knowledge that was not adequate.

Lee and Jeon¹⁸⁰ have carried out a study to get views of illiterates and their experience relating to hypertension. The samples were twenty six hypertensive patients. . They were asked open ended questions on compliance and non compliance. A majority of them documented faulty behaviour as the reason for hypertension than

hereditary features. The individuals thought weight reduction, dietary modification and doing exercise could help elimination of hypertension instead of taking drugs. They believed drugs were artificial; and not the choice for treatment, even likely to produce side effects.

A team of professionals¹⁸¹ in Alexandria made an assessment of the family physicians' knowledge, attitude, practice and performance concerning holistic management of hypertensive patients with the use of a KAP questionnaire. The sample size was 27 physicians working in 5 family medical centers in Alexandria Governorate. The design of KAP questionnaire was such as to enable assessment of their knowledge, practice and performance. Their performance with hypertensive patients was observed using a checklist. Men physicians scored more than women in terms of knowledge and practice of 81.8%, 62.5% respectively. Each one had positive attitude about holistic care of hypertensive patient.

Bell, Kravitz¹⁸² have scrutinized audiotapes verbatim held between patients and physicians from thirty primary care clinicians, eleven specialists in cardiology, and 120 individuals with high BP to estimate to what extent physicians render counseling and their satisfaction. They asked for drug compliance, despite not providing of counseling on hypertension and lifestyle to a greater extent. They satisfied over lifetime counseling given for a number of visits.

2.8. CONCEPTUAL FRAMEWORK

This research study is aimed at assessing the effectiveness of life style modification strategies on reducing blood pressure among newly diagnosed hypertensive patients/clients. The researcher has explored various theoretical concepts and adopted the prescriptive theory (1964), developed by Ernestine Wiedenbach¹⁸³, as

the basis of conceptual framework for this study. Wiedenbach's vision of nursing practice closely follows the assessment, implementation, and evaluation steps of the nursing process is a helping art model. This theory involves a target directed, intentional building of thoughts, awareness, procedures to understand the patient and his condition, circumstances and need to enhance his potential, advance his care, avoid reoccurrence of the problem and to deal with apprehension, disability and suffering . The major factors covered in the model are, namely, central purpose, prescription and realities.

Factor1. Central Purpose

Chinn, P., & Jacobs, M.¹⁸⁴ refer to the basic assumption of the health care member as vital to a unique branch of nursing. This central purpose provides directions to the functions of the nurse for achievement of the patients' welfare.

It is based on the nurse's personal philosophy on the attitude towards the existence and actuality that has originated from specific faith and doctrine. A caring philosophy is unique and personal; it motivates action, guides thinking and influences decisions.

There are three vital aspects of a nurse's conviction, namely, worship of life, esteem of a person and functioning continuously based upon one's beliefs affects the healthcare goal laid down by the nurse or self.

The central purpose of this study is to lower blood pressure among the newly diagnosed patients with primary hypertension through administering LSMS.

Factor 2. Prescription

Prescription¹⁸⁵ refers to the schedule of intervention prepared for a patient/client. It highlights the pattern of doing which may cater to the nurses' aim

and reason for that deed. It may indicate broad general actions as well as specific actions congruent with the central purpose.

The actions specified in the prescription can be voluntary (mutually understood and agreed on by the nurse and patient and either patient-or practitioner-directed for an intended response) or involuntary (actions that cause an unintended response). The nurse can implement the identified prescription through the nursing plan.

This research refers to implementation of life style modification strategies such as brisk walking, yoga, DASH Diet to the patients in the experimental group. Understood and agreed to by the patient.

Factor 3 Realities

Marriner-Tomey¹⁸⁶, This refers to the practicality in the instant situation which has impact on the central purpose. They are physiological, mood, bodily and religious factors which have the potential for interplay in the practicing atmosphere of a nurse. There are five realities described by the author, namely, the agent, the patient, the aim, the means and the framework.

The agent is the bedside nurse or attendant who has qualification, the personal quality, ability, dedication and fitness to render service. As the mediator, a nurse directs all actions toward the goal. Her 4 basic responsibilities are to resolve assumptions about the actuality indicate the objectives, carry out nursing according to the objectives and to take on the related activities that leads to self-realization and the improvement of nursing.

In this study, the agent or the mediator is the investigator, who provides LSMS to the newly diagnosed hypertensive patients

The client is the patient having personal power, troubles, competence, ambition, and facility to deal with. The recipient is the one who come into the healthcare system and takes delivery or on whose behalf actions are taken such as care, instruction, or guidance. The recipient is vulnerable and dependent and need not be ill since someone in receipt of health-related education would also meet the criteria as a patient. In this study, the recipients are newly diagnosed hypertensive patients.

The aim is one which the nurse plans to achieve; it specifies nursing roles and enlightens the rationale of adopting those roles in reduction of blood pressure among the hypertensive patients.

The means refers to the activities that the nurse is empowered to achieve the goals. On the other hand, it refers to the behavior and instruments adopted by the health care member to accomplish the aim. They include specific skills, procedures and techniques the manner in which a nurse uses these means related to the central purpose and prescription. In this study activities like brisk walking, DASH Diet, yoga, isspecific activities that will be carried out for getting BP among the hypertensive patients to normal.

The framework consists of the human, environmental, professional, and organizational facilities. It refers to the setting in which nurse practices; it comprises human, environmental, professional, and organizational aspects of care. In this study frame work refers to the community areas of Villupuram district namely Vazhudareddy for control group and Vikravandi for experimental group.

Based on this theory the practical nursing holds 3 steps. They are,

- Step I : Identifying the need for help
- Step II : Ministering the need for help.
- Step III : validating the need for help being met.

Step I: Identifying the need for help ¹⁸⁷

Wiedenbach assumed every human being experiences wants as a common part of living. A need is something the person may need to preserve or sustain himself contentedly or capably in his circumstances. The nurse recognizes the a patient's need for help through examination of presenting behaviors and symptoms, investigation of the significance of those symptoms with the patient , determining the cause of uneasiness, and determining the patient's capacity to resolve the distress or if the patient has a need for help from the nurse or other healthcare professionals.

It comprises visualizing the care recipient as an individual having, a unique representation, and a competence and empathize the patient's understanding of the problem. Getting to know the patients necessity for help is based on its presence, realization, the preventing factors, and the patient's ability to meet his needs on his own. The nurse recognizes feeling of inconvenience or incapability and the strength of patients to solve his problem. She believes each one perceives the need as a normal part of existence. A trait is said to be a need which the person may demand for taking care of himself without pain or proficiently in his condition. In nutshell, the person should attain his goal through improvement or strengthening of his capacity. The nurse explores the patients' experience of discomfort or incapability and his ability to solve the problem.

In this study the newly diagnosed hypertensive patients are indentified through a survey using a checklist to screen for hypertension based on the inclusion and exclusion criteria. Baseline information of hypertensive patients was collected including socio demographic clinical data as well as pre assessment of level of blood pressure, using sphygmomanometer and stethoscope.

Step II: Ministering the need for help.

George, J. (Ed.).¹⁸⁸It means implementing the required help based on the identified need as the patient demands for help or any measure or action essential and preferred by the human being and which has potential for re-establishing or extending his ability to deal with the demands inherent in his situation. The nurse prepares a plan for solving the patients' necessity for help. It depends on the thinking and comprehending ability and also the capability to do by the patient and the nurse. The nurse presents the plan to the patient, and the patient responds to it.

This involves rendering of the required service. Followed by the pre assessment level of blood pressure, the interventional protocol LSMS is administered and importance of life style modifications is emphasized to them to be practiced regularly in order to lower their blood pressure levels among the experimental groups. The interventional protocol includes the brisk walking, DASH diet, yoga, enforced to the newly diagnosed patients in experimental group. The control group **members were not disturbed and they** were allowed to continue to take the prescribed therapy as prescribed by their physicians without any restrictions.

Step III: validating that the need for help was met.

This describes gathering of data dealing with resolution of a recipient's demands and the consequent restoration of functions as an immediate effect of the nurse's intervention. The data regarding confirmation is collected from the patient that the purpose of the nursing actions has been fulfilled. The senior nurse authenticates that the proceedings were indeed helpful and that the patient's functional ability was restored as a result of the help given.

This is accomplished in this study through post assessment on the level of blood pressure after the administration of interventional protocol. The post test I was assessed on the 12th week and the post test II was assessed on 24th week.

The findings were compared with the pre test observation within and between the control and experimental group. The effectiveness of LSMS was also measured using rating scale on satisfaction of intervention as well as open ended questionnaire on feedback of LSMS. It was found that the intervention was effective in lowering BP, established through statistical analysis of the observations. The evaluation of the study reveals the importance of enhancing routine life behavior for lowering hypertension among hypertensive patients.

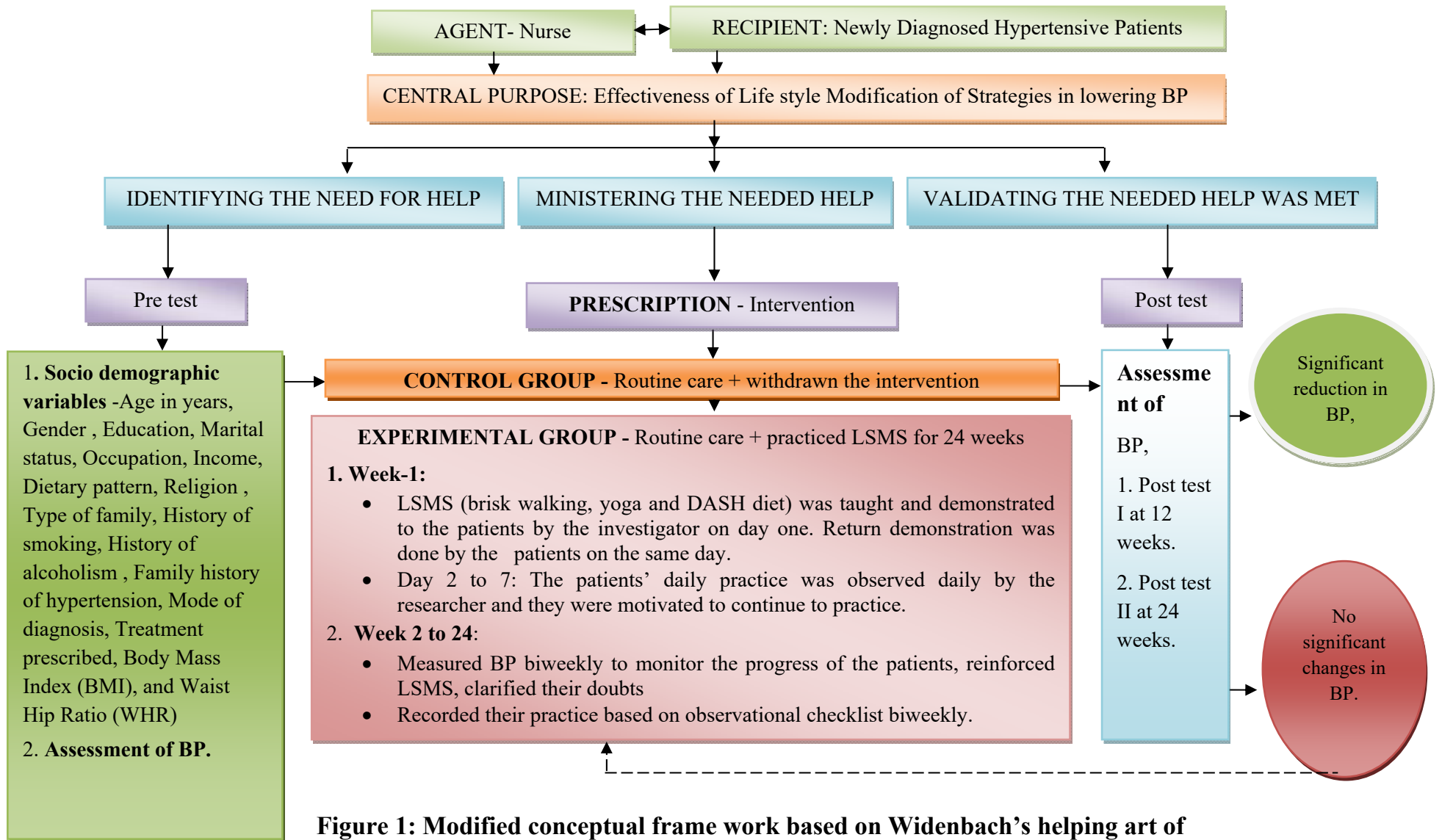


Figure 1: Modified conceptual frame work based on Widenbach’s helping art of clinical nursing theory (1964)

X Intervention - the LSMS was introduced to the experimental group along with routine care whereas the control group was allowed to continue the routine care and not exposed to the intervention.

O₂ Post test I assessment of BP was done at 12 weeks for both the control and experimental group.

O₃ Post test II assessment of BP was done at 24 weeks for both the control and experimental group. A description of the research design is produced herewith.

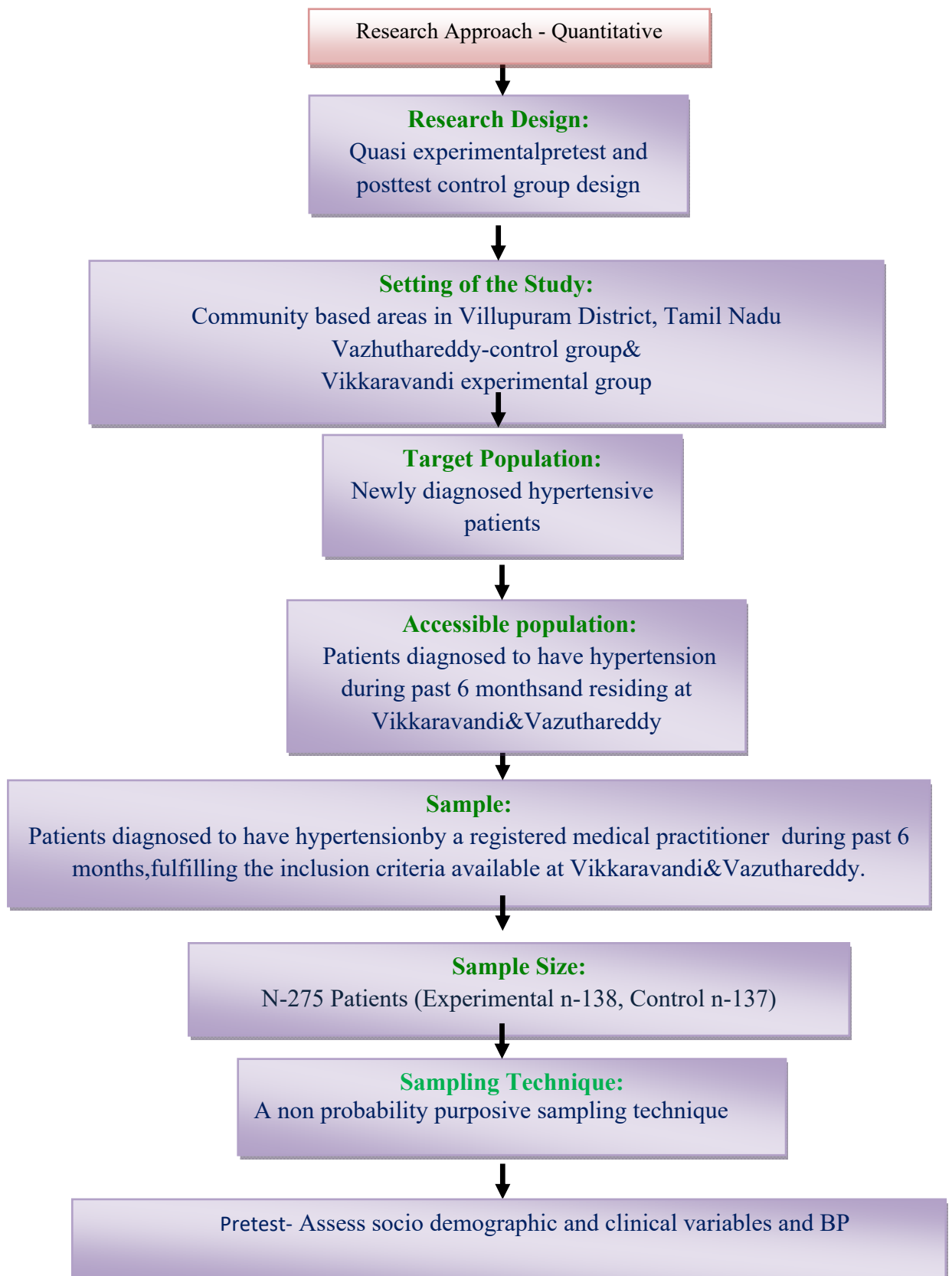
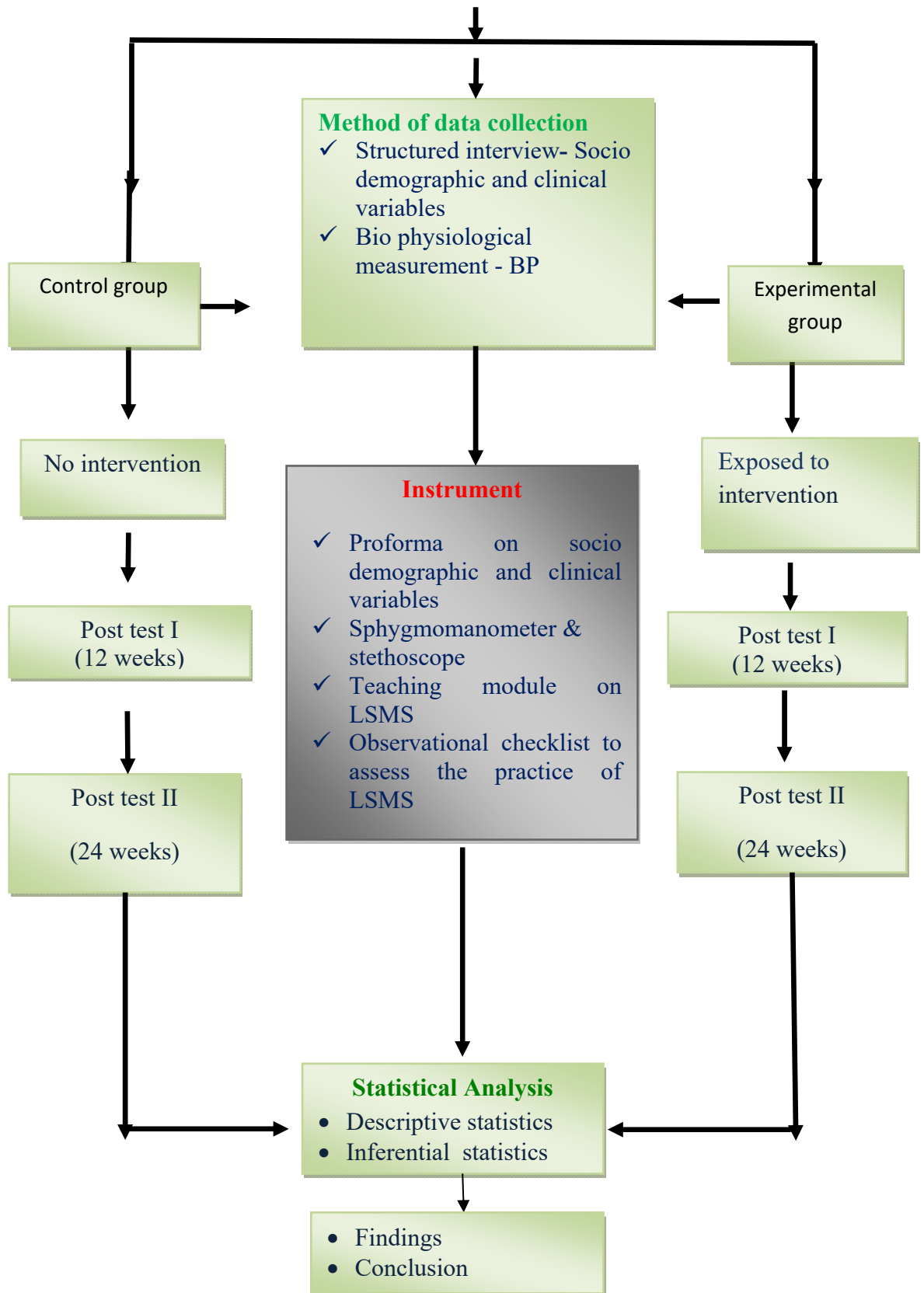


Fig-3.1 Schematic diagram of the research methodology

Continued



3.3. VARIABLES

Three variables have been **included in this study**.

Independent and Dependent variables

In the present study, the independent variable refers to Life Style Modification Strategies (LSMS) as a comprehensive intervention package, **while dependent variable refers to b blood pressure**.

Extraneous variables

The extraneous variables considered are: socio demographic and clinical variables comprising age, gender, education, occupation , income, dietary pattern, marital status, religion, type of family, history of smoking (past and present), history of alcoholism (past and present), family history of hypertension, the mode of diagnosis, treatment prescribed, body mass index (BMI) and waist hip ratio(WHR).

3.4. SETTINGS

The current study was carried out in two areas of villupuram district catered by Primary Health Centre. Villupuram is the largest (7011 sqkms.) district **in** Tamil Nadu State in India situated **not for from** the State capital (**160 Km**), Chennai. India has a population of 1.252 billion¹⁸⁹. The total population of the district as per 2011 census ¹⁹⁰ was 3458873 out of which 1740819 (50.3%) were men and 1718054 (49.7%) were women. The sex ratio is 987 women for every 1000 men.

The areas chosen for this study were two community areas, namely, Vazuthareddy and Vikkaravandi. These areas were chosen by the investigator, on the basis of the feasibility, accessibility, and cooperation of the participants and the concerned authorities. Selected settings were randomly assigned for control

(Vazuthareddy) and experimental (Vikkaravandi) groups through lottery method to prevent contamination. The distance between the two chosen urban areas was 20 km.

Vazhudareddy is one among the 42 wards catered to by urban primary health center Villupuram covering the population of 96253 dwelling in 8.36SqKM. Vazuthareddy comprises 2650 population in about 800 families. The investigator had chosen 14 streets for purpose of the study and found 165 cases for investigation.

A block primary health center is located at Vikkiravandi , covering the population of 30250 catering 79 villages serving a radius of 6.8 Sq KM. Vikkiravandi itself has a population of 5000 in about 2000 families. The investigator had chosen 14 streets and found 210 eligible samples. V.Salai and Panayapuram of Villupuram for the intervention and the control groups respectively were venues for the pilot study.

3.5. POPULATION

Target population

The newly diagnosed hypertensive patients were the target population for this study.

Accessible population

In this study, accessible population refers to those patients newly diagnosed **as having** hypertension within a period of the past 6 months and residing at Vikkiravandi and Vazuthareddy of Villupuram district.

3.6. SAMPLE

Samples for the study were patients who were newly diagnosed **as having** hypertension within the past six months by a registered medical practitioner with or

without prescription of drugs and **falling** between the age group of 31 and 60 years of both genders, and fulfilling the inclusion criteria.

3.7. SAMPLE SIZE AND SAMPLE SIZE CALCULATION

Based on the effectiveness of intervention established in an earlier study conducted by Mausumi¹⁹¹, the mean post test systolic BP was 144.1± 24. 6 and the diastolic BP was 79.9± 12.4 in the experimental group. The sample size of the current study was estimated on the basis of these findings. Sample size was calculated using the following formula.

$$= \left(\frac{Z\alpha \times s.d}{error} \right)^2 = \left(\frac{1.96 \times 12}{2} \right)^2 = 138$$

In the above formula, Z is the critical standard score = 1.96

SD = 12

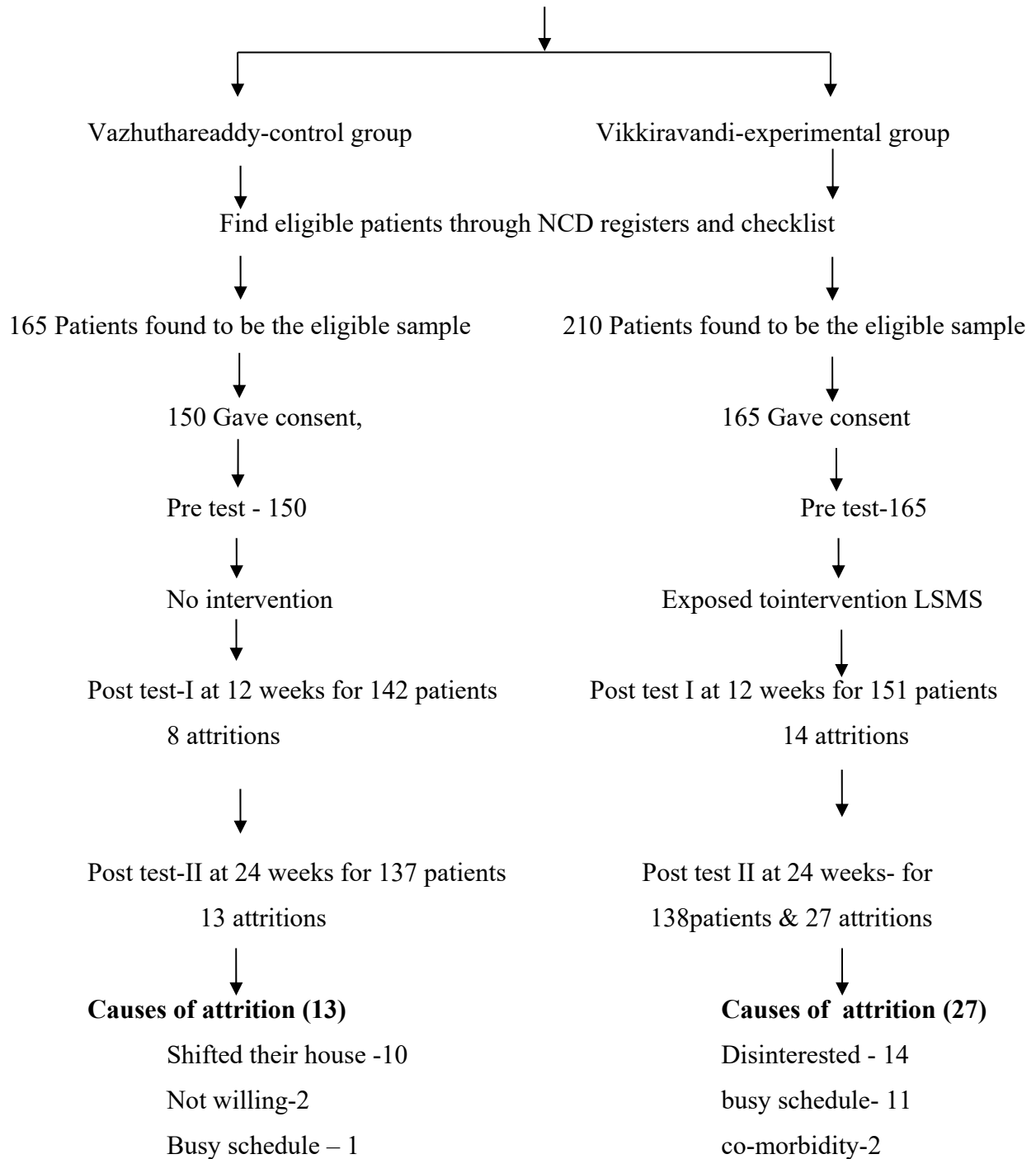
Margin of error = 2

In $\alpha = 0.05$ the sample size is 138 for 1 group.

If there are 2 groups, the required sample size is 138+138 =276

The sample size **of the present study** was 275. Considering the attrition, 10% of added sample were taken in the pretest. But finally in the post test 275 only arrived as depicted below.

PARTICIPANTS FLOW CHART



3.8. SAMPLING TECHNIQUE

The eligible patients who fulfilled the inclusion criteria were identified by the investigator and purposive sampling technique was adopted for it representing the population characteristics.

3.9. CRITERIA FOR SAMPLE SELECTION

Inclusion criteria:

Patient's characteristics;

- All new hypertensive patients diagnosed by a registered Medical officer within a period of the last 6 months.
- 31-60 years for both men and women.
- Ability to read and write in Tamil or English.
- Willing to participate.

Exclusion criteria

Patient's characteristics;

- Having secondary hypertension, or blood pressure <140/90 mm Hg at the time of screening
- Diagnosed with co morbidities like coronary artery disease, cerebro vascular accident, diabetes mellitus etc.
- Having altered sensory perception and major health problems such as having hard of hearing, breathing difficulty, pain while walking
- Known to practice yoga, any form of exercise and on Dietary Approaches to Stop Hypertension (DASH) diet.

3.10. DEVELOPMENT OF TOOL

Four tools were used for this study. All of them had been developed by the investigator with the help of expert opinion and review of relevant literature.

The following steps were adopted prior to the development of the tools.

- ✓ With the help of an extensive review from various sources that include reference books, journals, website, Medline search etc.
- ✓ The most suitable and appropriate tools for this present study **were** identified for use.
- ✓ **Incorporation of** personal experience of the investigator with the patients with hypertension.
- ✓ **Establishment of validity through** consultation and discussion with experts from medicine, nursing, research, biostatistics, yoga, nutrition and physiotherapy were done and modification and corrections were made accordingly.
- ✓ Preparation of the final draft and **presentation thereof.**

Development of the teaching module

The teaching module on LSMS had been developed by the **investigator on the basis of a review of the relevant literature** and guidance **from expert opinion.** This was oriented to suit to the newly diagnosed hypertensive patients and instructed to adopt it for 24 weeks.

The Steps involved in the construction of teaching module were as follows:

- Literature review.
- Formulation of objectives.
- The investigator has undergone training in brisk walking at Aathiparasakthi College of Physiotherapy Melmaruvathur, Kanchipuram district, Tamil

Nadu and Yoga at Athisivan Yoga & Nature Cure Kentra Villupuram district, Tamil Nadu. The certificate of training for DASH diet was obtained from Krishi Vingyan Kendra (KVK) Viruthachalam, Tamil Nadu.

- Preparation of the first draft of the teaching module.
- Development of criteria checklist for validation.
- Content validity of the teaching module
- Refining the draft of the teaching module.
- Finalizing the draft of the teaching module.

The first draft of the teaching module had been developed after a **thorough study** of the **relevant** literature from different sources and consulting experts. The content of the subject was made easy, simple, clear and comprehensive, keeping in view, the patient's capacity to comprehend information. The checklist of **criteria** consists of headings, such as objectives, content, and its organization, language, practicability, feasibility and any other suggestion. There were three response columns against each item in the plan namely relevant, needs modification and irrelevant. The evaluators were asked to judge the significance of each item and place a mark (✓) in the suitable column.

3.11. DESCRIPTION OF THE INSTRUMENTS

In this study, the tools comprised the following.

- ✓ Proforma on socio demographic and clinical variables
- ✓ Sphygmomanometer & stethoscope
- ✓ Teaching Module for LSMS
- ✓ Observational Checklist for assessment of practice of LSMS.

3.12. INTERPRETATION AND SCORING OF TOOLS

3.12.1 Tool I –Proforma on Socio demographic and clinical variables

There were 16 items in socio demographic and clinical data. These included age, gender, education, marital status, occupation, income, dietary pattern, religion, type of family, history of smoking past and present, history of alcoholism past and present, family history of hypertension, mode of diagnosis, treatment prescribed, BMI and WHR.

Administration

The data was collected using an interview schedule by the investigator. No score was allotted for this.

3.12.2 BP apparatus and stethoscope

BP was measured with the help of a standardized recently calibrated Diamond mercury BP apparatus and also Microtone stethoscope.

Administration

The investigator measured BP during pre test, post test I & II as per standard procedure. **(Refer annexure x and y).**

Scoring and interpretation

The measured BP was interpreted using a standard reference scale based on JNC7is as follows.

BP CLASSIFICATION	SBP (mmHg)	DBP(mmHg)
Normal	<120	and <80
Pre hypertension	120-139	Or 80-89
Stage 1 Hypertension	140-159	Or 90-99
Stage2Hypertension	≥160	Or >100

3.12.3 Tool III: Teaching Module on Lifestyle Modification Strategies

Orientation on teaching module on Life Style Modification Strategies (LSMS) was **provided** to the members of the experimental group face to face **at** their residence for an hour through lecture, demonstration and return demonstration. The A.V. aids used were power point, flex, real objects, standard nutritional cups and booklet.

The lecture components consisted of the following

- Definition of BP, normal BP and hypertension,
- Stages of hypertension
- Risk factors of hypertension
- Prevention and control
- Complications arising from uncontrolled and undiagnosed hypertension.

The demonstration components consisted of

- Brisk walking
- Yoga : a) Nadisuthi pranayama b) Shavasana
- DASH diet

An informational booklet on LSMS containing the above details and LSMS practice calendar (in Tamil) were distributed to the patients on the same day of intervention.

3.12.4.1 Brisk walking

This was demonstrated **on the basis of** pre structured steps **while** return demonstration was done by the patients in the presence of **the** investigator. Instructions were provided to participants on the criteria for their observation to be made by the investigator during biweekly visit for their adherence to LSMS. The patients were given guidelines to practice as below.

1. Stand erect and hold your head high.
2. Look forward; focus your eyes 5- 6 meters ahead, back straight, shoulders relaxed.
3. Bend elbow 90° with hands loosely clenched.
4. Lead with, and transfer your weight through heel.
5. Swing arms backwards and forwards without crossing **the** centre line. Move hands and legs in opposite direction.
6. Lean forward to balance better. Take smaller steps.

Practice for 30 minutes.

3.12.4.2 Yoga

There are components in yoga. They are: 1. Meditation, 2. Breathing exercise and 3. Asana. The second and third components of yoga were used for this study, namely, a breathing exercise called Nadisuthi pranayama and an asana called Savasana in which the researcher has theoretical and practical knowledge, having undergone training in yoga.

a) Nadisuthi pranayama

- Sit in sugasana over a mat or sheet. Let the muscles be relaxed. Let the spine be kept erect, head and then neck straight and eyes remain closed. You should be aware of your breathing.
- Hold nasikamuthra in the right hand throughout.
- Keep the left hand in gnanamuthra throughout.
- Keep the right thumb on **the** right nostril and the tip of the ring finger on the left nostril. Use the thumb and the ring finger of the right hand to close the right and left nostril respectively as you breathe in through the opposite nostril.
- Start the exercise by blocking your left nostril and breathing out through your right nostril. Continue to block your left nostril and breathe in through your right nostril.
- Open your left nostril **with simultaneous** cover and blocking your right nostril. Breathe out slowly using the open, left nostril. Once this is done go ahead and breathe in with your left nostril that is open.
- Close the left nostril and allow the air move out through your right nostril which you now leave open. This is considered as one cycle. Let the breathing be slow and rhythmic.
- Continue breathing the same way by opening and closing left and right nostrils and complete 20 cycles.

(b) Savasana

Participants were given instructions by the researcher to practice shavasana in the following manner:

- Lie on your back without any pillow. Have your legs straight and comfortably apart. Your feet should be dropped open and be relaxed. Rest your arms at your sides and your palms facing up. Close your eyes.
- Have a deep and slow breath through the nostrils.
- Allow your body to feel heavy on the ground. The entire body to be relaxed.
- Work starting from soles of your feet going up the crown of your head; deliberately contract and release every body part, organ, and cell. Consciously imagine that the organ or the body part which you consciously look into is healthy and relaxed.
- On each inhaling, keep your mind peaceful. Let your tension, stress, depression and worry exit from the body.
- Calm down your face and allow eyes drop deep into their sockets.
- Stay in Savasana for 10 minutes. Exit the pose. Start with beginning with a deep breath bringing a gentle movement and awareness back to your body. Wiggle your fingers and toes. Turn to your right side and rest there for a moment. With an inhalation, gently press yourself.

3.12.4. 3 DASH diet

Details of the DASH diet based on a 2000 calorie plan were conveyed to patients through lecture, demonstration and return demonstration. These are:

Table 3.1 DASH diet

Food groups	Daily servings	Quantity(g/day) /ml/day	One serving size
Grains and grain products	7-8	210- 240	whole-wheat bread 1 slice, dry cereal 1 cup, cooked rice ½ cup.
Vegetables	4-5	400-500	1 cup raw leafy vegetables, ½ cup cooked vegetables,

Fruits	4-5	400-500	1 medium fruit
Fat-free or low-fat milk and milk products	2-3	500-750	250 ml milk or 1 cup yogurt
Lean meat, poultry, and fish	2 or less	<100g	cooked lean meat ½ cup, poultry(skin peeled off), or fish; pulses 1 small bowl
Nuts seeds and legumes	4-5/week	30-35g/day 200-250g/week	1 small cup of legumes, 2 - 3 times a day
Fat and oils	2-3	10-15 ml	1 teaspoon vegetable oil
Sugar	5 or less per week	11 gram	1 table spoon sugar
Salt	5grams/day	5grams/day	1 teaspoon/day is adjusted throughout the day

3.12.5 Tool IV: Observational Checklist to assess the practice of life style modification strategies

The checklist for observation consisted of three components with 30 itemson lifestyle modification strategies as below. The 30 items were scaled against 12 columns based on biweekly observations.

S. No	Components	Item No	No of items	Score
1	Brisk walking	1-7	7	7
2	Yoga	8- 22	15	15
3	DASH diet	24-30	8	8
Total	3	30	30	30

Administration

The patients were provided instructions to practice LSMS lasting 24 weeks. For the practice of each item (criteria), a score of one was given, **while it was zero** for non practice. The minimum score was 1 and the maximum score was 30 for a

single observation. There were 12 observations so the minimum score was 12 and the maximum score was 360 for the 12 observations made during the period of 24 weeks by the investigator during the study. It was assessed during biweekly visit paid to the participants' houses to observe practice of brisk walking and yoga and to verify their cooking method, quantity and quality of food intake and to record their BP. Based on the overall score obtained , the level of practice was determined as follows.

The level of practice is graded as follows:

	Level of practice	Score range	Percentage (%)
1.	Inadequate practice	<180	<50
2.	Moderate practice	≥ 180 to 269	≥50-74
3	Adequate practice	270 to 360	≥75-100

3.13. RELIABILITY OF THE TOOLS /INSTRUMENTS

Reliability of BP apparatus was determined by measuring BP of 30 patients by two judges separately and inter rater reliability was determined using Cronbach's Alpha method with r value of 0.88 and seen reliable. The reliability of observational checklist was established by test retest method and the r value was 0.90 which is reliable.

3.14. VALIDITY OF THE TOOL/ INSTRUMENT

The tools were developed by the investigator by self. The proposal including operational definition, blue print and criteria check list were provided to experts who were requested to give their expert opinion on the precision, relevance and **appropriateness** of the content. There were three response columns against each item in the questionnaire, namely, relevant, needs modification and irrelevant. The

evaluators were asked to put \surd mark against **each** above mentioned column **as found relevant**. Validated tools were received from 17 experts in the field of nursing, medicine, education, research, bio statistics, nutrition, physiotherapy and yoga with their valuable opinion. Modification was done on the basis of their recommendations, while the suggested tool was approved by experts prior to data collection.

For content validity of the teaching module on LSMS, opinions and suggestions were obtained from 17 experts based on the blue print, objectives of the study and evaluation criteria checklist. Suggestions from them were incorporated and modifications were done in the wording of a few items, after which the final draft of the teaching module was prepared. Based on the expert's agreements over each item, the LSMS was evaluated for its appropriateness and relevance of the content. The content validity index score which was 0.76 showed good content validity of the tool. The content validity was obtained for the translated Tamil tools by translating the tool from English to Tamil and reverse translation done in English for preventing any semantic error. The certificates were obtained for the same.

The investigator had completed a diploma program in Yoga, had training in brisk walking as well as in DASH diet and obtained certificates for the same before applying it to the patients.

3.15. THE PILOT STUDY

A Pilot study was conducted among 28 (14 each from control and experimental groups) newly diagnosed hypertensive patients at Panayapuram and V.Salai of Villupuram district respectively.

The paired 't' and unpaired 't' value revealed the effectiveness of the intervention at the level of $P < 0.05$. The mean difference was 17.405 and 9.714 mmHg in Systolic BP and Diastolic BP respectively in the experimental group between pre and post test II. The tool was found to be feasible for conducting the core study. The samples of the pilot study were excluded from the main study.

Modification

- Milk and milk products were excluded from the DASH diet since none of them **was** found to exceed the recommended intake.
- A few variables were reduced. i.e. detailed information (quantity, frequency) on habit of smoking and alcohol.

3.16. DATA COLLECTION PROCEDURE

Table 3.3 ACTIVITY CHART

Period	ACTIVITIES PERFORMED	
	CONTROL GROUP	EXPERIMENTAL GROUP
I week	Pretest was conducted	<ul style="list-style-type: none"> • Pretest was conducted • Introduced LSMS
II WEEK WEEK TO XI WEEK (Follow up)	No follow up	<ul style="list-style-type: none"> • Reinforced LSMS • Blood pressure was quantified and recorded on biweekly basis by the investigator.
XII WEEK (Post test I)	The Blood Pressure, was assessed by the investigator.	Blood Pressure was assessed by the investigator.
XIII WEEK TO XXIII WEEK	No Follow up ---	<ul style="list-style-type: none"> • Reinforced LSMS • Blood pressure was assessed and recorded on biweekly basis by the investigator
XXIV WEEK (Post test II)	<ul style="list-style-type: none"> • Blood Pressure was assessed by the investigator. • At the end of post test II, LSMS was administered by the investigator. 	<ul style="list-style-type: none"> • Blood Pressure was assessed by the investigator

The ethical committee clearance was obtained at CSI JACON Madurai for conducting the study. The duration of data collection was one year (January 2014 to December 2014). It was conducted on all days of the week from 9.00AM to 6.00 PM

for the conduct of pretest and introduction of intervention. The biweekly observation for the practice of LSMS was conducted between 6 AM and 6 PM on all days of the week followed by a pretest.

Data collection was done in five phases.

- Phase I screening and case identification of patients
- Phase II pretest
- Phase III Introduce LSMS,
- Phase IV Post test I at 12 weeks,
- Phase V Post test II at 24 weeks

The data was collected in five phases.

Phase I: Identification of the patients

- The NCD registers were verified. A list of patients and their addresses enrolled within 6 months were selected with the permission of the medical officers of the respective PHCs.
- Permission was obtained from the councilor of Vazhudareddy and chairman of Vikkiravandi municipality for the screening and examination of the control and the experimental groups respectively.
- After reaching the residences of chosen patients, their eligibility for being the study samples was assessed using the checklist for screening the hypertensive patients. Those who scored 17 based on the checklist as samples. The procedure was same for both vazhudureddy & vikkiravandi for control & experimental group respectively.
- The patients in the control group were divided into 8 groups according to proximity of their locality to ensure feasibility in the conduct of post test.

- In the same manner, the experimental group patients were divided into 16 groups in accordance with their physical closeness of their houses to enable monitoring of their practice the conduct of post test.

Phase II: Pre test

- Explanation was provided to eligible participants, as also the significance of LSMS. The purpose was winning the confidence of the patients. Voluntary written consent was obtained from them.
- „Socio demographic and clinical variables were collected through the use of interview schedule and BP was measured. The process was same for both the groups.
- There were 165 patients in the experimental group and 150 patients in the control group during pretest.

Phase III: Introduction of LSMS

- ❖ Following pre test, face to face explanation was given for each patient on hypertension, brisk walking, yoga and DASH diet using the teaching module relating to LSMS through lecture, demonstration and return demonstration, power point, booklet, flex, and real objects like nutritional cups and spoons.
- ❖ In the case of patients who were not used to cooking by themselves, a cooking member of the family was included while teaching DASH diet for the preparation and serving of DASH diet. The equivalent measure of standard nutritional cups available in their house was used for helping them to maintain a consistent measure for them. The patient's doubts were clarified. The investigator ensured that, the patient had good knowledge of the right technique at the end of the

session. Each patient was given a booklet on LSMS. 15 minutes were required for teaching and 45 minutes for demonstration and return demonstration. In other words, administration of LSMS was gone through in one hour.

- ❖ LSMS was imparted on day one and, from day two onwards for **next** consecutive 6 days, patients were closely monitored and made to practice brisk walking, yoga and had a meal under the guidance of **the** investigator. During this period, the investigator used the observational checklist **consisting** of three components with 30 items on brisk walking, yoga and DASH diet to **ensure** the **meticulous following of the** steps of procedure. The patients were made aware of the same. They were reinforced to learn the right technique and no scoring was allotted during first week.
- ❖ There were biweekly visits to the participants' houses for monitoring the practice of LSMS and record their BP. Use of observational checklist by the investigator, score was allotted to the practice of brisk walking, yoga and DASH diet. During each visit, they were reinforced to practice the LSMS and their doubts regarding their cooking method, quantity and quality of food intake etc., were clarified.
- ❖ The experimental group alone was exposed to intervention while the control group was not. The experimental group followed the intervention for 24 weeks irrespective of the time they started to follow.

Phase IV: Post test I

- The BP was measured during 12 weeks by the investigator for both the groups.
- There were 141 samples of experimental group & 142 samples of control group available to get post test I conducted.

- 14 and 8 patients from the experimental and control group were excluded respectively during post test I.
- **Phase V: Post test II**
- ❖ The BP was measured by the investigator at 24th week both for both groups. **Non compliant participants** were removed from the study. There were 138 samples in the experimental group and 137 samples in the control group available for post test II. Analysis was done of the data pertaining to persons in the experimental group available for post test II. BP was measured on a fortnightly basis for the experimental group. But the measure of 12th and 24th weeks was taken for analysis. There were 13 attritions in the control group and LSMS was administered to all the patients of control group following the post test II at 24 weeks.

Table 3.4 Data Collection Schedule

S. No	Pre test date	Date of introducing LSMS	Type of group	No of samples	Post test -1	Post test -2
1	01-01-2014 to 28-02-2014	-	Control	137	01-06-2014 to 31-07-2014	1-09-2014 to 31-10-2014
2	01-03-2014 to 30-06-2014	01-03-2014 to 30-06-2014	Experimental	138	1.08-2014 to 31-10-2014	01-11-2014 to 31-12-2014

3.17. PLAN FOR DATA ANALYSIS

The plan of analysis is given below.

Table 3.5 Plan for data analysis

Method	Type of statistics	Purpose
Descriptive Statistics	Frequency, percentage, mean, standard deviation	Assess the socio demographic clinical data and bio physiological parameters
Inferential Statistics	Paired 't' test	Compare the level of BP before and after the intervention within the groups.
	Independent 't' test	Compare the BP before and after the LSMS between the control and experimental group.
	RMANOVA	Identify the differences in BP within the experimental group among pretest, post test I and II.
	Chi square	Find out the association between socio demographic variables and BP.

3.18. ETHICAL CONSIDERATION

The right to self determination:

- The Research proposal was approved by the screening committee of The Tamil Nadu Dr.M.G.R. Medical University, Chennai, Tamil Nadu.
- Institutional Ethical Committee clearance was obtained from CSI JeyarajAnnapakkiyam College of Nursing Madurai.

- Prior permission was **obtained** from **the** concerned authorities of the respective study areas before commencing the study namely, Chairman and Councilor of Vikkiravandi and Vazhudareddy of Villupuram district respectively.
- Written consent was obtained from the participants and **assurance** of confidentiality of their responses was **provided**.

The right to freedom from harm

- Though this study is an intervention design, the interventions used were non-invasive.
- A teaching program with demonstration was administered to patients. They have return demonstrated the LSMS in the **presence of** the investigator, before letting them to practice the LSMS.
- **Participants in** the control group were administered LSMS after the post test II and the effectiveness was not measured.

The right to full disclosure

Patients were advised about the voluntary nature of the study and were given the freedom to withdraw from the study at any stage without being subjected to any penalty.

The right to privacy

- Participants were informed that, the collected information was stored in the computer disc for final analysis and would be shredded after completion of the study.
- Privacy was maintained throughout the study.

CHAPTER – IV

RESULTS AND ANALYSIS

This chapter deals with the analysis and interpretation of data collected from 275 patients residing at Vikkiravandi and Vazhudareddy of Villupuram district, Tamil Nadu. Assessment of the effectiveness of the strategies of life style modification **inbringing down** blood pressure among newly diagnosed hypertensive patients was the subject matter of this research work.

The data were analyzed using **the** IBM SPSS version 20 as per schedule given below.

Objective I was analyzed as follows.

- Socio demographic and clinical variables and BP were analyzed in terms of frequency and percentage.
- Analysis of pretest and posttest I and II blood pressure level, was done using mean and standard deviation.

The objective II was measured as follows.

- Paired‘t’ test was used **for finding** the difference in mean BP before and after LSMS between experimental and control groups.
- Independent‘t’ test was used to find the difference in mean value of BP before and after LSMS within the experimental and control groups.
- Repeated measures ANOVA was used to find out intra and inter group pre and post test I and II blood pressure, in both the experimental and control groups.

Assessment of the third objective was done as under.

- Analysis of the association between blood pressure levels with socio demographic clinical variables done using chi square.

The findings were organized and presented under the following sections.

Section-I:

- Distribution of samples based on their BP in their pre test.
- Distribution of samples based on their systolic and diastolic BP in pre test, post test I & II.
- Distribution of samples based on their BP observed in pre test, post test I & II.

Section II

- Mean and standard deviation of observations in pre and post test systolic BP among the experimental and the control groups
- Mean and standard deviation of pre and post test diastolic BP among experimental and control groups
- Comparison of mean difference of post test II systolic and diastolic BP between the experimental and control groups.
- Difference between the mean BP in the pre test and post test II among the experimental and control group of the newly diagnosed hypertensive patients.
- Comparison of pre test and post test II systolic and diastolic BP among the experimental group.
- Comparison of post test II systolic and diastolic BP between the control and experimental groups.
- Independent 't' test for mean systolic BP in posttest I and II based on level of overall compliance to LSMS among experimental group.

- Independent 't' test for mean diastolic BP in post test I and II on level of compliance to LSMS among experimental group.
- Independent 't' test for mean systolic BP in post test I and II on level of compliance to brisk walking among experimental group.
- Independent 't' test for mean posttest diastolic BP in post test I and II on level of compliance of brisk walking among experimental group.
- Independent 't' test for mean systolic BP in post test I and II on level of compliance to yoga among experimental group.
- Independent 't' test for mean diastolic BP in post test I and II on level of compliance to yoga among experimental group.
- Independent 't' test for mean systolic BP in post test I and II on level of compliance to DASH diet among experimental group.
- Independent 't' test for mean diastolic BP in post test I and II on level of compliance to DASH diet among experimental group.

Section III

- Association between the pre test level of systolic BP in the experimental group and the selected socio demographic variables of newly diagnosed hypertensive patients.
- Association between the pre test level of systolic BP in the control group and the selected socio demographic variables of newly diagnosed hypertensive patients.
- Association between the pretest II level of diastolic BP in the experimental group and the selected socio demographic variables of newly diagnosed hypertensive patients.

- Association between the pretest level of diastolic BP in the control group and the selected socio demographic variables of newly diagnosed hypertensive patients
- Association between the post test II level of BP in the experimental group and the BMI of newly diagnosed hypertensive patients.
- Association between the posttest II level of BP in the experimental group and WHR of the newly diagnosed hypertensive patient.

SECTION-I: DISTRIBUTION OF PATIENTS BASED ON THEIR SOCIO DEMOGRAPHIC AND CLINICAL VARIABLES.

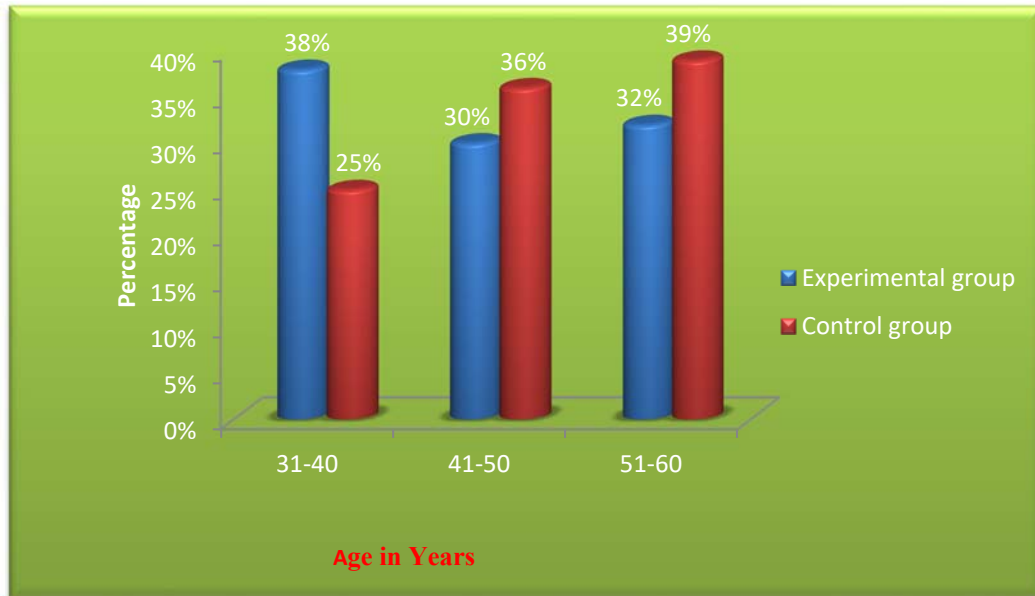


Fig: 4.1.1 Percentage distribution of the experimental and control group based on age

Fig: 4.1.1 Shows the frequency and percentage distribution in the experimental and control groups on the basis of on age. It shows that, in experimental group, more than one third 52 (38 %) were in the 31-40 group, whereas 54(39%) in the control group were between 51 and 60. The mean ages of the participants in the control and the experimental groups were 49.54 and 46.20 years respectively.

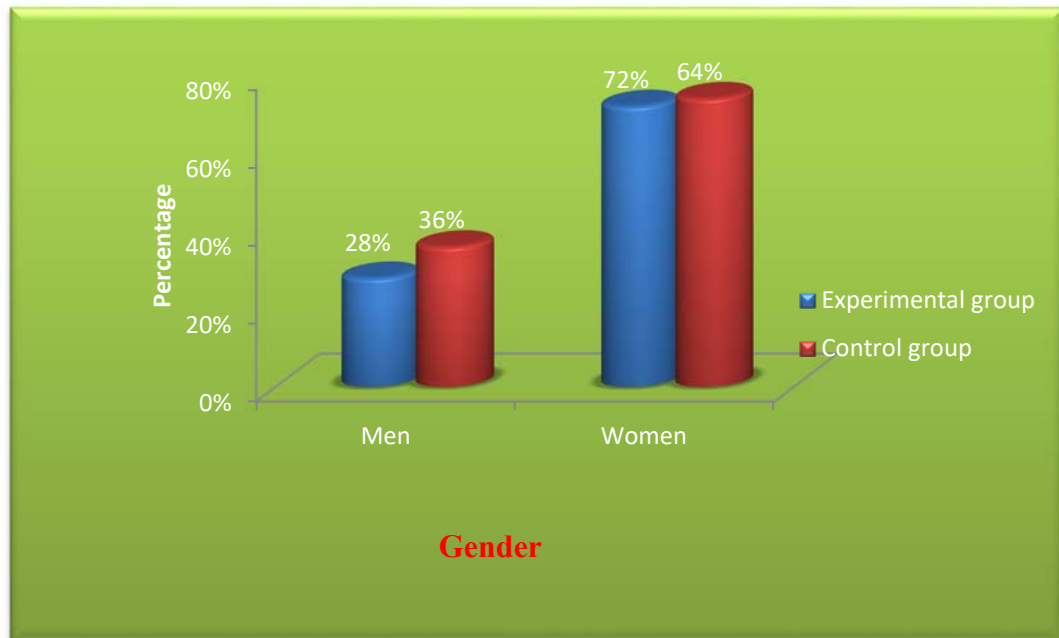


Fig: 4.1.2 Percentage distribution of the experimental and control group based on gender

Fig: 4.1.2 depicts the frequency and percentage distribution of the experimental and the control groups based on gender. In both the groups women (72%), 87(64%) outweighed men in the experimental and the control groups respectively.

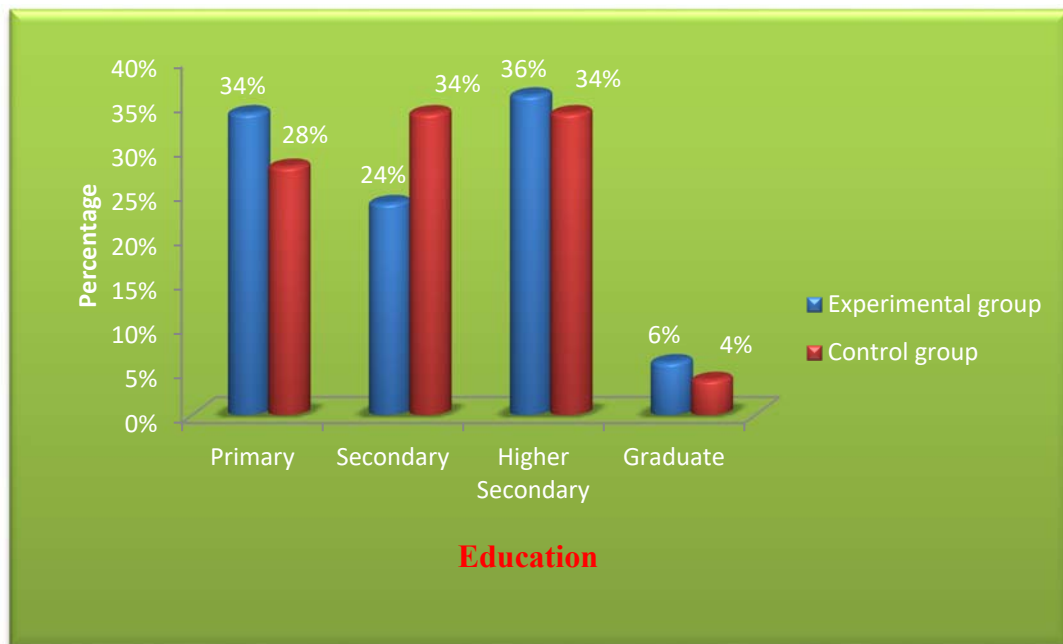


Fig: 4.1.3 - Percentage distributions of the experimental and Control group based on education

4.1.3 Shows the percentage distribution of the experimental and control groups on the basis of education. 47 (34%) had education up to the primary school stage and 49 (36%) had education leading up to higher secondary school level. They were equal in number in the experimental group, where as in the control group the level of education was nearly equal in terms of primary 39 (28%), secondary 46 (34%) and Higher secondary 46 (34%).

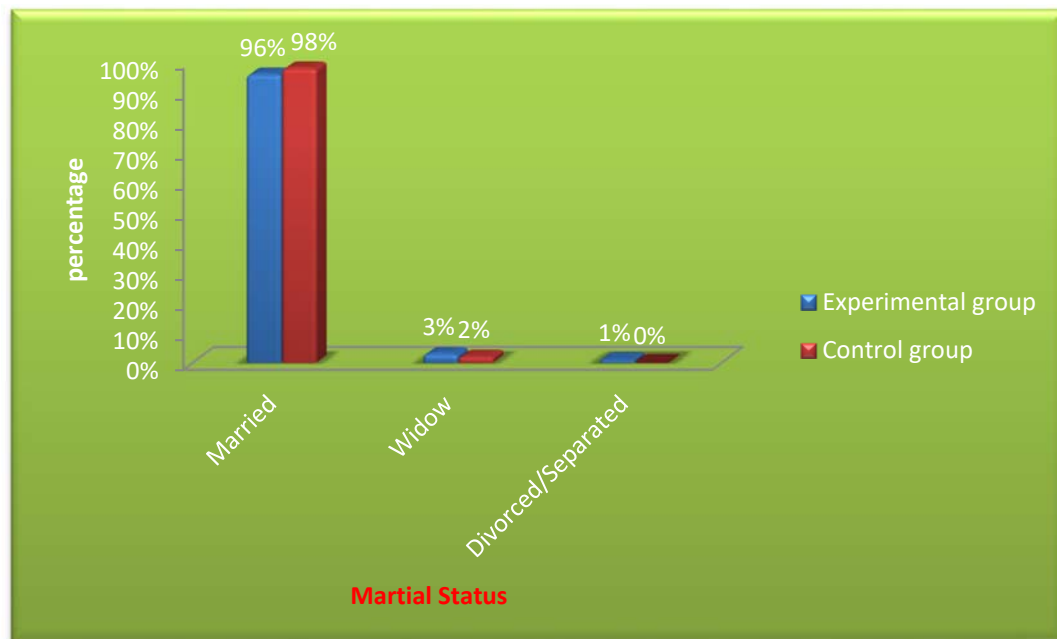


Fig: 4.1.4 - Percentage distributions of the experimental and control group according to marital Status

4.1.4 displays percentage of distribution in the experimental and control group on the basis of marital status. Most of the members in both the groups were married 133(96%) and 134 (98%) for the experimental and the control groups.



Fig: 4.1.5 Percentage distributions of Experimental group and control group according to occupation.

4.1.5 depicts percentage of distribution in the experimental and control group on the basis of occupation. Homemakers 61 (44%) and laborers 52(38%), formed the majority in the experimental groups. Figure for the control group were 65 (47%) and 44 (32%) as laborers and home makers respectively.

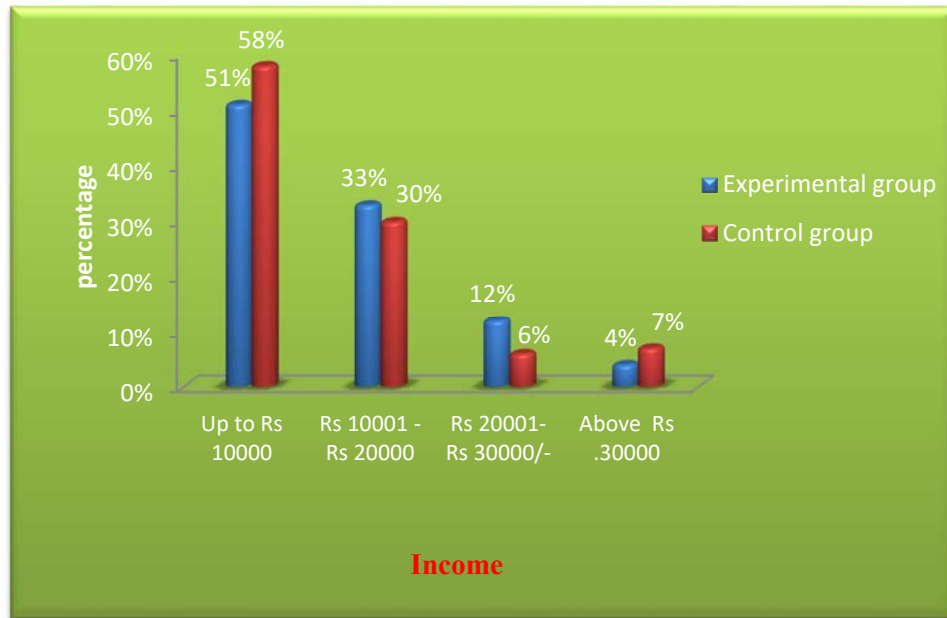


Fig: 4.1.6 Percentage distributions of experimental group and control group according to income

4.1.6 Shows percentage of distribution in the experimental and control groups on the basis of income. About 50% of the income toss had monthly income less than Rs.10,000 (70-51%). It was 79(58%) for the control groups.

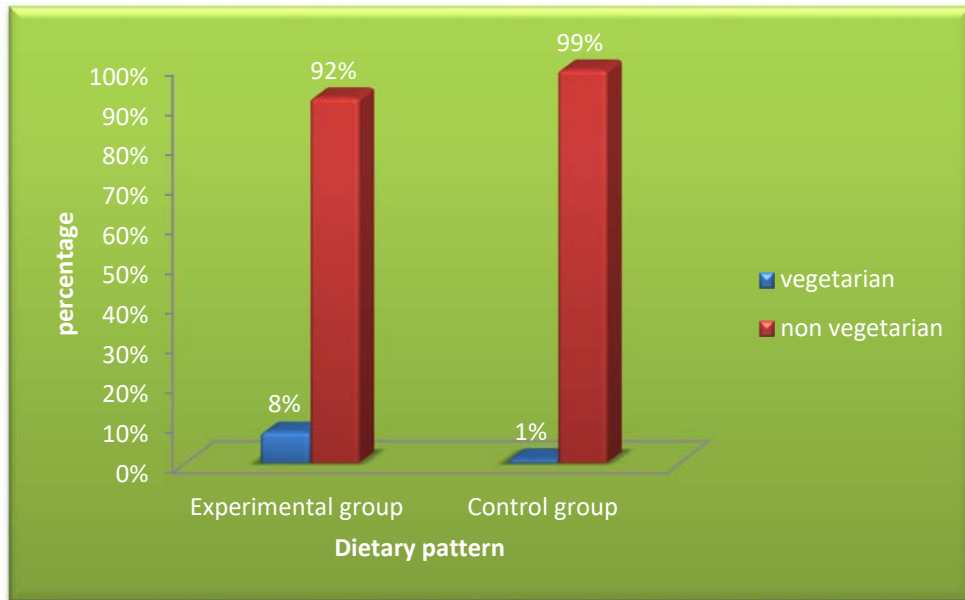


Fig: 4.1.7 Percentage distributions of experimental group and control group according to dietary pattern.

4.1.7 depicts percentage distribution in the experimental and control group based on dietary Pattern. Non vegetarians were more than vegetarians in both the groups 127(92%) and 135(99%) patients in the experimental and the control groups respectively.

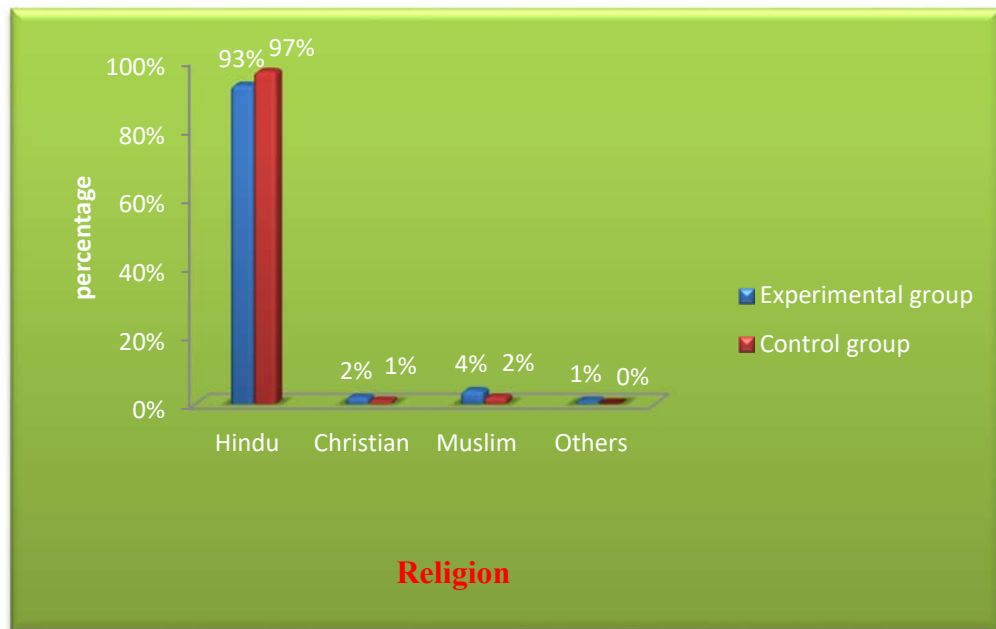


Fig: 4.1.8 Distribution (Percentage wise) in experimental group and control group on the basis of religion

Fig4.1.8depicts the percentage distribution in respect of the experimental and the control groups on basis of religion. Hindus were predominant in both groups. Figures were 128 (93%) or 132 (97%) in the experimental and control groups respectively.

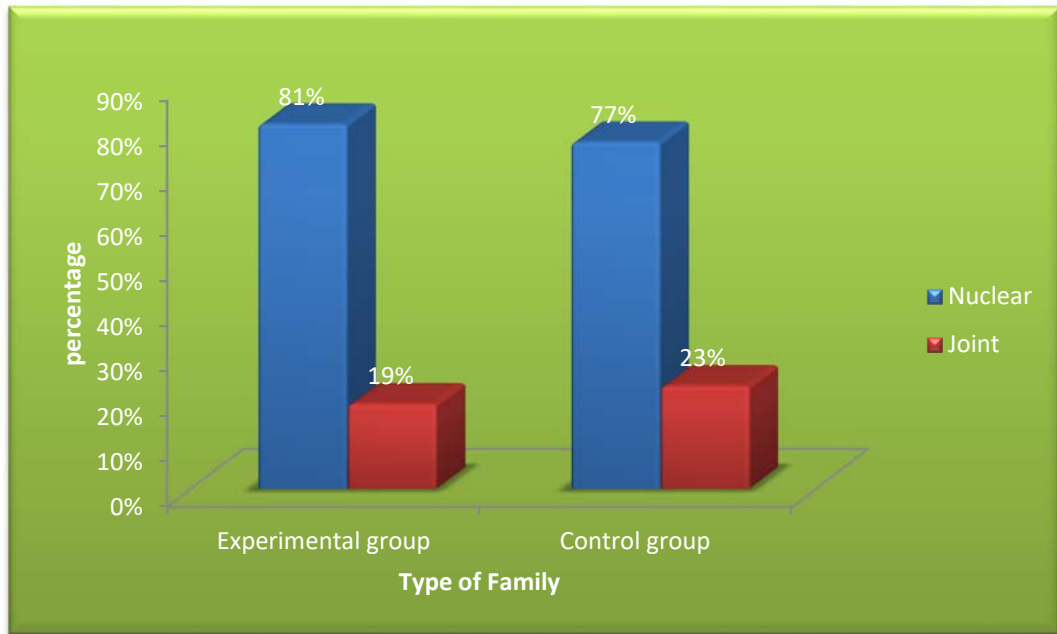


Fig: 4.1.9 Distributions (Percentage wise) in experimental group and control group on the basis of the type of family.

4.1.9 demonstrates the percentage distribution of the experimental and control group based on type of family. 112(81%) of patients in the experimental group and 105(77%) of control group lived in nuclear families.

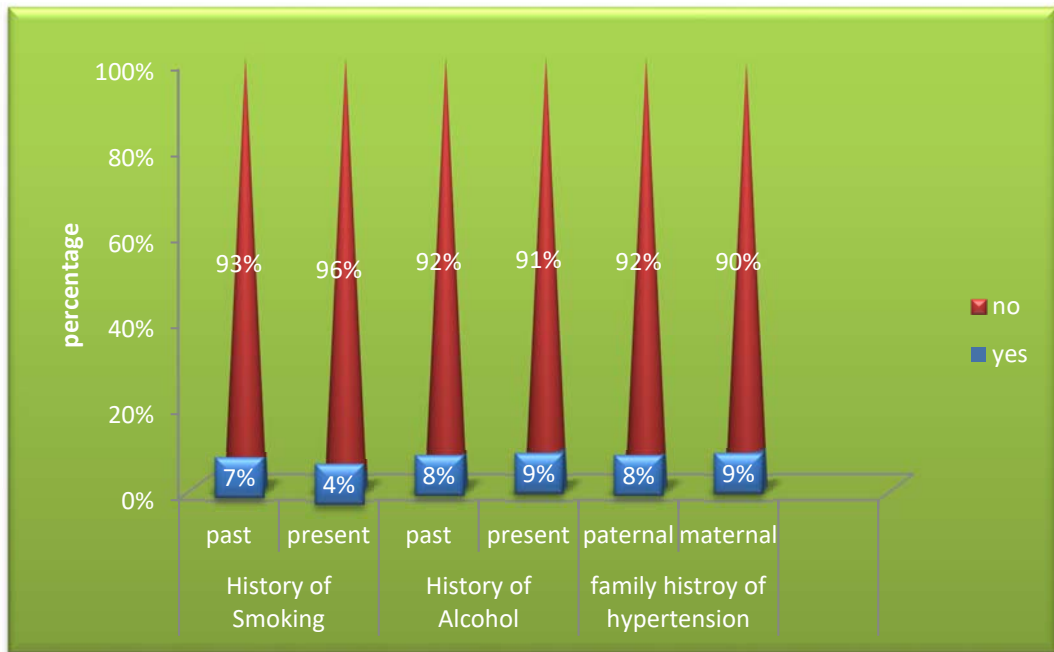


Fig: 4.1.10 Distribution of persons in the groups on the basis of history of smoking, use of alcohol and family history of hypertension among experimental group.

Figure 4.1.10 explains the percentage distribution of the experimental group on the basis of history of smoking, use of alcohol and family history of hypertension. Majority of them had no history of smoking in the past (93%) and present (96%). Similarly most of them had no history of alcoholism in the past (92%) and present (91%). With respect to family history of hypertension, 92% and 90% had no history of paternal and maternal hypertension respectively.

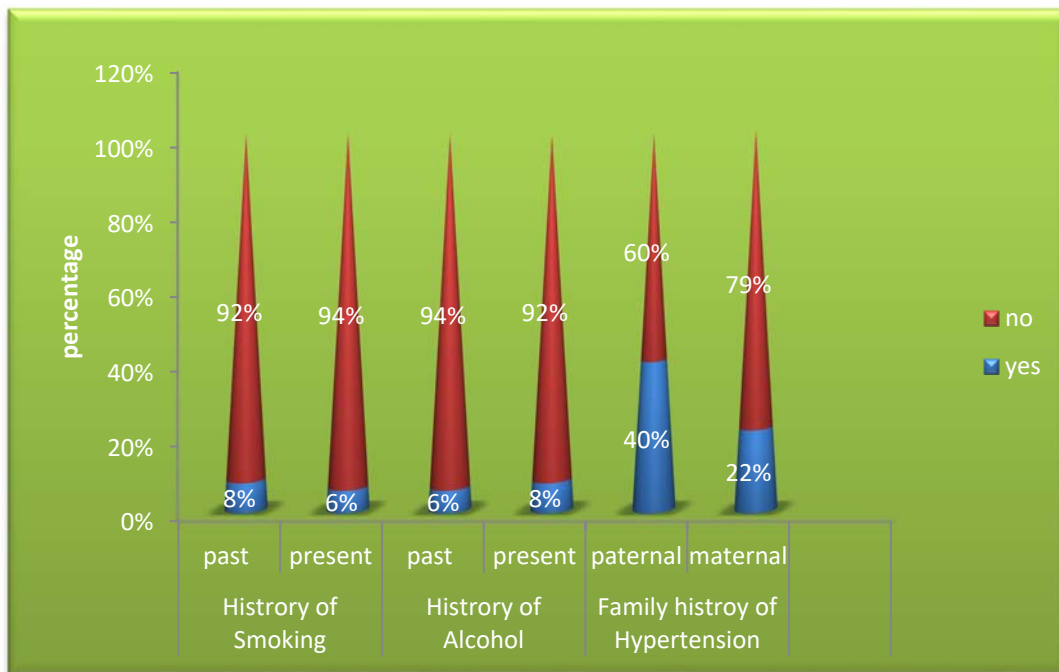


Fig: 4.1.11 Distribution on the basis of the smoking, alcoholism and family history of hypertension among control group.

Fig4.1.11 illustrates the distribution by way of percentage for the control group on the basis of history of smoking, alcohol use and family history of hypertension. With respect to history of smoking, 92% and 94% respectively had given the answer “no” for past and present. Likewise, the figures were 94% and 92% respectively for no history of alcoholism in the past and present. Among them 60% and 79% had no history of paternal and maternal hypertension.

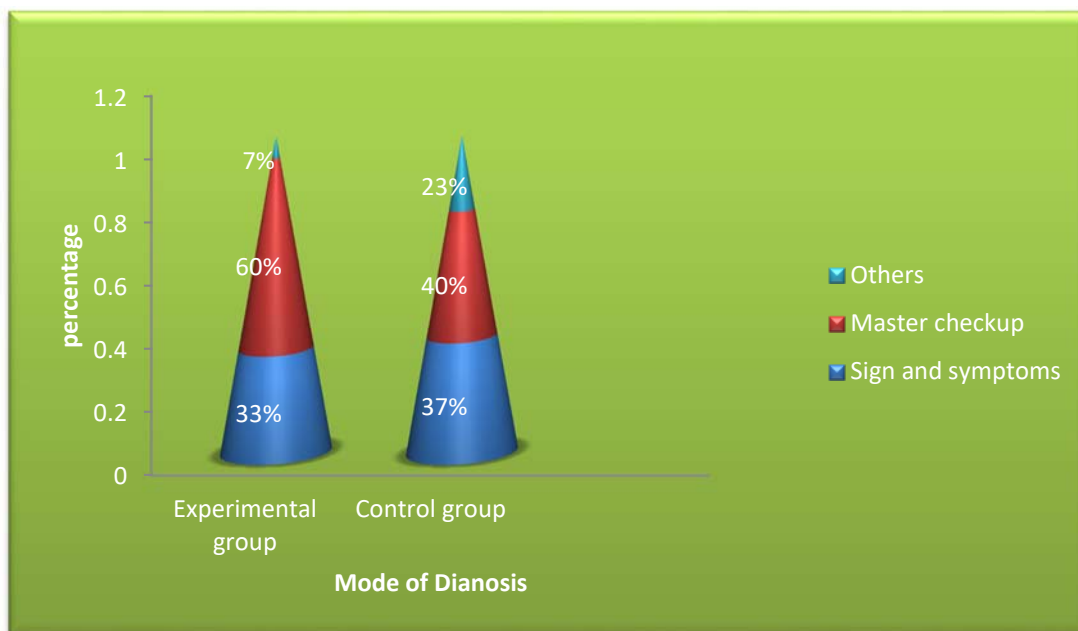


Fig: 4.1.12 Comparison of mode of diagnosis for experimental group and control groups.

4.1.12 shows the distribution by way of percentage among the participants in the experimental and the control groups on the basis of mode of diagnosis. In the case of mode of diagnosis, 46(33%) patients in experimental group and 52(37%) patients in the control group had a diagnosis of hypertension through signs and symptoms while 82(60%) and 55(40%) in the experimental and the control groups respectively got diagnosed through a master health check up.

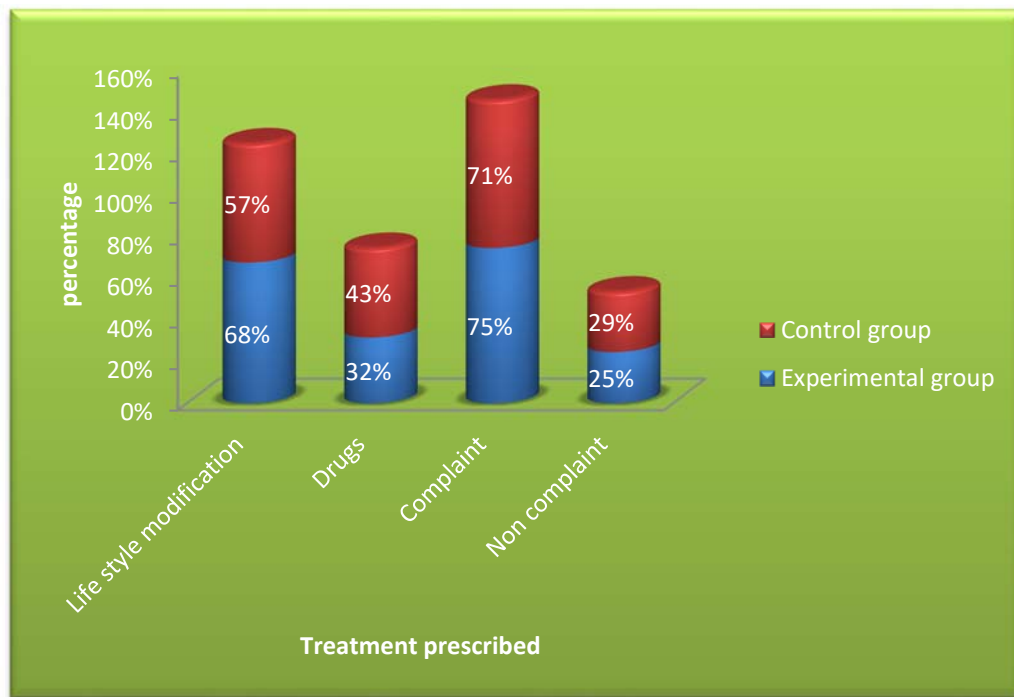


Fig: 4.1.13 Comparison of treatment prescribed for the experimental group and the control group.

4.1.13 provides details of percentage distribution in the experimental and control groups on the basis of the treatment prescribed for the experimental group and the control groups. A majority 94(68%) in the experimental group had prescription of life style modification against 78 (57%) in the control group. The number of patients who were provided prescription of drugs were 44(32%) and 59(43) patients in experimental and control group respectively. Regarding regularity of taking drugs 33 (75%) in the experimental group and 42(71%) in the control group showed compliance to drug to the utmost extent.

TABLE 4.1.1**Distribution of samples based on their BP in the pre test****N=275**

Bio physiological parameters in pre test	Classification/ Range	Experimental group n=138		Control group n=137	
		F	%	f	%
Systolic Bp	<140	2	2	45	33
	140 – 159	119	86	66	48
	160 and above	17	12	26	19
Diastolic Bp	<90	24	17	35	26
	90 – 99	80	58	88	64
	100 and above	34	25	14	10

Table 4.1.1 reveals the distribution of samples on the basis of their BP seen in the pre test, .A majority viz 119(86%) patients in the experimental, 66 (48%) patients in the control group had BP between 140 and 159mmHg. The diastolic BP was between 90-99 mmHg for most 80(58%) of the patients in experimental group and 88(64%) patients in the control group.

In the pretest, none had diastolic BP <90 in both the groups. Predominantly, the diastolic BP was 90-99 mmHg holding 121 (88%) and 132 (96%) patients respectively in the experimental and the control groups.

TABLE 4.1.2

Distribution of samples based on the systolic and diastolic BP in pre test, post test I & II.

N=275

Duration of BP	Range	Group			
		Experimental group n=138		Control group n=137	
		f	%	f	%
Pre test systolic	<140	2	2	45	33
	140 – 159	119	86	66	48
	160 and above	17	12	26	19
Post test I systolic	<140	72	52	60	44
	140 – 159	57	41	56	41
	160 and above	9	7	21	15
Post test II systolic	<140	135	98	75	55
	140 – 159	3	2	43	31
	160 and above	0	0	19	14
Pre test diastolic	<90	24	17	35	26
	90 – 99	80	58	88	64
	100 and above	34	25	14	10
Post test I diastolic	<90	90	65	55	40
	90 – 99	45	33	65	48
	100 and above	3	2	17	12
Post test II diastolic	<90	125	91	67	49
	90 – 99	13	9	55	40
	100 and above	0	0.00	15	11

Table-4.1.2 shows the level of hypertension among samples based on their systolic and diastolic BP in pre test, post test I & II in the experimental and the control groups.

With regard to the systolic BP in the pre test, a majority viz 119(86%) patients in the experimental groups, 66 (48%) patients in the control group had BP between 140 and 159 mmHg. The diastolic BP was between 90-99 mmHg for most 80(58%) of the patients in experimental group and 88(64%) patients in the control group.

Regarding systolic BP in the post test I, a majority 72(52%) patients in the experimental group had achieved the targeted BP, but in the control group, the figure was only 60 (44%). While discussing the diastolic BP in the post test I, most of them 90 (65%) in the experimental group had target BP < 90 mmHg. But, in the control group, most of them 65 (48%) had diastolic Bp above 90 mm Hg

In the post test IIs, 135(98%) patients in the experimental group and 75 (55%) patients in the control group had systolic BP < 140 mmHg. In the post test II, 125(91%) patients in the experimental group had achieved the target diastolic BP, whereas in the control group only 67(49%) patients had targeted diastolic BP.

The inference is that during pre test, none was found to have normal BP in both the groups. But, in the post test, the experimental group showed a marked reduction in BP especially in post test II compared to in post test I. But in control group there is no such reduction found between the posttest I and II.

TABLE 4.1.3**Distribution of samples based on their BP in pre test, post test I & II****N=275**

BP (mm/Hg)	Experimental group n=138				Control group n=137			
	<140/90		≥140/90		<140/90		≥140/90	
	f	%	f	%	f	%	f	%
Pre test	0	0	138	100	0	0	137	100
Post test I	85	62	53	38	31	22	108	78
Post test II	124	90	14	10	45	32	94	68

Table 4.1.3 shows the distribution of samples based on BP in pre test, post test I & II in the experimental and the control groups. A majority 85(62%) of patients in the experimental group had achieved the target BP, while the figure was just one fourth in the control group 31(22%).

The Inference is that the number of patients found to have hypertension above 140/90 mmHg in the control group is higher in post test I conducted at the end of 12 weeks after the intervention compared to the experimental group. In the post test II the number of patients having normal BP is significant in the experimental group while compared to control group. This reflects the effectiveness of intervention.

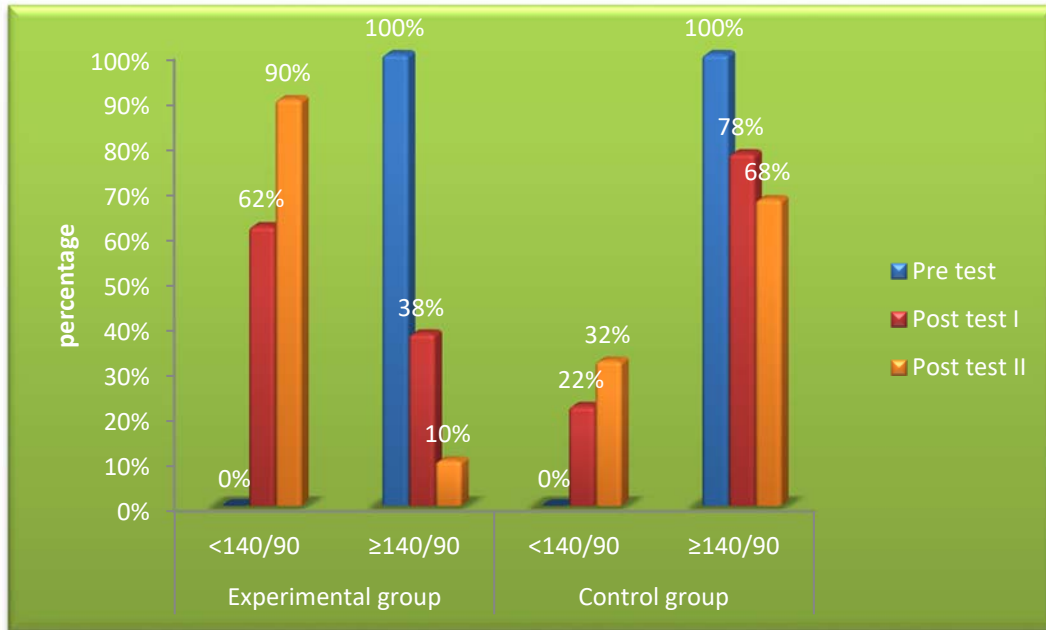


Fig: 4.1.14 Distribution of patients based on their post test I & II level of BP in the experimental and the control groups.

As per Table 4.1.14 In pretest, none of them had BP <140/90mmHg in both groups. The experimental group showed 62% and 90% of patients achieved targeted BP <140/90mmHg in post test I&II respectively.

There were only 22% and 32% of patients in the control group attained BP <140/90mmHg respectively in post test I&II.

SECTION II

TABLE 4.2.1

Mean and Standard Deviation of pre and posttest Systolic BP among the experimental and the control groups

N=275

period of systolic BP	experimental n=138		Control n=137	
	Mean	SD	Mean	SD
Pre test	145.80	15.38	143.67	11.00
Post testI	127.90	16.88	140.07	7.09
Post test II	122.61	16.29	137.99	4.88

* P<0.05

Table 4.2.1 depicts the mean and standard deviation of pre and posttest systolic BP among the experimental and the control groups pre and post test I and II mean systolic BP in the experimental and control group. The mean pretest systolic BP in experimental and control group were 145.80 (SD15.38) and 143.67 (SD 11) respectively. The mean systolic BP in post test I was 127.90(SD16.88), and 140.07(SD 7.09), in the experimental and the control groups respectively. The mean post test II systolic BP was 122.61(SD16.29), and 137.99(SD 4.88), in the experimental and the control groups respectively.

The inference that there is gradual reduction in systolic BP in the experimental group from pre test to post test I and II whereas, in the control group, there is no such significant reduction in BP. So the result was attributed to LSMS.

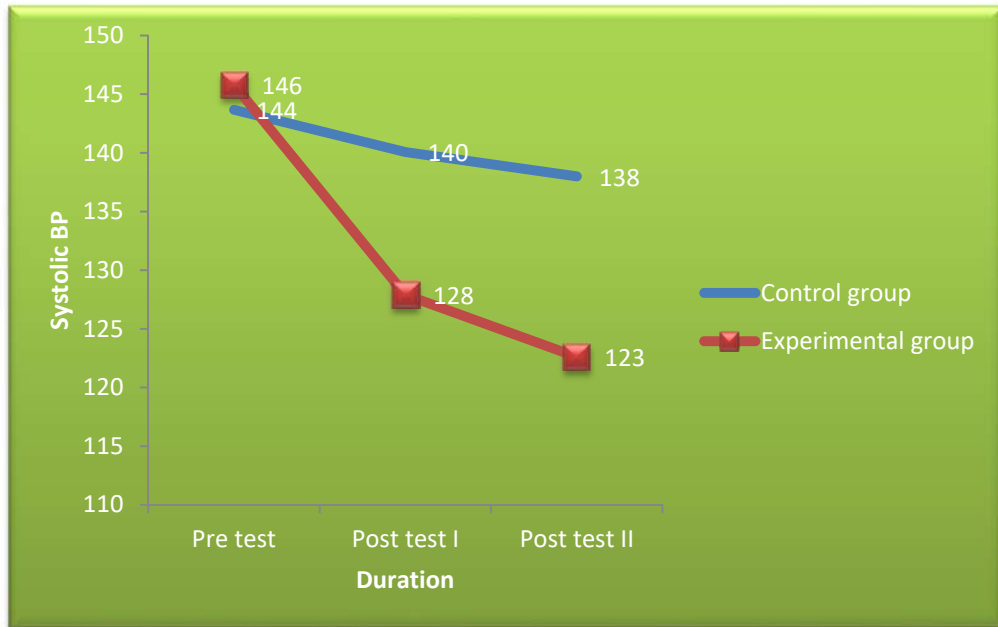


Fig: 4.1.15 Comparison of Systolic BP in three periods

Figure 4.1.15 depicts the mean systolic BP among the experimental and control groups in pre test and post test I&II. The reduction in BP was significant from pretest to posttest I&II in the experimental group as revealed by the mean systolic BP of 146,128 and 123mmHg respectively. But this significance was not found in the control group as evidenced by the mean systolic BP of 144,140 and 138mmHg respectively in pre,post test I&II.

TABLE 4.2.2

Mean and Standard Deviation of pre and post test diastolic BP among experimental and control group

N=275

Duration of diastolic BP	Group			
	Experimental		Control	
	n=138		n=137	
	Mean	SD	Mean	SD
Pre test	90.65	8.30	93.88	13.11
Post test I	83.55	5.51	88.20	12.98
Post test II	80.65	3.24	86.23	14.19

* P<0.05

Table 4.2.2 portrays the mean and standard deviation of pre and post test diastolic BP among experimental and control groups. Mean diastolic BP in pre test, post test I and II in the experimental group is 90.65, 83.55 and 80.65 with SD being 8.30, 5.51 and 3.24 respectively whereas, the mean diastolic BP in pre test, post test I and II was 93.88, 88.20 and 86.23 with SD being 13.11, 12.98 and 14.19 respectively in the control group.

We can infer that the experimental group showed, the gradual reduction of diastolic BP from pre to post test II which is not so evident in the control group.

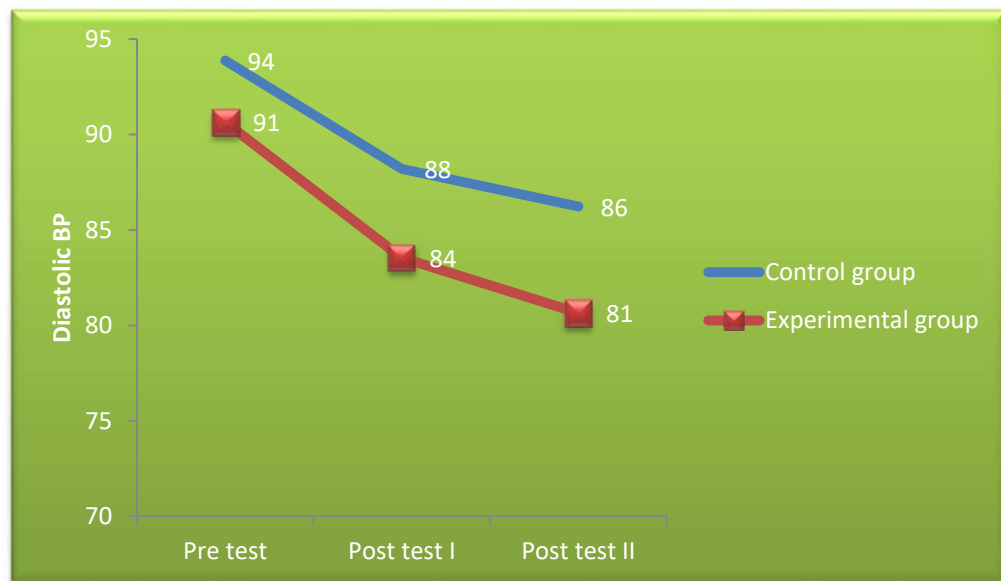


Fig: 4.1.16 Comparison of diastolic BP in pre, posttest I& post II among experimental and the control groups.

Figure 4.1.16 portrays the comparison of diastolic BP in pre, post I& post II among experimental and the control groups. The diastolic BP in the experimental group was 91,84 &81mmHg in pre, post I&II respectively which was statistically significant. The diastolic BP in the control group was 94,88,86mmHg respectively in the pre, post I&II which is not significant.

TABLE 4.2.3

Comparison of mean difference of post test II based on systolic BP and diastolic BP between experimental and control group

N=275

POST TEST II BP	Cumulative Mean		Mean difference	t value	P value
	experimental (n=138)	control (n=137)			
Systolic	132.10	140.66	8.56*	5.48	p<0.001
Diastolic	84.95	89.33	4.38*	3.52	p<0.001

Table 4.2.3 shows the cumulative mean difference of systolic and diastolic BP between the experimental and control group.

The posttest II mean systolic BP in the experimental group was seen as 132.10, but in the control group it was 140.66, the mean difference was seen as 8.56 and the t-value is 5.48 which is statistically significant at 0.001 level. The results draw disagreement of the null hypothesis and acceptance of the research hypothesis.

Similarly, the posttest II mean diastolic BP in the experimental group was 84.95 while it was 89.33 in the control group, the mean difference was 4.38 and the t-value is 3.52 which is statistically significant at 0.001 level. The proven difference helps the researcher to agree the research hypothesis H₂. That there is no significant difference in posttest II mean Systolic BP between the experimental and control group.

TABLE 4.2.4

Difference between the mean BP in Pretest and Posttest II among the control group of the newly diagnosed hypertensive Patients.

(N=137)

Bio physiological parameters	Control Group				Mean Difference	Paired 't'- value	P- value
	Pre test		Post test II				
	Mean	SD	Mean	SD			
SBP	143.67	15.38	137.99	16.29	5.68	1.46	NS
DBP	93.88	13.11	86.23	14.19	7.65	2.73	<0.01

Table 4.2.4 presents the comparative mean of pre and post test II BP in Control group.

The above table reveals, the pretest and post test II mean systolic BP in control group as 143.67 [SD 15.28], and 137.99 [SD 16.29] respectively with the mean difference of 5.68 and 't' value of 1.46 which is statistically not significant. The above findings make the investigator to adopt the research hypothesis.

With regard to diastolic BP in control group, the pretest and the posttest II mean figures are 93.88 [SD 13.11], and 86.23[SD 14.19] respectively. The mean difference of 7.65 and the 't' value is 2.73 is statistically significant at 0.05 level. The result of the study confirms, the significant difference between the pretest and the posttest II mean value of diastolic BP in the control group. Even though there is statistically significant difference in pre and post test of diastolicBP in control group, it is not clinically significant.

TABLE 4.2.5

Comparison of pre test&post test II diastolic and systolic BP among experimental group.

(N=138)

Period of BP	experimental Group		Mean difference	Paired 't' value
	Mean	S D		
Pretest systolic	145.80	11.00	23.19	
Posttest II systolic	122.61	4.88		19.68**
Pretest diastolic	90.65	8.30	10.0	
Posttest II diastolic	80.65	3.24		9.46**

*p<0.001

Table 4.2.5 shows the comparison of pre test&post test II systolic and diastolic BP among experimental group.

The above table reveals, the mean systolic BP of experimental group in the pretest was 145.80 [SD 11], the posttest II was 122.61 [SD 4.88], the mean difference was 23.19 and 't'-value was 19.68 which is statistically significant at 0.05 level. In the same way, the pretest mean diastolic BP, in the experimental group, it was 90.65 [SD 8.30], in the pretest and 80.65 [SD 3.24] in the posttest. The mean difference is 10mmHg and the t-value is 9.46 which are statistically significant. The result reveals a significant difference between the pretest and the posttest II mean SBP in the experimental group. No support for the null hypothesis is seen from the above findings. The researcher is driven to accept the research hypothesis.

Inference:

The obvious reduction in systolic and diastolic BP in post test II is brought out by the life style modification strategies adopted by the experimental group at the

level of $P < 0.05$. The reduction in the systolic and diastolic BP after treatment is believed to be the result of the influence as reported by Wilkins K et al in their study on hypertension among clients in Canada that differs by age and sex. Similarly Tripathi S K found there was high BP among the non vegetarians. He feels that high sodium intake may be attributed to be the cause.

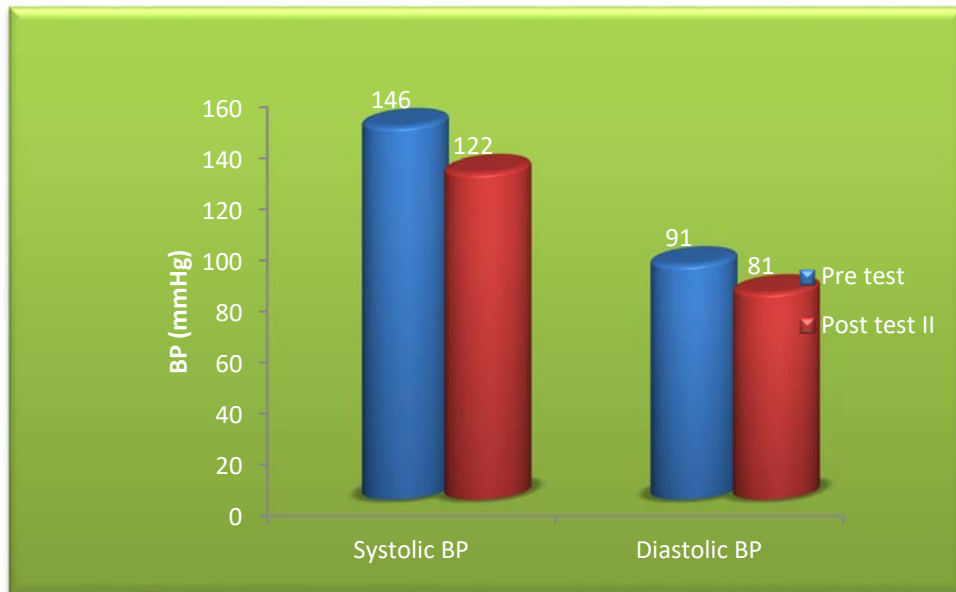


Fig: 4.1.17 Difference in pre and post test II systolic BP in experimental group

Fig: 4.1.17 reveals the difference in pre and post test II systolic BP in the experimental group. There was a reduction of 24 mm Hg of systolic BP in the experimental group from pre test (146 mm Hg) to post test (122 mm Hg). The reduction in diastolic BP was 10 mm Hg from pre to post test II viz., 91 to 81 mm Hg in the experimental group.

TABLE 4.2.6

Comparison of post test II systolic and diastolic BP between the control and the experimental groups.

N=275					
POST TEST II BP	experimental (n=138)		control(n=137)		't' value
	Mean	SD	Mean	SD	
Systolic BP	122.61	4.88	138.10	16.29	11.73*
Diastolic BP	80.65	3.34	88.23	14.19	8.08 **

* P<0.05* P<0.001

Table 4.2.6 provides a comparison of post test II systolic and diastolic BP between the control and experimental groups.

Significant difference in systolic BP in the posttest II between the two groups is shown by the above table, as evidenced by the values of 122.61 and 138.10 and the t-value 11.73 which is significant at the level of 0.05 rejects the null hypothesis and confirms the research hypothesis.

In the same way, the posttest II mean diastolic BP in the experimental group was 80.65 [SD 3.34], the posttest mean diastolic BP in the control group was 88.23 [SD 14.19], and the 't'-value was 8.08 which is statistically significant. Therefore the researcher agrees with the research hypothesis that there is no significant difference is seen between the posttest II mean systolic and diastolic BP in the experimental and the control groups”.



Fig: 4.1.18 Difference in posttest II systolic BP of experimental and control group

Fig: 4.1.18 exposes the difference in posttest II systolic BP of experimental and control groups. The posttest II BP in the experimental group was 123 mm Hg where as it was 138 mm Hg in the control group. The posttest II diastolic BP was 81 and 88 mm Hg in the experimental and control group respectively.

The inference is that there is a great difference between the systolic and diastolic BP of post test II between the experimental and the control groups. The above said null hypothesis is rejected and research hypothesis is accepted as revealed by Soroush that systolic BP was based on number of steps of brisk walking per day expressing linear relationship. The LSMS have brought changes in the life style of patients as it is assessed by annexure N. The significant difference between both the groups was established by Cohen that multi component life style changes reduced BP significantly in addition to administration of minimal medication.

TABLE 4.2.7

Independent ‘t’ test for mean systolic BP in posttest I Vs II based on level of overall compliance to LSMS among experimental group

N=138					
Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	28	130.71	6.04	2.52*
	Adequate practice	110	127.46	7.095	
Post test II	Moderate practice	28	124.64	5.76	2.23*
	Adequate practice	110	122.09	5.76	

* P<0.001

Table 4.2.7 shows the comparison of posttest I and II mean systolic BP between the moderate practice and adequate practice in the experimental group.

The above table reveals the posttest I and II mean systolic BP between the moderate practice (n= 28) and adequate practice (n=110) participants in experimental group. The mean posttest I systolic BP was 130.71, 127.46 [SD 6.04., 7.095] respectively among the moderate practice and adequate practice participants in the experimental group. Similarly, the mean systolic BP in posttest II are 124.64, 122.09 [SD 5.76., 5.76] respectively among the moderate practice and the adequate practice participants in the experimental group. The obtained t value drives the researcher to accept the research hypothesis than to reject the null hypothesis.

TABLE 4.2.8

Independent 't' test for mean diastolic BP in post test I Vs II on level of overall compliance to LSMS among Experimental group

N=138

Duration	Level of compliance	N	Mean	SD	't' test
Pretest I	Moderate practice	28	87.14	5.35	4.01*
	Adequate practice	110	82.64	5.19	
Post test II	Moderate practice	28	82.86	4.60	2.69*
	Adequate practice	110	80.46	2.09	

* P<0.05

Table 4.2.8 shows the comparison of posttest I and II mean diastolic BP based on overall compliance to LSMS in the experimental group. "There is a significant difference between the moderate practice and the Adequate practice groups" to LSMS in the reduction in BP in the experimental group as $H_0 2$. The above table reveals, the posttest I and II mean DBP between the moderate practice (n= 28) and adequate practice (n=110) group in the experimental group. This means DBP II is 87.14 and 82.64 [SD 5.35., 5.19] and DBP III are 82.86, 80.46 respectively among the moderate practice and adequate practice participants in the experimental group. The calculated t-value is 4.01 and 2.69. This is a statistically considerable result, So H_2 is accepted.

TABLE 4.2.9

Independent ‘t’ test for mean systolic BP in post test I Vs II on level of compliance to brisk walking among Experimental group

N=138

Duration	Level of compliance	N	Mean	SD	‘t’ value
Pretest I	Moderate practice	24	130.83	5.84	2.12*
	Adequate practice	114	127.54	7.11	
Post test II	Moderate practice	24	124.58	5.88	2.41*
	Adequate practice	114	122.19	4.56	

* P<0.05

Table 4.2.9 shows the comparison of posttest I and II mean systolic BP between the participants of moderate practice and adequate practice to brisk walking in the experimental group. The H_0 is stated as “There is no significant difference between the moderate practice and adequate practice participants to LSMS in the reduction in BP in the experimental group”. The above table reveals the posttest I and II mean systolic BP between the moderate practice (n= 24) and adequate practice (n=114) in the experimental group. The mean systolic BP I are 130.83 and 127.54 [SD 5.84., 7.11] respectively among the moderate practice and adequate practice participants in the experimental group. Equally, the means SBP II are 124.58 and 122.19 [SD 5.88., 4.56 respectively among the moderate practice and adequate practice group in the experimental group. The value of independent t- is 2.12 and 2.41 in I and II of post test, which is statistically noteworthy and hence H_2 is accepted.

TABLE 4.2.10

Independent ‘t’ test for mean posttest diastolic BP in post test I Vs II on level of compliance of brisk walking among experimental group

N=138

Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	24	82.92	4.64	3.81*
	Adequate practice	114	80.53	2.24	
Post test II	Moderate practice	24	87.08	5.50	3.49*
	Adequate practice	114	82.81	5.24	

* P<0.05

Table 4.2.10 shows the comparison of post test I and II mean diastolic BP between the participants of moderate practice and adequate practice among the experimental group.

The above table reveals, the post test I and II mean diastolic BP between the moderate practice (n= 28) and adequate practice (n=110) participants in the experimental group. The mean pretest I diastolic BP are 82.92, 80.53 [SD 4.64., 2.24] respectively among the moderate practice and adequate practice participants in the experimental group. Correspondingly, the mean post test II diastolic BP are 87.08, 82.81 [SD 5.50. 5.24] respectively among the moderate practice and adequate practice in the experimental group. Both the said measures are statically outstanding enabling acceptance of H₂.

TABLE 4.2.11

Independent ‘t’ test for mean systolic BP in post test I Vs II on level of compliance to Yoga among experimental group

N=138

Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	29	130.34	6.26	1.95*
	Adequate practice	109	127.52	7.095	
Post test II	Moderate Adequate practice	29	124.48	5.72	2.37*
	Adequate practice	109	122.11	4.53	

* P<0.05

Table 4.2.11 shows the comparison of post test I and II means SBP between the moderate practice and Adequate practice participants in the experimental group.

The above table reveals, the post test I and II mean SBP between the moderate practice (n= 28) and Adequate practice (n=110) participants in the experimental group. The means SBP I are 130.34, 127.52 [SD 6.26., 7.095] respectively among the moderate practice and adequate practice group in the experimental group. In the same way, the means SBP II are 124.48, 122.11 [SD 5.72., 4.53] respectively among the moderate practice and adequate practice in the experimental group. The values of independent t are 2.519 and 2.232 respectively of the former and the latter group which is statistically considerable at 0.05 levels. Hence the H₂ is agreed that the level of BP is lower among those who are highly adequate practice to LSMS compared to those who do not.

TABLE 4.2.12

Independent ‘t’ test for mean diastolic BP in post test I Vs II on level of compliance to Yoga among experimental group

N=138

Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	29	82.76	4.55	3.95*
	Adequate practice	109	80.46	2.10	
Post test II	Moderate practice	29	86.89	5.41	3.86*
	Adequate practice	109	82.66	5.21	

* P<0.05

Table 4.2.12 shows the comparison of post test I and II mean diastolic BP between the moderate practice and adequate practice participants in yoga among the experimental group.

This table reveals, the post test I and II mean diastolic BP between the moderate practice (n= 24) and adequate practice (n=114) in experimental group. The means DBP I are 82.76 and 80.46 [SD 4.55., 2.10] respectively among the moderate practice and adequate practice in the experimental group. Likewise, the mean diastolic BP II are 86.89 and 82.66 [SD 5.41, 5.21] respectively among the moderate practice and adequate practice in the experimental group. The values of independent’s’ are 3.95 and 3.86 for former and later said group respectively at 95% confidence interval suggesting the desirability of accepting the H₂ that the level of BP will be lower among those who Adequate practice to LSMS than those who do not.

TABLE 4.2.13

Independent ‘t’ test for mean systolic BP in post test I Vs II on level of compliance to DASH diet among experimental group

N=138					
Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	25	130.80	5.72	2.15*
	Adequate practice	113	127.52	7.14	
Post test II	Moderate practice	25	124.80	5.86	2.53*
	Adequate practice	113	122.12	4.52	

* P<0.001

Table 4.2.13 shows the comparative mean post test I and II of systolic BP between the moderate practice and adequate practice participants in the experimental group.

The above table reveals, the post test I and II mean systolic BP between the moderate practice (n= 25) and adequate practice (n=113) group in experimental group. The mean systolic BP in post test I are 130.80, 127.52 [SD 5.72., 7.14] respectively among the moderate practice and adequate practice in the experimental group. Similarly, the means systolic BP II are 124.80, 122.12 [SD 5.86., 4.52] respectively among the moderate practice and adequate practice in the experimental group. The values of independent t are 2.519 and 2.232 respectively for moderate practice and adequate practice groups which is statistically (P < 0.05) a remarkable result. It supports the hypothesis H₂ that the level of BP is lower among those who are highly done adequate practice to LSMS compared those who do not.

TABLE 4.2.14**Null hypothesis**

“There is no significant difference between the moderate practice and adequate practice group” to LSMS in the reduction in diastolic BP in the experimental group

Independent ‘t’ test for mean diastolic BP in post test I Vs II on level of compliance to DASH diet among experimental group

N=138					
Duration	Level of compliance	N	Mean	SD	‘t’ test
Pretest I	Moderate practice	25	82.80	4.58	3.66*
	Adequate practice	113	80.53	2.25	
Post test II	Moderate practice	25	87.20	5.42	3.84*
	Adequate practice	113	82.74	5.23	

* P<0.001

Table 4.2.14 show the comparison of post test I and II mean diastolic BP between the moderate practice and adequate practice participants among the experimental group.

The above table reveals that, the post test I and II mean diastolic BP between the moderate practice (n= 25) and adequate practice (n=113) in the experimental group. The mean diastolic BP I are 82.80, 80.53 [SD 4.58., 2.25] respectively among the moderate practice and adequate practice groups in the experimental group. The values of independent t are 3.66, indicate that, intervention as effective to lower the BP at 95 % of the confidence interval.

Similarly, diastolic BP II mean figures are 87.20, 82.74 [SD 5.42., 5.23] respectively among the moderate practice and adequate practice in the experimental group. The calculated t-value is 3.84 which is statistically significant at 0.05 level.

TABLE 4.3.1

Association between pre test level of systolic BP in the experimental group and the selected socio demographic variables of newly diagnosed hypertensive patients

n=138

Socio demographic variables	Experimental group n = 138						chi square	p value
	Pre test systolic BP in mmHg							
	<140		140-159		160 & Above			
	f	%	f	%	f	%		
I. Age in years							6.51	.164
1.31-40	2	1.4	44	31.9	6	4.3		
2.41-50	0	0.0	38	27.5	3	2.2		
3.51-60	0	0.0	36	26.1	9	6.5		
II. Gender								
1. Men	0	0.0	30	21.7	9	6.5	5.452	.065
2. Women	2	1.4	88	63.8	9	6.5		
III. Education								
1.Primary	0	0.0	41	29.7	6	0	8.866	.181
2.Secondary	2	1.4	25	18.1	6	2		
3.Higher Secondary	0	0.0	43	31.2	6	0		
4.Graduate Level	0	0.0	9	6.5	0	0		
IV. Marital status								
1.Married	2	1.4	114	82.6	17	12.3	.728	.948
2.Widow	0	0.0	3	2.2	1	.7		
3.Divorced/Separated	0	0	1	0.7	0	0		

Continued

Socio demographic variables	Experimental group n = 138						chi square	P value	
	Pre test systolic BP in mmHg								
	<140		140-159		160 & Above				
	f	%	f	%	f	%			
5. occupation									
1.Labour	1	.7	47	34.1	4	2.9	4.606	.799	
2.Business	0	0.0	16	11.6	5	3.6			
3.Health Professional	0	0.0	3	2.2	0	0.0			
4.Non Health professional	0	0.0	1	.7	0	0.0			
5.Home maker	1	.7	51	37.0	9	6.5			
6.Income									
1.Up to Rs 10000/-	1	.7%	65	47.1	4	2.9	10.692	.098	
2.Rs 10001- Rs 20000/-	1	.7	35	25.4	9	6.5			
3.Rs 20001- Rs 30000/-	0	0.0	12	8.7	5	3.6			
4.Above Rs 30000/-	0	0.0	6	4.3	0	0.0			
7.Religion									
1.Hindu	2	1.4	109	79.0	17	12.3	.847	.991	
2.Christian	0	0.0	3	2.2	0	0.0			
3.Muslim	0	0.0	5	3.6	1	.7			
4.Others	0	0.0	1	.7	0	0.0			
8.Type of family									
1.Nuclear	2	1.4	93	67.4	17	12.3	2.967	.227	
2.Joint	0	0.0	25	18.1	1	.7			
9. History of Smoking									
1.past							1.10	0.29	
1.Yes	0	0.0	7	5.1	3	2.2	2.836	.242	
2.No	2	1.4	111	80.4	15	10.9			
2.present							10.102	.006 *	
1.Yes	0	0.0	2	1.4	3	2.2	10.102	.006 *	
2.No	2	1.4	116	84.1	15	10.9			

Continued

Socio demographic variables	Experimental group n = 138						chi square	p value
	Pre test systolic BP in mmHg							
	130-139		140-159		160 and above			
	f	%	f	%	f	%		
10. History of alcohol								
1. Past								
1. Yes	0	0.0	6	4.3	5	3.6	11.140	.004 *
2. No	2	1.4	112	81.2	13	9.4		
2. present								
1. Yes	0	0.0	8	5.8	5	3.6	8.281	.016 *
2. No	2	1.4	110	79.7	13	9.4		
11. Family history of hypertension								
1. Paternal								
1. Not applicable	2	1.4	108	78.3	17	12.3	.357	.836
2. degree of relationship	0	0.0	10	7.2	1	.7		
3. degree of relationship	0	0.0	0	0.0	0	0.0		
4. degree of relationship	0	0.0	0	0.0	0	0.0		
2. Maternal								
1. Not applicable	2	1.4	106	76.8	16	11.6	.665	.995
2. degree of relationship	0	0.0	10	7.2	2	1.4		
3. degree of relationship	0	0.0	1	.7	0	0.0		
4. degree of relationship	0	0.0	1	.7	0	0.0		
12. Mode of diagnosis								
1. sign and symptom of hypertension	0	0.0	40	29.0	6	4.3	0.12	
2. Master checkup	2	1.4	69	50.0	11	8.0		
3. others	0	0.0	1	.7	0	0.0		

Continued

**13.Treatment
prescribed**

1.life style modification	2	1.4	82	59.4	10	7.2		.309
2.Drugs	0	0.0	36	26.1	8	5.8	2.347	
If on drugs, level of compliance								
Compliant	0	0.0	34	24.6	7	5.1		
Partially compliant	2	1.4	84	60.9	11	8.0	1.617	.446

Table 4.3.1 shows the association between pretest level of systolic BP in experimental group and the socio demographic variables of the newly diagnosed hypertensive patients. It is inferred that there is an association between pretest level of SBP in experimental group and the selected socio demographic variables such as present history of smoking (chi square =10.102, $p < 0.06$), and history of alcoholism past (chi square =11.140, $p < .004$) and present (chi square =8.281, $p < 0.016$) . On account of that H_3 is accepted that there is association between history of smoking, alcoholism and BP.

TABLE 4.3.2

The null hypothesis is stated as follows. There is no significant association between pretest level of SBP in experimental group and the selected socio demographic variables.

Association Between the Pre test level of SBP in the control group and the selected socio demographic variables of newly diagnosed hypertensive patients

n=137

Socio demographic variables	Control group (n=137)						chi square	p value
	Pre test systolic Bp in mmHg							
	130-139		140-159		160 and above			
f	%	f	%	f	%			
1.Age in years								
1.3-40	9	6.6	22	16.1	3	2.2		
2.41-50	16	11.7	19	13.9	14	10.2	8.35	0.08
3.51-60	20	14.6	26	19.0	8	5.8		
2. Gender								
1. Men	18	13.1	27	19.7	5	3.6	3.592	0.16
2. Women	27	19.7	40	29.2	20	14.6		
3.Education								
1.Primary	11	8.0	19	13.9	9	6.6	2.665	.850
2.Secondary	14	10.2	23	16.8	9	6.6		
3.Higher			23	16.8				
Secondary	17	12.4			6	4.4		
4.Graduate Level	3	2.2	2	1.5	1	.7		
4.Marital status								
1.Married	44	32.1	65	47.4	25	18.2	.758	.685
2.Widow	1	.7	2	1.5	0	0.0		
3.Divorced/Sepa rated	0	0.0	0	0.0	0	0.0		

continued

Socio demographic variables	Control group (n=137) Pre test systolic value				chi square		p value	
	130-139		140-159		160 and above			
	f	%	f	%	f	%		
5.Occupation								
1.Labourer	21	15.3	32	23.4	12	8.8	7.148	0.521
2.Business	10	7.3	10	7.3	4	2.9		
3.Health Professional	0	0.0	1	.7	0	0.0		
4.Non Health Professional			1	.7				
5.Home maker	14	10.2	23	16.8	7	5.1		
6.Income								
1.Up to Rs 10000/-	26	19.0	38	27.7	15	10.9	7.726	.259
2.Rs 10001- Rs 20000/-	10	7.3	21	15.3	10	7.3		
3.Rs 20001- Rs 30000/-	5	3.6	3	2.2	0	0.0		
4.Above Rs 30000	4	2.9	5	3.6	0	0.0		
7.Religion								
1.Hindu	43	31.4	64	46.7	25	18.2	1.328	.857
2.Christian	1	.7	1	.7	0	0.0		
3.Muslim	1	.7	2	1.5	0	0.0		
8.Type of family								
1.Nuclear	36	26.3	51	37.2	18	13.1	0.595	.743
2.Joint	9	6.6	16	11.7	7	5.1		
9. History of Smoking								
1.past								
1.Yes	5	3.6	5	3.6	1	.7	1.158	.561
2.No	40	29.2	62	45.3	24	17.5		
2.present								
1. Yes	2	1.5	6	4.4	0	0.0	2.893	.235
2. No	43	31.4	61	44.5	25	18.2		

continued

Socio demographic variables	Control group (n=137) Pre test systolic BP in mm Hg						chi square	p value
	130-139		140-159		160 and above			
	f	%	f	%	f	%		
10. History of alcoholism								
1.past								
1.Yes	2	1.5	5	3.6	1	.7	0.634	.728
2.No	43	31.4	62	45.3	24	17.5		
2.present								
1.Yes	3	2.2	6	4.4	2	1.5	0.191	.909
2.No	42	30.7	61	44.5	23	16.8		
11. Family history of hypertension								
1.paternal								
1.Not applicable	24	17.5	42	30.7	16	11.7	3.291	.772
2.1 degree relative	7	5.1	13	9.5	4	2.9		
3.2 degree relative	13	9.5	11	8.0	5	3.6		
4.3 degree relative	1	7	1	.7	0	0.0		
2.Maternal								
1.Not applicable	35	25.5	55	40.1	19	13.9	5.286	.508
2.1 degree relative	7	5.1	6	4.4	5	3.6		
3.2 degree relative	2	1.5	6	4.4	1	.7		
4.3 degree relative	1	7	0	0.0	0	0.0		
12.Mode of diagnosis								
1.sign and symptom of hypertension	16	11.7	24	17.5	12	8.8	8.775	.187
2.master checkup	22	16.1	21	15.3	10	7.3		
3.others	3	2.2	8	5.8	2	1.5		
13.Treatment prescribed								
1.Life style modification	5	3.6	3	2.2	1	.7	2.259	.323
2.Drugs	40	29.2	64	46.7	24	17.5		
If on drugs level of compliance								
Compliant	30	21.9	39	28.5	19	13.9	2.681	0.26
Partially compliant	15	10.9	28	20.4	6	4.4		1709

Table 4.3.2 shows the association between pretest level of systolic BP in control group and the socio demographic variables of the newly diagnosed hypertensive patients.

It is shown that there is no association between pretest level of systolic BP in control group and the selected socio demographic variable.

TABLE 4.3.3

Association Between the Pre test level of SBP in the control group and the selected socio demographic Variables of newly diagnosed hypertensive patients

Socio demographic variables	Experimental group n=138						chi square	p value
	Pre test diastolic in mmHg							
	130-139		140-159		160 and above			
f	%	f	%	f	%			
1.Age in years								
1.3-40	47	34.1	5	3.6	0	0.0	0.77	.680
2.41-50	36	26.1	5	3.6	0	0.0		
3.51-60	42	30.4	3	2.2	0	0.0		
2. Gender								
1. Men	36	26.1	3	2.2	0	0.0	0.190	.663
2. Women	89	64.5	10	7.2	0	0.0		
3.Education								
1.Primary	44	31.9	3	2.2	0	0.0	0.856	.836
2.Secondary	29	21.0	4	2.9	0	0.0		
3.Higher Secondary	44	31.9	5	3.6	0	0.0		
4.Graduate Level	8	5.8	1	.7	0	0.0		
4.Marital status								
1.Married	0	0.0	0	0.0	0	0.0	.540	.764
2.Widow	120	87.0	13	9.4	0	0.0		
3.Divorced/Separated	4	2.9	0	0.0	0	0.0		

Socio demographic variables	Experimental group n=138 Pretest diastolic BP in mmHg				chi square	p value		
	130-140		140-160					
	f	%	f	%	f	%		
5.Occupation								
1.Labourer	43	31.2	9	6.5	0	0	6.190	.185
2.Business	20	14.5	1	.7	0	0		
3.Health Professional	3	2.2	0	0.0	0	0		
4.Non Health Professional	1	.7	0	0.0	0	0		
5.Home maker	58	42.0	3	2.2	0	0		
6.Income								
1.Up to Rs 10000/-	62	44.9	8	5.8	0	0.0	1.349	.717
2.Rs 10001- Rs 20000/-	42	30.4	3	2.2	0	0.0		
3.Rs 20001- Rs 30000/-	16	11.6	1	.7	0	0.0		
4.Above Rs 30000	5	3.6	1	.7	0	0.0		
8.Religion								
1.Hindu	117	84.8	11	8.0	0	0.0	2.586	.460
2.Christian	2	1.4	1	.7	0	0.0		
3.Muslim	5	3.6	1	.7	0	0.0		
9.Type of family								
1.Nuclear	99	71.7	13	9.4	0	0.0	3.332	.068
2.Joint	26	18.8	0	0.0	0	0.0		
10. History of Smoking								
1.past								
1.Yes	9	6.5	1	.7	0	0.0	0.004	.948
2.No	116	84.1	12	8.7	0	0.0		
2.present								
1. Yes	5	3.6	0	0.0	0	0.0	0.540	.463
2. No	120	87.0	13	9.4	0	0.0		

Socio demographic variables	Experimental group n=138						chi square	p value
	Pretest diastolic BP in mmHg							
	130-139		140-159		160 and above			
	f	%	f	%	f	%		
11. History of alcoholism								
1. past								
1. Yes	10	7.2	1	.7	0	0.0	0.002	.969
2. No	115	83.3	12	8.7	0	0.0		
2. present								
1. Yes	12	8.7	1	.7	0	0.0	0.050	.823
2. No	113	81.9	12	8.7	0	0.0		
12. Family history of hypertension								
1. paternal								
1. Not applicable	115	83.3	12	8.7	0	0.0	.002	.969
2.1 degree relative	10	7.2	1	.7	0	0.0		
3.2 degree relative	0	0.0	0	0.0	0	0.0		
4.3 degree relative	0	0.0	0	0.0	0	0.0		
2. Maternal								
1. Not applicable	112	81.2	12	8.7%	0	0.0	.234	.972
2.1 degree relative	11	8.0	1	.7	0	0.0		
3.2 degree relative	1	.7	0	0.0	0	0.0		
4.3 degree relative	1	.7	0	0.0	0	0.0		
13. Mode of diagnosis								
1. sign and symptom of hypertension	43	31.2	3	2.2	0	0.0	0.820	.845
2. master checkup	73	52.9	9	6.5	0	0.0		
3. others	9	6.5	1	0.7	0	0.0		

14. Treatment prescribed

1. Life style modification	86	62.3	8	5.8	0	0.0	0.286	.593
2. Drugs	39	28.3	5	3.6	0	0.0		
If on drugs level of compliance								
Compliant	35	25.4	6	4.3	0	0.0	1.858	.173
Partially compliant	90	65.2	7	5.1	0	0.0		

Table 4.3.3 shows the association between pretest level of systolic BP in control group and the socio demographic variables of the newly diagnosed hypertensive patients.

There is no association between pretest level of diastolic BP in experimental group and the selected socio demographic variables.

TABLE 4.3.4 Association between pre test level of diastolic BP in the experimental group and the selected socio demographic variables of newly diagnosed hypertensive patients

n=137

Socio demographic variables	Control group (n=137)						chi square	p value
	Pre test diastolic BP in mmHg							
	<90		90-99		100 & Above			
	f	%	f	%	f	%		
1. Age in years							4.98	0.289
1.31-40	6	4.4	16	11.7	12	8.8		
2.41-50	9	6.6	21	15.	19	13.9		
3.51-60	3	2.2	25	18.2	26	19.0		
2. Gender								
1. Men	8	5.8	21	15.3	21	15.3	0.678	0.712
2. Women	10	7.3	41	29.9	36	26.3		
3. Education								
1.Primary	7	5.1	14	10.2	18	13.1	4.899	.557
2.Secondary	4	2.9	21	15.3	21	15.3		
3.Higher Secondary	7	5.1	23	16.8	16	11.7		
4.Graduate Level	0	0.0	4	2.9	2	1.5		
4. Marital status								
1.Married	18	13.1	60	43.8	56	40.9	.764	.682
2.Widow	0	.0	2	1.5	1	0.7		
3.Divorced/ Separated	0	0.0	0	0.0	0	0.0		

Continued

Socio demographic variables	Control group (n=137)						chi square	p value
	Pre test diastolic BP in mmHg							
	<90		90-99		100 & Above			
f	%	f	%	f	%			
5. occupation								
1.Labour	8	5.8	25	18.2	32	23.4	9.598	.294a,c
2.Business	3	2.2	13	9.5	8	5.8		
3.Health Professional	0	0.0	1	.7	0	0.0		
4.Non Health professional	0	0.0	0	.0	3	2.2		
5.Home maker	7	5.1	23	16.8	14	10.2		
6.Income								
Up to Rs 5000/-	48	35.0	23	16.8	8	5.8	####	.018*
Rs 5001- Rs 10000/-	16	11.7	19	13.9	6	4.4		
Rs 10001- Rs 15000/-	2	1.5	2	1.5	4	2.9		
Above Rs 15000	6	4.4	2	1.5	1	.7		
7.Religion								
1.Hindu	17	12.4	61	44.5	54	39.4	3.097	.542
2.Christian	0	.0	1	.7	1	0.7		
3.Muslim	1	.7	0	0.0	2	1.5		
4.Others	0	0.0	0	0.0	0	0.0		
8.Type of family								
1.Nuclear	10	7.3	49	35.8	46	33.6	5.193	.075
2.Joint	8	5.8	13	9.5	11	8.0		
9. History of Smoking								
1.past								
1.Yes	0	0.0	4	2.9	7	5.1	3.176	.204
2.No	18	13.1	58	42.3	50	36.5		
2.present								
1.Yes	1	0.7	2	1.5	5	3.6	1.664	.435
2.No	17	12.4	60	43.8	52	38.0		

Socio demographic variables	Control group (n=137)						chi square	p value
	Pre test diastolic BP in mmHg							
	<90		90-99		100 & Above			
	f	%	f	%	f	%		
10. History of alcohol								
1. Past								
1. Yes	0	0.0	3	2.2	5	3.6	2.121	.346
2. No	18	13.1	59	43.1	52	38.0		
2. present								
1. Yes	1	0.7	6	4.4	4	2.9	0.456	.796
2. No	17	12.4	56	40.9	53	38.7		
11. Family history of hypertension								
1. Paternal								
1. Not applicable	2	1.4	108	78.3	17	12.3	6.366	.383
2. degree of relationship	0	0.0	10	7.2	1	.7		
3. degree of relationship	0	0.0	0	0.0	0	0.0		
4. degree of relationship	0	0.0	0	0.0	0	0.0		
2. Maternal								
1. Not applicable	14	10.2	53	38.7	42	30.7%	7.212	.302
2. degree of relationship	4	2.9	5	3.6	9	6.6%		
3. degree of relationship	0	0.0	3	2.2	6	4.4%		
4. degree of relationship	0	.0	1	0.7	0	0.0%		
12. Mode of diagnosis								
1. sign and symptom of hypertension	4	2.9	28	20.4	20	14.6	6.887	0.331
2. Master checkup	11	8.0	19	13.9	23	16.8		
3. others	3	2.2	15	10.9	14	10.2		
13. Treatment prescribed								
1. life style modification	0	0.0	6	4.4	3	2.2	2.400	.301
2. Drugs	18	13.1	56	40.9	54	39.4		
If on drugs, level of compliance								
Compliant	14	10.2	34	24.8	40	29.2	4.695	0.096
Partially compliant	4	2.9	28	20.4	17	12.4		

Table 4.3.4 shows the association between pretest level of diastolic BP in experimental group and the socio demographic variables of the newly diagnosed hypertensive patients. It is inferred that there is an association between pretest level of diastolic BP in control group and the income.

TABLE 4.3.5

Association between the Post test II level of BP in the experimental group and the BMI of newly diagnosed hypertensive patients

N= 138

POST TEST BMI	BP						Chi square	
	2	Abnormal		Normal		Total		
		$\geq 140/90$		$< 140/90$		F		%
	f	%	f	%				
<18.5	1	3	5	5	6	4		
18.5-24.9	19	51	84	83	103	75		
25-29.9	11	30	11	11	22	16		
30-34.9	4	11	1	1	5	4	22.68***	
ABOVE 35	2	5	0	0	2	1		
Total	37	27	101	73	138	100		

***P< 0.001

Table 4.3.5 shows the association between posttest II level of BP in experimental group and the BMI of the newly diagnosed hypertensive patients. This table exhibits the presence of association between posttest II level of BP in experimental group and the BMI (chi square =22.68, $p<0.001$). The unfurl findings of the study drives the researcher to accepts the research hypothesis and reject null hypothesis.

TABLE 4.3.6

Association between the Posttest II level of BP in the experimental group and WHR of the newly diagnosed hypertensive patient.

N=138

Post test 2 WHR	BP				Total	χ^2
	$\geq 140/90$		$< 140/90$			
	F	%	F	%		
Abnormal	32	87	67	66	99	72
Normal	5	14	34	34	39	28
Total	37	100	101	100	138	100

5.42*

*P<0.05

Table 4.3.6 shows the association between posttest II level of BP and WHR in experimental group of the newly diagnosed hypertensive patients. The inference is that there is an association between posttest II level of BP in experimental group and the WHR (chi square =5.42, p<0.05). Hence the null is rejected and research hypothesis H₃ is accepted.

Inference:

It is caused by the interventional strategies advocated by the experimental group. These findings are consistent with the study findings of Gupta R et al that there was significant association found between WHR and BP.

CHAPTER – V

DISCUSSION

This present study attempts assessment of the effectiveness of Life Style Modification Strategies (LSMS) in lowering Blood Pressure among newly diagnosed hypertensive patients in sample areas of Villupuram district, Tamil Nadu, India. The sample size was 275 patients from two areas of Villupuram district, selected according to the need of the study. In order to achieve the objectives of this study, quasi experimental pretest and posttest control group design was adopted. The patients were chosen using the purposive sampling technique. Blood pressure was measured by using BP apparatus and stethoscope biweekly and adherence to life style modification strategies was monitored by daily practice LSMS calendar by volunteers on a daily basis and by the investigator once in two weeks. The results, based on objectives, were compared and contrasted in different aspects of study variables. The analyzed data was discussed under the following headings.

- 5.1 Development of the instrument
- 5.2 Distribution of patients according to socio demographic clinical data and bio physiological parameters.
- 5.3 Description of the BP level
- 5.4 Effectiveness of life style modification strategies in bringing down BP.
- 5.5 Associations between blood pressure and socio demographic clinical variables.
- 5.6 Level of satisfaction for life style modification strategies
- 5.7 Open ended feedback questionnaire on life style modification strategies.

5.1 Development of the instrument

In this present study, the following instruments were developed by the researcher on the basis of an extensive review of relevant literature from various sources based on the objectives of the study. They are as follows

1. Proforma on socio demographic and clinical variables
2. The sphygmomanometer and stethoscope
3. Module for LSMS instruction
4. Observational checklist to assess the practice of LSMS.

The study findings are discussed in this chapter as below.

5.2 Socio demographic and clinical variables.

Age

The patients chosen for the study were both males and females. A majority of members in the experimental group 52 (37.7 %) were aged between 31-40 years. The mean figures of age of the patients in the control and the experimental group were 49.54 and 46.20 years respectively. The predominant age group for the prevalence of hypertension is above 40 years as shown in a majority of references in reviewed literature. But the age group in the present study is something striking which shows that the disorder has taken upper hand to affect the middle aged adult than before in the age group of 31-40 years .

A majority 54(39%) of participants in the control group were in the age group of 51-60 years. These findings are supported by a similar study made by Prathiba who assessed the life style modification of hypertensive patients among 60 patients in Karnataka state, India.

Gender:

In this study, women predominated both in experimental 99(72%) and control group 87(63%) among the newly diagnosed hypertensive patients. These findings were identical with the findings of Kokilavani and Girija who made a study in Tamil Nadu among 100 patients. The reasons attributable for women being a majority 1. Women tend to be the home makers and available during day time 2.the incidence of hypertension and gender difference is lost after menopause.

Wilkins et al ¹⁷⁰ have made investigations on Canadian adults and found that hypertension was present in an estimated 19% (4.6 million) of adults aged 20 to 79 years. The overall prevalence of hypertension was nearly the same in men (19.7%) and women (19.0%). The prevalence of hypertension rose with age in both sexes combined. At ages 20 to 39 years, approximately 2% had hypertension, compared with 18% of those aged 40 to 59 years, and 53% of those aged 60 to 79 years.

Education:

A majority 49 (36 %) and 46 (34 %) of patients in the experimental and the control groups respectively had education at the higher secondary level.

These findings are supported by the study of Teena on waist hip ratio (WHR) among clients with uncontrolled and controlled hypertension among 104 patients. The result states that in clients with controlled and uncontrolled hypertension, a majority 64 (60 %) and 56 (60 %) of patients respectively had higher secondary education.

Marriage:

In this study, nearly all participants were married in both the groups as depicted by 133 (96 %) and 134 (98 %) patients in the experimental and control group respectively. A Longitudinal Study by Haijiang¹⁷⁴ among Chinese Women reveals a

relationship between marital status and hypertension. Spinsters among women, widowed or separated showed a higher risk for hypertension (OR= 2.98, 95% CI: 1.16-7.62 and OR=2.27, 95% CI: 1.10-4.69, respectively) relative to married women.

Occupation:

A majority of participants were homemakers 61 (44 %) in the experimental group, whereas working adults 65 (47 %) predominated in the control group , with the nature of work being hard and strenuous in both.

Income:

A majority 70 (51 %) and 79 (58%) of participants in the experimental and the control group had income up to Rs.10, 000/month in the present study.

This is supported by Malar in her investigation of analysis of the cost of treatment among hypertensive patients in private and government hospitals at Erode, Tamil Nadu. A majority 54 (72 %) and 69 (92 %) of patients had income of Rs. < 10000/month in both attending private and government hospital respectively.

Diet:

Diet wise 117 (85 %) patients in the experimental group and 135 (99 %) patients in control group were non-vegetarian. The present study patients were beef eaters taking weekly thrice in the experimental group.

Religion:

A majority 128 (93 %) and 132 (97 %) in the experimental and the control group respectively were Hindus. Similar findings are provided by Kiran in his study on health behavior of hypertensive patients between controlled and uncontrolled

blood pressure in Tamil Nadu. He found that Hindus predominated 45 (90 %) in both groups of controlled and uncontrolled hypertension.

Type of family:

More than three fourths 112 (81 %) and 105 (77 %) patients in the experimental and the control groups live in nuclear families. This is a growing pattern seen in developing countries like India.

Smoking:

The patients in the both the groups were predominately (> 92 %) non smokers in the past as well as in the present. Vaishali Patel has different findings. He conducted a study at **Ahmadabad to find the profile of pulmonary hypertension patients coming to civil hospital** .Out of total 50 patients, 60% of patients were men. Among 30 men 26 (87%) patients were smokers.

Alcohol:

There is contradicting ideation of some evidences establishing the beneficial nature of alcohol whereas some suggest quitting alcohol in order to have control over it. Predominantly there was no history of smoking in the past 127 (97%) as well as in the present 125 (91%) among the experimental group. Similarly in the control group too there was no history of smoking among 131(94%) and 128(92%) in the past and present respectively.

Family history of hypertension:

The present study found no family history of hypertension among 127 (92 %) and 83 (60 %) of patients in the experimental and control group respectively. But Priya found the presence of family history of hypertension among 57 % of patients at Mangalore in her attempt to identify the factors influencing hypertension and obesity.

Mode of diagnosis

More than half, 52(37.4%) in the control group got diagnosed of hypertension through signs and symptoms while 82(59.4%) respondents in the experimental group got diagnosed through a master health check up. Getting diagnosed through master health check up is a healthy sign for the risk groups. It reveals a march ahead for the utilization of the health care systems.

Treatment prescribed

A majority were prescribed lifestyle modification, the figures in the experimental and the control group were 94 (68.1%) and 78 (56.9%) patients respectively. Regarding drug compliance, 33 (75%) respondents in the experimental group and 42(71%) in the control group were compliant to prescribed drugs. Remaining 25% of the patients are struggling to be compliant to drugs. The reasons to be mined out and it has to be rectified.

OBJECTIVE 1

The first objective involves measuring the pre and post test Blood Pressure (BP) of newly diagnosed hypertensive patients in the experimental and control groups.

In the pre test a majority 119(86%) of patients in the experimental group and 66 (48%) in the control group, had systolic BP 140-159mmHg. The diastolic Blood pressure was between 90-99 mmHg for most of the patients 80 (58%) and 88(64%) in the experimental and control group respectively.

With respect to the systolic blood pressure in the post test I, achievement of the target BP less than 140 mmHg was seen in a majority 72(58%) of patients in the experimental group. But in the control group, only 60 (44%) patients had the target

BP. While discussing the diastolic BP in the post test I, for most of them 90(65%) and 55(40%) patients in the experimental and the control groups had target diastolic BP <90 mmHg respectively.

In the post test two, 135(98%) participants in the experimental group and 75 (55%) in the control group had systolic blood pressure <140 mmHg. With respect to the post test II diastolic BP, while everyone 125(91%) in the experimental group had achieved the target BP, the figure for the control group was only 67(49%).

The findings of this study are compared and contrasted as follows.

Zemedkun⁷³ in their study in the Sub-Saharan African countries, Ghana in South Africa found large prevalence of hypertension both stage 1 and 2 as higher in South Africa (46%) compared to Ghana (42.4%). This is mostly due to obesity, leading sedentary life, living in urban and consuming lesser fruit seen in persons above 50 years of age.

A Study of clinic social profile of young women with hypertension in a tertiary care hospital by Mausumi¹⁶⁹ shows the mean systolic blood pressure and mean diastolic blood pressure as 144.1 (SD 24.6 mmHg) and 79.9 (SD 12.4 mmHg) respectively. Newly detected hypertensive patients were 21.4%, which 39.1% were in stage 1 hypertension and 60.9% were in stage 2 which is contradictory to the current study.

Wilkins et al ¹⁷⁰ have done investigation on the Canadian adults and found that hypertension was present in an estimated 19% (4.6 million) of Canadian adults aged 20 to 79 years. The overall prevalence of hypertension was nearly the same in men (19.7%) and women (19.0%). The prevalence of hypertension rose with age in both sexes combined. At ages 20 to 39 years, approximately 2% had hypertension, compared with 18% of those aged 40 to 59 years, and 53% of those aged 60 to 79

years. The mean systolic BP for women was (101.4 and 111.7 mm Hg,)respectively were lower than those of men (109.9 and 116.5 mm Hg)

Yadav et al⁷⁴ report the prevalence of hypertension and pre-hypertension among 1746 adults (age ≥ 30 yrs) residing in an urban area in north India as 32.2 percent and was 32.3 per cent respectively. Those 60-69 years of age were tending to have hypertension, whereas pre hypertension was seen in person in the age group 30-39.

5.3. OBJECTIVE 2

The Second objective is to ascertain the effectiveness of Life Style Modification Strategies (LSMS) in bringing down blood pressure by comparing the pre test BP with that of post test BP within and between the experimental and control group among newly diagnosed hypertensive patients which was established by table 4.2.1 to 4.2.14.

The pretest and the posttest II mean systolic BP in the experimental group was 145.80 [SD 10.99], and 122.61 [SD 4.88], the mean difference is 23.19 and the t-value is 19.68 which is statistically significant at 0.05 level as revealed by Table no. 4.2.5 The pretest mean diastolic BP in the experimental group is 90.65 [SD 8.30], the posttest II mean diastolic BP is 80.65 [SD 3.24], the mean difference is 10.00 and the t-value is 9.46 which is statistically significant at 0.05 level as expressed in Table 4.2.5. Thus the LSMS has lowered SBP and DBP. This has occurred not by chance but as a result of manipulation.

The posttest II mean value of SBP in the experimental group is 122.61 [SD 4.88], the posttest mean value of SBP in the control group is 138.10 [SD 16.29], the mean difference is 15.49 and the t-value is 11.73 which is statistically significant at

0.05 level. The posttest II mean value of DBP in the experimental group is 80.65[SD 12.14], the posttest mean value of DBP in the control group 88.23 [SD 14.19], the mean difference 7.60 and the t-value 8.08 which is statistically significant at 0.05 level and it was manifested by table no4.2.6.

Hence the LSMS is found effective in lowering BP. The value of BP was also seen getting lower in the post test confirmed through RM ANOVA.

.The above findings do not support the null hypothesis. Hence, the null hypothesis is rejected while the research hypothesis is accepted. These findings are supported by the following study results.

Subramanian et al¹³⁹ have carried out a home based study using cross over experimental control design on complementary therapy among patients with hypertension in Pudhucherry in 2007. The sample size was 98 patients. There was significant reduction in the systolic BP in post test compared to pretest from 132,130, 127 mmHg to 127,127,126 respectively through physical exercise, reduction in salt consumption and yoga group respectively. This was significant at the level of 95% confidence interval.

Similarly Siad et al made an investigation of the extent of superiority of the lifestyle modification program compared to the usual care in hospital settings among hypertensive. The impact was that the intervention resulted in reduction of BP at the level of $P < 0.05$ in six months.

Brisk walking, yoga and DASH diet each independently as well as in combination produced reduction in BP. Brisk walking and its role in bringing down hypertension were studied by Azeem k. His findings revealed significant reduction caused in systolic and diastolic BP, BMI and WHR. Both accumulated and

intermittent walking were found to be effective in controlling BP. He recommended exercising for half an hour per day, at least with an average of 4 days per week.

In another study by Yadav, yoga was identified as an efficient technique to control BP. The practice of Pranayama and Savasana resulted in decreased BP.

The same was supported by the end result of a study made by Dusek. The systolic and diastolic blood pressure were reduced by 10.2 and 9.4 mm Hg respectively after yoga therapy.

The findings of the current study were further strengthened by the report of Mellen in his research on DASH diet proved that it was effective in producing lowered BP level.

The findings are further supported by the result of a study done by Saptharishi L et al, who have chosen four groups. A reduction was seen in BP among the three therapy groups was 5.3, 2.6 and 2.0 mm Hg in systolic pressure and 6.0, 3.7 and 2.6 in diastolic blood pressure as a result of physical exercise, salt consumption and yoga respectively. There was no significant change in the control group between pre and post test BP.

Adherence to prescribed treatment is highly important for facilitating the action of the prescribed therapy. The investigator found a difference in the level of reduction in BP among compliant and partially compliant participants as shown in table 29. The mean values of posttest I systolic pressure were 130.714, 127.455 [SD 6.042, 7.095] respectively among the partially compliant and compliant group in the experimental group. The calculated t-value is 2.519, which is statistically significant at 0.05 levels. Similarly, the mean value of posttest II systolic BP was 124.643, 122.091 [SD 5.762, 5.762] respectively among the partially compliant and compliant participants in the experimental group. The calculated t-value of 2.232 is statistically

significant at 0.05 level. The 'F' value is 202.94, which is more than table value seen in the Table reflecting the significance of the LSMS in lowering the BP. The concept of adherence is mostly influenced by mutual understanding between the patient and healthcare providers as reported by Holland N and Nandi O.

The LSMS as an intervention not only helped lowering BP and with significant the BMI and Waist hip ratio in the post test of the experimental group. This is proved by the study findings of Nargis Akhter who found that after the lifestyle intervention the BMI had lessened from 38.49 to 36.18 significantly ($t= 6.38$) at the level of $P<0.05$.

These results are supported by the results of a study conducted by Frisolil et al to assess the life style modification and blood pressure in Germany. He reports that a positive association amid weight and BP. In case of gaining weight, the BP also tend to raise parallel with increasing weight.

These findings are identical with the study results of Lopes et al. who conducted a study with the objective of discovering the effect of teaching program on compliance towards non drug therapy in arterial high BP among 216 hypertensive clients. He found the occurrence of reduction in BMI after health education and adoption of these educational strategies.

The objective of Sanya and Ogwumike¹⁶⁸ was to find the relationship between BMI, WHR with BP at Nigeria. The sample consisted of 404 men and women between 15 and 85 years. BMI, WHR & BP were measured along with a study of lifestyle, occupation and family history. The average Waist Hip Ratio of men was 0.88 which is within the normal range. But, for women, the ratio fell within the category of overweight and obese. For all of them, the average BMI was 22-23 kg/m² considered as healthy weight. The mean BMI falls within the normal range for

greater values of WHR in the obese category. Hence WHR is a reliable indicator compared to BMI. It was also found that $BMI > 25 \text{ kg/m}^2$, $WHR > 0.9$ correlated with BP. Sanya and his colleagues found WHR as a valuable indicator than BMI in assessing intra abdominal fat and coronary artery disease and both BMI and WHR are seen to have a linear relationship with BP.

Wexler¹⁷² attempted to find barriers to hypertension treatment on the basis of African American patients' opinions and got response that the health care system, the individual, the family and the community as a whole were factors that had palpable influence on compliance and hurdles for adopting the treatment.

OBJECTIVE 3

To associate the blood pressure level with selected socio demographic clinical variable and BMI and WHR among newly diagnosed hypertensive patients.

This is discussed in two aspects as follows.

1. Association between the level of blood pressure and selected socio demographic clinical variables.
2. Association between the level of blood pressure and BMI, WHR

1. Association between blood pressure and selected socio demographic variables.

Table no 4.3.1 to 4.3.4 describes the association between blood pressure and selected socio demographic variables

- A significance association was found between the pretest systolic level of BP and present history of smoking, past and present history of alcoholism in pretest systolic blood pressure among the participants in the experimental group as shown in Table no .4.3.1.
- There was no association found between the pretest systolic BP with other socio demographic variables in the experimental group.

- There was no association found between pretest systolic BP and socio demographic variables in the control group.
- There were no association found between pretest diastolic BP and socio demographic variables in the experimental and control groups

The findings based on objective three are supported and contrasted as follows

There is no association between smoking and hypertension.

Pajak Aand Kawalec E¹⁴⁹ conducted a cross-sectional study among a random sample of 1157 women and 1153 men, among permanent inhabitants of Krakow at the age of 45-64 years. Men of binge drinkers had borderline significance ($p = 0.057$) to develop hypertension and no significant relation between smoking and hypertension was found in them. In women, moderate alcohol consumption was related to a lower chance of hypertension (OR = 0.72) and women of current smokers had lower chance of hypertension (OR = 0.67). The findings confirmed weight control as an effective tool for preventing hypertension and increasing physical activity. Refraining from binge drinking may have a protective effect.

Tripathi¹⁷¹ et al found association between BP and alcoholism. The subjects taking non vegetarian and vegetarian diet from plain showed significantly high SBP, 129 (SD 19) ,133 (18) and DBP 81(13) and 85(13) mmHg respectively. But this difference is not noticed among non vegetarian and vegetarian from hill area. The high BP among non vegetarian subjects may be due to increased dietary sodium intake through fish, sea food and the consumption of spices and salt.

Lipowicz andLopuszanska¹⁷³ have reported in their study that unmarried men had on average higher systolic BP and diastolic BP than married men. The unmarried had also a higher risk of hypertension when compared to married men, even with adjustment for different demographic, socio-economic, life-style variables, and even

that never married men had lower BMI compared to married persons. The never married had psychological stress (prolonged stress and low social support), faulty dietary intake (mainly sodium and potassium intake) and economic aspects of living alone are suggested as factors, which might explain at least partly the marital diversity in blood pressure and the risk of hypertension in men.

2. The association between level of blood pressure, BMI and WHR

2. A. Association between levels of blood pressure BMI:

There was a significant association between BP and BMI as depicted in Table 4.3.5 . The chi square value was 22.68 which is significant at the level of $P < 0.001$. In the post test II it was made known that there was significant association between BMI and level of blood pressure. As the value of BMI goes above, the value of blood pressure tend to be higher. Hence the hypothesis H_3 was accepted that there is significant association between level of blood pressure and BMI.

This relationship also is strengthened by the outcome of the study made by AnjumHumayunArbab and Riffat sultana¹⁶² **at Pakistan**. They found that the prevalence of hypertension was getting elevated with the BMI increase, established the existence of stronger link between BMI especially central obesity and BP. This had been proved by relation of normal BMI with hypertension is 34% and overweight is 58% while that of obese is 77% indicating a strong relationship of hypertension with BMI.

A study conducted by Premalatha¹⁶⁰ found the prevalence of hypertension and its correlation among 200 school children (both boys and girls) between 10-12 years at Chennai. Systolic BP and diastolic BP showed positive correlation with BMI, height and weight at $p < 0.05$.

Tesfaye et al ¹⁶⁵ have reported the relation between BP and BMI in women in three countries namely Ethiopia, Vietnam, and Indonesia. Generally, both mean systolic BP and mean diastolic BP increased along with increasing BMI quintiles. The increase in mean systolic BP begins around the second BMI quintile for Indonesian men and women, corresponding to mean BMI increase among Vietnamese men.

2. B. The association between level of blood pressure and WHR.

Considerable association between level of blood pressure and WHR (Table 4.3.6) was seen in post test II. The higher the value of WHR, the higher was the level of blood pressure. Hence the hypothesis H₃ was accepted that there was significant association between level of blood pressure and WHR.

Teenaann john¹⁶¹ made investigation of waist-hip ratio among clients with uncontrolled and controlled hypertension at Trivandrum, Kerala. The mean waist circumference 93(SD=10.57), hip circumference 98.6(SD=9.69) and waist- hip ratio 0.94(SD=.094) were higher among hypertensive clients with no control compared to controlled hypertensive clients.

Damirchi. Mehrabani¹⁶³ found the Prevalence of obesity, overweight and high blood pressure significantly increasing with aging, monthly income, number of family members, and low level of education and physical activity ($p < 0.05$). Therefore, in all age groups, there was striking relation between obesity and high blood pressure ($p < 0.0001$). Highest prevalence of obesity (50.3%) and high BP (71.1%) were in older group. Obese persons in all groups had high BP ($p < 0.05$).

Breenin his article ¹⁶⁴ on hypertension confirms increase in body weight the risk of hypertension (Stamler 1991) due to excessive body weight. A high proportion of abdominal fat (central obesity) detected by waist circumference is also a sign of

adverse cardiovascular outcomes (Williams1994). A body mass index (BMI) of 20-25kg/m² is recommended, combined with a waist circumference of ≤102cm for European men, ≤88cm for European women, ≤90cm for South Asian men and ≤80cm for South Asian women (British Cardiac Society *et al* 2005).

The results of a study conducted by Tesfayeet al¹⁶⁵ and his team in Ethiopia, Vietnam and Indonesia agree with these findings. This was carried out for measuring the extent to which BMI and BP were interconnected. It was known that mean systolic BP and diastolic BP along with hiking BMI quintiles. The systolic BP tends to rise getting close to second BMI quintile for the study population. The increase in mean systolic BP begins around the second BMI quintile for Indonesian men and women, corresponding to mean BMI increase among Vietnamese men.

Moore¹⁶⁶ has conducted a survey among the students (N = 2053) in Anadarko public schools belonging to multiracial, multiethnic (American Indian, white, African American, and Hispanic) population in southwestern Oklahoma. There were high rates of excess weight, with American Indians and African Americans at greatest risk. Elevated BMI was strongly associated with elevated blood pressure.

Gupta et al ¹⁶⁷ for their epidemiological study, made a random selection of 1800 (men 960, women 840) adults aged above 20 years in an urban Indian city and measured bio physiological variables. This study established the prevalence of hypertension rise along with ascend of BMI and WHR.

The following discussion is based on the responses from an open ended feedback questionnaire administered at the end of intervention package for 24 weeks for the experimental group. Item no 1 was :why do you like this? A majority among patients 41 (30%) expressed the reason for liking it as that it is easy to do. The reason for feeling so, is that it is not tough to do and they could schedule their timings to do

it, as well as the effect is acknowledged with optimistic attitude and unmindful of the difficulties encountered which may drive them to be compatible for regular work. The second reason for its, having been liked is that it causes a reduction in BP as reported by 39(28%) of the experimental group. Of course, this is the core aim of this study for which the study was undertaken. The reduction was steady and gradual which was estimated through biweekly assessment of BP which is the response expected from each one of them. But for analysis the measurement of 12 and 24 weeks was taken. The third reason for the liking of this LSMS done by them is, that it provides a sense of happiness as reported by 31 (22%) of them. They recognize the effect (both physical and mental) which drives them to do it irrespective of the reasons advanced. There are other reasons too for the liking from the patients. They are: it causes stress free mind, good to do this rather than taking medicines, causes weight reduction, makes it headache free and others. Two of them reported that they have not liked it but they still continue to do it.

Item no: 2 of open ended feedback questionnaire was:Do you feel any discomfort by doing this LSMS'? Eighty nine (64%) of them in the experimental group told they did not perceive any discomfort in regular practice, revealing pacification of their felt need and their ability to spare time for daily practice. The determination to achieve the target provides a feeling of absence of discomfort to take effort to practice LSMS daily. Next to that, 36 (26%) patients responded that it is difficult to do it daily. It means their ability to do it, but continuously doing daily without break is their problem. The work schedule, functions, festivals, rituals may create such situations, forcing them out of a position to do it on a daily basis. This leads to a thought that it is difficult to do daily. Occasionally they could not do it as well, when combined with attending functions outside and with need to do take food

outside. In spite of all that, they practiced it continuously as they felt comfortable doing LSMS. The third response for this item was that about 13 (9%) patients said that they were unable to follow this, when they had heavy work. The reason behind this may be, most of the patients are persons at work and homemakers. The household chores in Indian families are very tedious, especially during festivals and rituals on auspicious days. This takes considerable time, hence, the inability to schedule time to do the LSMS at times.

The feedback for open ended questionnaire for the item No. 3: “How much do you like to follow this” was as below. A majority 62(45%) of them reported that they would like to follow this LSMS until their health is totally improved. Once they recognize that this LSMS could do something to solve their health problem, it brings hope in their mindset that this LSMS could give a curing result which provokes them to feel that they will continue to practice it until their health is totally improved, since they witnessed it as a benefit. ‘Prefer to follow daily’ was the reply from 38(27%) of them. Since they scheduled themselves and realized the effects of LSMS, they wanted to follow it daily to be benefited by this. The answer from 19(14%) of them was that they do follow as long as they like it. Some of them view it as a leisure time activity or intentionally doing it joyfully, that they would like to follow this as long as they liked it. “As much as I can” was the notion put forth by 18 (13%) patients. They may convey this irrespective of any hurdles or challenges faced. They would pursue scheduling of their timings, and create a situation for doing it to the maximum. Only one among them reported that he used continue to do it when he had time to practice.

The 4th item was “How much is this useful to you”? Almost a half 65(47%) of them reported that improvement in their general health. Hypertension gives rise to generalized as well as specific signs and symptoms that leads to a sense of sickness.

Improvement in general health means is progress in physical and mental wellbeing achieved because of LSMS and as the result of BP kept under control. This reveals that LSMS not only causes reduction in BP but also improvement in general health among the doers of LSMS. Next to the general health, 38(28%) of them indicated reduction in BP. This reflection is the core aim of this study. There are plenty of therapies available for non communicable diseases. But this specific combination works out well to bring down BP to normal. Followed by 15(11%) of them revealed that they could do their regular activities comfortably. This is possible, due to the reason that once BP is under control, other signs and symptom automatically come under control or vanish. LSMS play a vital role in getting rid of the symptoms such as headache, dizziness, fainting, vomiting exertion etc and make them symptom free. They would ensure scheduling their meetings. This might result in helping the patients perform their routine schedule without any interruption. About 8(6%) of them indicated this LSMS as useful in reducing weight. One of the factors which causes development of hypertension is weight. The LSMS also caused weight reduction, especially due to DASH component. As the weight reduces, the BP tends to fall automatically. Similarly it was useful in getting rid of headache and fainting as pointed out by 8(6%) patients. It was interesting to note that 4(3%) of them declared their feeling at peace. BP causes stress and stress causes high BP. Yoga calms down the mind, also helping relaxation of blood vessels, nerves and thereby releasing the stress in body and mind.

A four point rating scale on the level of satisfaction was administered for 24 weeks for the experimental group. A majority 126 (91.3%) of them were highly satisfied and 12(8.7%) of them in the experimental group. In Indian culture, it is the practice to rise before sun rise, especially in a rural based society where most of them

are workers. So, getting up early in the morning is not at all a difficult task for them. A routine, followed, is to go in for fresh cow's milk which demands some walking. So, adopting this LSMS is just a modification of routine life in terms of walking. On returning home, after a brisk walk, they could relax by sitting for nadisudhi pranayama which takes 10 minutes to practice with 20 cycles of it for completion. Practicing savasana takes 10 minutes. This can be done after completion of morning chores. So incorporating this LSMS is not a difficult venture in daily routine. Following this, normal work can be taken up. Hence, following practice on a daily basis does not involve any difficulty at all. Moreover the effect of it is experienced by them positively. Hence, it gives a high sense of satisfaction with LSMS.

**“EFFECTIVENESS OF LIFE STYLE MODIFICATION
STRATEGIES IN LOWERING BLOOD PRESSURE AMONG
NEWLY DIAGNOSED HYPERTENSIVE PATIENTS”**

A Thesis

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DOCTOR OF PHILOSOPHY IN NURSING

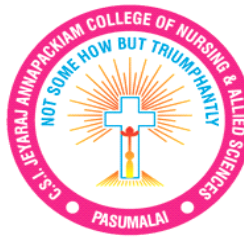


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CHAPTER VI

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

6.1 SUMMARY

This chapter presents a summary of the study, its major findings, conclusions, implications and recommendations for future research. The study was to assess the effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients. It was conducted at two sample areas in Villupuram district, Tamil Nadu, India. WHO 2009⁸ states that high BP accounts for , 13% of deaths in the list of disorders among non communicable disorders seen as fatal.

The non communicable disease risk factor survey ²⁸ of 2007 predicts the overall distribution of hypertension in Tamil Nadu as 18%. The risk of hypertension is known to grow parallel in combination with age, regardless of gender. Education status is reflected in the difference in the rate of distribution of this disorder, with increased rate among illiterates compared to literates as revealed by statistics of 23% and 18% among those with no schooling and those with higher level schooling respectively. It is seen higher (24%) among men than in women (15%).

Several studies lay stress on the importance of maintenance of healthy behavior and regular habits in daily life. Chintamani⁴ and Brunner⁵ report lifestyle modification bringing desirable changes in blood pressure. About 10kg reduction in weight can help reduction of five to twenty mm Hg in BP. The DASH food helps decrease of 8-14 mm Hg. Sodium restriction lowers BP of 2--8 mmHg. Physical

activity brings down the BP to 2-8 mm Hg. Hence, physical activity, yoga and DASH diet form the right combination strategies to lower BP.

Considering the magnitude of the problem and the availability of feasible measures, the investigator had chosen LSMS as ideal for control, the delay of onset of BP and prevention of the development of complications.

Objectives of the study:

- To assess the pre and post test Blood Pressure (BP), of newly diagnosed hypertensive patients in the control and the experimental groups.
- To evaluate the effectiveness of Life Style Modification Strategies (LSMS) in lowering BP by comparing the pre test and post test BP within and between the control and the experimental groups among newly diagnosed hypertensive patients.
- To find out the association between blood pressure level and selected socio demographic and clinical variables among newly diagnosed hypertensive patients.

Hypotheses

H₁ There is a significant difference between the value of pre and post test blood pressure BMI, WHR with the control and experimental groups.

H₂ A significant difference exists between in the value of blood pressure and BMI, WHR after the Life Style Modification Strategies (LSMS) between the control and experimental groups.

H₃ There is a significant association between the blood pressure BMI, WHR and selected socio demographic clinical variables among newly diagnosed hypertensive patients in the control and experimental groups .

The investigator has used the modified Wiedenbach's prescriptive theory (1964), a helping art model, as the basis of conceptual framework. A quantitative approach has been used for this study. Quasi experimental pretest/posttest control group design has been adopted for this study.

The areas for study were assigned by in a random manner using the lottery method. This study was conducted in two settings, namely, Vazuthareddy and Vikkaravandi in the Villupuram district. The target population for the study consisted of newly diagnosed hypertensive patients. Reference in this study is to those patients diagnosed to have hypertension within the proceeding period of 6 months, and residing at Vikkiravandi and Vazhuthareddy. Samples were the patients, who were diagnosed with hypertension and in the age group of 31 to 60 years of both genders, within the period of 6 months and who fulfilled the inclusion criteria. Selection of the subjects during data collection was done on the basis of a non probability purposive sampling.

The investigator, for this study, developed tools which were seven in number and comprised the following.

Tool 1.Proforma on socio demographic and clinical variables

Tool 2.The sphygmomanometer and stethoscope

Tool 3.Teaching module on LSMS

Tool 4. Observational checklist to assess the practice of LSMS.

The data was collected in five phases.

Phase I - case identification

Phase II Pretest to both groups

Phase III -Introduce LSMS to experimental group

Phase IV - Post test I at 12th week to both groups

Phase V - Post test II at 24th week to both groups

The data were analyzed in terms of objectives of this study using descriptive and inferential statistics (Paired 't' test, Independent 't' test, repeated measures ANOVA, ANCOVA, and Chi square)

Major findings of the study

A. Findings related to socio demographic variables of the patients.

- A majority 99(707%) and 87(63%) of the patients were women in the intervention and the control groups respectively.
- Almost all participants in both groups 133(96%) and 134(98%) were married.
- Nearly half of the patients 61(44%) in the experimental group were homemakers but, in the control group, most 44(32%) of them were laborers.
- By religion, Hindus were a majority in both the groups, 128(93%) and 132(97%) patients in the experimental and the control groups respectively.
- More than three fourths in both groups were in nuclear families

B. Findings related to clinical parameters namely BP BMI and WHR of the patients.

1. There is significant difference between the pretest and the posttest II mean systolic BP in the experimental group. There was reduction in the systolic blood pressure of 17.68 mmHg in post test II in the experimental group which is significant as $P < 0.05$. The pretest mean systolic BP in the experimental group is 145.80 [SD 11], the posttest II mean systolic BP in the experimental group is 122.61 [SD 4.88], the mean difference is 23.19 and the 't'-value is 19.68 is statistically significant at 0.05 level

2. There is a significant difference among the pretest, posttest I and II mean systolic BP between the experimental and the control groups. The pre test, posttest I and II mean systolic BP in experimental group are 145.80, 127.90 and 122.61 [SD 11, 16.88, 4.88]. The pre test, posttest I and II mean values of SBP in the control group are respectively 143.67, 140.07 and 137.99 [SD 11, 7.09, 4.88], The calculated f-value in RMANOVA is 47.05 which is higher than the table value. It signifies the effectiveness of the LSMS in lowering BP across the periods.
3. A significant difference is seen between the pretest and the posttest II mean diastolic BP in the experimental group. The pretest mean diastolic BP in experimental group is 90.65 [SD 8.30] and the posttest II mean diastolic BP is 80.65 [SD 3.24]. The mean difference is 10 and the t-value is 9.46 which are significant at 0.05 level of significance.
4. There is a significant difference among pretest, posttest I and II mean diastolic BP between the experimental and the control groups. The pre test, post test I and II mean diastolic BP in the experimental group are 90.65, 83.55 and 80.65 [SD-8.30, 5.51 and 3.24] respectively. The pre test, posttest I and II mean value of DBP in the control group is 93.88, 88.20, 86.23 and [SD -13.11, 12.98 and 14.19], The calculated f-value is 25.11 which is statistically significant at 0.001 level.
5. The calculated 'f' value (27.931, 7.657) in ANCOVA with the co variant drug compliance is more than the table value with respect to systolic and diastolic BP respectively establishing the effectiveness of LSMS in lowering BP.

6. There is a significant difference between the pre test and the posttest II mean value of BMI in the experimental group. The pretest mean value of BMI is 25.02[SD 4.80], and the posttest II mean value of BMI was 23.01[SD 3.39], the mean difference is 2.3223 and the t-value is 11.576 which is statistically significant at 0.05 level.
7. There is significant difference between the pre and the posttest II mean WHR in the experimental group .The pretest mean WHR is .97 [SD. 23], the posttest II mean WHR is 0.92 [SD .16], the mean difference is 0.219 and the t-value is 2.907* which is statistically significant at 0.05 level.

C. Findings related to association between BP and socio demographic clinical variables, of newly diagnosed hypertensive patients.

1. A significant association was found between the level of blood pressure and occupation and religion in the Pretest systolic blood pressure among the experimental group. There was no significant association between level of blood pressure and age, gender, educational status, income, dietary pattern, marital status, type of family, habit of smoking past and present, habit of alcoholism past and present, family history of hypertension, mode of diagnosis and the treatment prescribed.
2. There was a significant association between the level of blood pressure and age in the Pretest systolic blood pressure among the control group. The association between the level of blood pressure and gender, educational status, occupation ,income, dietary pattern, marital status, , type of family, habits of smoking past and present, habit of alcoholism past and present, religion , family history of hypertension, and the mode of diagnosis and the treatment prescribed were not statistically significant among the control group in pretest.

3. A significant association between level of pretest diastolic blood pressure and type of family in the experimental group was seen. A significant association was also seen between level of pretest diastolic blood pressure and the type of family in the experimental group. But no association was found between the level of diastolic blood pressure and age, gender, educational status, occupation, income, dietary pattern, marital status, habits of smoking past and present, habits of alcohol past and present, religion, family history of hypertension, mode of diagnosis and the treatment prescribed in Pretest diastolic blood pressure among the experimental group.
4. Regarding the association between the level of blood pressure and socio demographic variable in the pretest diastolic blood pressure, in the control group, none of the variables including age, gender, educational status, occupation, income, dietary pattern, marital status, type of family, habit of smoking past and present, habit of alcoholism past and present, religion, family history of hypertension, mode of diagnosis and the treatment prescribed.
5. There was a significant association found between BP and BMI in the post test II among the experimental group.
6. There was a significant association found between BP and WHR in the post test II among the experimental group.

6.2 IMPLICATIONS

The present study assessed the effectiveness of life style modification strategies in lowering Blood Pressure among the newly diagnosed hypertensive patients at sample areas of Villupuram district, Tamil Nadu. The study findings indicate a significant difference between the pretest and posttest blood pressure in the

control and the experimental groups. It indicates the significant role played by Life Style Modification Strategies (LSMS) in lowering blood pressure. These findings of the study have implications for nursing education, nursing practice, nursing administration and nursing research.

Nursing Practice

- The study reveals the fundamental responsibility of the nurse to be supportive to hypertensive patients with various interventions such as brisk walking, yoga and Dietary Approaches to Stop Hypertension (DASH) diet and improve the well being of the client.
- The study findings could be disseminated to practicing nurses. This will motivate them to administer these interventions for the clients diagnosed with hypertension in the healthcare institutions as well as in the community in general.
- Nursing professionals working in nursing care settings should incorporate the recommended alternative therapies such as yoga and meditation in the routine nursing care.
- Nurses should equip themselves with adequate, appropriate knowledge regarding the needed lifestyle modifications to improve the quality of life of hypertensive patients.
- Simple alternative therapies like yoga do not require extensive training. Hence, this can be incorporated in the nursing care routine easily especially by those who are functioning, in the specialty area/department of non communicable disease.

- Nurses should counsel the clients in their regular follow up visits to practice LSMS.
- Nurses should insist the clients with hypertension or prone to develop hypertension to practice these lifestyle modifications regularly and not haphazardly.
- The study emphasize the core responsibility of the community health nurse is to be supportive enough to the patients with Hypertension and to lead a healthy life style.
- The study findings could be disseminated to the community health nurses with suitable motivation practices to administer the lifestyle modifications for the patients with hypertension or patients who are prone to hypertension to avoid complications.
- Nurses working in community areas as health care professionals should equip themselves and incorporate lifestyle modification strategies in their routine care.
- Complementary therapies could be included as part of the routine outpatient care of treatment for hypertension.

Nursing Education:

- Nursing curriculum should embrace conditions such as hypertension and its complications in detail and should provide exposure to students in various clinical settings where they come across patients with hypertension which enable their application of theory into practice and those who are working in specialized departments of hypertension.

- Nurse educators should encourage nursing students to practice various alternative therapies and educate them along with the routine, standard nursing care.
- Nursing curricula need periodical evaluation based on the patient and family centered approach.
- Certain alternative therapies which meet the needs of the patients can be added as nursing procedures for nurses working in health care settings.
- Nursing curriculum should emphasize not only on physical domain but more on the psychological wellbeing of the patient.

It is essential to create awareness among the nurse educators regarding importance of LSMS.

- Providing orientation to the students on the use of LSMS and allotment of time exclusively for teaching LSMS will be useful.
- Hypertension being a common problem in the present context, strategies like LSMS which are proven effective can be included in the daily practice.
- Greater emphasis can be given for hands- on- training of the students on various relaxation strategies yoga during their basic clinical postings.
- Students can be actively involved in patient education on LSMS. Providing orientation to the students on the LSMS and allotment of time for exclusive teaching LSMS will be useful.
- Hypertension being a common problem in the present context, strategies which are proven effective such as the LSMS can be enlightened. More emphasize can be given for hands- on- training of the students on various LSMS strategies including brisk walking, yoga. DASH diet during their basic clinical postings. Students can actively involved in patient education on LSMS

Nursing administration

- Nurses are the prominent work force in health care and no significant transformation can be achieved without them.
- Practicing nurses can be educated on various LSMS through in service education program.
- They can be motivated to incorporate LSMS during their daily practice.
- Short-term programs on LSMS may be organized for nurses to improve their proficiency in special therapies.
- The curriculum could be modified by the authorities to include emphasis on such therapies.
- Nurse administrators can organize continuing nursing education on lifestyle modification strategies on the basis of the needs of the patients.
- Nurse administrators can collaborate with nursing researchers to conduct further research in utilization of LSMS.
- Nurse administrators should make close observations on the clients with hypertension and tailor the lifestyle strategies for voluntary adoption.
- Community health nurses can organize mass screening and surveys to detect hypertensive problems at an early stage and to obviate long term consequences like renal diseases, cardiovascular disease, etc. as a team work.
- Community health nurses can organize mass awareness programs on hypertension and its dimensions through IEC program for early adults to adopt it at the earliest to promote health.
- Community health care nurses can impart health education to patients on preventive and curative aspects of hypertension related health problems to improve their quality of life.

- Community health nurses can participate in the conduct of hypertension Clinics periodically to diagnose and treat hypertensive problems and to counsel them.
- The concept of hypertension can be included as a component of health in the school curriculum. This can be considered as a primordial prevention in terms of preventing hypertension related health problems during midlife and old age
- Nurses are the prominent work force in the health care field and so great transformation can be achieved through them by arranging school health program or by school health nurses to students.
- Education to practicing nurses to various LSMS through in-service education programs. They can be motivated to incorporate LSMS during their daily practice.
- Short-term programs on LSMS may be organized for nurses to improve proficiency in special therapies. The syllabus could be modified by the authorities to include emphasis on such therapies.

Nursing Research

- Various researches have to be undertaken for ensuring compliance with the lifestyle of the patients with hypertension for suitability and practicality.
- Nurse researchers have to carry out various research studies in diverse aspects of LSMS to prevent complications in future.
- Play way methods of LSMS to be identified and offered to ensure adherence to treatment.

- Public health policy including the practice to reduce the exposure of the whole population to major risk factor such as unhealthy diet, physical inactivity, harmful use of alcohol and tobacco use should be strengthened and monitored.
- As LSMS is found to be useful, research initiative can be fostered among the nurses and nursing students on aspects of LSMS.
- Long term and on-going studies can be encouraged to understand the sustained effects of LSMS.
- Active and permanent research wing can be employed in the clinical area for following up long term LSMS trials.
- Collaborative research can be conducted among the departments of Nursing, physiotherapy, yoga and, dietetics and to identify and disseminate the effects of LSMS among various patient groups.
- As LSMS is found to be useful, research initiative can be fostered among the nurses and nursing students on aspects of LSMS.
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- Collaborative research can be conducted among the departments of Nursing, physiotherapy, yoga and, dietetics and to identify and disseminate the effects of LSMS among various patient groups.

6.3 RECOMMENDATIONS

1. A longitudinal study can be conducted to assess the effects of hypertension and the severity of hypertension among patients with complications.
2. A qualitative study can be conducted on LSMS among patients with hypertension.
3. A longitudinal or time series study can be conducted for identifying the effect of LSMS among patients with hypertension.
4. A cross cultural study can be conducted among Indian patients on hypertension related health problems.
5. An explorative study can be conducted to understand and appreciate the health related risk factors among hypertensive patients.
6. This study can be replicated in different clinical settings including morbid conditions
7. An extensive survey can be conducted to assess the practice of LSMS across the country among hypertensive patients.
8. The same study can be conducted at community areas in Villupuram other than those taken up in this study.
9. A study can be conducted to find out the cost effectiveness of LSMS over medical treatment.
10. A comparative study can be conducted with alternative therapies to lessen the hypertension and prevent the complications.
11. A study on the knowledge and attitude of school teachers and students towards hypertension can be conducted.
12. The same study can be conducted using old cases of hypertensive patients.

13. The same study can be replicated by overcoming the limitations of the present studies.
14. A research initiative can be fostered among the nurses and nursing students on the various aspects of LSMS.
15. Long term studies can be encouraged for understanding the sustained effects of LSMS.
16. Active and on-going research wing can be employed in the clinical area for following up long term LSMS trials.
17. Collaborative research can be conducted among the departments of nursing, physiotherapy, yoga and, dietetics and to identify and disseminate the effects of LSMS among various patient groups.

6.4 LIMITATIONS OF THE STUDY

1. The samples are those who got diagnosed within the proceeding period of 6 months but the exact onset of hypertension is not known, hypertension being asymptomatic.
2. Interview schedule with closed ended questions limited the views and expressions of the hypertensive patients.
3. The data collected was cross sectional in nature, could not elicit the patients to come out with their long term problems.
4. The reliance on the memory of study subjects for eliciting the family history of hypertension was limited.
5. The study was limited to Vikravandi and Vazhudareddy areas of Villupuram.
6. Generalization is limited to the population as samples selected through purpose sampling technique and a small sample size.

6.5 CONCLUSION

Hypertension starts with young age, even in 20s. But, unlike others, once identified at an early stage, this condition is easy to control despite being a silent killer. The problem lies in screening and identifying its presence. Getting a master check up done regularly for the public especially for the high risk group could eliminate half of the treatment burden. Teaching the victims regarding the availability of complementary and alternative therapies help them adopt a suitable measure for them. It is the respectability of health care personnel to screen, identify and create awareness of the disorder in coordination with the public. This paves the way to, make use of their resources, change their life style with determination and regularity of treatment and monitor themselves thereby prevent and treat complications in time.

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APPENDIX – A

LETTER SEEKING PERMISSION FOR DATA COLLECTION

From

**K. THAMARAI SELVI
Principal,
E.S.College of Nursing
Villupuram**

To

Respected Sir/Madam

Subject : Seeking permission to do Ph.D Data collection reg.

I, Mrs.K. Thamarai selvi, doing ph.D in nursing at CSI Jeyaraj Annapackiam college of Nursing, Madurai, which is affiliated to the Tamilnadu Dr.M.G.R. Medical University, Chennai have undertaken the topic for thesis titled, “EFFECTIVENESS OF LIFE STYLE MODIFICATION STRATEGIES IN LOWERING BLOOD PRESSURE AMONG NEWLY DIAGNOSED HYPERTENSIVE PATIENTS”.

My study topic requires newly diagnosed hypertensive patients as study samples. Hence, I request your goodself to grant me permission to collect data in your esteemed area.

Expecting you favourable reply.

Thanking you

Yours Sincerely
Mrs.K. Thamarai selvi,

APPENDIX-B

PERMISSION LETTER FOR CONDUCTING MAIN STUDY- VIKKIRAVANDI

From

The President
Vikkiravandi town panchayat
Villupuam District.

To

Prof.K.Thamarai selvi.K
Principal
E.S College of Nursing,
Villupuram.

Respected madam

I here by grant permission to prof.Thamarai selvi.K,
Principal,E.S College of Nursing, Villupuram, to conduct data
collection for her Ph.D title " Effectiveness of life style
modification strategies in lowering blood pressure among newly
diagnosed hypertensive patients" residing at Vikkiravandi for
the period from January -2014 to December-2014.



A. Mohanann
SIGNATURE

அ.மலர்மன்னன், B.E.,
பேரூராட்சி மன்ற தலைவர்,
விக்கிரவாண்டி பேரூராட்சி,
விழுப்புரம் மாவட்டம்-605

APPENDIX-C

PERMISSION LETTER FOR CONDUCTING MAIN STUDY- VAZHUDAREDDY

PERMISSION CERTIFICATE

I hereby grant permission to prof.Thamarai selvi.K, Principal, E.S College of Nursing, Villupuram, to conduct data collection for her Ph.D title **“Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients”** residing at vazhudhareddy, Villupuram District during the period from January-2014 to December-2014.


M.Ganeshan
முத்து கணேசன், B.A.
நகர் மன்ற உறுப்பினர்,
27வது வார்டு, வகுதரெட்டி
கிழப்பூர்ம் நகராட்சி.

APPENDIX-D

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

Minutes of the ethical committee meeting held on 08.08.2009 in C.S.I. Jeyaraj Annapackiam College of Nursing, Madurai. The research title "Life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients" was approved by the committee and Mrs. K. Thamarai Selvi is permitted to do the research under the Guidance of Dr. R. Rajkumar, M.D., Ph.D and Co-Guidance of Prof. Dr. Santhi Appavu, M.Sc(N), Ph.D for the research work is provisionally registered from 01.10.2010 for your years as a part time candidate for research leading to the award of Doctor of Philosophy in Nursing in the broad field of Community Health Nursing to The Tamil Nadu Dr.M.G.R. Medical University, Chennai.

1. Chairperson Prof.Dr.A.Charles Stephen Rajasingh, M.S.,M.Ch., Medical Superintendent, Christian Mission Hospital, Madurai.	6. Member Secretary Prof.Dr.C. Jothi Sophia, M.Sc(N), Ph.D., Principal, C.S.I. Jeyaraj Annapackiam College of Nursing, Madurai.
2. Co-Chairperson Prof.Dr. K. Rajalakshmi, M.Sc(N), Ph.D., Research Coordinator, C.S.I. Jeyaraj Annapackiam College of Nursing, Madurai.	7. Member-Clinician Prof.Dr.P. Jeyasingh, M.D.,D.V.,Ph.D., Head of Department (STD), Christian Mission Hospital, Madurai.
3. Medical Scientist Prof.Dr.V.N.Rajasekaran, M.D. Ph.D., Medical Director, Meenakshi Mission Hospital, Madurai	8. Legal Expert Mr. C. Fernandez Rathinaraja, M.A.,B.L., Legal Advisor, DM & R , Madurai.
4. Philosopher Prof.Dr..J.P.Gabriel, M.Sc.,M.Ed.,M.Phil.,Ph.D., Director, C.S.I. School of Education, Madurai.	9. Social Scientist Mr. R. Ravikumar, M.A,B.Ed., M.Phil., Principal, Bethsan Special School, Madurai.
5. Member Secretary Curriculum Development, The Tamil Nadu Dr.M.G.R. Medical University, Chennai.	10. Community Worker Mrs. Gandhimathi,M.A., Community Worker-Grade-III, Thiruparankundrum, Madurai.


Signature of the Chairperson
Prof.Dr.A.Charles Stephen Rajasingh
CHAIRPERSON
ETHICAL COMMITTEE
NURSING RESEARCH CENTRE,
C.S.I. JEYARAJ ANNAPACKIAM
COLLEGE OF NURSING,
JONESPURAM, PASUMALAI,
MADURAI - 4.

APPENDIX-E

CERTIFICATES

1.YOGA CERTIFICATE



Athisivan Yoga & Nature Cure Kendra

Run by:
Human Health Development Trust-Villupuram
Tamil Nadu.
Reg No:187/2006

Certificate of Merit

This is to certify that **PROF. MRS. K. THANARAJAN** of
ES. COMBEE DE. NURSING VILLUPURAM..... has completed a DIPLOMA COURSE IN YOGA

He / she is awarded **I**..... Grade for his / her performance in the examination held during the
Academic year **2013**

Date **25.10.2013**

K.P.L
Yoga Instructor
Athisivan Yoga & Nature Cure Kendra, Vpm.

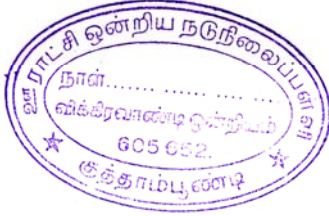
S. Myruthan
Founder & Managing Trustee
Human Health Development Trust, Villupuram.

O:90-100, E:80 - <90, D:70 - <80, A : 60 - <70, B:50 - <60, C:40 - <50, NC : Less than 40

TRANSLATION CERTIFICATE

I certify that the tools used for the study on “Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients” by Prof. Mrs. Thamaraiselvi. K. registered her Ph. D in Nursing under the guidance of Dr. R. Rajkumar at The Tamil Nadu Dr.M.G.R.Medical University, Chennai Tamil Nadu was translated by me to the best of my judgment from Tamil to English.

Seal



Signature

I.MARIA JOSEPH, M.A., M.A., M.Ed., M.Phil.,
Graduate Teacher (B.T. Asst.)
Govt. Panchayat Union Middle School,
Kuthampoondi, Vikravandi Taluk,
Villupuram District - 605 652.

TRANSLATION CERTIFICATE

I certify that the tools used for the study on “Effectiveness of life style modification strategies in lowering blood pressure among newly diagnosed hypertensive patients” by Prof. Mrs. Thamaraiselvi. K. registered her Ph. D in Nursing under the guidance of Dr. R. Rajkumar at The Tamil Nadu Dr.M.G.R.Medical University, Chennai Tamil Nadu was translated by me to the best of my judgment from English to Tamil.

Seal



Signature

A. NATARAJAN, M.A., B.Ed.
B.T. TEACHER, (TAMIL)
P.U.M. SCHOOL, KUTHAMPOONDI,
VIKRAVANDI BLOCK,
VILLUBURAM DISTRICT, 605 652.

APPENDIX-F

LETTER SEEKING EXPERT OPINION FOR THE CONTENT VALIDITY OF TOOL

From

Prof. K. Thamaraiselvi,
Principal,
E.S. College of Nursing,
Villupuram.

To

Respected Madam,

I, **Ph.D Scholar** request your good self to kindly validate my dissertation tool for the study titled, “Effectiveness of lifestyle modification in lowering blood pressure among newly diagnosed hypertensive patients” enrolled under the TN.Dr. MGR Medical University, Chennai.

I would be deeply grateful for the validation of my tool and for your valuable suggestions.

Thanking you

Yours faithfully

(K. THAMARAISELVI)

Date:

Place:

Encl:

1. Tool 1-7
2. Validity certificate
3. Self addressed envelope

APPENDIX-G

CRITERIA CHECKLIST FOR VALIDATION OF THE TOOL

Dear madam/sir

Kindly go through the evaluation criteria check list for validation of the tool. There are three columns given for your responses and a column for your remarks. Kindly put a tick mark in the appropriate column and give your valuable remarks in the column wherever appropriate.

S.No	Criteria	Relevant	Needs Modification	Irrelevant	Remarks
1.	Base line data a)all the characteristics necessary for the study b)relevant to the topic of the study c)all items are measurable d)all the items can be retained e)any other suggestions				
2.	Proforma on socio demographic clinical variable				
3.	Proforma on bio physiological variables				
4.	Teaching module on life style modification strategies				
5.	Daily practice LSMS calendar				
6.	Rating scale on level of satisfaction of life style modification strategies				
7.	Open ended feedback questionnaire on life style modification strategies				
8.	Check list on life style modification strategies				

APPENDIX -H

CRITERIA CHECK LIST FOR TEACHING MODULE

S.NO	ITEMS	RELEVANT	NEEDS MODIFICATION	IRRELEVANT
1.	Definition blood pressure, hypertension and goal Blood Pressure.			
2.	Stages of hypertension			
3.	Risk factors of hypertension.			
4.	Benefits of effective control on hypertension			
5	Complications of undiagnosed and uncontrolled hypertension.			
6	Demonstration of brisk walking			
7	Demonstration of yoga- Nadisudhi pranayama and Savasana			
8.	Imparting DASH diet			

APPENDIX-I

CERTIFICATE OF THE TOOL VALIDATION

I, hereby certify that I have validated the tool presented by Prof. **Mrs. K. Thamaraiselvi, Ph.DScholar**, enrolled under **The Tamil Nadu Dr. M.G.R. Medical University, Chennai**, who is undertaking the study **“Effectiveness of lifestyle modification strategies in lowering Blood pressure among newly diagnosed hypertensive patients”** and it is found to be valid.

Signature of the expert :

Name :

Designation :

Seal :

Place:

Date:

APPENDIX-J

LIST OF EXPERTS WHO VALIDATED THE TOOL

S.No	Name of the Expert	Working Place	Area of Spealication
1	Dr.PRAMOD KUMAR K.P	Consultant Cardiologist Appollo Hospitals Chennai-600 006	M.D(Med) D.M(Cardiology)
2	DR.KANCHANA	Professor And Head Department Home Science College Research Institution Madurai-625 104	Food Science And Nutrition
3	DR.ANICE GEORGE	Professor MCON Manipal	Medical Surgical Nursing
4	DR.A JUDIE	Dean SRM College Of Nursing Chennai	Paediatrices Nursing
5	PROF.DR.RAJALAKSHMI	C.S.I Jeyaraj Annapackiam College Of Nursing And Allied Science Merry New Hills Jonespuram Pasumalai Madurai-625 064	Paediatrices Nursing And Research Guide
6	S.VIJAYALAKSHMI	Principal Vignesh College Of Nursing, Thiruvannamalai	OBG
7	DR.S.KANCHANA	Principal Omayalachi College Of Nursing. Nu.45 Ambattur Road, Puzhal Chennai-600 066	Community Health Nursing
8	DR.KARALINE KARUNAGARI	Professor Of Rani Meiyammai College Of Nursing Annamalai University Annamalai Nagar.	M.Sc(N),Ph.D

9	MS.RAJESWARL.R	Staff Nurse, NCD Clinic, Villupuram Government Medical College and Hospital, Villupuram	DGNM
10	DR.K. NATARAJAN	HOD And Associate Professor of Medicine Government Medical College and Hospital, Villupuram	M.D (Gen, Med)
11	DR.R.NARMADHA LAKSHMI	Chief-IMCU Government Medical College And Hospital, Villupuram	Chief-IMCU Department Of Medicine
12	MR.SUNDHARAMOORTHY	Yoga Master	M.A, M.Phil, Ph.D
13	DR.SANTHI APPAVU	Principal Christian College Of Nursing Neyyoor-629 02 Kanniya Kumari District, Tamil Nadu	Medical Surgical Nursing
14	MR.JAYALAKSHMI	Principal College Of Nursing, SVBCH Silvassa U.T of D and NH	Medical Surgical Nursing
15	DR.PRPAKASH CHANDIAN	Sr.Consultant-Cardiologist Apollo Hospitals Chennai-600 006	M.D DNB (Cardio)
16	DR.PATRICIA TRUE MAN	HOD-Diet And Education Mv-Hospitals For Diabetes	Hod-Diet And Education
17	Dr. KANNAN	KVK, Viruthachalam (Co Ordinator)	M.Sc (Food Science), Ph.D.

APPENDIX-K

PATIENT CONSENT FORM-ENGLISH

CONSENT FORM

Name:

Date:

I, the newly diagnosed hypertensive Patient have been clearly explained of the Life Style Modification Strategies (LSMS) by the nursing researcher for her nursing Research. I am whole heartedly willing to participate in this study. I would like to come forward to participate in this research. The researcher has given me the permission to withdraw myself at any stage of my participation. I give consent to use all my personal data for the research purpose. I was assured for the confidentiality regarding the information gathered from me.

Signature of the researcher.

Signature of the patient.

APPENDIX-L

INFORMED CONSENT FORM-TAMIL

ஓப்புதல் அறிக்கை

பெயர்:

நாள்:

எனக்கு “புதிதாக கண்டறியப்பட்ட ரத்த அழுத்த நோயாளிகளுக்கு ரத்த அழுத்தத்தை குறைக்க வாழ்க்கை நடைமுறை மாற்ற பயிற்சிகளின் பங்கு” என்ற இந்த செவிலிய ஆய்வினை பற்றிய முழு விவரம் விளக்கமாக எடுத்துரைக்கப்பட்டது. இந்த ஆய்வில் பங்கு கொள்வதில் இருந்த நன்மைகள் பற்றி முழுமையாக புரிந்து கொண்டேன். இந்த ஆய்வில் தானாக முன்வந்து பங்கு பெறுகிறேன். மேலும் எனக்கு இந்த ஆய்வில் இருந்து எந்த சமயத்திலும் விலகிக்கொள்ள முழு அனுமதி வழங்கப்பட்டுள்ளது. என்னுடைய விவரங்களை பார்வையிட்டு அதை ஆய்வில் பயன்படுத்தி கொள்ள முழு அனுமதி அளிக்கிறேன். ஏன்னுடைய பெயர் மற்றும் அடையாளங்களை ரகசியமாக வைத்து கொள்ளப்படும் என்றும் எனக்கு உறுதியளிக்கப்பட்டுள்ளது.

செவிலியர் கையொப்பம்

நோயாளின் கையொப்பம்

APPENDIX - M

TOOL 1- CHECKLIST FOR SCREENING THE HYPERTENSIVE PATIENTS

S.NO: _____ NAME: _____ TELEPHONE NO: _____

ADDRESS: _____

S. No.	Type of Criteria	Variables	Item No.	Classification	Score	
					Yes	No
1.	Inclusion	Age in years	1	31-60	1	0
2.		BP (mmHg)	2	Systolic >140	1	0
			3	Diastolic >80	1	0
3.		Known H/O hypertension	4	<6 months	1	0
4.		Type of hypertension	5	Primary	1	0
5.	Exclusion	Any major health problems	6	Altered sensory perception	0	1
			7	Hard of hearing	0	1
			8	Breathing difficulty	0	1
			9	Pain on walking	0	1
			10	Diabetes Mellitus	0	1
			11	any other	0	1
6.	Exclusion	Complications of hypertension	12	Stroke	0	1
			13	Kidney disease	0	1
			14	Vision impairment	0	1
			15	Cardiac disease	0	1
7.	Practice any form of LSMS like yoga, brisk walking, etc	16	Practice any form of LSMS	0	1	

Development

The checklist on screening for hypertension was developed by the investigator based on literature review and experts opinion. The content of this tool was based on inclusion and exclusion criteria for sample selection.

Interpretation

The checklist on screening for hypertension consisted of seven variables namely age, BP, known history of hypertension, type of hypertension, practice of LSMS (brisk walking, yoga, DASH diet), any major health problems and complications of hypertension with 16 items. The first four variables were based on inclusion criteria with four items and 5 responses and given a score of one for “yes” response and 0 for “No” response. There were two variables in exclusion criteria with 10 items with 10 responses and they were given a score of “0” for “yes” response and a score of one for “No” response. Under the head of practice of LSMS, there was one item with one response and given a score of one “No” response. Thus in total there were seven variables and sixteen items. Those patients, scored seventeen (5- yes response, 11- no response) were chosen as samples to participate in the study.

**TOOL 2. PROFORMA ON SOCIODEMOGRAPHIC CLINICAL
DATA**

S.No. _____ **Patient's Name:** _____

Address _____

Phone No 1: _____ **Phone No. 2:** _____

- | | | | |
|---|----------------------------------|----|--|
| 1 | Age in years: | 10 | History of smoking |
| | a) 31-40 | | 1. Past |
| | b) 41-50 | | a) Yes |
| | c) 51-60 | | b) No |
| 2 | Gender | 2. | Present |
| | a) Men | | a) Yes |
| | b) Women | | b) No |
| 3 | Education | 11 | History of alcoholism |
| | a) Primary | | 1. Past |
| | b) Secondary | | a) Yes |
| | c) Higher secondary | | b) No |
| | d) Graduate Level | | 2. Present |
| | e) Post Graduate Level | | a) Yes |
| 4 | Marital Status | | b) No |
| | a) Married | 12 | Family history of hypertension |
| | b) Window | | 1. Paternal |
| | c) Divorced /Separated | | a) Not applicable |
| 5 | Occupation | | b) 1 degree relative(Siblings) |
| | a) Labor | | c) 2 degree relative(Grandparents,
grandchildren, aunts, uncles,
nephews, nieces or half siblings) |
| | b) Business | | d) 3 degree relative(First cousins,
great- grandparents or great
grandchildren) |
| | c) Health Professional | | |
| | d) Non Health Professional | | |
| | e) Home Maker | | |
| 6 | Income Per month(Indian rupees) | 2. | Maternal |

- a) <5000
 - b) 5001-10000
 - c) 10001-15000
 - d) >15001
- 7 Dietary Pattern
- a) Vegetarian
 - b) Non vegetarian
- 8 Religion
- a) Hindu
 - b) Christian
 - c) Muslim
- 9 Type of family
- a) Nuclear
 - b) Joint
 - c) Extended family
- a) Not applicable
 - b) 1 degree relative
 - c) 2 degree relative
 - d) 3 degree relative
- 13 Mode of diagnosis
- a) Not applicable
 - b) Sign and symptom of hypertension
 - c) Master checkup
 - d) Other condition
- 14 Treatment prescribed
- a) Life Style Modification
 - b) Drugs
1. If on drugs level of compliance
- a) To the most extent
 - b) To the less extent

Content	pretest	Posttest II
15. BMI		
Weight		
Height		
16. WHR		
Hip circumference		
Waist circumference		

TAMIL TOOL

சமூக மருத்துவ தரவு

வரிசை.எண் _____ நோயாளியின் பெயர்: _____

முகவரி: _____

தொலைபேசிஎண் 1: _____ தொலைபேசி எண். 2 _____

1. வயது / வருடங்கள்
 - அ) 30-40
 - ஆ) 41-50
 - இ) 51-60
2. பாலினம் / இனம்
 - அ) ஆண்
 - ஆ) பெண்
3. கல்வி நிலை
 - அ) ஆரம்பக்கல்வி
 - ஆ) இடைநிலை
 - இ) உயர்நிலை
 - ஈ) பட்டப்படிப்பு
4. திருமண நிலை
 - அ) திருமணம் ஆனவர்
 - ஆ) கணவன்/மனைவியை இழந்தவர்
 - இ) விவாகரத்து ஆனவர்
5. தொழில்
 - அ) கூலி வேலை
 - ஆ) சுய தொழில்
 - இ) மருத்துவம் சார்ந்த தொழில்
 - ஈ) மருத்துவம் சாரா தொழில்
 - உ) இல்லத்தரசி
10. உங்களுக்கு புகைபிடிக்கும் பழக்கம் இருந்ததா?
 - அ) ஆம்
 - ஆ) இல்லை
 - 10.1. தற்போது புகைக்கிறீர்களா?
 - அ) ஆம்
 - ஆ) இல்லை
11. உங்களுக்கு மது அருந்தும் பழக்கம் இருந்ததா?
 - அ) ஆம்
 - ஆ) இல்லை
 - 11.1. தற்போது மது அருந்துகிறீர்களா?
 - அ) ஆம்
 - ஆ) இல்லை
12. குடும்பத்தில் யாருக்கேனும் உயர்இரத்த அழுத்தம் உள்ளதா?
 - 12.1 தந்தை வழி
 - அ) முதல் நிலை சொந்தம்
 - ஆ) இரண்டாம் நிலை சொந்தம்
 - இ) மூன்றாம் நிலை சொந்தம்
 - 12.2. தாய்வழி
 - அ) முதல் நிலை சொந்தம்
 - ஆ) இரண்டாம் நிலை சொந்தம்
 - இ) மூன்றாம் நிலை சொந்தம்

6. மாத வருமானம் (இந்திய ரூபாயில்)

- அ) 10000ரூபாய்
- ஆ) 10001-20000ரூபாய்
- இ) 20001-30000ரூபாய்
- ஈ) 30000 ரூபாய்

7. உணவு முறை

- அ) சைவம்
- ஆ) அசைவம்

8. மதம்

- அ) இந்து
- ஆ) கிறிஸ்துவர்
- இ) இஸ்லாமியர்

9. குடும்ப வகை

- அ) சிறு குடும்பம்
- ஆ) கூட்டுக் குடும்பம்

13

எவ்வாறு உங்களுக்கு உயர் இரத்த அழுத்தம் இருப்பது கண்டறியப்பட்டது?

- அ) அறிகுறிகள்
- ஆ) ஆரோக்கிய பரிசோதனைகள்
- இ) இதர காரணங்கள்

என்ன வைத்தியம்

14

அறிவுறுத்தப்பட்டிருக்கிறது?

- அ) வாழ்க்கை முறை மாற்றம்
- ஆ) மாத்திரைகள்

14.1 மாத்திரைகள் எனில் தினசரி தவறாது எடுத்துக்கொள்கிறீர்களா?

- அ) கூடுமான அளவிற்கு
- ஆ) ஓரளவிற்கு

15.உடல் பரும விகிதம்

எடை-

பொருள்	முந்தைய நிலை	பிந்தைய நிலைII
15. உடல் பரும விகிதம்		
ஏடை		
உயரம்		
16. இடைதொடைவிகிதம்		
இடையளவு		
தொடையளவு		

Tool 3. Assessment of BP

S.No	Items	Pre test at week 1	Posttest I 12 weeks	Posttest II at 24 weeks
1	Systolic Blood Pressure			
2	Diastolic Blood Pressure			

TOOL 4 STRUCTURED TEACHING MODULES ON LIFESTYLE MODIFICATION STRATEGIES ON HYPERTENSION

Topic: **“Lifestyle modification strategies on hypertension”**

Group: Newly diagnosed Hypertensive patient.

Time: 30 minutes. Size: 1

Place : Vikkravandi

Method of teaching: Lecture cum discussion, demonstration, and returns demonstration.

Audio visual aids: Real objects, Flex, Standard nutritional cups, booklet and video clip.

CENTRAL OBJECTIVE:

At the end of teaching program, the newly diagnosed Hypertensive patients will be able to gain adequate knowledge and desirable attitude towards lifestyle modification strategies on hypertension, and apply this knowledge in their day to day life.

CONTRITUTIVE OBJECTIVES:

Newly diagnosed hypertensive patients will be able to

1. Define blood pressure, normal Blood Pressure and hypertension
2. State the stages of hypertension
3. Enlist the risk factors of hypertension.
4. Discuss the benefits of effective control on hypertension
5. Mention the complications
6. Impart LSMS-
 - a. Demonstrate brisk walking
 - b. Demonstrate yoga- Nadisudhi pranayama, Savasana
 - c. Discuss/ impart the DASH diet.
7. Communicate the tips to adopt DASH diet.

INTRODUCTION:

We feel happy looking at a aerated and colorful balloon, but when the pressure inside the balloon exceeds, it gets bust and our happiness is also lost. Our blood vessels are compared to colorful balloons. If the blood pressure is within normal limits, a man looks and feels healthy like a beautiful balloon. When the blood pressure reaches the peak, the blood vessel get ruptured, and he has to face the consequences.

In case the pressure is maintained within optimal level, it lasts longer, be it in case of a balloon or a human body. Here are a few tips to keep one to be like a beautiful balloon.

Hypertension or high BP is a non communicable disease and hypertension itself does not manifest any signs and symptoms. It is revealed while initiatives are taken to diagnose other conditions or when it ends up with irrevocable complications. Hence it is called, a silent killer. In case the high BP is identified in time and treatment is initiated, one can lead a normal life. If neglected, one has to face hazardous consequences.

S. No	Contributory Objective	Contents	Researchers activity	Patients activity
1.	Define the blood pressure, Normal Blood Pressure and Hypertension.	<p>Blood pressure:</p> <ul style="list-style-type: none"> ➤ Blood pressure measures the amount of force / pressure on the walls of the arteries as the blood is pumped by the heart and circulated throughout the body. <p>Normal BP:</p> <ul style="list-style-type: none"> ➤ Normal BP is less than 120 and 80 mm/ Hg of systolic and diastolic BP respectively for healthy persons. ➤ But for the hypertensive patients the BP level < 140/90 mmHg, is considered as optimal. <p>Hypertension/high BP:</p> <ul style="list-style-type: none"> ➤ Hypertension is the term used for high blood pressure reading above twice at 140 mmHg of systolic BP or above 90 mmHg of diastolic BP. It is confirmed by checking two different times within a day or within a week by an examiner using the same instrument. ➤ Blood pressure that is consistently more than 140/90 mm of Hg requires treatment. 	Explaining and demonstrating	Listening and observing

2.	State the stages of hypertension	<table border="1"> <thead> <tr> <th>S.NO</th> <th>Systolic Blood Pressure</th> <th>Diastolic Pressure</th> <th>Blood JNC</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><120 and</td> <td><80</td> <td>Normal</td> </tr> <tr> <td>2</td> <td>120 to139 or</td> <td>80 to 89</td> <td>Pre hypertension</td> </tr> <tr> <td>3</td> <td>140 to159 or</td> <td>90 to 99</td> <td>Stage-1</td> </tr> <tr> <td>4</td> <td>≥ 160 or</td> <td>>`100</td> <td data-bbox="1245 528 1350 555">Stage-2</td> </tr> </tbody> </table>	S.NO	Systolic Blood Pressure	Diastolic Pressure	Blood JNC	1	<120 and	<80	Normal	2	120 to139 or	80 to 89	Pre hypertension	3	140 to159 or	90 to 99	Stage-1	4	≥ 160 or	>`100	Stage-2	Explaining and demonstrating	Listening and observing
S.NO	Systolic Blood Pressure	Diastolic Pressure	Blood JNC																					
1	<120 and	<80	Normal																					
2	120 to139 or	80 to 89	Pre hypertension																					
3	140 to159 or	90 to 99	Stage-1																					
4	≥ 160 or	>`100	Stage-2																					
3.	Enlist The risk factors of hypertension	<p>a) Non-modifiable risk factors:</p> <p>No control is possible over the following factors. But early identification is possible and treatment initiation is essential:</p> <ol style="list-style-type: none"> <li>1. Heredity – it is a cause for hypertension <li>2. Age – Cardio Vascular Disease (CVD) risk increases with age. <li>3. Gender – men are more prone to CVD. After menopause, a woman is at equal risk as a man. <li>4. Genetic Factors <li>5. Family History - Family History of CVD is also a predisposing factor. <p>b) Modifiable risk factors:</p> <p>The following factors can be modified through our life style with due care, to enable control can over the risk of developing high blood pressure:</p> <ul style="list-style-type: none"> <li>➤ Dietary pattern: A diet high in sodium is one of the major hypertension risk factors. <li>➤ Weight: If body mass index (BMI) is 25 or higher, it is considered to be overweight and indicates a greater hypertension risk. <li>➤ Lack of exercise: Sedentary lifestyle is a major hypertension risk factor. <li>➤ Habits: Tobacco use and excessive alcohol consumption are known 	Explaining	Listening																				

		<p>contributors to high blood pressure.</p> <ul style="list-style-type: none"> ➤ Diabetes: Diabetes actually doubles the risk of developing high blood pressure, and people who have both diabetes and high blood pressure are at four times the risk of developing heart disease considering a person without either condition. ➤ Stress: Stress increases the Blood Pressure level. ➤ Patients' non compliance towards treatment: <ul style="list-style-type: none"> • Not getting blood pressure checked regularly. • Not taking medication exactly as prescribed by the doctor. • Stopping the medication when the blood pressure reaches the normal by itself. 		
4.	The benefits of effective control on hypertension	<ul style="list-style-type: none"> • Prevents or delays the development of high blood pressure and its complications. • Enhances the effectiveness of blood pressure medications. • Lowers the direct and indirect cost of management 	Explaining	Listening, questioning
5.	The complications	<ul style="list-style-type: none"> ➤ Stroke ➤ Heart attack ➤ Heart failure ➤ Kidney failure ➤ Peripheral vascular disease ➤ Impotence ➤ Dementia ➤ cognitive impairment, ➤ Eye damage (blindness) 	Explaining using video clip, Clarifying	Listening and questioning

6.	Impart LSMS- a. Demonstrate brisk walking	<p>Life style modification strategies includes the following</p> <ul style="list-style-type: none"> ➤ Brisk walking, yoga and DASH diet. The participants were instructed as follows <p>Brisk walking</p> <ol style="list-style-type: none"> 1. Stand erect and hold your head high look forward; focus your eyes 5- 6 meters ahead, back straight and shoulders relaxed. 2. Bend elbow 90° with hands loosely clenched. Swing arms without crossing centre line. 3. Lead with, and transfer your weight through your heel. 4. Move hands and legs in opposition. 5. Lean forward to balance better. Take smaller steps. 6. Practice it for 30 minutes. <p>ACTION:</p> <ol style="list-style-type: none"> 1. Act on sympathetic nervous system and relaxes the nerves and vessels thereby lower BP 2. Increases the level of Nitrous Oxide and endogenous antioxidant which are essential to keep the arteries patent. 	<p>Demonstration using booklet</p> <p>Demonstration</p>	<p>Listening</p> <p>Observing, Return demonstration</p>
	b. Demonstrate yoga- Nadisudhi pranayama, Savasana	<p>Nadisudhi pranayama</p> <ol style="list-style-type: none"> 1. Sit in sugasana over a mat or sheet. Relax the muscles of the body and become aware of your breath. Keep the spine erect and your head and neck straight and eyes remain closed. 	demonstration	<p>Observing, Return demonstration</p>

		<ol style="list-style-type: none"> 2. Place the left hand in gnanamuthra. (Hold the left thumb and index finger together lightly and let the other three remaining fingers remains extended. Place the left hand on the left thigh in palm up position) 3. With right hand, let your fingers stretch and bend your index and your middle fingers and place them on the palm of your same hand (Nasikamuthra). 4. Place the right thumb on right nostril and the tip of the ring finger against the other nostril. The thumb and ring finger of the right hand will be used to close the alternate nostrils as you breathe in. 5. Begin the exercise by blocking your left nostril and breathe out with your right nostril. 6. Continue to block your left nostril and breathe in through your right nostril. 7. Open your left nostril as you simultaneously cover and block your right nostril. Breathe out slowly using the open, left nostril. 8. Once this is done go ahead and breathe in with your left nostril that is open. 9. Close the left nostril and let the air move out through your right nostril that you now leave open. 10. This is considered one cycle. Let the breathing be slow and rhythmic. 12. Continue breathing this way by opening and closing left and right 		
--	--	--	--	--

nostrils and complete 20 cycles.

ACTION:

- ✓ Act on sympathetic nervous system and relaxes the nerves and vessels thereby lower blood pressure.
- ✓ The pranayama purifies the whole blood system and helpful to increase the overall health of the body.
- ✓ The whole body is nourished with an extra supply of pure oxygen, and the carbon dioxide is more efficiently eliminated.

B) STEPS IN SHAVASANA:

(ii) Savasana.

Practice as follows.

1. Lie on your back without pillows with your legs straight and comfortably apart. Let your feet drop open and be relaxed. Rest your arms at your sides and your palms facing up. Close your eyes.
2. Breathe deeply and slowly through the nostrils.
3. Allow your body to feel heavy on the ground. Let the whole body be relaxed.
4. Work from the soles of your feet up to the crown of your head; consciously

		<p>contract and release every body part, organ, and cell. Imagine that the organ or the body part which you consciously look into is healthy and relaxed.</p> <p>5. On each inhaling, invite peace and silence into your mind, body, and soul. On each exhaling let your tension, stress, depression and worry run away on each exhaling.</p> <p>6. Relax your face. Let your eyes drop deep into their sockets.</p> <p>7. Stay in Savasana for 10 minutes. To exit the pose, first begin to deepen your breath bringing gentle movement and awareness back to your body, wriggle your fingers and toes. Roll to your right side and rest there for a moment. With an inhalation, gently press yourself.</p> <p>ACTION:</p> <ul style="list-style-type: none"> ○ It induces calmness of mind by regulating the flow of prana in the body ,thereby keeping blood vessels relaxed ○ Very good to increase the resistance power of the body. ○ Good to increase concentration and sound sleep. 		
	c. Discuss DASH diet.	The DASH (Dietary Approaches to Stop Hypertension) dietary pattern is recommended by the American Heart Association, and the National Cancer Institute.	Explaining, discussing and clarifying with	Listening, discussing, questioning

		<p>The DASH dietary pattern is</p> <ul style="list-style-type: none"> • Lower in fat, saturated fat, cholesterol (decreasing intake of saturated fat and Trans fat as well as overall intake of dietary fat.) • Sodium (less than 1,500 milligrams of sodium per day), and • Higher in potassium, magnesium, and calcium (for adults is 4.7 grams/day). <p>We should know our weight for height and energy requirement to estimate the food to be taken.</p> <p>This can be judged by the following method,</p> <p>Formula:</p> <p>Calculation for weight for height= height (cm)-100 = weight in Kg.</p> <p>Example:</p> <p>150cm-100=50 Kg.</p> <p>Energy requirement = weight in Kg x 24 + ½ (weight x 24)</p> <p>Example:</p> <p>50 Kg x 24 + ½ (60Kg + 24) = 1200+600=1800</p> <p>So, 50 Kg person needs 1800 Kcal/day.</p> <p>COMPONENTS OF DASH DIET:</p>	<p>the use of flex, measuring cups, spoons and booklet on LSMS.</p>	
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	<p>1. GRAINS: (6 to 8 servings a day)</p> <ul style="list-style-type: none"> ➤ Example : Grains include bread, rice and millets. ➤ Examples of one serving: 1 slice whole-wheat bread, 1 ounce (oz.) dry cereal, or 1/2 cup cooked cereal, rice or millets. <p>2. VEGETABLES :(4 to 5 servings a day)</p> <ul style="list-style-type: none"> ➤ Example: Vegetables should also comprise green leafy vegetables, roots and tubers and cruciferous vegetables. ➤ Example of One serving: includes 1 cup raw leafy green vegetables or 1/2 cup cut-up raw or cooked vegetables. <p>3. FRUITS: (4 to 5 servings a day)</p> <ul style="list-style-type: none"> ➤ Examples: banana, watermelon, orange, grapes, pine apple. ➤ Examples of one serving: include 1 medium fruit or 1/2 cup fresh fruit or 4 ounces of juice. <p>4. LOW FAT OR FAT FREE DAIRY FOODS (2 to 3 servings a day)</p> <ul style="list-style-type: none"> ➤ Examples: butter milk, goat milk. ➤ Examples of one serving: 1 cup skim or 1 percent milk. <p>5. LEAN MEAT, POULTRY AND FISH :(2 or fewer servings a day)</p> <ul style="list-style-type: none"> ➤ Examples of one serving: 1 oz. cooked skinless poultry, seafood or lean meat or 1 egg. <p>6. NUTS, SEEDS AND LEGUMES: (4 to 5 servings a week)</p> <ul style="list-style-type: none"> ➤ Examples: almonds, sunflower seeds, groundnut, peas, kidney beans. ➤ Examples of one serving: 1/3 cup (1 1/2 oz.) nuts, 2 tablespoons 		
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7.		<p>seeds, or 1/2 cup cooked beans or peas.</p> <p>7. FATS AND OILS :(2 to 3 servings a day)</p> <p>➤ Examples: vegetable oil.</p> <p>Examples of one serving: 1 teaspoon vegetable oil/day.</p> <p>8. RESTRICT SALT IN YOUR DIET: (1 serving a day)</p> <p>➤ Examples of one serving: It is ideal to use not more than one level teaspoon of salt per day (i.e. 5 grams per day.)</p> <p>9. SWEETS AND ADDED SUGARS: (5 servings a week)</p> <p>➤ Examples: sugar, jelly, jam, hard candy.</p> <p>Examples of one serving: 1 Tbsp sugar, 1 Tbsp jelly or jam of low fat.</p> <p>ACTION:</p> <p>DASH diet causes pliability of arteries and arterioles and resultant vasodilatation and lowering the effect of blood pressure.</p> <p>TIPS TO ADOPT DASH DIET</p> <p>1. Restriction of fat and calories</p> <ol style="list-style-type: none"> a. When you begin to eat food, first eat fruits, greens and green leafy vegetables b. Use less oil in diet and reduce the use of ghee, butter, vanaspathi, coconut oil and palm oil as they contain high amount of fat. c. Avoid or restrict the following items which are rich in fat, fried non vegetarian food, vada , bajji, bonda, samosa, puffs, deep 		
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	<p>Communicate the tips to adopt DASH diet</p>	<p>fried snacks, packed snacks and savories (mixture, pagoda, chips etc.), biryani, fried rice, parrotta etc.</p> <p>d. Better alternatives for fried snacks are raw sprouts and oil free snacks such as puffed rice, sundal, vegetables, roasted grams, puttu, steamed snacks etc.</p> <p>2. Cooking tips for reducing fat in the diet:</p> <p>a. Use a small spoon of oil rather than pouring it from the container.</p> <p>b. Avoid reuse of the oil.</p> <p>c. It is better to alternate or switch the cooking oil once in every month instead of using one of the same brand or variety all through.</p> <p>d. Boil food instead of frying.</p> <p>e. Before cooking non-vegetarian food, it is better to remove the skin off the meat or chicken.</p> <p>f. Non-stick utensils can be used especially for dosa, chapatti, roti & addai.</p> <p>g. If you have temptation to eat vadai, bajji, bonda, puffs at least press them into a tissue paper so that excess oil gets absorbed.</p> <p>3. Restriction of salt in your diet:</p> <p>a. Avoid the habit of sprinkling /adding extra salt to the food.</p>	<p>Explaining, discussing and clarifying with the use of flex, measuring cups, spoons and booklet on LSMS.</p>	<p>Listening, discussing, questioning</p>
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		<ul style="list-style-type: none">b. Avoid canned foods such as dry fish, pappads and bottled items like pickles, jams, aerated drinks etc.c. Fresh lime, pepper and pudina etc can be used as an alternative for salt.		
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Conclusion

Effective control of blood pressure by compliant to LSMS, helps in the prevention of complications.

உயர் இரத்த அழுத்தத்திற்கான வாழ்க்கை நடைமுறை மாற்ற உத்திகள்

பாடத்திட்டம்

மையக்குறிக்கோள்:

புதிதாக கண்டறியப்பட்ட உயர் இரத்த அழுத்த நோயாளிகள் இந்த பாடத்தை கேட்ட பிறகு அவர்கள் வாழ்க்கை நடைமுறை மாற்ற உத்திகளை பற்றிய அறிவு மற்றும் அணுகுமுறை பெற்று இப்பயிற்சியினை தினந்தோறும் கடைபிடித்தல்.

துணைக்குறிக்கோள்கள்:

புதிதாக கண்டறியப்பட்ட உயர் இரத்த அழுத்த நோயாளிகள்

1. இரத்த அழுத்தம் இயல்பான இரத்த அழுத்தம் மற்றும் உயர் இரத்த அழுத்தத்தை வரையறுப்பர்.
2. இரத்த அழுத்த நிலைகளை கூறுவர்.
3. உயர் இரத்த அழுத்த காரணிகளை பட்டியலிடுவர்.
4. இரத்த அழுத்தத்தை கட்டுக்குள் வைத்திருப்பதால் ஏற்படும் நன்மைகளை பகிர்ந்து கொள்வர்.
5. உயர் இரத்த அழுத்தத்தால் ஏற்படும் விளைவுகளை குறிப்பிடுவர்.
6. வாழ்க்கை நடைமுறை மாற்ற உத்திகளைப் பற்றி விளக்குவர்.
 1. துரிதநடையை செயல்முறைபடுத்துதல்.
 2. நாடிசுத்தி மூச்சு பயிற்சி (ம) சவாசனத்தை செயல்முறைபடுத்துதல்.
 3. உயர் இரத்த அழுத்தத்திற்கான சிறப்பு உணவைப் பற்றி பகிர்தல்.
7. உயர் இரத்த அழுத்தத்திற்கான சிறப்பு உணவை கடைபிடிக்கும் வழிமுறைகளை எடுத்துரைப்பர்.

முன்னரை:

நாம் காற்றடைக்கப்பட்ட வண்ணமிகு பலூனை காணும்போது மகிழ்ச்சியடைகிறோம். ஆனால் பலூனின் உள்ளே உள்ள காற்றழுத்தம் அதிகமாகி வெடிக்கும்போது நம் மகிழ்ச்சியும் போய்விடுகிறது. இதைப்போலவே நம் இரத்த அழுத்தம் கட்டுக்குள் இருக்கும்போது ஒரு மனிதன் ஆகோக்கியமாக உணர்கிறான். தென்படுகிறான். இரத்த அழுத்தம் அதிகரிக்கும் போது இரத்த குழாய் வெடிப்பு ஏற்பட்டு அந்த மனிதன் மருத்துவமனையில் அனுமதிக்கப்பட்டு அனைத்து விதமான பிரச்சனைகளுக்கும் உள்ளாகிறான். தற்போது அழகிய பலூனை பாதுகாப்பது போல் நம் உடலின் இரத்த அழுத்தத்தை கட்டுக்குள் வைக்க உதவும் சில உத்திகளை காண்போம்.

இதனை சரியான காலத்தில் கண்டறிந்து சிகிச்சை மேற்கொண்டால் இயல்பான வாழ்க்கையை வாழ முடியும். இதனை உதாசினப்படுத்தினால் அதன் பின்விளைவுகளை நாம் சந்திக்க நேரிடும்.

வரிசை எண்	துணைக்குறிக்கோள்கள்	பொருளடக்கம்	ஆய்வாளர் செயல்முறை	நோயாளி செயல்முறை															
1.	இரத்த அழுத்தம், இயல்பான இரத்த அழுத்தம் மற்றும் உயர் இரத்த அழுத்தத்திற்கான வரையறை.	<p>இரத்த அழுத்தத்தின் பொருள்-</p> <ul style="list-style-type: none"> ➤ இரத்த அழுத்தம் என்பது நம்முடைய இரத்த நாள சுவர்களில் உள்ள இரத்தம் இதயம் சுருங்கும் போது எந்த அளவிற்கு வேகத்தை ஏற்படுத்தி உடல் முழுவதும் பாய்கிறது என்பதாகும். <p>இயல்பான இரத்த அழுத்தம்:</p> <ul style="list-style-type: none"> ➤ ஆரோக்கியமானவர்களின் இரத்த அழுத்தம் <120/80 mm Hg இருத்தல் வேண்டும். ஆனால் உயர் இரத்த அழுத்த நோயாளிகள் இரத்த அழுத்தத்தை <140 90 ன் கீழ் பராமறித்தல். <p>உயர் அழுத்தத்தின் பொருள்:-</p> <ul style="list-style-type: none"> ➤ உயர் இரத்த அழுத்தம் என்றால் இரத்த அழுத்தம் அதிகமாகுதல். ➤ இரத்த அழுத்தம் 140/90 mmHg க்கு மேல் தொடர்ந்து இருப்பின் மருத்துவ மேலாண்மைகள் தேவைப்படும். ➤ ஒருநாளைக்கு இருமுறையோ (அ) ஒரு வாரத்திற்கு இருமுறையோ இரத்த அழுத்தமானது ஒரே பரிசோதரரால் பரிசோதிக்கப்படும் போது இருமுறையும் 140/90 mm Hg க்கு மேல் இருப்பின் உயர் இரத்த அழுத்தம் உறுதிசெய்யப்படுகிறது. 	விளக்கமும் செயல்முறையும்	கவனித்தல்															
2.	இரத்த அழுத்த நிலைகள்	<table border="1"> <thead> <tr> <th>வரிசை எண்</th> <th>சிஸ்டாலிக் இரத்த அழுத்தம்</th> <th>டயஸ்டாலிக் இரத்த அழுத்தம்</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><120 மட்டும்</td> <td><80</td> </tr> <tr> <td>2</td> <td>120-139 அல்லது</td> <td>80-89</td> </tr> <tr> <td>3</td> <td>140-159 அல்லது</td> <td>90-99</td> </tr> <tr> <td>4</td> <td>≥160 அல்லது</td> <td>>100</td> </tr> </tbody> </table>	வரிசை எண்	சிஸ்டாலிக் இரத்த அழுத்தம்	டயஸ்டாலிக் இரத்த அழுத்தம்	1	<120 மட்டும்	<80	2	120-139 அல்லது	80-89	3	140-159 அல்லது	90-99	4	≥160 அல்லது	>100	விளக்கமும் செயல்முறையும்	கவனித்தல்
வரிசை எண்	சிஸ்டாலிக் இரத்த அழுத்தம்	டயஸ்டாலிக் இரத்த அழுத்தம்																	
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3.	உயர் இரத்த அழுத்த காரணிகள்	<p>அ) மாற்ற முடியாத ஆபத்து காரணிகள்:-</p> <ol style="list-style-type: none"> 1. பரம்பறை: உயர் இரத்த அழுத்தத்திற்கு பரம்பறையும் ஓர் காரணம். 2. வயது- வயது அதிகமாவதால் இருதயநோய்களின் ஆபத்து காரணிகள் அதிகமாகிறது. 3. பாலினம்- இருதயநோய் வர ஆண்களுக்கே அதிக வாய்ப்பு உள்ளது. மாத விலக்கு ஏற்பட்ட பின் இருபாலருக்கும் சமமான ஆபத்து உள்ளது. 4. மரபியல் காரணிகள்:- 5. குடும்ப வரலாறு: இருதய நோய்க்கு குடும்ப வரலாறு ஒரு முக்கியமான காரணியாகும். <p>ஆ) மாற்றக்கூடிய ஆபத்து காரணிகள்:-</p> <ol style="list-style-type: none"> 1) உணவு முறை:- <ul style="list-style-type: none"> ➤ அதிகமாக நம்முடைய உணவில் சோடியம் உட்கொள்வதால் இரத்த அழுத்தம் ஏற்பட காரணியாக உள்ளது. ➤ குறைவான உப்பு, கொழுப்பு (ம) அதிகமான காய்கறிகளை உட்கொள்வதால் இதனை குறைக்கலாம். 2) எடை:- <ul style="list-style-type: none"> ➤ உடல் பருமன் விகிதம் அளவு 25 அல்லது 25ற்கு மேல் இருந்தால் இது அதிக உடல் எடையாக கருதப்படுகிறது. 3) உடற்பயிற்சியின்மை:- <ul style="list-style-type: none"> ➤ உடற்பயிற்சி இல்லாததால் உயர் இரத்த அழுத்தம் வர காரணமாக அமைகிறது. 	விளக்கமும் செயல்முறையும்	கவனித்தல்
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		<p>4) தீய பழக்கங்கள்:</p> <ul style="list-style-type: none"> ➤ புகையிலை பழக்கம் மற்றும் அதிகமாக மது உட்கொள்ளுதல். இதுவே உயர் இரத்த அழுத்தத்திற்கு காரணமாக அமைகிறது. <p>5) நீரிழிவு:</p> <ul style="list-style-type: none"> ➤ நீரிழிவு நோய் உள்ளவர்களுக்கு உயர் இரத்த அழுத்தம் ஏற்பட இருமடங்கு காரணியாக அமைகிறது. இருதய நோய் வர இயல்பானவர்களைக்காட்டிலும் 4 மடங்கு வாய்ப்புள்ளது. <p>6) மன அழுத்தம்:</p> <ul style="list-style-type: none"> ➤ மன அழுத்தம் இரத்த அழுத்தத்தை அதிகரிக்கிறது. மன அழுத்தம் உள்ளவர்களின் சூழ்நிலையை புரிந்துகொண்டு அவர்களின் உடலும், மனமும் தளர்வாக இருப்பதற்கு காற்றோட்டமான பகுதிக்கு அழைத்துச் செல்லவும். <p>7) சிகிச்சை முறைக்கு நோயாளியின் இசைவு:</p> <ul style="list-style-type: none"> ➤ குறிப்பிட்ட கால இடைவெளியில் இரத்த அழுத்தத்தை பரிசோதனை செய்து கொள்ளுதல். ➤ மருத்துவ ஆலோசனைப்படி தகுந்த மருந்துகளை எடுத்துக் கொள்ளவும். ➤ இரத்த அழுத்தம் இயல்பு நிலைக்கு திரும்பிய பின்னும் மருந்துகளை தொடர்ந்து எடுத்தல். 		
4.	இரத்த அழுத்தத்தை கட்டுக்குள் வைத்திருப்பதால் ஏற்படும் நன்மைகள்	<ul style="list-style-type: none"> • உயர் இரத்த அழுத்தத்தை அதிகரிக்காமல் கட்டுப்படுத்துதல். • மருந்தின் செயல்பாட்டை மேம்படுத்துதல் • நேரடி மற்றும் மறைமுகமான செலவினங்களை குறைத்தல் 		

5.	உயர் இரத்த அழுத்தத்தால் ஏற்படும் விளைவுகள்	<ul style="list-style-type: none"> ➤ பக்கவாதம் ➤ மாரடைப்பு ➤ இருதய செயலிழப்பு ➤ சிறுநீரக செயலிழப்பு ➤ இரத்த நாள நோய்கள் ➤ ஆண்மையின்மை ➤ ஞாபகமறதி ➤ அறிவு திறன் குறைதல் ➤ கண்பார்வை பாதிப்பு 	ஒளிக்காட்சி பயன்படுத்தி விளக்கமளித்தல்	கவனித்தல்
6.	வாழ்க்கை நடைமுறை மாற்ற உத்திகள் 1. துரிதநடையை செயல்முறைபடுத்தல்.	<p>நாம் கடைபிடிக்கப்போகும் வாழ்க்கை முறை மாற்றங்களின் உத்திகளை இப்போது விளக்குகிறேன்.</p> <ul style="list-style-type: none"> • சுறுசுறுப்பாக நடத்தல். • யோகா. <ul style="list-style-type: none"> ➤ நாடி சுத்தி பிரணாயாமம். ➤ சுவாசணா. • உணவு முறை. <p>சுறுசுறுப்பாக நடக்கும் முறைகள்:</p> <ul style="list-style-type: none"> ➤ நிமிர்ந்து நின்று தலையை நேராக வைக்கவும். ➤ கண்களை 5-6 மீட்டர் அளவிற்கு முன்னோக்கி பார்த்து முதுகை நிமிர்த்தியவாறும் தோள்பட்டையை தளர்வான நிலையிலும் வைத்துக்கொள்ளவும். ➤ முழங்கையை 90° அளவில் மடக்கி கை விரல்களை தளர்வாக மூடவும். 	விளக்கமும் செயல்முறையும்	கவனித்தல்

		<ul style="list-style-type: none"> ➤ குதிங்காலை முன்வைத்து குதிங்காலிலேயே உடல் எடையை செலுத்தவும். ➤ கைகளை உடலின் நடுப்பகுதியின் குறுக்கே வராமல் முன்னும் பின்னும் அசைக்கவும். கைகளை கால்களின் திசைக்கு எதிர்திசையில் அசைக்கவும். ➤ உடல் எடையை சமன் செய்ய முன்னோக்கி நகரவும். சிறுசிறு அடியாக எடுத்து வைக்கவும். இதனை தினமும் 30 நிமிடம் செய்யவும். <p>செயல்முறை:</p> <ol style="list-style-type: none"> 1. இது நரம்பு மண்டலம் (ம) இரத்த நாளங்களின் மீது செயல்பட்டு தளர்ச்செய்வதன் மூலம் இரத்த அழுத்தத்தைக் குறைக்கிறது. 2. இந்த துரித நடை உடலினுள் சுரக்கும் வேதிப்பொருளான நைட்ரஜன் ஆக்ஸைடு (ம) நோய் எதிர்ப்புக் காரணிகளை அதிகர்ப்பதன் மூலம் இரத்த அழுத்தத்தைக் குறைக்கிறது. 		
	நாடிசுத்தி முச்சு பயிற்சி (ம) சவாசனத்தை செயல்முறைபடுத்துதல்.	<p>நாடிசுத்தி ப்ரணாயாமா:</p> <ul style="list-style-type: none"> ➤ பாய் (அ) விரிப்பின் மீது சகாசனத்தில் அமரவும். உடல் தசைகளை தளர்வாகவும் தலை மற்றும் கழுத்தை நேராகவும் கண்களை மூடியும் அமரவும். உங்கள் சவாசத்தை உற்று நோக்கவும். ➤ இடது கையை ஞானமுத்திராவில் வைக்கவும். ➤ வலது கையை நாசிகாமுத்திராவில் வைக்கவும். ➤ வலது கையின் கட்டை விரலை வலது நாசியின் மீதும் மோதிரவிரலை இடது நாசியின் மீதும் வைக்கவும். கட்டை 	விளக்கமும் செயல்முறையும்	கவனித்தல் செய்துகாட்டுதல்

		<p>விரலையும் மோதிர விரலையும் சுவாசித்தலின் போது மாறி மாறி மூடவும்.</p> <ul style="list-style-type: none"> ➤ உடற்பயிற்சி செய்ய ஆரம்பிக்கும் போது இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின் வழியாக மூச்சை வெளியே விடவும். ➤ தொடர்ந்து இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின் வழியாக மூச்சை உள்ளிழுக்கவும். ➤ இதையே மாறாக வலது நாசியை அடைத்துக் கொண்டு இடது நாசியின் வழியாக மூச்சை வெளியே விடவும். ➤ பின்பு வலது நாசியை அடைத்துக் கொண்டு இடது நாசியின் வழியாக மூச்சை உள்ளிழுக்கவும் ➤ இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின் வழியாக மூச்சை வெளிவிடவும். ➤ இது ஒரு சுழற்சி ஆகும். பின்பு மெதுவாக சுவாசிக்கவும். ➤ தொடர்ந்து இதுபோல் வலது இடது மூக்கின் வழியான சுவாசத்தை 20 சுழற்சி வரை செய்ய வேண்டும். <p>செயல்முறை:</p> <ol style="list-style-type: none"> 1. இது நரம்பு மண்டலம் (ம) இரத்த நாளங்களின் மீது செயல்பட்டு தளர்ச்செய்வதன் மூலம் இரத்த அழுத்தத்தைக் குறைக்கிறது. 2. இந்த மூச்சு பயிற்சி உடலிலுள்ள இரத்தத்தை சுத்தம் செய்து உடலின் ஆரோக்கியத்தை ஒழுங்குபடுத்துகிறது. 3. இந்த உடற்பயிற்சியின் மூலம் உடலுக்குத் தேவையான பிராணவாயு அதிகமாக கிடைப்பதன் மூலம் கார்பன்-டை-ஆக்சைடு வெளியேற்றப்படுகிறது. 		
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		<p>ஆ) சுவாசனாசெய்முறை :-</p> <ul style="list-style-type: none"> ➤ முதுகுத் தண்டுநேராக இருக்குமாறுகீழே தலையணையின்றி கண்களை மூடியவாறு படுக்கவும். இருகால்களையும் நேராக வசதியான இடைவெளியில் வைக்கவும். பாதங்கள் தளர்வாக இருக்கட்டும். கைகளை உடலின் பக்கவாட்டில் வைக்கவும். உள்ளங்கை மேல்நோக்கி இருக்கட்டும். ➤ மெதுவாக ஆழ்ந்த மூச்சு எடுக்கவும். ➤ உடலின் எடை முழுவதும் தரையில் இருப்பதாக உணருங்கள். உடல் முழுவதும் தளர்வான நிலையில் இருக்கட்டும். ➤ ஒவ்வொரு உள் வெளி சுவாசத்தின் போதும் உடல் தளர்ந்த நிலையில் இருப்பதாக உணருங்கள். ➤ ஒவ்வொரு வெளி சுவாசத்தின் போதும் உங்களது பதற்றம் , மன அழுத்தம், மனச்சோர்வு (ம) கவலை வெளியேற்றப்படும். ➤ இப்பொழுது ஒவ்வொரு உடல் உறுப்பையும் காலில் இருந்து தலைவரை மனக்கண்ணால் பார்க்கவேண்டும். எந்தெந்த உறுப்புகளை நீங்கள் காண்கிறீர்களோ அவ்வுறுப்புகள் ஆரோக்கியமாகவும் தளர்ந்தநிலையிலும் இறுக்கமில்லாமலும் இருப்பதாக உணருங்கள். ➤ உங்கள் முகத்தை தளர்வாக வைத்துக்கொள்ளுங்கள். உங்கள் கண்களும் ஆழ்ந்த நிலையில் இருக்கட்டும். உங்கள் உடலிலும் மனதிலும் அமைதியை வரவழையுங்கள். ➤ தினமும் இந்த ஆசனத்தை 10 நிமிடம் செய்யவும். இந்த ஆசனத்தின் முடிவில் ஆழ்ந்து சுவாசித்து கால் கையின் 	<p>விளக்கமும் செயல்முறையும்</p>	<p>கவனித்தல் செய்து காட்டுதல்</p>
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		<p>விரல்களையும் உடலையும் மெதுவாக அசைக்கவும். பின் வலது பக்கம் திரும்பி ஒரு நொடி ஓய்வெடுக்கவும். பின்பு மூச்சை உள்ளிழுத்தவாறு எழுந்து அமரவும்.</p> <p>செயல்முறை:</p> <ol style="list-style-type: none"> 1. உடலின் ஆற்றலை சீர்செய்வதன் மூலம் இரத்த குழாய்களை தளர்வடைய செய்து மனதிற்கு அமதியைக் கொடுக்கிறது. 2. இது உடலின் நோய் எதிர்ப்பு சக்தியை மேம்படுத்துகிறது. 3. இது மனதை ஒருமுகப்படுத்தவும், ஆழ்ந்த உறக்கம் பெறவும் உதவுகிறது. 		
8.	<p>உயர் இரத்த அழுத்தத்திற்கான சிறப்பு உணவை கடைபிடிக்கும் வழிமுறைகளை எடுத்துரைத்தல்</p>	<p>இரத்த அழுத்தத்திற்கான சிறப்பு உணவை பின்பற்றுதல்:</p> <p>I. கொழுப்பு மற்றும் மாவுச்சத்தை குறைத்தல்.</p> <ul style="list-style-type: none"> ➤ சாப்பிட ஆரம்பிப்பதற்கு முன் பழங்கள், காய்கள் மற்றும் கீரை வகைகளை சாப்பிடவும் ➤ சமைப்பதற்கு மிகக் குறைவான எண்ணெயையே பயன்படுத்தவும். கொழுப்பு சத்து அதிகமுள்ள எண்ணெய்களான நெய், வெண்ணெய், வனஸ்பதி, தேங்காய் எண்ணெய் மற்றும் பனை எண்ணெய் ஆகியவற்றை மிக குறைவான அளவில் பயன்படுத்தவும். ➤ கொழுப்பு சத்து அதிகம் நிறைந்த கீழ்கண்ட உணவுகளை தவிர்க்கவும் (அ) மிக குறைந்த அளவு 		

		<p>சாப்பிடவும். உதாரணமாக எண்ணெயில் பொரித்த புலால் உணவு, வடை, பஜ்ஜி, போன்டா, சமோசா, பப்ஸ், எண்ணெயில் பொரித்தெடுக்கப்பட்ட திண்பண்டங்கள், பைகளில் அடைக்கப்பட்ட பதார்த்தங்கள், காரவகைகள் (மிக்சர், பக்கோடா, சிப்ஸ்) பிரியாணி, வறுத்த சோறு, பரோட்டா மற்றும் பல.</p> <p>➤ எண்ணெயில் பொரித்த உணவுகளுக்கு பதிலான உணவு வகைகளான முளைகட்டிய பயறுகள், பொறி, சுண்டல், காய்கறிகள், வறுத்த கடலைகள், புட்டு, ஆவியில் வெந்த திண்பண்டங்கள் ஆகியவற்றை சாப்பிடுங்கள்.</p> <p>II. சமையலில் எண்ணெயை குறைக்க உதவும் குறிப்புகள்:</p> <p>➤ சமையல் எண்ணெயை பாட்டிலிலிருந்து நேரடியாக ஊற்றாமல் சிறிய கரண்டியைப் பயன்படுத்தவும்.</p> <p>➤ ஒரு முறை பயன்படுத்திய எண்ணெயை மறுபடியும் பயன்படுத்தாதீர்கள்.</p> <p>➤ சமையலுக்கு ஒரே எண்ணெயை பயன்படுத்தாமல் மாதந்தோறும் வெவ்வேறு எண்ணெய்களை மாற்றி மாற்றி பயன்படுத்தவும்.</p> <p>➤ உணவை பொரிப்பதற்கு பதிலாக அவிக்கவும்.</p> <p>➤ புலால் உணவுகளை தோலை நீக்கி சமைத்து சாப்பிடுவது சிறந்தது.</p>		
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		<ul style="list-style-type: none"> ➤ தோசை, சப்பாத்தி, ரொட்டி மற்றும் அடை போன்றவற்றை சமைக்க ஒட்டாத பாத்திரங்களை பயன்படுத்தவும். ➤ நீங்கள் வடை, பஜ்ஜி, போன்டா மற்றும் பப்ஸ் போன்றவற்றை சாப்பிட நேர்ந்தால் அவற்றை திகு காகிதத்தில் வைத்து அழுத்தி எண்ணெயை எடுத்தபின் சாப்பிடவும். <p>III .உணவில் உப்பைக் குறைக்கும் முறைகள்:</p> <ul style="list-style-type: none"> ➤ உணவில் உப்பை தூவும் மற்றும் கூடுதலாக இடும் பழக்கத்தை கை விடுங்கள். ➤ பதப்படுத்தப்பட்ட கருவாடு, அப்பளம் மற்றும் பாட்டிலில் அடைக்கப்பட்ட ஊறுகாய், ஜாம் மற்றும் காற்றடைக்கப்பட்ட பானங்கள் போன்றவற்றை விட்டொழியுங்கள். ➤ உப்பின் சுவைக்கு மாற்றாக எலுமிச்சம்பழம், மிளகு, புதினா போன்றவற்றை பயன்படுத்தவும். 		
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முடிவுரை:

நாம் இந்த வாழ்க்கை நடைமுறை மாற்ற உத்திகளைப் பின்பற்றி உயர் இரத்த அழுத்தத்தைக் குறைப்பதன் மூலம் நாம் உயர் இரத்த அழுத்தத்தால் ஏற்படும் பின்விளைவுகளை தடுக்கலாம்.

TOOL 5 OBSERVATIONAL CHECK LIST- ENGLISH

S.NO	ITEMS	YES	NO
I	BRISK WALKING		
	1. Does he/she stand erect and hold his/her head high, look forward focussing eyes 5- 6 meters ahead with back straight and shoulders relaxed?		
	2. Does he/she bend elbow 90° with hand loosely clenched, swing arms without crossing centre line?		
	3. Does he/she lead with and transfer weight through his /her heel?		
	4. Does he/she move hands and leg in opposition?		
	5. Does he/she lean forward to balance better, take smaller steps?		
	6. Does he/she practice it for 30 minutes?		
II a	YOGA		
	1. Does he/she sit in sugasana over a mat or sheet, relax the muscles of the body and become aware of his/her breath, keep the spine erect and his/her head and neck straight and eyes remain closed.		
	2. Does he/she let with right hand , fingers stretch and bend his/her index and middle fingers and place them on the palm of his/her same hand (nasikamuthra).		
	3. Does he/she place the left hand in gnanamuthra. (hold the left thumb and index finger together lightly and let the other three remaining fingers remains extended. Place the left hand on the left thigh in palm up position)		
	4. Does he/she place the right thumb on right nostril and the tip of the ring finger against the other nostril and let the thumb and ring finger of the right hand to close the alternate nostrils as he/she breathe in.		

	5. Does he/she begin the exercise by blocking his/her left nostril and breathe out with your right nostril.		
	6. Does he/she continue to block his/her left nostril and breathe in through his/her right nostril.		
	7. Does he/she open his/her left nostril as he/she simultaneously cover and block his/her right nostril and breathe out slowly using the open, left nostril.		
	8. Does he/she go ahead and breathe in with his/her left nostril that is open.		
	9. Does he/she close the left nostril and let the air move out through his/her right nostril that he/she then leave open.		
	10. Does he/she let the breath be slow and rhythmic and complete 20 cycles.		
II b	1. Does he/she lie on his/her back without pillows with his/her legs straight and comfortably apart? Let his/her feet drop open and be relaxed, rest his/her arms at his/her sides, palms facing up and close his/her eyes.		
	2. Does he/she breathe deeply and slowly through the nostrils.		
	3. Does he/she allow his/her body to feel heavy on the ground and let the whole body be relaxed.		
	4. Does he/she contract and relax every body part, organ, and cell from the soles of his/her feet up to the crown of his/her head,		
	5. Does he/she stay in Shavasana for 10 minutes daily. To exit the pose, he/she begin to deepen his/her breath, wriggle his/her fingers and toes. Roll to his/her right side and rest there for a moment. With an inhalation, gently press himself/herself.		

III.	DASH DIET		
	1. Does he/she consume 7-8 servings (180-240g) of grains daily?		
	2. Does he/she consume 4 - 5servings of vegetable daily?		
	3. Does he/she take 4 - 5 servings of fruits daily?		
	4. Does he/she consume 2 or less servings of lean meat /poultry daily?		
	5. Does he/she consume less than 20-25g of nuts, legumes, seeds per day? (150g/week)		
	6. Does he/she take < 15 ml of vegetable oils daily?		
	7. Does he/she take < 11g of sugar daily?		
	8. Does he/she take < 5 g of salt daily?		

TOOL 5 OBSERVATIONAL CHECK LIST-TAMIL

வ.எண்	பொருள்	ஆம்	இல்லை
I	துரித நடை		
	1. அவர் தலையை உயர்த்தி நிமிர்ந்து நின்று முதுகு தண்டை நேராகவும் தோள்பட்டையை தளர்வாகவும் வைத்து கண்களால் 5-6 மீட்டர் முன்னோக்கி பார்க்கின்றாரா?		
	2. அவர் முழங்கையை 90°மடக்கியும் கைகளை தளர்வாக பாதி முடிய நிலையிலும் வைத்திருக்கிறாரா?		
	3. அவர் குதிங்காலை முன்வைத்து, உடல் எடையை குதிங்காலிலேயே செலுத்துகிறாரா?		
	4. அவர் கைகளை உடலின் நடுப்பகுதியின் குறுக்கே வராமல் முன்னும் பின்னும் அசைத்து கைகளையும் கால்களையும் எதிர்திசையில் அசைக்கிறாரா?		
	5. அவர் உடல் எடையை சமன் செய்ய முன்னோக்கி சாய்வதுடன் சிறு சிறு அடி எடுத்து வைக்கிறாரா?		
	6. இப்பயிற்சியை 30 நிமிடங்கள் செய்கின்றாரா?		
II	யோகா		
	நாடிசுத்தி ப்ரணாயாமம்		
	1. அவர் பாய் (அ) விரிப்பின் மீது சுகாசனத்தில் அமர்ந்து முதுகுத்தண்டு, தலை மற்றும் கழுத்தை நேராகவும், கண்களை மூடியும், உடல் தசைகளை தளர்வாகவும் வைத்திருக்கின்றாரா?		
	2. அவர் இடது கையை ஞானமுத்திராவில் வைத்திருக்கின்றாரா?		
	3. அவர் வலது கையை நாசிகாமுத்திராவில் வைத்திருக்கின்றாரா?		
	4. அவர் வலது கையின் கட்டை விரலை வலது நாசியின் மீதும், மோதிரவிரலை இடது நாசியின் மீதும் வைத்து கட்டை விரலையும், மோதிர விரலையும் சுவாசித்தலின் போது மாறி மாறி முடுகின்றாரா?		
5. அவர் உடற்பயிற்சி செய்ய ஆரம்பிக்கும் போது, இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின்			

	வழியாக மூச்சை வெளியே விடுகின்றாரா?		
	6. அவர் தொடர்ந்து இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின் வழியாக மூச்சை உள்ளிழுக்கின்றாரா?		
	7. அவர் இதையே மாறாக, வலது நாசியை அடைத்துக் கொண்டு இடது நாசியின் வழியாக மூச்சை வெளி விடுகின்றாரா?		
	8. அவர் பின்பு வலது நாசியை அடைத்துக் கொண்டு இடது நாசியின் வழியாக மூச்சை உள்ளிழுக்கின்றாரா?		
	9. அவர் இடது நாசியை அடைத்துக்கொண்டு வலது நாசியின் வழியாக மூச்சை வெளிவிடுகின்றாரா?		
	10. அவர் தொடர்ந்து இதுபோல் 20 சுழற்சி வரை செய்கின்றாரா?		
	சவாசனா செய்முறை:		
	1. அவர் முதுகுத் தண்டுநேராக இருக்குமாறு கீழே தலையணையின்றி கண்களை மூடியவாறு படுத்து, இருகால்களையும் நேராக வசதியான இடைவெளியில் வைத்து, பாதங்கள் தளர்வாகவும் கைகளை உடலின் பக்கவாட்டிலும் வைத்து, உள்ளங்கை மேல்நோக்கி இருக்குமாறு படுத்திருக்கின்றாரா?		
	2. அவர் மெதுவாக ஆழ்ந்த மூச்சு எடுக்கின்றாரா?		
	3. அவர் உடலின் எடை முழுவதும் தரையில் இருப்பதாகவும் , உடல் முழுவதும் தளர்வான நிலையில் இருப்பதாகவும் உணர்கின்றாரா?		
	4. அவர் ஒவ்வொரு உள் வெளி சவாசத்தின் போதும், உடல் தளர்ந்த நிலையில் இருப்பதாக உணர்கின்றாரா?		
	5. அவர் ஒவ்வொரு வெளி சவாசத்தின் போதும் தனது பதற்றம், மன அழுத்தம், மனச்சோர்வு (ம) கவலை போன்றவை வெளியேருமாறு உணர்கின்றாரா?		
	6. அவர் ஒவ்வொரு உடல் உறுப்பையும் காலில் இருந்து தலைவரை மனக்கண்ணால் பார்த்து, எந்தெந்த உறுப்புகளை அவர் காண்கிறாரோ அவ்வறுப்புகள் ஆரோக்கியமாகவும்,		

	தளர்ந்தநிலையிலும், இறுக்கமில்லாமலும் இருப்பதாக உணர்கின்றாரர் ?		
	7. அவர் தனது முகத்தை தளர்வாகவும், கண்களை ஆழ்ந்த நிலையில் வைத்து, தனது உடலிலும் , மனதிலும் அமைதியை வரவழைக்கின்றாரா?		
	8. அவர் தினமும் இந்த ஆசனத்தை 10 நிமிடம் செய்கின்றாரா இந்த ஆசனத்தின் முடிவில் ஆழ்ந்து சுவாசித்து, கால் கையின் விரல்களையும் , உடலையும் மெதுவாக அசைத்து பின் வலது பக்கம் திரும்பி, ஒரு நொடி ஓய்வெடுத்து, பின்பு மூச்சை உள்ளிழுத்தவாறு எழுந்து அமர்கின்றாரா?		
III.	சிறப்பு உணவுமுறை:		
	1. அவர் தினமும் 180-240கி.க்குள் தானியங்களை உட்கொள்கிறாரா ?		
	2. அவர் தினமும் 400-500கி காய்கறிகளை உட்கொள்கிறாரா ?		
	3. அவர் தினமும் 400-500கி பழங்களை உட்கொள்கிறாரா?		
	4. அவர் தினமும் 100கி க்கு மிகாமல் மீன் /கோழி இறைச்சி சாப்பிடுகிறாரா ?		
	5. அவர் தினமும் 20-25கி கொட்டைகள் பருப்பு வகைகள் விதைகளை எடுத்துக்கொள்கிறாரா ? (ஒரு வார காலத்திற்குள் 150கி)		
	6. அவர் தினமும் 15மிலி.க்கு மிகாமல் தாவரஎண்ணெய் எடுத்துக்கொள்கிறாரா ?		
	7. அவர் தினமும் 11கி.க்கு மிகாமல் இனிப்பு வகை எடுத்துக்கொள்கிறாரா ?		
	8. அவர் தினமும் உப்பின் அளவை 5கி.க்கு மிகாமல் சேர்த்துக்கொள்கிறாரா ?		

SCORING OF LSMS PRACTICE

Sl.no	LSMS Practice	Bi weekly observation												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Brisk Walking													
2	Yoga													
	Nodisuthi Pranayama													
	Shavana													
3	DASH diet													
	TOTAL													

TOOL6 RATING SCALE ON LEVEL OF SATISFACTION ON LIFESTYLE MODIFICATION STRATEGIES–ENGLISH

Blue print of rating scale to assess the level of satisfaction on practicing Life style modification strategies among hypertensive patients in experimental group.

S.NO.	CONTENT	ITEMS	TOTAL ITEMS	PERCENTAGE
1	LSMS	1-3	3	25
2	Effectiveness of LSMS	4-8	5	33
3	Investigator's attitude	9-12	4	42

Purpose: This rating scale is designed to assess the level of satisfaction of the participants. This is developed by the investigator for the same purpose. This is a 4 point scale with the score ranging from 4-1(Highly satisfied, satisfied, dissatisfied and highly dissatisfied).

Instruction:

There are 12 items below. Kindly read the items. Response extends from highly satisfied, satisfied, dissatisfied and highly dissatisfied. Put a tick mark against your answers. Describe your responses frankly. The responses will be kept confidential and used for research purpose only.

S. No	Items	Highly satisfied	Satisfied	Dissatisfied	Highly dissatisfied
1	I feel more comfortable in following the life cycle modification strategies				
2	I am able to follow all the instruction				
3	I like to follow it regularly				
4	It controls my Blood Pressure				
5	Experience reduction in symptoms of Blood Pressure				
6	I could spare time to do this				
7	It improved my well being				
8	It is at affordable cost				
9	The explanation about LSMS was clear				
10	All the doubts were cleared by the investigator				
11	Demonstration by investigator was easily understandable				
12	Throughout the procedure, the investigator completely guided me				

TOOL 6 RATING SCALE ON LEVEL OF SATISFACTION –TAMIL

- ✓ கீழே 12 வினாக்கள் கொடுக்கப்பட்டுள்ளன. அதை படியுங்கள். வினாக்களுக்கு உங்கள் பதில் மிகவும் திருப்திகரமானது, திருப்திகரமானது, அதிருப்திகரமானதுமற்றும் மிகவும் அதிருப்திகரமானது என்பனவற்றில் எதைத்தேர்ந்தெடுக்கிறீர்களோ அதனை (✓) அடையாளக் குறி மூலம் குறிப்பிடவும். உங்கள் பதில் உண்மையாக இருக்கட்டும்.

உங்கள் பதில் இரகசியமாக வைக்கப்பட்டு ஆராய்ச்சிக்காக மட்டுமே பயன்படுத்தப்படும்.

வரிசை.எண்	பொருளடக்கம்	மிகவும் திருப்திகரமானது	திருப்திகரமானது	அதிருப்திகரமானது	மிகவும் அதிருப்திகரமானது
1.	வாழ்க்கைநடைமுறைம ாற்றம்				
2.	குறித்தஉத்திகளைபின் பற்றுவதுஎனக்குமிகவும் வசதியாக இருக்கிறது. என்னால்				
3.	அனைத்துஉத்திகளை யும் பின்பற்றமுடிகிறது. நான்				
4.	இதைத்தொடர்ந்துபின்ப ற்றவிரும்புகிறேன். இதுஎன்				
5.	இரத்தஅழுத்ததினைக் கட்டுப்படுத்துகிறது. இரத்தஅழுத்தத்திற்கா னஅறிகுறிகள்				
6.	குறைவதைஎன்னால் உணரமுடிகிறது. இதனைசெய்வதற்குஎன் னால்				
7.	முடிந்தவரைநேரம் ஒதுக்கமுடிகிறது. இதுஎன்				
8.	உடல்நலத்தைமேம்படு த்திஉள்ளது. இதுமிகவும்				
9.	விலைமலிவானது. வாழ்க்கைநடைமுறைம ாற்ற உத்திகள்				
10.	பற்றியவிளக்கம் எனக்குதெளிவாகவிளக் கப்பட்டது.				
11.	அனைத்துசந்தேகங்க ளும் ஆய்வாளரால் தெளிவாகதீர்க்கப்பட்ட து. ஆய்வாளர்				
12.	செய்துகாட்டியசெய்மு றைபயிற்சியிலும் எளிதாகபுரிந்துகொள் ளும் முறையில் இருந்தது. செயல்முறையின் போதுஆய்வாளர் என்னைமுழுமையாகவ ழிநடத்தினார்.				

TOOL 7 OPEN ENDED FEEDBACK QUESTIONNAIRE ON LSMS

1. Do you like this LSMS? If yes, give reasons.
2. Do you feel any discomfort to follow this LSMS?
3. To what extent do you continue to do this LSMS?
4. To what extent do you feel this LSMS is useful to you?

TOOL 7 OPEN ENDED FEEDBACK QUESTIONNAIRE ON LSMS - TAMIL

1. நீங்கள் இந்த வாழ்க்கை நடைமுறை மாற்ற உத்திகளை விரும்புகிறீர்கள்?
ஆம் எனில் காரணம் கூறவும்
2. இந்த வாழ்க்கை நடைமுறை மாற்ற உத்திகளை கடைபிடிப்பதால்
ஏதேனும் அசௌகரியத்தை உணர்கிறீர்களா?
3. இந்த வாழ்க்கை நடைமுறை மாற்ற உத்திகளை எந்த அளவிற்கு
தொடர்ந்து செய்ய விரும்புகிறீர்கள்?
4. இந்த வாழ்க்கை நடைமுறை மாற்ற உத்திகள் உங்களுக்கு எந்த
அளவிற்கு உபயோகமாக இருக்கிறது என்று உணர்கிறீர்கள்?

APPENDIX-N

VALUES OF BIO PHYSIOLOGICAL PARAMETERS

➤ JNC 7(JAMA 2003) classification of hypertension for adults

BP CLASSIFICATION	SBP (mmHg)	DBP(mmHg)
Normal	<120	And <80
Pre hypertension	120-139	Or 80-89
Stage 1 Hypertension	140-159	Or 90-99
Stage2Hypertension	≥160	Or >100

2. BMI measurement:

Height measurement:

- The subject stands erect with heel of the feet touching against the wall.
- The ruler is leveled with skull vault and the height is recorded to the nearest 0.5cm using an inch tape.

Weight Measurement:

- The patient stands on a regularly calibrated bathroom weighing scale in light clothes and no shoes. Read nearest 100gm (0.1kg).

Example:

- Weight = 68kg, Height = 165cm (1.65m)
- $BMI = 68 / (1.65)^2 = 24.98 \text{ Kg/m}^2$.

3. WHR measurement:

Waist circumference

- It is measured at the level of the umbilicus to the nearest 0.5cm.

- The subject stands erect with relaxed abdominal muscles, arms at the side, and feet together.
- The measurement was taken at the end of a normal expiration.

4. Hip circumference

- It is measured at the point of greatest circumference around hips and buttocks to the nearest 0.5cm.
- The subject was standing.
- Measurement taken with a flexible, non-stretchable tape in close contact with the skin, but without indenting the soft tissue.

BMI and WHR reference range based on NHLBI Obesity

Education Initiative (2000)

S.NO	VARIABLE	CATEGORY	REFERENCE RANGE
1	Body Mass Index(BMI)	Underweight	< 18.5
		Normal range	18.5 – 24.9
		Overweight:	25 –29.9
		Obesity	30–34.9
		Extreme obesity	>40.0
	Waist Waist–hip ratio (WHR)	Cut off point	≤ 0.90 cm (M) ≤ 0.85 cm (W)

APPENDIX - O

WORK SCHEDULE

Weeks	Pretest	Observation to experimental group	Post test I	Post test II
1.	Control group I	-	-	-
2.	Control- area II	-	-	-
3.	Control- area III	-	-	-
4.	Control- area IV	-	-	-
5.	Control- area v	-	-	-
6.	Control- area vi	-	-	-
7.	Control- area vii)	-	-	-
8.	Control- area VIII)	-	-	-
9.	Experimental group-1	-	-	-
10.	Experimental group 2	-	-	-
11.	Experimental group 3	group-1(10 samples/week)		-
12.	Experimental group 4	group-2(10 samples/week)		-
13.	Experimental group 5	group-1,3(4 samples/day*5 days)	Control group I (10 samples/2 days)	-
14.	Experimental group 6	group-2, 4(4 samples/day*5 days)	Control group II (10 samples x 2 days)	-
15.	Experimental group 7	group-1,3,5(6 samples/day*5 days)	Control group III (10 samples x 2 days)	-
16.	Experimental group 8	group-2,4,6(6 samples/day*5 days)	Control group IV (10 samples/day x2 days)	-
17.	Experimental group 9	group-1,3,5,7(8 samples/day*5 days)	Control- area v (10 samples/ day x2 days)	-
18.	Experimental group 10	group-2,4,6,8(8 samples/day*5 days)	Control- area vi (10 samples/ day x2 days)	-
19.	Experimental group 11	group-1,3,5,7,9(10 samples/day*5 days)	Control- area vii (10 samples/ day x2 days)	-

20.	Experimental group 12	group-2,4,6,8,10(10 samples/day*5 days)	Control- area VIII (10 samples/ day x2 days)	-
21.	Experimental group 13	group-3,5,7,9,11	Experimental group-1	-
		8-9samples/day		
22.	Experimental group 14	group-4,6,8,10,12	Experimental group 2	-
		8-9 samples/day		
23.	Experimental group 15	group-1,5,7,9,11,13	Experimental group 3	-
		10samples/day		
24.	Experimental group 16	group-2,,6,8,10,12,14	Experimental group 4	-
		10 samples/day		
25.	-	group-1,3,7,9,11,13,15	Experimental group 5	Control-I (10 samples/2 days)
		16 samples/day*5 days		
26.	-	group-2,4,8,10,12,14,16	Experimental group 6	Control-II (10 samples/2 days)
		16 samples/day*5 days		
27.	-	group-1,3,5,9,11,13,15	Experimental group 7	Control-III (10 samples/2 days)
		16 samples/day*5 days		
28.	-	group-2,4,6,10,12,14,16	Experimental group 8	Control-IV (10 samples/2 days)
		16 samples/day*5 days		
29.	-	group-1,3,5,7,11,13,15	Experimental group 9	Control-v (10 samples/2 days)
		16 samples/day*5 days		
30.	-	group-2,4,6,8,12,14,16	Experimental group 10	Control-vi (10 samples/2 days)
		16 samples/day*5 days		
31.	-	group-1,3,5,7,9,,13,15	Experimental group 11	Control-vii (10 samples/2 days)
		16 samples/day*5 days		

32.	-	group-2,4,6,8,10 ,14,16	Experimental group 12	Control- VIII (10 samples/2 days)
		16 samples/day*5 days		
33.	-	group- 3,5,7,9,11,15	Experimental group 13	Experiment al group-1
		11-12 samples/day		
34.	-	group- 4,6,8,10,12 ,16	Experimental group 14	Experiment al group 2
		11-12samples/day*5 days		
35.	-	Group- 5,7,9,11,13,	Experimental group 15	Experiment al group 3
		10 samples/day		
36.	-	group- 6,8,10,12,14,	Experimental group 16	Experiment al group 4
		10 samples/day		
37.	-	group- 7,9,11,13,15		Experiment al group 5
		8-9 samples/day		
38.	-	group- 8,10,12,14,16		Experiment al group 6
		8-9 samples/day		
39.	-	Group- 9,11,13,15		Experiment al group 7
		7-8 samples/day		
40.	-	Group- 10,12,14,16		Experiment al group 8
		7-8 samples/day		
41.	-	Group-11,13,15		Experiment al group 9
		5-6 samples/day		

42.	-	Group-12,14,16		Experiment al group 10
		5-6 samples/day		
43.	-	Group-13,15		Experiment al group 11
		4-5 samples/day		
44.	-	Group-14,16		Experiment al group 12
		4-5 samples/day		
45.	-	Group-15		Experiment al group 13
		2-3 samples/day		
46.	-	Group-16		Experiment al group 14
		2-3 samples/day		
47.	-			Experiment al group 15
48.	-			Experiment al group 16

APPENDIX - P

PHOTO DOCUMENTATION



Measuring Bp



Collection of data



Teaching LSMS



Audio Visual Aids for DASH diet



Demonstration of brisk walking

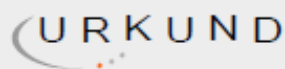


Demonstration of Shavana



Demonstration of Nodisuthi pranayama

ANTI PLAGIARISM REPORT



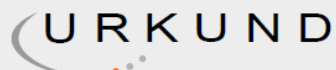
Urkund Analysis Result

Analysed Document: CHAPTER 1 .docx (D27572518)
Submitted: 2017-04-26 10:46:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 %

Sources included in the report:

Instances where selected sources appear:

0



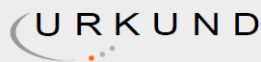
Urkund Analysis Result

Analysed Document: CHAPTER II.docx (D27572519)
Submitted: 2017-04-26 10:46:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 %

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Urkund Analysis Result

Analysed Document: CHAPTER III.docx (D27572521)
Submitted: 2017-04-26 10:46:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 <mailto:mirthaasan@yahoo.co.in>

Sources included in the report:

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URKUND

Urkund Analysis Result

Analysed Document: Chapter IV.docx (D27572522)
Submitted: 2017-04-26 10:46:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 %

Sources included in the report:

Instances where selected sources appear:

0

URKUND

Urkund Analysis Result

Analysed Document: CHAPTER V.docx (D27572517)
Submitted: 2017-04-26 10:46:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 %

Sources included in the report:

Instances where selected sources appear:

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URKUND

Urkund Analysis Result

Analysed Document: K.T Selvi.docx (D27551297)
Submitted: 2017-04-25 19:22:00
Submitted By: mirthaasan@yahoo.co.in
Significance: 0 %

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