

**EFFECTIVENESS OF HIBISCUS TEA IN TERMS OF BLOOD  
PRESSURE REDUCTION AMONG THE HYPERTENSIVE  
PATIENTS IN IDAIKAL VILLAGE, TIRUNELVELI DISTRICT.**



DISSERTATION SUBMITTED TO  
**THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY**  
**CHENNAI**  
IN PARTIAL FULFILLMENT FOR THE DEGREE OF  
**MASTER OF SCIENCE IN NURSING**  
**APRIL 2012**

**EFFECTIVENESS OF HIBISCUS TEA IN TERMS OF BLOOD  
PRESSURE REDUCTION AMONG THE HYPERTENSIVE  
PATIENTS IN IDAIKAL VILLAGE, TIRUNELVELI DISTRICT.**

**BY**

**Mrs. ANITHA BANU.M.S.**



DISSERTATION SUBMITTED TO  
**THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY**

**CHENNAI**

IN PARTIAL FULFILLMENT FOR THE DEGREE OF

**MASTER OF SCIENCE IN NURSING**

**APRIL 2012**



## **SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING**

**Affiliated To The Tamil Nadu Dr. M.G.R. Medical University,  
K.R.Naidu Nagar, Sankarankovil, , Tirunelveli District-627 753  
Tamil Nadu.**

---

### **CERTIFICATE**

This is bonafide work of **Mrs. ANITHA BANU. M.S. M.Sc(N), (2010 – 2012 batch)** second year student of Sri. K. Ramachandran Naidu College of Nursing, Sankarankovil, Pincode -(627 753) Submitted in partial fulfillment for the **Degree of Master of Science in Nursing**, under The Tamil Nadu Dr.M.G.R. Medical University, Chennai.

**SIGNATURE** \_\_\_\_\_

**Prof. (Mrs). N. SARASWATHI, M.Sc (N), Ph.D (N),**  
Principal, Head of the Department in Paediatric Nursing,  
Sri. K. Ramachandran Naidu College of Nursing,  
Sankarankovil, Tirunelveli-627 753  
TamilNadu.

**COLLEGE SEAL**

**A STUDY TO ASSESS THE EFFECTIVENESS OF HIBISCUS  
TEA IN TERMS OF BLOOD PRESSURE REDUCTION AMONG  
THE HYPERTENSIVE PATIENTS IN IDAIKAL VILLAGE,  
TIRUNELVELI DISTRICT.**

APPROVED BY THE DISSERTATION COMMITTEE ON \_\_\_\_\_

**PROFESSOR IN NURSING RESEARCH**

**Prof. (Mrs). N. SARASWATHI**, M.Sc.(N), Ph.D (N) \_\_\_\_\_  
Principal, Head of the Department in Paediatric Nursing,  
Sri.K.Ramachandran Naidu College of Nursing,  
Sankarankovil, Tirunelveli-627 753  
TamilNadu.

**CLINICAL SPECIALITY CO GUIDE**

**Mrs. V. JAYA**, M.Sc. (N), \_\_\_\_\_  
Lecturer, Department of Medical Surgical Nursing,  
Sri.K.Ramachandran Naidu College of Nursing,  
Sankarankovil, Tirunelveli-627 753  
TamilNadu.

**MEDICAL GUIDE**

**Dr. V. SHUNMUGIAH**, M.B.B.S, M.D, \_\_\_\_\_  
Maharaja Clinic,  
Kadayanallur, Tirunelveli District-627 751  
TamilNadu.

DISSERTATION SUBMITTED TO  
**THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY**  
**CHENNAI**  
IN PARTIAL FULFILLMENT FOR THE DEGREE OF  
**MASTER OF SCIENCE IN NURSING**  
**APRIL 2012**

## ACKNOWLEDGEMENT

I wish to express my deepest gratitude and warmest appreciation to the following people, who, in any way have contributed and inspired me to the overall success of the undertaking. There were much guidance and supports, assisting hands in this journey, which made it yield. I am fortunate to have found an abundance of all requisites at every step. With immense gratitude, it is a pleasure to thank those who made this thesis possible.

I thank **Almighty Allah** with reverence and sincerity for the abundant blessings, guidance, wisdom, courage and strength throughout this endeavor.

At the outset, I the researcher of this study express my heartfelt gratitude to **Mr.R. Vivekanandhan**, Chairman and **Mrs.G. Prem Shantha**, managing trustee of Sri. K. Ramachandran Naidu College of Nursing for the precious opportunity of being a part of this esteemed institution.

I owe my profound gratitude and sincere thanks to **Prof.(Mrs).N.Saraswathi**, M.Sc.(N), Ph.D(N), Principal, Head of the Department in Paediatric Nursing, Sri.K.Ramachandran Naidu College Of Nursing, for her constant supervision, patience, endurance and valuable suggestions and guidance and helped me in completion of my study successfully.

I am indeed gratitude to my Research Co Guide **Mrs.V.Jaya**, M.Sc.(N), Lecturer in medical surgical nursing, whose encouragement guidance and support in every phase of my study.

I extend my thanks to **Mrs.J.Sathya**, M.Sc.(N), Lecturer in medical surgical nursing for her guidance and support for the study.

I am indeed greatly indebted to **Mrs. P.Subbalakshmi**, M.Sc.(N), Associate professor Class Coordinator for her constant supervision and Valuable suggestion in completing the study.

My sincere thanks to **Dr. V. Shunmugiah**, M.B.B.S.,M.D., Medical officer of primary health centre, Idaikal for his expert guidance and for granting me the permission to conduct the study.

I extend my sincere thanks to all the **Medical and Nursing Experts** who have given their enlightened ideas in giving shape to the study in its early stage.

I also thank all the **respondents** for their active involvement, trust, co operation & support which they extended in completing the endeavor. Without their support and co operation this dissertation completion would not have been possible.

I acknowledge my genuine gratitude to **Prof.A.Shanmugavelu**, Professor of Bio-Statistics for his suggestions and guidance in data analysis and presentation of data.

I extend my sincere thanks to **Mr.S.A.Mohamed Hanifa, M.A, M Ed., M.Phil**, Head Master, for his patience and expertise in editing the content in English.

I am thankful to the **librarians** of Sri. K. Ramachandran Naidu college of Nursing and Tamil Nadu Dr. M. G. R. Medical University for their cooperation in collecting the related literature for the study.

It is my proud privileges to express my profound sense of deep gratitude and thanks to my beloved husband **Mr.M.Mohamed Rafeek**. The words are inadequate to express the affection, inspiration and devotion shown by my father **Mr. Sheik Uduman**, my mother **Mrs. Rahmath**, Father in law **Mr.Magdoom** , Mother in law **Mrs. Rahmath, Brother, sister** and My dear son **Ahmad Rafan** for their measureless love, unending words of encouragement and constant support throughout this study. This study would not have been possible without the co-operation and constant support of my family members for their prayer and motivation.

## TABLE OF CONTENTS

CHAPTER NO	TITLE	PAGE No.
<b>I</b>	<b>INTRODUCTION</b>	1 - 16
	Background of the study	1
	Need for the Study	5
	Statement of the problem	9
	Objectives of the study	9
	Hypotheses	10
	Operational definition	10
	Assumptions	12
	Delimitation	12
	Projected Outcome	12
	Conceptual Framework	13
<b>II</b>	<b>REVIEW OF LITERATURE</b>	17 - 31
	Review of related literature	17
<b>III</b>	<b>RESEARCH METHODOLOGY</b>	32 - 43
	Research Approach	32
	Research design	32
	Variables	33
	Setting of the study	33
	Study Population	33
	Sample	33
	Sample size	34

	Sampling technique	34
	Criteria for sample selection	35
	Research Tool and Technique	36
	Content validity	39
	Reliability of the Tool	39
	Pilot study	39
	Data Gathering Process	40
	Plan for Data Analysis	41
	Protection of human subjects	42
	Summary	42
<b>IV</b>	<b>DATA ANALYSIS AND INTERPRETATION</b>	44 - 74
	Organization of data	44
	Presentation of data	46
<b>V</b>	<b>DISCUSSION</b>	75 - 79
<b>VI</b>	<b>SUMMARY, CONCLUSION, IMPLICATIONS, LIMITATION AND RECOMMENDATIONS</b>	80 - 87
	<b>BIBLIOGRAPHY</b>	
	<b>APPENDICES</b>	



## LIST OF TABLES

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE NO</b>
1	Frequency and percentage distribution of the samples based on demographic variables such as age, sex, religion, education, occupation, income, dietary habits, family history, body built and life style practice.	46
2	Assessment of pre and post test level of systolic blood pressure among experimental group.	56
3	Assessment of pre and post test level of systolic blood pressure among control group.	58
4	Assessment of pre and post test level of diastolic blood pressure among experimental group.	60
5	Assessment of pre and post test level of diastolic blood pressure among control group.	62
6	Comparison of post test level of blood pressure between the experimental and control group of hypertensive patients.	64
7	Comparison of the pre and post test level of blood pressure among experimental group.	66
8	Comparison of the pre and post test level of blood pressure among control group.	68
9	Association of post test level of blood pressure in experimental group with demographic variables.	70
10	Association of post test level of blood pressure in control group with demographic variables.	72

## LIST OF FIGURES

FIGURE NO	TITLE	PAGE NO
1	Conceptual Framework based on Daniel .L. Stuffle Beams context, input, process and product evaluation model.	16
2	Schematic representation of Quasi Experimental pre test – post test control group Design.	32
3	Schematic representation of Research Methodology	43
4	Distribution of sample according to age in experimental and control group.	51
5	Distribution of sample according to sex in experimental and control group.	51
6	Distribution of sample according to Religion in experimental and control group.	52
7	Distribution of sample according to Education in experimental and control group.	52
8	Distribution of sample according to Occupation in experimental and control group.	53
9	Distribution of sample according to Dietary Habits in experimental and control group.	53
10	Distribution of sample according to Income in experimental and control group.	54
11	Distribution of sample according to Family history of hypertension in experimental and control group.	54
12	Distribution of sample according to Body Built in experimental and control group.	55
13	Distribution of sample according to Life style practice in experimental and control group.	55
14	Frequency and percentage distributions of pre and post test level of systolic blood pressure among experimental group.	57

15	Frequency and percentage distributions of pre and post test level of systolic blood pressure among control group.	59
16	Frequency and percentage distributions of pre and post test level of diastolic blood pressure among experimental group.	61
17	Frequency and percentage distributions of pre and post test level of diastolic blood pressure among control group.	63
18	Comparison of the post test level of systolic blood pressure between experimental and control group.	65
19	Comparison of the post test level of diastolic blood pressure between experimental and control group.	65
20	Comparison of the pre and post test level of Systolic blood pressure among experimental group.	67
21	Comparison of the pre and post test level of Diastolic blood pressure among experimental group.	67
22	Comparison of the pre and post test level of Systolic blood pressure among control group.	69
23	Comparison of the pre and post test level of Diastolic blood pressure among control group.	69

## LIST OF APPENDICES

APPENDIX	TITLE
A	Letter seeking permission for conducting the study
B	Letter seeking experts opinion for content validity of the tool
C	List of experts for content validity
D	Certificate of English editing
E	Informed consent
F	Copy of the tool for data collection
G	Steps of intervention

## **ABSTRACT**

The Research Project, “**A Study to assess the effectiveness of Hibiscus tea in terms of blood pressure reduction among the hypertensive patients**” in **Idaikal village, at Thirunelveli District**. It is conducted in partial fulfillment of the requirement for the Degree of Master of science in nursing at Sri K Ramachandran Naidu College of Nursing Which is affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai during the year 2011-2012.

### **The Objectives of the study were:**

- To assess the pre test level of blood pressure among hypertensive patients in experimental and control group.
- To find out the effectiveness of hibiscus tea on reduction of blood pressure among hypertensive patients in experimental and control group.
- To compare the pre and post test level of blood pressure among hypertensive patients in experimental group.
- To associate the post test level of blood pressure among experimental and control group of hypertensive patients with their selected demographic variables.(Age, Sex, Education, Occupation, Dietary pattern, Income etc.)

### **All Hypotheses were tested at 0.05 level of significant**

- H<sub>1</sub> Mean post test level of blood pressure among the hypertensive patients in experimental group was significantly lower than the mean post test level of blood pressure in control group.
- H<sub>2</sub> Mean post test level of blood pressure among the hypertensive patients was significantly lower than the mean pre test level of blood pressure in experimental group.

H<sub>3</sub> There was significant association between the level of blood pressure in experimental and control group of hypertensive patients with their selected demographic variables. (Age, Sex, Education, Occupation, Dietary pattern, Income etc.)

**The framework of the study was based on the Daniel. L. Stuffle Beam's CIPP model.**

Totally Sixty patients were selected from village. Thirty were assigned to experimental group, thirty patients were assigned to control group. The sample was selected based on the criteria for sample collection. According to convenient sampling technique the patients were assigned to the experimental group and control group. Hibiscus flower petals were dried in a room temperature and it was made in powder. The hibiscus powder (25gram) was mixed with 250ml of hot water and tea was prepared and given to the patients. The experimental Group received hibiscus tea for seven days in three times a day. An evaluation was carried out for the experimental group after hibiscus tea administration on seventh day by using manual sphygmomanometer and evaluation was carried out for the control group on seventh day by using sphygmomanometer.

The **Research design** was Quasi experimental – Pre test and Post test control group design.

The **setting of the study** was conducted in Idaikal village, it was situated from 48 km from Sri.K.Ramachandran Naidu College of Nursing at Tirunelveli.

The Sample was Sixty Hypertensive patients were selected 30 in experimental and 30 in control group by using convenient sampling technique who fulfilled the inclusive criteria.

The descriptive and inferential statistics were used to analyze the data.

**The significant Findings of the study were**

On analysis of frequency and percentage of demographic variables, majority of Patients 15 (50%) were between the age group of 35 - 44 years among hypertensive patients in experimental group. With regard to sex classification, majority of patients 17 (57%) were female in the experimental group, With respect to dietary habits majority of the patients 19 (63%) were non vegetarian in the experimental group. With regard to occupation majority of patients 13 (43%) were belongs to sedentary worker in the experimental group.

With regard to income, majority of patients 17(57%) of them had monthly income of above Rs.5000, in the experimental group. Whereas in the control group 17(57%) of subjects had monthly income of above Rs.5000.Regarding the family history of hypertension, majority of patients 18(60%) of patients were absent, in the experimental group, whereas in the control group out of 30 patients, 20(67%) of them were absent.

With regard to body built, majority of patients 12(40%) of them were thin body built in the experimental group, whereas in the control group majority of patients, 15(50%) of them were moderate body built. Regarding the life style practice majority of patients, 11(37%) of them were smoking in the experimental group. whereas in the control group, majority of patients 9(30%) of them were smoking, 9(30%) of had alcoholism.

There was a significant difference between the mean score in the experimental group before and after receiving hibiscus tea among the patients with hypertension. Justification for undertaken this study was to give hibiscus tea for reduction of blood

pressure and to determine its effectiveness, so that hibiscus tea can be used in future for all the hypertension patients for health promotion.

On analysis of mean score of systolic blood pressure among experimental group 1.23 and control group 1.96 after intervention. Standard deviation of after intervention among experimental group 0.66 and control group was 0.22 and calculated t value was 9.12. Mean score of diastolic blood pressure among experimental group 0.5 and control group was 1.6, standard deviation of diastolic blood pressure among experimental group 0.5 and control group 0.71 in after intervention and calculated t value was 10. It shows reduction of blood pressure in experimental group.

There was significant difference among the experimental group before and after receiving Hibiscus tea systolic blood pressure is ( $t=5.86$ ) and diastolic blood pressure is ( $t=12.3$ ).

There was an association between the level of blood pressure in the experimental group and age, religion, education, occupation, dietary habits, income, family history of hypertension, body build and life style practice except sex. Obtained chi square value was significant at 0.05 level.

**Based on the findings of the study, it is recommended that,**

1. Similar study can be conducted with large samples for better generalisation.
2. A study can be conducted to assess the effectiveness of other herbs such as cumin seeds, celery with grape juice and whole grains for effective blood pressure control.



3. The study can be conducted to assess the knowledge and practice of nurses with regard to nursing intervention for control of blood pressure in patients with hypertension.
4. A comparative study can be conducted by using hibiscus tea and laughter therapy in reduction of blood pressure in hypertension patients.
5. The Same study can be repeated by using the true experimental design.
6. The effectiveness of hibiscus tea can be tested for other disease condition such as dysmenorrheal problem, obesity, renal problems.

As a nurse working in hospital has a vital role to provide effective nursing care for the patients. The nurses are need to develop their knowledge and skills in management of hypertension by accurately measuring the blood pressure and providing care to the hypertensive patients, and to use wide variety of interventions in order to reduce hypertension in such patients.

## **CONCLUSION**

The key conclusion that there was a significant difference on level of blood pressure patients who received hibiscus tea. Hibiscus tea is easily available, easy to use and potentially risk free intervention. Thus an administration of hibiscus tea is effective to control the blood pressure among hypertensive patients.

# BIBLIOGRAPHY

## BOOKS

1. Aleamma, (1999). *Cardiovascular Nursing*. (2<sup>nd</sup> ed). New Delhi: B.I.Churchill living Stone Pvt Ltd.
2. Basavanthappa B.T., (2003). *Medical Surgical Nursing*. (1<sup>st</sup> ed). New Delhi: Jaypee Brothers Medical Publications.
3. Black.M.Joyce,(1997). *Medical Surgical Nursing*. (5<sup>th</sup> ed). Singapore: Harcourt brace and company Pvt Ltd.
4. Cathie E.Cruzzetta, (1992). *Cardio Vascular Nursing*. (1<sup>st</sup> ed). Torondo: Mosby Publications.
5. Churchill Livingstone,(2000). *Text book of Medicine*. (18<sup>th</sup> ed). London: British Library Cataloging Publication.
6. Das. P.C, (2004). *Text book of Medicine*. (4<sup>th</sup> ed). Kolkata: Current book International limited.
7. Dolores .F. Saxton,(1998). *Comprehensive Review of medicine*. (15<sup>th</sup> ed). India: Mosby Publications.
8. Jeyakuruvilla, (2007). *Essentials of Critical care Nursing*. (1<sup>st</sup> ed). New Delhi: Brother's Publishers Printers Publication.
9. Jones A Dorothy,(1978). *Medical Surgical Nursing*. (1<sup>st</sup> ed). Mumbai: Gramhill Publications.
10. Kulkarni A P & Baride J.P, (1998). *Textbook of medicine*. (1<sup>st</sup> ed). Mumbai Medical Publications.
11. Polit Denise, (2003). *Nursing Research*.. (5<sup>th</sup> ed). Philadelphia: J B Lippincott company.

12. Kusam samant, (1998). *Medical Surgical Nursing (3<sup>rd</sup> ed)*.Vora Medical Publication.
13. Lems Kevil, (2000). *Medical Surgical Nursing. (6<sup>th</sup> ed)*. New Delhi: Mosby Publications.
14. Sharon L Lewis, (2007). *Medical Surgical Nursing. (7<sup>th</sup> ed)*. New Delhi : Mosby Publications.
15. Long C Barbara, (1993). *Medical Surgical Nursing- A Nursing process approach. (3<sup>rd</sup> ed)*. Chicago Alison Milles Pvt ltd.
16. Park. K, (2007). *Preventive and social medicine*. Jabalpur Banarsidars publications.
17. Peters J, (2005). *Evidence based Cardiology (2<sup>nd</sup> ed)*. New Delhi .Lippincott Williams & Wilkins Publications.
18. Phipps long woods, (2002). *Shafers Medical Surgical Nursing. (7<sup>th</sup> ed)*. New Delhi: W.B Saunders company.
19. Phipps.J.Wilma,(1999). *Medical Surgical Nursing Health & Illness Perspective. (7<sup>th</sup> ed)*. Philadelphia: Mosby Publications.
20. Royle A Joan, (1992).*Medical Surgical Nursing and Related Physiology. (4<sup>th</sup> ed)* Somerset: Butter & Tanner Ltd.
21. Smeltzer C Suzane, (2003). *Brunner and Suddarths: Text Book of Medical Surgical Nursing. (4<sup>th</sup> ed)* New Delhi: Volters Kluwer.
22. Suryakantha A H, (2004). *Community Medicine. (6<sup>th</sup> ed)*. New Delhi. Jaypee Brothers Publications. (*1<sup>st</sup> ed*). New Delhi: Lippincott Williams and Wilkins Publications.
23. Taylor carol, (1993). *Fundamentals of Nursing. (2<sup>nd</sup> ed)*. philasephin Lippitcott company.

24. Wilson J W Kathleen, (1996). Text Book of health and illness. (8<sup>th</sup> ed). New York Churchill Livingstone.
25. Winifred Hector JS, (1979). Text book of medicine for nurses. (3<sup>rd</sup> ed) London: Williams Heinemann medical books Ltd.

## **JOURNALS**

26. Ando, (2004). Modification of daily life in patients with mild hypertension cardiology today. 74 (1) 1542 – 46.
27. Anne Heart, (2009). Complementary and alternative therapies for high blood pressure. American Journal of clinical nutrition. 90 (1), 493 – 498.
28. Cart Hauseman M.K, (2000). The effects of hypertension. Vibrant life 18, 13-15.
29. Gupta B, (2000). Prevalence of hypertension. Journal of medicine. 14(3), 75 – 83
30. Kumar P, (1985). Hypertension and its effect. Indian heart journal. 41 (5). 19 -20.
31. Linus P, (1990). Hibiscus tea to blood pressure control. Journal of National academy of science 87 (2), 6204 – 6207.
32. Solomon James, (2008). Effects of Diet and Exercises on Hypertension Nurses of India. 9 (2), 156 -159.
33. Suzuki S, (2008). Benefits of Hibiscus tea on hypertension, Journal of alternative medicine. 20 (9), 33 – 34.
34. Sampol Sambhaji, (2009). Prevalence & Sociodemographic factors of hypertension in rural maharastra. Journal of medicine in health. 34(3), 46 – 53.

35. Andre Pascal kengen, (2007). The Burden of high blood pressure and related risk factors in urban area. Africa Journal of American Heart Association. 8(9), A33 -36
36. Avadaiammal, (2005). Study of urban community survey in India. International Journal of Medical Science. 2(5), 70 – 78.
37. Byline Surya, (2007). Nonpharmacological management of hypertension. Indian Journal of medical science. 22(3), 33.
38. Vincent Henry, (1996). A Comparative study of hypertension prevalence, awareness, treatment and control rates in St. Lucia , Jamaica ., Journal of Hypertension., 14, 53 – 56.
39. Harsha.D.W. Journal of American Diet Association. 33 (5), 77 – 82.
40. Shacks F. Obarzank, (1999). Herbal therapy to prevent hypertension., review of the herbal therapy. American Journal of clinical nutrition. 22(3), 1116-1120.
41. SU.Hwang, (2009). Ethnic Variation in hypertension prevalence of women in Taiwan. Journal of Human Hypertension. 23 (5) 160 – 163.
42. Anne Hart, (2008, Feb 4) Hibiscus tea treatment for hypertension.
43. Bernard P Nelson, (2009). High blood pressure causing DASH diet study.
44. Dave Munger, (2010) .The daily monthly can high blood be controlled by diet.,
45. Earl Minelell, (2009). Herbs For high blood pressure.
46. Eel Edelson, (2009). Health day, Fewer sugary drinks less high blood pressure.
47. Farhang Khosh, N.D, (2001). Health Practice and Hypertension. Alternative medicine review, 6616, 590 – 600.

## WEBSITES

48. Alex Zorach, (2003). Hibiscus Tea Lower Blood pressure., Retrieved from <http://www.ezinearticles.com>
49. David Gulcierez, (2009). Hibiscus Tea scientifically lowers blood pressure, Retrieved from <http://www.telegraph.co.uk>
50. Richard N Fogaros, (2009). Complications of hypertension, Retrieved from <http://www.heartdisease.about.com/od/a/heartsymptoms.html>
51. Blumberg JB (2010) Herbal Remedies of hypertension, Retrieved from <http://www.naturalnews.com/boodhibiscuspressure.html>
52. Williams B, Poulter NR et al (2004). Management of hypertension. Retrieved from <http://www.en.eikipedia.org/wiki/hypertension>
53. Rockville pike, (2011). High blood pressure. Retrieved from <http://www.ncbi.nlm.nih.gov/pumbedhealth>
54. Kamran Riaz, (2011). Epidemiology of hypertension. Retrieved from <http://emedicine.medscape.com/html>
55. Jane Morlay Koychen, (2006). Trends in prevalence incidence and control of hypertension. Retrieved from <http://www.annualreviews.org.pubhealth>
56. Zhongliang chen, (2008). prevalence rate of hypertension, Retrieved from <http://www.cmaj.ca/content.full>
57. Colleen, (2011). Hibiscus world collection. Retrieved from <http://www.hibiscus.org>
58. Hendrick Adriaan, (2007). Traptical Hibiscus is a Lillibiscus. Retrieved from <http://www.hibiscus-sinesis.com.html>
59. Les Beers, Jim Houie, (2000). Growing hibiscus. Retrieved from <http://www.hibiscusworld.com.html>

60. L.D.Sparnaaji, (2002). The introduction of new hibiscus cultivars. Retrieved from <http://www.actahort.org.html>
61. Saad Fayed, (2001). How to make hibiscus tea. Retrieved from <http://www.mideastfoodabout.com.html>

## APPENDIX A

### LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY



#### SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

Approved by Govt. of Tamilnadu and Indian Nursing Council / T.N.C  
Affiliated to the Tamilnadu Dr. M.G.R. Medical University

K.R. Naidu Nagar - 627 753, Paruvakudi Village, Post Bag No.1, Karivalam (via)  
Sankarankovil (Tk), Tirunelveli (Dt), Ph. : 04636 - 260950, Fax : 04636 - 260377, E - Mail : srikncon@yahoo.com

31.03.2011

To

The Medical Officer,  
Primary Health Centre,  
Tenkasi (Tk),  
Tirunelveli District.


**Mrs. Anitha Banu .M.S** is a bonafide student of our college studying in M.Sc (N) programme. As a partial fulfillment of the university requirement for the award of M.Sc (N) degree, She needs to conduct research project.

Her chosen research project is as follows “**A study to assess the effectiveness of hibiscus tea in terms of blood pressure reduction among the hypertensive patients in Idaikal village, Tirunelveli District.**”

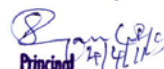
She will abide by the rules and regulations of the village home and adhere to village policies during her period of data collection. Permission may kindly be granted to her for conduction of the study at your village.

Further details of the proposal project will be furnished by the student personally, Confidentiality will be ensured in the research project.

Thanking you

  
Dr. V. Srinivasan  
S. A. 1A  
Reg. No. 40238  
M.D.

Yours faithfully

  
Principal  
Sri K. Ramachandran Naidu  
College of Nursing  
K.R. Naidu Nagar - 627 753, Karivalam (Via)  
Sankarankovil (T.K.) Tirunelveli Dt.,



**APPENDIX B**  
**LETTER SEEKING EXPERTS OPINION FOR CONTENT**  
**VALIDITY**

FROM:

Mrs ANITHA BANU.M.S.  
M.Sc Nursing II<sup>nd</sup> Year  
Sri.K.Ramachandran Naidu College Of Nursing  
SankaranKovil.

TO:

**SUBJECT: Seeking validation of tool and content validity**

RESPECTED Sir/ Madam,

I am II<sup>nd</sup> year of M.sc Nursing student studying at Sri K Ramachandran Naidu college of Nursing, Sankarankovil, Tamilnadu Dr.MGR Medical University working on dissertation titled, "**TO ASSESS THE EFFECTIVENESS OF HIBISCUS TEA IN TERMS OF BLOOD PRESSURE REDUCTION AMONG THE HYPERTENSIVE PATIENTS IN IDAIKAL VILLAGE, TIRUNELVELI DISTRICT.**" The dissertation is to be submitted to the Tamilnadu Dr.MGR Medical University, as a partial fulfillment for the requirement of M.sc nursing degree. Hence I request you to kindly evaluate the tool items and give your valuable opinion and suggestions for improvement of this tool. I would be highly obliged and thankful to hear from you.

Thanking you in anticipation.

Yours sincerely,

(ANITHA BANU.M.S.)

Enclosures:

Statement of the problem

Research tool

Scoring key

## **APPENDIX – C**

### **LIST OF EXPERTS FOR CONTENT VALIDITY**

#### **MEDICAL EXPERTS**

1. **Dr.V.Shunmugiah.,MD.,**  
Maharaja clinic,  
Kadayanallur,  
Tirunelveli District.
2. **Dr.S.Siby Mary.MD(S).,**  
Augustinmuni Child Care Centre,  
Nagercoil,  
K.K.District.

#### **NURSING EXPERTS**

1. **Ms. Santhi Appavu**  
Principal,  
Christian college of nursing,  
Kanyakumari Medical Mission.,  
Kanyakumary CSI diocese, Neyyoor,  
Kanyakumari dist.-629 802
2. **Ms. Selma Thomas,**  
Reader,  
Apollo college of nursing,  
Vanagaram to Ambattur Main road,  
Ayanambakkam,  
Chennai - 600 095
3. **Ms. Jasmine Parimala,**  
Principal.  
Christian College Of Nursing,  
Thisianvilai., Tirunelveli District.

## **APPENDIX – D**

### **CERTIFICATE OF ENGLISH EDITING**

#### **TO WHOM SO EVER IT MAY CONCERN**

This is to certify that **Mrs.Anitha Banu M.S.** II year. M.Sc Nursing student of Sri. K. Ramachandran Naidu College of Nursing, Sankarankovil (Tk), Tirunelveli District, has done a dissertation study on “**TO ASSESS THE EFFECTIVENESS OF HIBISCUS TEA IN TERMS OF BLOOD PRESSURE REDUCTION AMONG THE HYPERTENSIVE PATIENTS IN IDAIKAL VILLAGE, TIRUNELVELI DISTRICT.**”April 2012, this study was edited for English language appropriateness.

**Signature**

**(Mr.S.A.Mohamed Hanifa. M.A., M.Ed.,M.Phil.,)**

**APPENDIX - E**

**INFORMED CONSENT**

Good Morning,

I, **Mrs. M.S. Anitha Banu**, M.sc Nursing II Year student of Sri.K Ramachandran Naidu College of Nursing, conducting a study **“TO ASSESS THE EFFECTIVENESS OF HIBISCUS TEA IN TERMS OF BLOOD PRESSURE REDUCTION AMONG THE HYPERTENSIVE PATIENTS IN IDAIKAL VILLAGE, TIRUNELVELI DISTRICT.”** a partial fulfillment of the requirement for the degree of M.Sc Nursing under The Tamil Nadu Dr. M.G.R Medical University. The Hypertensive Patients will be given 250 milliliter of hibiscus tea. Orally 3 times per day and blood pressure will be assessed by using sphygmomanometer after administration of seventh day.

I assure you that information obtained will be kept confidential. So, I request you to kindly co operate with me and participate in this study by giving your frank and voluntary consent.

Thank you.

# **APPENDIX - F**

## **DESCRIPTION OF THE TOOL**

### **Section A**

It consists of a structured interview schedule. It had questions related to the demographic data of the patients.

### **Demographic Variables**

1. Age
  - a) 35-44 Years
  - b) 45-54 Years
  - c) 55-64 Years
  
2. Sex
  - a) Male
  - b) Female
  
3. Religion
  - a) Hindu
  - b) Muslim
  - c) Christian
  
4. Education
  - a) Illiterate
  - b) Primary Education
  - c) Higher Education
  - d) Graduate Education
  
5. Occupation
  - a) Sedentary Worker
  - b) Moderate Worker
  - c) Heavy Worker

6. Dietary Habits
  - a) Vegetarian
  - b) Non Vegetarian
  
7. Income
  - a) Below Rs 2000
  - b) Between Rs 2000 to 5000
  - c) Above Rs 5000
  
8. Family History of Hypertension
  - a) Present
  - b) Absent
  
9. Body Built
  - a) Thin Body (< 40 kg)
  - b) Moderate Body (<40 – 69 kg)
  - c) Obese (Above 70 Kg)
  
10. Life Style Practice
  - a) Smoking
  - b) Alcoholism
  - c) Tobacco Chewing
  - d) None

## Section B

### Sphygmomanometer

- Checking blood pressure level with help of manual sphygmomanometer and stethoscope before and after hibiscus tea administration.

### Scoring Key

Level of blood pressure		Interpretation	Score
Systolic (mm of Hg)	Diastolic (mm of Hg)		
$\leq 120$	$\leq 80$	Normal	0
121 to 139	81 to 89	Pre Hypertension	1
140 to 159	90 to 99	Stage 1 HYPERTENSION	2
Above 160	Above 100	STAGE 2 HYPERTENSION	3

## APPENDIX - G

### STEPS OF INTERVENTION

#### Ingredients

- Hibiscus Flower
- Hot water

#### Steps



1. Collect the hibiscus flower



2. Dry the hibiscus flower petals in room temperature.





3. Store the hibiscus flower petals.



4. Powder the dried petals.



5. Take 250 ml of hot water and mix with twenty five gram of dried hibiscus powder to prepare the hibiscus tea.
6. Blood pressure level was checked by using sphygmomanometer and who fulfilled the inclusive criteria were given hibiscus tea. (25 gram of dried hibiscus powder mixed with 250 ml of hot water per day three times in seven consecutive days).
7. After seventh day of intervention post assessment was done.

# CHAPTER I

## INTRODUCTION

*"In joy or sadness, flowers are our constant friends."*

*Kozuko Okakura*

### BACKGROUND OF THE STUDY

High blood pressure, termed "hypertension," is a condition that afflicts almost 1 billion people worldwide and is a leading cause of morbidity and mortality. More than 20% of Americans are hypertensive, and one-third of these Americans are not even aware they are hypertensive. Therefore, this disease is sometimes called the "silent killer." This disease is usually asymptomatic until the damaging effects of hypertension (such as stroke, myocardial infarction, renal dysfunction, visual problems, etc.) are observed. (**Richard E. Klabunde 2007**)

Hypertension, a chronic illness is a growing condition in our society, due to lifestyle changes once it is diagnosed its control basically depends on adapting a healthy lifestyle and therapeutic compliance.

Hypertension is the silent killer disease of today and the single most important predictor of cardiovascular risk. Hypertension is a major risk factor for coronary artery disease and "heart attacks," which may require coronary artery bypass surgery. (**Bryan Williams 2010**).

Hypertension is defined as a consistent elevation of Systolic blood pressure >120mm of hg and consistent elevation of diastolic blood pressure > 80 mm of hg, hypertension mainly of two types primary (essential)and secondary hypertension. (**Sharon Lewis 2007**).

According to American classification of hypertension there is four types, In this normal, pre hypertension, stage 1 hypertension and stage 2 hypertension. **(2002)**.

Hypertension is a medical condition in which constricted arterial blood vessel increase the resistance to blood flows causing the blood to exert excessive pressure against vessel walls. The heart must work harder to pump blood through the narrowed arteries if the condition persists, it will damage the heart and blood vessels, increasing the risk for stroke, heart attack and kidney failure often it causes no symptom until it reaches a life threatening stage, if we strive for better hearts for our people, the holistic management of hypertension need to be reached as well as practiced. **(Wasier 2003)**.

Hypertension, so silent, produces hemodynamic changes, macro-and micro vascular, in turn caused by malfunction of the endothelium and vascular wall remodeling the resistance arterioles, responsible for maintaining peripheral vascular tone. These changes, which precede in time the pressure elevation, produce specific organic lesions, some clinically defined. **( Carretero 2000)**.

Common risk factors for hypertension such as Age, Ethnicity, Gender, Family History, Smoking, Activity Level, Exercise, Diet, Medications, drugs, Kidney Problems and Other Medical Problems.**(Carol 2002)**.

In most cases, hypertension produces no symptoms until dangerous complications occur. However there are some known symptoms of hypertension, which a person with hypertension may experience. Headaches may be experienced due to elevation in blood pressure. Sometimes morning headaches can also be felt due to hypertension. Dizziness is often experience by people with high blood

pressure. Heart pain, Palpitations, Nosebleeds, Difficulty in breathing, Tinnitus (ringing or buzzing in the ears), Blurred Vision, Frequent urination. **(Lewis 2007)**.

Uncontrolled high blood pressure can lead to Heart attack or stroke, Aneurysm, Heart failure, Weakened and narrowed blood vessels in kidneys, Thickened, narrowed or torn blood vessels in the eyes, Metabolic syndrome, Trouble with memory or understanding.

Most people with hypertension are treated with antihypertensive medications, Diuretic drugs, cardio inhibitory drugs either block beta-adrenoreceptors on the heart (i.e., beta-blockers) or L-type calcium channels (i.e., calcium-channel blockers), Vasodilator drugs, Included in these drugs are alpha-adrenoreceptors antagonists(alpha-blockers), direct-acting vasodilators, angiotensin-converting enzyme inhibitors and angiotensin receptor blockers. **(Luther 2003)**.

Dietary modification remains key to the treatment of patients with hypertension and prevention of complication due to hypertension and life style modification and dietary management. The blood pressure can be controlled it helps to prevent the incidents of hypertension in the world. **(Lewis 2007)**.

The incidence and prevalence of hypertension can be significantly, reduced by low salt intake, vegetarian dish, stress management, cessation of smoking, reduction of alcohol intake. This is also helpful in reducing the doses of antihypertensive drugs and its side effects. **(Barbara 2003)**.

Hibiscus tea is the infusion made from the calyces (sepals) of the Hibiscus sabdariffa flower, an herbal tea drink consumed both hot and cold by people around the world. It is also referred to as roselle.

Asia and the Pacific islands are the origins of Hibiscus Tea. Hibiscus is also the state flower of Hawaii and the national flower of Malaysia. There are thousands of sub-varieties with different colors. Some varieties have blossoms two inches in diameter and others ten to twelve inches. This tea is made from organic red hibiscus flower petals. It is a deep red colored, strong, sweet-tart brew, high in vitamin C and caffeine free. **(Augie Miller 2003).**

The report published in the Journal of Human Hypertension has showed that drinking hibiscus tea can reduce high blood pressure in people with type 2 diabetes. The study results show the average systolic blood pressure for those drinking hibiscus tea decreased from 134.8 mmHg (17.97 kPa) at the beginning of the study to 112.7 mmHg (15.03 kPa) at the end of the study, duration of one month. **(Elwin karl 2001).**

A study conducted of 65 subjects found that 3 cups of hibiscus tea daily for 2 weeks reduced systolic blood pressure by 7 mm Hg in prehypertensive and mildly hypertensive participants. In those with mean systolic blood pressure over 129 mm Hg, the reduction was nearly 14 mm Hg. The study's lead author has noted that hibiscus flowers contain anthocyanins, which are believed to be the active antihypertensive compounds, acting as angiotensin-converting enzyme (ACE) inhibitors. **( Karol 2009).**

A study conducted to compare the Hibiscus sabdariffa to the drug lisinopril on people with hypertension. "Blood pressure" reductions and therapeutic effectiveness were lower than those obtained with lisinopril ( $p < 0.05$ )." The author concluded that hibiscus "exerted important antihypertensive effectiveness with a wide margin of

tolerability and safety, while it also significantly reduced plasma ACE activity and demonstrated a tendency to reduce serum sodium (Na) concentrations without modifying potassium (K) levels." He attributed the blood pressure reducing effect of hibiscus to its diuretic effect and its ability to inhibit the angiotensin-converting enzyme through the presence of anthocyanins. (**Jurian 2007**).

A study conducted to compare the effectiveness of hibiscus tea to the ACE-inhibiting drug captopril. The authors found that the "obtained data confirm that the hibiscus sabdariffa extract, standardized on 9.6mg of total anthocyanins, and captopril 50 mg/day, did not show significant differences relative to hypotensive effect, antihypertensive effectiveness, and tolerability." (**Anand et al 2004**).

Various studies have shown that drinking Hibiscus tea has many internal properties such as reducing blood pressure, assisting in weight loss, strengthening your immune system, preventing bladder infections and easing constipation.

According to Taiwanese scientist hibiscus tea can control cholesterol and thereby no risks of heart disease. The extract from the flower can also be used to treat high blood pressure as well as liver disorder. It also improves blood circulation, reduces stress levels, protects body against bacterial attack, reduces weight, and prevents bladder infection and constipation. This natural-colored tea has a delicious taste and a pleasant fragrance. Hibiscus tea contains vitamin C. It is considered healthier and more valuable than conventional teas. (**Faseb 2005**).

### **NEED FOR THE STUDY:**

Hypertension or High blood pressure is one common ailment in adults. It is estimated that more than 10 million people may have higher blood pressure but also

unaware of their illness. As per research conducted in India, about 2 percent of adults in cities and 10 percent in rural areas have been suffering from hypertension. The overall incidence of hypertension is inhaled estimated to be 66 million. **(J Hum 2000).**

A study conducted a survey by association of physicians of India urban areas in the counts had a significantly higher incidence of hypertension 27-37% as compared to rural area 2 to 8%. In India about 20%of the adult population suffers from hypertension making if the country's biggest silent killer from this almost 90% of the cases fall into the category of primary as essential hypertension. **(Agarwal 2001).**

A study conducted 385 camps in rural areas in tamilnadu and 7.98 lakhs people were screened in these camps. In that 5.02% of population was affected with hypertension. **(Tamilnadu Government Public Health and Preventive Medicine 2003).**

A study conducted in Chennai urban population to know the privilege of hypertension, 1262 samples were participated in this study, and the result shows that privilege of hypertension appears to be high in this urban south Indian population and these calls for urgent steps for its prevention and control. **(Shanthirani et al 2003).**

A study conducted at the University of Michigan suggested that even slightly elevated blood pressures can be dangerous for some people, especially those who are obese. Here, systolic pressures are sometimes allowed to rise to 180 to compensate for aging arteries, as long as the patient doesn't have other risk factors such as obesity or high cholesterol. **(Job S 2006).**



A study conducted national survey of more than 1,500 Americans over the age of 50 to gauge the awareness of high blood pressure, including its risks and causes. This group is considered to be at great risk for complications from uncontrolled high blood pressure. **(National Council on Aging (NCOA) 2006).**

Recent data suggest that normotensive individuals over 65 years of age have a lifetime risk of approximately 90% for hypertension. Since the number of undiagnosed patients has increased from 25% to almost 33% in 2003, the prevalence of hypertension increased from less than 100 per million inhabitants to > 250 per million. **(Journal of Framingham Heart Study 2004).**

A study conducted on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. This report says that Prehypertension is not a disease but a category that identifies people at high risk of developing hypertension. Before age of 50 years diastolic blood pressure is a more potent risk factor for heart disease, while systolic blood pressure is after 50 years of age. **(Joint National Committee 2003).**

A study showing that consuming Hibiscus Tea does in fact help lower blood pressure. At the beginning of the study their blood pressure was taken in a period of week intervals throughout the study. It shows the reduction of blood pressure after consuming the hibiscus tea. **(Agricultural Research Service 2000).**

A study data supports the regular use of Hibiscus Tea in individuals with high blood pressure can reduce the blood pressure. **(United States Department of Agriculture 2002).**

High blood pressure (BP) is a major risk factor and better to control and can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular diseases in India. Epidemiological studies demonstrate that prevalence of hypertension is increasing rapidly among Indian urban populations and using the current definitions more than two-fifths of the Indian urban adult population has hypertension. **(Rajeev Gupta et al 2001).**

A study conducted regarding hypertension to find out the prevalence rate in Jaipur 30% men and 33% women aged  $\geq 20$  years and reported it in 31% men and 41% women in Thiruvananthapuram, while reported a crude prevalence rate of 21% in Chennai and 34% middle-class executives in Mumbai, but after multiple BP measurements it was confirmed in 27% male and 28% female officers. **(Gupta et al 2002).**

A study conducted to find out the complication of hypertension caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. **(J Hum 2004).**

Recent report submit that cardiovascular diseases will be the largest cause of death and disability by 2020 in India. In 2020 AD, 2.6 million Indians are predicted to die due to coronary heart disease which constitutes 54.1 % of all CVD deaths. Nearly half of these deaths are likely to occur in young and middle aged individuals (30-69 years). **(World Health Report 2002).**

The study estimates that 52% of CVD deaths occur below the age of 70 years in India as compared to 23% in established market economies. (**Global Burden of Disease (2005)**).

A study conducted regarding the prevalence of hypertension was significantly higher in cases with obesity, android obesity and for persons aged >40 years. (**New World Health Organization 2007**).

The investigator selected this study because during her clinical experience she observed many clients suffering from complications of hypertension because they have not taken proper treatment for the control of hypertension because of side effects and cost of anti-hypertensive medications. Hibiscus tea is safe herb with no side effects and easily available. Hence the investigator was interested in assessing the effectiveness of hibiscus tea for reducing blood pressure level among the patients with hypertension.

## **STATEMENT OF THE PROBLEM**

A Study to assess the effectiveness of Hibiscus tea in terms of blood pressure reduction among the hypertensive patients in Idaikal village, Thirunelveli District.

## **OBJECTIVES OF THE STUDY**

- To assess the pre test level of blood pressure among hypertensive patients in experimental and control group.
- To find out the effectiveness of hibiscus tea on reduction of blood pressure among hypertensive patients in experimental and control group.

- To compare the pre and post test level of blood pressure among hypertensive patients in experimental group.
- To associate the post test level of blood pressure among hypertensive patients in experimental and control group with their selected demographic variables. (Age, Sex, Education, Occupation, Dietary pattern, Income etc)

## **HYPOTHESES**

All Hypotheses were tested at 0.05 level of significant

- H<sub>1</sub> Mean post test level of blood pressure among the hypertensive patients in experimental group will be significantly lower than the mean post test level of blood pressure in control group.
- H<sub>2</sub> Mean post test level of blood pressure among the hypertensive patients will be significantly lower than the mean pre test level of blood pressure in experimental group.
- H<sub>3</sub> There will be a significant association between the level of blood pressure in experimental and control group of hypertensive patients with their demographic variables. (Age, Sex, Education, Occupation, Dietary pattern, Income etc)

## **OPERATIONAL DEFINITION**

### **◆ Assess**

It refers to systematically and continuously collecting, validating and communicating the data regarding reduction of blood pressure among hypertension patients by sphygmomanometer.

◆ **Effectiveness**

It refers to outcome of hibiscus tea on reduction of blood pressure among hypertensive patients.

◆ **Hibiscus Tea**

Hibiscus tea is an herbal drink made from the calyces of the hibiscus sabdariffa flower. Preparation of hibiscus tea is dry the hibiscus flower petals in a room temperature and make the powder and mix with boiled water. (25grams of hibiscus powder mixed with 250ml of hot water and given three times a day for seven consecutive days). It contains anthocyanins, calories, fat, carbohydrates, protein, vitamin C.

**The nutritive value of 25 gram of hibiscus tea as follows,**

- ❖ Anthocyanins - 40%., Cyanidin - 10%, Delphinidin-15%, Polysaccharides – 20%.
- ❖ Citric acid-3%., Maleic acid-4%., Tartaric acid-3%., Calories -84 K.cal.
- ❖ Carbohydrates – 17.7 gram., Total fat- 0.28 gram., Sugar – 0 gram., Protein – 2.61gram., Vitamin C – 30mg.

◆ **Blood Pressure**

In this study blood pressure refers to blood pressure level between 121-160mm of hg (Systolic blood pressure) and 81-100 mm of hg (Diastolic blood pressure)

**◆ Hypertension**

Hypertension defined as a repeatedly elevated blood pressure exceeding 120 over 80 mmHg, In this study refers to people who has elevated blood pressure level between 121-160mm of Hg (Systolic blood pressure) and 81-100 mm of Hg (Diastolic blood pressure).

**◆ Patients**

Patients of both male and female persons with hypertension under the age group of (35-64 years) residing at Idaikal village, Thirunelveli District.

**ASSUMPTIONS**

- Hibiscus tea may reduce the blood pressure.
- Hibiscus tea is easy to administer.
- Hibiscus tea has no adverse effects.

**DELIMITATION**

- The study is delimited for the period of four weeks.
- The study is delimited to Idaikal village only.
- The study is delimited to only patient with pre and stage I hypertension.

**PROJECTED OUTCOME**

The findings of study will help the nurses to plan the hibiscus tea in reducing hypertension and controlling the level of blood pressure of the subjects with hypertension. The hibiscus tea will help to improve blood circulation, reduces stress levels, protects body against bacterial attack and prevents bladder infection.

## CONCEPTUAL FRAMEWORK

The conceptual framework for research study presents the measure on which the purpose of the proposed study is based. The framework provides the perspective from which the investigator views the problem.

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

Here the conceptual framework was based on CIPP model,

**Daniel L. Stufflebeam** Which included context evaluation, input evaluation, process evaluation and product evaluation. Context evaluations help prioritize goals, input evaluations assess different approaches, process evaluations assess the implementation of plans, and product evaluations assess the outcomes (both intended and not intended). This model is used to evaluate both formative and summative assignments. The CIPP model advocates that "the purpose is not to prove, but to improve."

**Daniel L. Stufflebeam** model illustrate on four evaluation,

- ◆ Context Evaluation
- ◆ Input Evaluation
- ◆ Process Evaluation
- ◆ Product Evaluation

**Context Evaluation**

Context evaluation assesses the needs, problems, assets and opportunities to help decision makers define goal and priorities to help the broad group of users to judge goals, prioritize and outcome. The present study is carried out to determine the effectiveness of hibiscus tea to control blood pressure among patients with hypertension.

**Input Evaluation**

Input evaluation assesses alternative approaches completing action plans, specific resources, and strategies to meet target needs and achieving goals. Decision makers use input evaluation in choosing among competing plans, allocating resources and scheduling work. In this study input evaluation refers to

- Pre assessment of the level of blood pressure using sphygmomanometer.
- Administration of hibiscus tea.

**Process Evaluation**

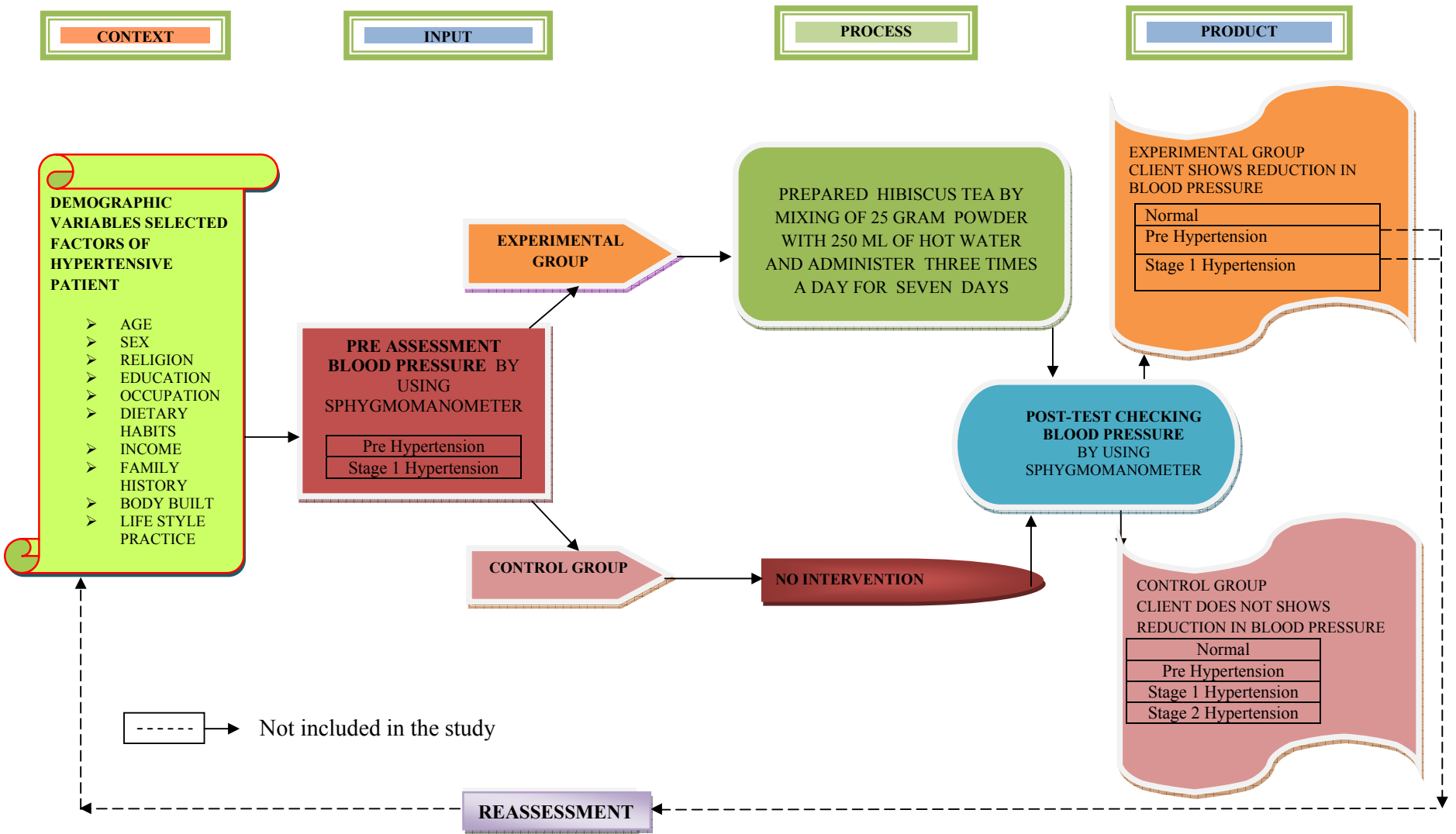
To assess implementation and help guide efforts and interpret outcomes. In the present study process evaluation refers to the assessment of the blood pressure after administration of the hibiscus tea.

**Product Evaluation**

Product evaluation helps to identify and assess the outcome intended short term and long term both help the investigator focused on achieving the important outcomes and ultimately to help the broader group of users gauge the effort of success in meeting the target needs.



In the present study product evaluation refers to the comparison of pretest and post test level of blood pressure among patients with hypertension. Improvement in the level of blood pressure is monitored and tabulated by statistical computation. Product evaluation further leads to recycling decisions. In this study the inadequate control of blood pressure among patients with hypertension needs attention to promote adequate control of blood pressure which is not included and denoted by line.



**FIGURE 1: DANIEL .L.STUFFLE BEAMS CONTEXT, INPUT, PROCESS AND PRODUCT EVALUATION MODEL (CIPP)**

## CHAPTER II

### REVIEW OF LITERATURE

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put a research problem in contest (**Polit & Beck, 2006**).

The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for use in practices or to provide a basis for conducting a study (**Burns, 1997**).

**Section A:** Literature related to prevalence and risk factors of hypertension.

**Section B:** Literature related to the effects of hibiscus tea on hypertension.

**Section C:** Literature related to effectiveness of hibiscus tea on other disease condition.

#### **SECTION A: Literature related to prevalence and risk factors of hypertension**

**Sampatti et al (2009)** conducted a cross-sectional study was used to analyze the prevalence and socio demographic factors for hypertension in rural Maharashtra. A total of 1297 persons aged 19 years and above were involved in this study. A house – to- house survey was conducted by using systematic random sampling method, pre tested structured standard questionnaire was administered to collect the data. Two independent blood pressure (BP) readings were taken in sitting position by visiting each participant at their home. Percentiles, Chi Square test, Chi- Square for linear trend, multiple logistic regression analysis on SPSS software Version 10 were used to analyze the finding. The results showed that overall prevalence of hypertension in the

study subjects was 7.24%. Multiple logistic regression analysis identified various factors significantly associated with hypertension were age, sex, BMI, additional salt intake. Smoking, diabetes mellitus, alcohol consumption, and higher socioeconomic status.

**Rajeev Guptha (2009)** conducted the cross sectional epidemiological study to assess the hypertension epidemiology in western India Ethnic groups in Taiwan. In this analysis, a total 2810 women who were at age of 20-80 years old and whose father and mother had same ethnic background Minnan, Hakka, Aborigines had the highest participated in the study. The findings revealed that Aborigines had the highest prevalence of hypertension (28.6%) and diabetes mellitus (8.9%) whereas the minnan group had the second highest prevalence of hypertension (19.2%) and diabetes mellitus (7.9%). The multivariate adjusted odds ratio (OR) (95% CI) was 1.19 (0.63 – 2.26). 1.92 (1.15-3.21) and 2.03 (1.00 – 4.12) for Hakka, Minnan and aborigines respectively. Elevated body mass index and central obesity were significantly associated with hypertension showing multivariate adjusted (95% CI) of 1.68 (1.18 – 2.38) and 1.85 (1.48 – 2.57) respectively. The study concluded that, there were ethnic variations in hypertension prevalence and determinants in Taiwanese women.

**Ramya Kannan (2007)** conducted a study, in Tamil Nadu Chennai with 2300 participants, aged 20 and above, the result was published in the Hindu paper on 2007 may 13. Research suggested that one in every five persons had hypertension, a majority are unaware, and even those undertake treatment do not have their condition under control in over all surveillance 23.2% men and 17.1% women. Among diabetics, the percentage of hypertensive was just over double at 40.8%. Over half of them had undiagnosed hypertension and control was poor at 22.1%.

**Vincent et al (2006)** conducted the study to estimate the hypertension prevalence of hypertension awareness, treatment and control in three countries in the Caribbean. Population-based samples of adults aged 25-74 years in St. Lucia, Barbados and Jamaica were surveyed regarding their cardiovascular health and their blood pressures were measured using a highly standardized protocol. At the 160/95 mm of Hg threshold, age-adjusted hypertension prevalence estimated for Jamaica, St. Lucia and Barbados were 17.5%, 18.3% and 21.5% respectively, and 24.7% 26.9% and 27.9% respectively, at the 140/90 mm of Hg threshold. The corresponding estimate for the Chicago site at the 140/90 mm of Hg threshold was 33.2%. The gradient in prevalence reasssembled the Gradient in body mass index (25.7 kg/m<sup>2</sup>) in Jamaica to 29.3 Kg/m<sup>2</sup> in the USA). At the 160/95 mm of Hg threshold, the proportion of all hypertensive who were aware of their disease, pharmacologically treated and controlled was highest in Barbados (90%, 85% and 72%, respectively and lowest in St Lucia (74%, 59% and 35%, respectively).

**Shyamal Kumar et al (2005)** conducted a cross sectional study to identify the risk factors and for suggesting intervention strategies in urban community in India. In that a researcher selected a total 1609 respondents out of 1662 individuals. Structured questionnaire was administered followed by blood pressure measurement. the results showed that pre-hypertensive levels of blood pressure of participants was 35.8% of the participants in systolic level of blood pressure (120-139mm of Hg) and 47.7% in diastolic group (80-89mm of Hg) Systolic hypertension (140 mm of Hg) was present in 40.9% of the participants. Age and sex-specific prevalence of hypertension showed progressive rise of systolic and diastolic hypertension in women when compared to men. Bivariate analysis showed significant relationship of hypertension with age, sedentary occupation, body mass index (BMI), diet, ischemic heart disease and smoking.

**Karen Niece (2005)** conducted a study to determine the prevalence of hypertension and pre-hypertension in adolescent. Cross – sectional assessment of blood pressure(BP) in 6790 adolescents (11 – 17 years) in Houston schools was conducted from 2003 to 2005 BP distribution at initial screen was 81.1% normal. 9.5% pre-hypertension and 9.4% hypertension (8.4% Stage 1:1% Stage 2) Prevalence after three screenings was 81.1% normal 15.7% pre-hypertension, and 3.2% hypertension (2.6% Stage 1; 0.6% stage2) The results indicated that hypertension and pre-hypertension increased with increasing BMI. Sex, race and overweight were independently associated with pre- hypertension.

**Subburam R et al (2005)** conducted the community based cross sectional study to assess the prevalence of hypertension and correlates among adults of 40-60 years in a rural area of Tamil Nadu. A total of 406 individuals with 45-60 years of age group were involved in this study. Systemic random sampling technique was used to assess the prevalence of hypertension in rural area of Tamil Nadu. Chi-square test and multiple logistic regressions were used to analyze data. The result shows over all 33% of hypertension was found in rural India.

**Donald Lloyd-Jones (2005)** conducted a community based cohort study to investigate the prevalence of blood pressure stages, hypertension treatment and control, and cardiovascular risk among older patients with hypertension. The data were collected from the participants during Framingham Heart Study examinations attended in the 1990. Participants were pooled according to age. Younger than 60 years, or 80 years or older. There 5296 participants who contributed 14,458 person-examinations of observation, including 7135 hypertensive person-examinations (4919 treated). The result showed that prevalence of hypertension and drug treatment

increased with advancing age, whereas control rates were markedly lower in older women for ages younger than 60 years, 60 to 79, and 80 years and older, respectively, control rates were 38%, 36% and 38% in men ( $P=0.30$ ) and 38%, 28% and 23% in women ( $P<0.001$ ).

**Theodora Psaltopoul (2004)** conducted the study to identify prevalence, awareness, treatment and control of hypertension in a general population. In this study 26,913 volunteers aged 20 – 86 years, were participated from several regions of Greece. Blood pressure measurements were taken by trained physicians and standard interviewing procedures were used to record medical history, and socio-demographic and lifestyle characteristics. The data were analyzed by using multiple regressions. The prevalence of hypertension (based on two arterial blood pressure measurements on a single occasion) was 40.2% for men and 38.9% for women (age adjusted to the adult Greek population of 2001). The awareness among hypertensive was 54.4% pharmaceutical treatment among those aware was 83.9% and effective control among hypertensive was 15.2%. The result also showed that the prevalence of hypertension increases with age and is higher in rural areas and among individuals of lower education.

**Federic sorigue et al (2003)** conducted a cross sectional study whether deterioration in the quality of the cooking oils in the family household contributes to the risk of high blood pressure. The study was among 1226 persons aged 18-65 years were selected randomly from the municipal census of Pizarra, Spain. The result showed that hypertension was strongly associated with obesity and was influenced by sex, diabetes, age and also concluded that the risk of hypertension is positively

independently associated with the intake of cooking oil polar compounds and inversely related to blood concentration of monounsaturated fatty acids.

## **SECTION B: Literature related to the effects of hibiscus tea on hypertension.**

**E pub (2009)** conducted an experimental study to assess the effectiveness of Hibiscus sabdariffa in the treatment of hypertension at King Saud University, The study included randomized controlled trials that had examined Hibiscus effectiveness and safety in the treatment of primary hypertension in adults. Four trials, with a total of 390 patients, met our inclusion criteria. Two studies compared Hibiscus sabdariffa to black tea. one study compared it to captopril and one to lisinopril. The studies found that Hibiscus had greater blood pressure reduction than tea but less than the ACE-inhibitors.

**J. Hum Hypertens (2009)** conducted an experimental study to evaluate the effects of sour tea (Hibiscus sabdariffa) on hypertension in patients with type II diabetes in iran, “To compare the antihypertensive effectiveness of sour tea with black tea (BT) infusion in diabetic patients”, this double-blind randomized controlled trail was carried out. Sixty diabetic patients with mild hypertension, without taking antihypertensive or anti hyperlipidemic medicines, were recruited in the study. Their blood pressure (BP) was measured on days 0 and 7 days intervention of the study. The mean of systolic BP (SBP) in the ST group decreased from 134.4 +/- 11.8 mm Hg at the beginning of the study to 112.7 +/- 5.7 mm Hg after 7 days (P-value <0.001), whereas this measure changed from 118.6 +/- 14.9 to 127.3 +/- 8.7 mm Hg (P value = 0.002) in the BT group during the same period. The intervention had no decreased



from 52.2+/-12.2 to 34.5+/-9.3 mm Hg (P-value <0.001) during the study, whereas in the BT group, it increased from 41.9+/-11.7 to 47.3+/-9.6 mm Hg (P value=0.01).

**Planta Med (2007)** conducted a study to assess the effectiveness of standardized herbal medicinal product of *Hibiscus sabdariffa* on patients with hypertension. A randomized, double-blind lisinopril controlled clinical trial, this two clinical trails have confirmed the antihypertensive effect using watery infusions, in which a natriuretic effect was also detected. Patients of either sex, 25-61 years of age, with hypertension stage I or II, were daily treated for 7 days. Results showed that the experimental treatment decreased blood pressure (BP) from 146.48/97.77 to 129.89/85.96 mmHg, reaching an absolute reduction of 17.14/11.98 mmHg (11.58/12.21%,  $p < 0.0$ ). In conclusion, the hibiscus tea exerted important antihypertensive effectiveness with a wide margin and demonstrated a tendency to reduce serum sodium (Na) concentrations without modifying potassium (K) levels.

**Fitoterapia (2007)** conducted a study to assess the antihypertensive effect and aqueous extract of calyx of *Hibiscus sabdariffa*. The present Study Was designed to investigate the efficacy of an aqueous calyx extract of *Hibiscus sabdariffa* (HS) in two forms of experiment hypertension: salt –induced and L- NAME (N(omega)-L-arginine methyl ester)- induced and in normotensive controls. The blood pressure and heart rate fell dose-dependently in both the hypertensive and normotensive rate after intravenous injection of 1-12 mg/kg of *Hibiscus Sabdariffa*, suggesting that *Hibiscus Sabdariffa* possesses anti-hypertensive, hypotensive and negative chronotropic effects. The fall in mean arterial pressure was significantly pronounced in the hypertensive rate (Salt-induced: 94.4+/-8.6 mm Hg; L-NAME-induced:136.5+/- 10.3 mm Hg) than in the normotensive controls (50.2+/-5.1 mm Hg;  $P<0.05$ ).

**Herrera Arellano A et al (2006)** conducted a study to assess the Effectiveness and tolerability of a standardized extract from Hibiscus sabdariffa in patient with mild to moderate hypertension. A controlled and randomized clinical trail to compare the antihypertensive effectiveness and tolerability of a standardized extract from Hibiscus sabdariffa with captopril. The experimental procedure consisted of the administration of an infusion prepared with 10- g of dry calyx from H. Sabdariffa on 0.5l water (9.6 mg anthocyanins content), daily before breakfast, or captopril 25 mg twice a day, for 2 weeks. The outcome variables were tolerability therapeutic effectiveness (diastolic reduction  $>$  or  $=$  10 mmHg and, in the experimental group, urinary electrolytes modification. Ninety subjects were included, 15 withdrew from the study due to non-medical reasons; so, the analysis included 39 and 36 patients from the experimental and control group, respectively. The results showed that Hibiscus. Sabdariffa was able to decrease the systolic blood pressure (BP) from 139.05 to 123.73mmHg (ANOVA  $p < 0.03$ ) and the diastolic BP from 90.81 to 79.52 mm Hg (ANOVA  $p < 0.06$ ). At the end of the study, there were no significant differences between the BP detected in both treatment groups (ANOVA  $P > 0.25$ ). The rates of therapeutic effectiveness were 0.7895 and 0.8438 with Hibiscus. Sabdariffa and captopril, respectively (Chi2,  $p > 0.560$ ), while the tolerability was 100% for both treatments. A natriuretic effect was observed with the experimental treatment. The obtained data confirm that the Hibiscus. Sabdariffa extract, standardized on 9.6 mg of total anthocyanin, and captopril 50 mg/day, did not show significant differences relative to hypotensive effect, antihypertensive effectiveness, and tolerability.

**J.Hypertens (2004)** conducted a study to determine whether hibiscus tea and black tea can attenuate the transient pressure effect of caffeine, or lower blood pressure during regular consumption. In the first study, the acute effects of four hot drinks hibiscus tea and black tea. Clinic blood pressure was measured before and 30 and 60 min after each drink had been ingested. In the second study, the effects on blood pressure of regular hibiscus and black tea ingestion were the effects on blood pressure of regular black tea ingestion were examined in 13 subjects with high normal systolic blood pressure and mild systolic hypertension. Five cups per day of hibiscus tea, black tea were consumed for 7 days each, in random order. Results are presented as means and 95% confidence intervals. The changes in blood pressure at 60 min was significant, the effect on 24-h ambulatory systolic and diastolic blood pressure of regular drinking of hibiscus tea [decreases of 7.7 mmHg and 6.9 mmHg respectively] was significant and black tea [increase of 0.7 mmHg and increase of 0.7 mmHg respectively] was not significant.

**J Nutr (2001)** conducted a study to assess the effectiveness of Hibiscus sabdariffa tea (tisane) on blood pressure in pre hypertensive and mildly hypertensive adults. The study was conducted at Antioxidants Research Laboratory Our objective in this study was to examine the antihypertensive effects of H. Sabariffa tisane (hibiscus tea) consumption in humans. A randomized, double-blind, placebo-controlled clinical trail was conducted in 65 pre-and mildly hypertensive adults, age 30-70 y, not taking blood pressure (BP)-lowering medications, with either 3 240-ml servings of brewed hibiscus tea or placebo beverage for 3 wk. Participants with higher BP at baseline showed a greater response to hibiscus treatment ( $r = -0.421$  for BP change;  $P = 0.010$ ).

**Ghannam et al (2001)** conducted a study to assess the effects of sour tea (*Hibiscus sabdariffa*) on hypertension in patients with type II diabetes. To compare the antihypertensive effectiveness of sour tea (ST; *Hibiscus sabdariffa*) with black tea (BT) infusion in diabetic patients, these double blind randomized controlled trial was carried out. Sixty diabetic patients with mild hypertension, without taking anti-hyperlipidemic medicines, were recruited in the study. The patients were randomly allocated to the ST and BT groups and instructed to drink ST and BT infusions two times a day for one week. Their blood pressure was measured on days 0 and 7 of the study. The mean pulse pressure of the patients in the ST group decreased from 52.2 $\pm$ 12.2 to 34.5 $\pm$ 9.3 mmHg (P-value= $\leq$ 0.001) during the study whereas in the BT group, it increased from 41.9 $\pm$ 11.3 to 9.6 mmHg (P-value= $\leq$ 0.01). In conclusion, consuming ST infusion had positive effects on BP in type II diabetic patients with mild hypertension. This study supports the results of similar studies in which antihypertensive effects have been shown for ST.

**Haji Faraji M et al (2000)** conducted a study to considering the high prevalence of hypertension at Shaheed Beheshti University of Medical Sciences and health services, the experimental study was conducted to evaluate the effect of hibiscus tea on essential hypertension. For this purpose, 31 and 23 patients with moderate essential hypertension were randomly assigned to an experimental and control group, respectively. Patients with secondary hypertension or those consuming more than two drugs were excluded from the study. Systolic and diastolic blood pressures were measured before and 15 days after the intervention. Statistical findings showed an 11.2% lowering of the systolic blood pressure and a 10.7% decrease of diastolic pressure in the experimental group. This difference between the two groups was also significant.

## **SECTION C: Literature related to effectiveness of hibiscus tea on other disease condition.**

**Phytomedicine (2010)** conducted a study to assess the effects of hibiscus sabdariffa extract powder and preventive treatment on the lipid profiles of patients with metabolic syndrome. The aim of the present study was to evaluate the effects of a Hibiscus sabdariffa extract powder (HSEP) and a recognized preventive treatment (diet) on the lipid profiles of individuals. The protocol was a follow – up study carried out in a factorial, randomized design was used. A total daily does of 100 mg Hibiscus sabdariffa extract powder was orally administered in capsules for one month. The patients treated with Hibiscus sabdariffa extract powder had significantly reduced glucose and total cholesterol levels, increased HDL –c levels, and an improved TAG / HDL–c ratio a marker of insulin resistance (t-test  $p < 0.05$ ). Therefore in addition to the well documented hypotensive effects of Hibiscus sabdariffa.

**Arch Latinoam (2010)** conducted a study to assess the dietary fiber and antioxidants are food constituents and functional ingredients that are generally addressed separately. It can be extended to other indigestible a food constituent that are resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine. The antioxidant dietary fiber concept was defined as a dietary fiber concentrate containing significant amounts of natural antioxidants associated with non digestible compounds. Hibiscus Sabdariffa flower shows in its composition an important percentage of dietary fiber and high antioxidant capacity. The infusion obtained by decoction of flowers, had been extensibility studied to the healthy properties in this work the principle nutritional aspects from Hibiscus sabdariffa and its use as a possible antioxidant dietary fiber source had been considered.

**Kurivan R et al (2010)** conducted a study to assess the evaluation of the hypolipidemic effect of an extract of Hibiscus Sabdariffa leaves in hyperlipidemic Indians: a double blind, placebo controlled trail , St. John's Research institute, Hibiscus sabdariffa is used regularly in folk medicine to treat various conditions. The study was a double blind, placebo controlled, randomized trail sixty subjects with serum LDL values in the range of 130-190 mg/dl and with no history of coronary heart disease were randomized into experimental and placebo groups. The experimental group received 1 gm of the extract for 90 days while the placebo received a similar amount of malt dextrin in addition to dietary and physical activity advice for the control of their blood lipids. Anthropometry, blood biochemistry, dietary and physical activity were assessed at baseline, day 45 and day 90.

**J Altern ( 2009)** conducted a study to assess the effectiveness of Sour tea (Hibiscus Sabdariffa) On lipid profile and lipoproteins in patients with type II diabetes. The objective of the present Study was to investigate the hypolipidemic effect of sour tea in patients with diabetes and compare them with those of black tea. In this sequential randomized controlled clinical trial was used 60 patients with diabetes were recruited and randomly assigned in to two groups. In the ST group mean of High-density lipoprotein-cholesterol (HDLc) increased significantly ( $p = 0.002$ ) at the end of the study, whereas changes in apolipoprotein-A1, and lipoprotein (a) Were not significant. Also, a significant decrease in the mean of total Cholesterol, low density lipoprotein-cholesterol, triglycerides, And Apo-B100 were seen in this group .In the BT group, Only HDLc showed significant change ( $p = 0.002$ )at the end of study and change in the other measure were not statistically significant. The results of the present study showed that ST has a significant effect on blood lipid profile in patients with diabetes.

**J Ethnopharmacol (2008)** conducted a study to assess the effectiveness of uricosuric effect of Roselle (*Hibiscus sabdariffa*) in normal and renal – stone former subjects. A cup of tea made from 1.5g of dry Roselle calyces was provided to subjects twice daily (morning and evening) for 15 days. A clotted blood and two consecutive 24-h urine samples were collected from each subject three times. In the RS group both uric acid excretion and clearance were significantly increased ( $p<0.01$ ). When the fractional excretion of uric acid (FEUa) was calculated, the values were clearly increased in both the NS and SF groups after the intake of tea and returned to baseline values in the washout period. These changes were more clearly observed when the data for each subject was presented individually.

**Prasongwatana V et al (2008)** conducted a study to assess the Uricosuric effect of Roselle (*Hibiscus sabdariffa*) in normal and renal stone former subjects in Thailand. A human model with nine subjects with no history of renal stones (non-renal stone, NS) and nine with a history of renal stones was used in this study. A cup of tea made from 1.5 g of dry Roselle calyces was provided to subjects twice daily (morning and evening) for 15 days. A clotted blood and two consecutive 24-h urine samples were collected from each subject three times. After taking the tea, the trend was an increase in oxalate and citrate in both groups and uric acid excretion and clearance were significantly increased ( $p<0.01$ ). These changes were more clearly observed when the data for each subject was presented individually. Our data demonstrate a uricosuric effect of Roselle Calyces. Since the various chemical constituents in Roselle calyces have been identified, the one exerting this uricosuric effect need to be identified.

**Phytother Res (2007)** conducted a study to assess the effects of water extract of *Hibiscus sabdariffa*. The effect of beverages prepared from the dried calyx of the flowers of *Hibiscus sabdariffa* on the excretion of diclofenac was investigated using a controlled study in healthy human volunteers. A high pressure liquid chromatographic method was used to analyse the 8h urine samples collected after the administration of diclofenac with 300ml (equivalent to 8.18 mg anthocyanins) of the beverage administered daily for 3 days. An unpaired two-tailed t- test was used to analyse for significant difference observed in the amount of diclofenac excreted before and after administration of the beverage. There was a reduction in the amount of diclofenac excreted and the wide variability observed in the control with the water beverage of *Hibiscus sabdariffa* ( $p < 0.05$ ). There is an increasing need to counsel patients against the use of plant beverages with drugs.

**J. Tseng YF et al (2005)** conducted a study to assess the effects of Roselle tea for relief of primary dysmenorrhea in adolescents. A randomized controlled trial in Taiwan. To determine the effectiveness of drinking rose tea as a intervention for reducing pain and psychophysiological distress in adolescents with primary dysmenorrhea, 130 female adolescents were randomly assigned to an experimental ( $n=70$ ) and a control ( $n=60$ ) group. The results showed that compared with the control group, the experimental group perceived less menstrual pain distress, and anxiety and showed greater psychophysiological well- being through time, at 1,3 and 6 months after the interventions. Findings suggest that drinking rose tea is a safe, readily available and simple treatment for dysmenorrhea, which female adolescents may take to suit their individual needs.



**J. Midwifery women's Health (2005)** conducted a study to assess the effectiveness of Roselle tea for relief of primary dysmenorrhea in adolescents. To determine the effectiveness of drinking rose tea as an intervention for reducing pain and psychophysiological distress in adolescents with primary dysmenorrhea, 130 female adolescents were randomly assigned to an experimental (n=70) and a control (n=60) group. Pre intervention and post intervention data at 1 month, 3 months and 6 months were gathered on the bio psychosocial outcomes of dysmenorrhea. The results showed that compared with the control group, the experimental group perceived less menstrual pain distress, and anxiety and showed greater psychophysiological well-being through time, at 1, 3 and 6 months after the interventions. Findings suggest that drinking roselle tea is a safe, readily available and simple treatment for dysmenorrhea, which female adolescents may take to suit their individual needs.

**J Med Thai (2005)** conducted a study to evaluate the efficacy of roselle flower tea (RFT) administration as an oral negative contrast agent for study, Thailand. Roselle flower tea was prepared by packing 4.000 mg of dry ground roselle flower in a tea bag and soaked with 480ml of hot distilled water. Roselle flower tea was tested in phantom volunteer subjects and was studied in patients for study. Qualitative analysis was made by evaluation of the conspicuity of biliary system after roselle flower tea administration. Quantitative comparison was performed by comparing the contrast – to – noise ratio between each part of the biliary system with stomach and duodenum. Roselle flower tea can effectively reduce signal intensity of the stomach and duodenum. There was statistically significant ( $p < 0.05$ ) improvement in the common bile duct. There was slight improvement in conspicuity of common hepatic duct, ampulla and main pancreatic duct. Contrast – to – noise ratios were all statistically significantly improved. Roselle flower tea contains 0.6 mg of iron and 1.28 mg of manganese content. Roselle flower tea is a very efficient oral negative contrast agent. It is natural, safe, inexpensive and palatable for oral administration.

## CHAPTER III

### RESEARCH METHODOLOGY

Research methodology refers to the techniques used to structure a study and to gather and analyze information in a systematic fashion (**Polit & Hungler, 2008**). Methodology includes the steps, procedures and strategies for gathering and analyzing the data in the research investigation.

This chapter consists of research approach, research design, and variables in the study, setting of the study, population, Sample size, sampling technique, criteria for selection of sample, development and description of the tool, content validity, pilot study, reliability, data collection procedure and plan for data analysis.

#### RESEARCH APPROACH

Quantitative approach was adopted for this study. In this the researcher lays out in advance the steps to be taken to maximize the integrity of the study and then follows those steps as faithfully as possible. (**Polit & Hungler 2008**).

#### RESEARCH DESIGN

Research design used in this study quasi experimental pre - test and post- test control group design. It can diagrammatically represented as

<b>GROUP</b>	<b>PRE TEST</b>	<b>INTERVENTION</b>	<b>POST TEST</b>
Experimental	O1	X	O2
Control	O1	-	O2

**Figure 2: Schematic Representation of Research Design.**

**Keys**

- O1 - Pre test level of blood pressure in experimental group
- X - Administration of hibiscus tea
- O2 - Post test level of blood pressure in experimental group
- O1 - Pre-test level of blood pressure in control group
- X - No intervention
- O2 - Post test level of blood pressure in control group

**VARIABLES**

Variables are characters that can have more than one value. The categories of variables discussed in the present study are, independent variable and dependent variable.

**Independent variable**

Hibiscus Tea.

**Dependent variable**

Blood Pressure.

**SETTING OF THE STUDY**

The Study was conducted in Idaikal village. The total population of the village is 7260. In that 3670 were male and 3590 were female. The total family living in Idaikal village is 2500. The distance of Idaikal village from Sri. K. Ramachandran Naidu College of Nursing is 48 Km.

**STUDY POPULATION**

The Population of the study was adults with hypertension.

## **SAMPLE**

Samples consist of pre hypertension and stage I hypertension patients in the age group of 35-64 years and residing at Idaikal village, Thirunelveli District.

## **SAMPLE SIZE**

The Sample size for the study is 60. Among 60 samples, 30 persons were in experimental Group and another 30 persons were in control Group. The Samples were selected based on the inclusive criteria.

## **SAMPLING TECHNIQUE**

The investigator got formal permission from the director of the primary health centre, Idaikal village. The investigator used a survey method to find out the patients with hypertension. Total population of Idaikal village is 7260. The total family living in Idaikal village is 2500. In that 3670 were male and 3590 were female, among that 1770 were children, 1935 were under the age group of 18-34 years, 1735 were above the age group of 64 years and the total adults under the age group of 35-64 years were 1820 people. Among 1820 people, 920 people who fulfilled the inclusive criteria were selected and blood pressure level was checked using manual sphygmomanometer. According to classification of hypertension among 920 people, 430 persons had normal blood pressure, 185 persons had pre hypertension, 160 persons had stage I hypertension and 145 persons had stage II hypertension. Among that population 340 persons had pre and stage I hypertension. Among those population 178 persons were male and 162 persons were female. Each day 43 persons blood pressure were checked. Among those people 18-20 persons had normal blood pressure, 8-9 persons had pre hypertension, 7-8 persons had stage I hypertension and 6-7 persons had stage II hypertension. Based on the researcher convenience, the

investigator selected 60 samples by using convenient sampling technique. Among these 60 persons 24 persons were male and 36 persons were female. In that 30 persons were in experimental group (13 male and 17 female) and 30 persons were in control group (11 male and 26 female).

## **CRITERIA FOR SAMPLE SELECTION**

The sample was selected based on the following inclusion and exclusion criteria.

### **Inclusive Criteria**

- Hypertensive patients of both sexes between 35 to 64 years of age.
- Hypertensive patients who have the pre and stage I hypertension (systolic blood pressure level between 121mm Hg to 160mm Hg and diastolic blood pressure level between 81mm of hg to 100mm of Hg.)
- Hypertensive patients who are able to understand Tamil and English.

### **Exclusive Criteria**

- Hypertensive patients whose blood pressure above 160/100mm of Hg.
- Hypertension associated with other systemic illness.
- Hypertensive patients with Complications.
- Hypertensive patients who are not willing to participate.
- Hypertensive patients who have regular medications.
- Hypertensive patients who have other herbal treatment.

## RESEARCH TOOL AND TECHNIQUE

### Development and Description of Tool

The method and procedures employed for the collection of data are called techniques and instrument used are called tool. The tool consists of two sections.

#### Section A

It consists of a structured interview schedule. It had questions related to the demographic data of the patients.

#### Demographic Data

- Deals and demographic variables include age, sex, religion, education, occupation, dietary habits, income, family history of hypertension, body built and life style practice.

#### Section B

#### Sphygmomanometer

- Checking blood pressure level with help of manual sphygmomanometer and stethoscope before and after hibiscus tea administration.

#### Scoring Key

Level of blood pressure		Interpretation	Score
Systolic (mm of Hg)	Diastolic (mm of Hg)		
≤ 120	≤ 80	Normal	0
121 to 139	81 to 89	Pre Hypertension	1
140 to 159	90 to 99	Stage I Hypertension	2
Above 160	Above 100	Stage II Hypertension	3

### **Description of intervention**

Hibiscus flowers contain three major effective agents.

- Anthocyanins (40%) - It contains acidic polysaccharides – 10% and flavonoid glycosides such as cyanidin – 10%, delphinidin – 15%, chromenylium, triolchloride
- It has anti hypertensive compounds and anti-oxidant properties. It contains esculetin, 6, 7-dihydroxychromen-2-one, gossypetin. It controls the proper level of blood viscosity reducing blood pressure and enhancing activity of intestinal peristalsis.
- It acting as angiotensin – converting enzyme (ACE) inhibitors, it reduce the activity of the rennin angiotensin aldosterone system, block the conversion of angiotensin I to angiotensin II, leading to decreased blood pressure.

Hibiscus tea is rich in vitamin c. It contains 15-30% of organic acids including 3% citric acid, 4% maleic acid and 3% tartaric acid. It strengthens our immune system, ability to oxidize lipoproteins that they act by diluting the concentration of waxy built up in the arteries due to the action of lipoproteins. It is required for the conversion of cholesterol to bile acids. It has rich natural sources of gamma – linoleinic acids, which against cholesterol deposits in blood vessels.

Hibiscus tea helps to lowers cholesterol, fight cancer and reducing bloating. It can also strengthen the immune system and fight free radicals. It also improves blood circulation, reduces stress levels, protects body against bacterial attack, reduces weight, prevent bladder infection and constipation.

**Hibiscus tea contains following nutrients,**

25 gram of hibiscus powder contains,

- Anthocyanins–40%, polysaccharides–10%., cyanidin–10%, delphinidin–15%,
- Calorie-84 k.cal, Fat - 0.28 gram, Carbohydrate – 17.75gram
- Protein - 2.6175gram, Vitamin C – 30 gram, Sugar – 0 gram. Organic acids 15-30%, Citric acid 3%, Maleic acid 4%, Tartaric acid 3%.

The hibiscus tea was prepared by the following method,

Hibiscus flower petals were dried in a room temperature and it was powdered.

The hibiscus powder (25gram) was mixed with 250ml of hot water and tea was prepared and given to the experimental group patients three times per day for seven consecutive days. The experimental Group received hibiscus tea for seven days in three times a day.

- Rapport was established with patients and a brief introduction about the study was given.
- Consent was obtained from each patients and reassurance was provided that the collected data would be kept confidential.
- The data related to demographic variable was collected by interview method.
- Blood pressure level was checked using sphygmomanometer and the patients who had blood pressure level of 121 to 160 mm of hg / 81 to 100 mm of hg was selected.
- 250 ml of hibiscus tea was administered orally per day three times for seven consecutive days and again blood pressure level was checked on seventh day.



## **CONTENT VALIDITY**

The content of the tool was established on the basis of opinion of one medical expert and three nursing experts in the field of medical surgical nursing and one expert from siddha medicine. No modifications were done in the tool.

## **RELIABILITY OF THE TOOL**

Reliability of the tool was established by the test- retest method. The reliability score was  $r = 0.92$  showed higher degree of consistency and correlation of the tools. Hence the tool was considered reliable for proceeding with main study.

## **PILOT STUDY**

It is a rehearsal for the main study. The researcher got permission from Principal and Research ethical committee of Sri. K. Ramachandran Naidu College of Nursing and HOD of medical surgical nursing. A formal permission was obtained from the Director of the Primary Health Center. The pilot study was conducted in Mangalapuram village for the period of seven days (24-03-2011 to 31-03-2011) from 9 am to 6 pm. The sample size was six adults and they were selected by using convenient sampling technique. Rapport was established with the patients and a brief introduction about the study was given. Consent was obtained from each patients and reassurance was provided that the collected data would be kept confidential. The data related to demographic variable was collected by interview method.

Hibiscus tea was prepared by the method of dried hibiscus powder (25 gram) mixed with 250 ml of hot water. And given to the clients for 7 consecutive days at three times per day. The results of the pilot study showed that the experimental group

had a reduction of blood pressure as compared to the control group. The study was found to be feasible and hence the same procedure was decided to be followed in the main study. There was no modification made in the tool after pilot study. The samples selected for the pilot study were not included for the main study.

## **DATA GATHERING PROCESS**

The researcher got permission from Principal and research ethical committee and HOD of medical surgical nursing, Sri. K.Ramachandran Naidu College of Nursing. Before the data collection a formal permission was obtained from the Primary health Center, Idaikal village for conducting main study.

The data were collected from 01.04.2011 to 30.04.2011, between 8.00 a.m. to 4 p.m., seven days in a week. Clients who required hibiscus tea were selected by using convenient sampling technique according to the inclusive criteria after obtaining the consent from the clients. The investigator used a survey method to find out the patients with hypertension. Total population of Idaikal village is 7260. The total family living in Idaikal village is 2500. In that 3670 were male and 3590 were female, among that 1770 were children, 1935 were under the age group of 18-34 years, 1735 were above the age group of 64 years and the total adults under the age group of 35-64 years were 1820 people. Among 1 820 people, 920 people who fulfilled the inclusive criteria were selected and blood pressure level was checked using manual sphygmomanometer. According to classification of hypertension among 920 people, 430 persons had normal blood pressure, 185 persons had pre hypertension, 160 persons had stage I hypertension and 145 persons had stage II hypertension. Among that population 340 persons had pre and stage I hypertension. Among those population 178 persons were male and 162 persons were female. Each day 43 persons blood pressure were checked. Among those people 18-20 persons had normal blood pressure, 8-9 persons had pre hypertension, 7-8 persons had stage I hypertension and

6-7 persons had stage II hypertension. Based on the researcher convenience, the investigator selected 60 samples by using convenient sampling technique. Among these 60 persons 24 persons were male and 36 persons were female. In that 30 persons were in experimental group (13 male and 17 female) and 30 persons were in control group (11 male and 26 female).

Rapport was established with the patients and a brief introduction about the study was given. Consent was obtained from each patients and reassurance was provided that the collected data would be kept confidential. The data related to demographic variables were collected by interview method. Blood pressure was checked using manual sphygmomanometer. Hibiscus tea was prepared by the method of 25 gram of dried hibiscus powder mixed with 250ml of hot water. And given to the clients for 7 consecutive days at three times per day to the experimental group. The control group was not received any intervention. After seven days of intervention the blood pressure level was checked in experimental and control group. The findings of the study was calculated  $t$  value was 5.86 and 12.3, indicating that there was a highly significant reduction in post test level of blood pressure among the experimental group at  $p < 0.05$  level.

## **PLAN FOR DATA ANALYSIS**

Both descriptive and inferential statistics were used.

### **Descriptive Statistics**

- The frequency and Percentage distribution were used to analysis the demographic variables of the samples.
- Mean and standard deviation were used to assess the effectiveness of hibiscus tea on reducing hypertension.
- Frequency and Percentage distribution was used to assess the post interventional level of blood pressure among the hypertensive patients.

**Inferential Statistics**

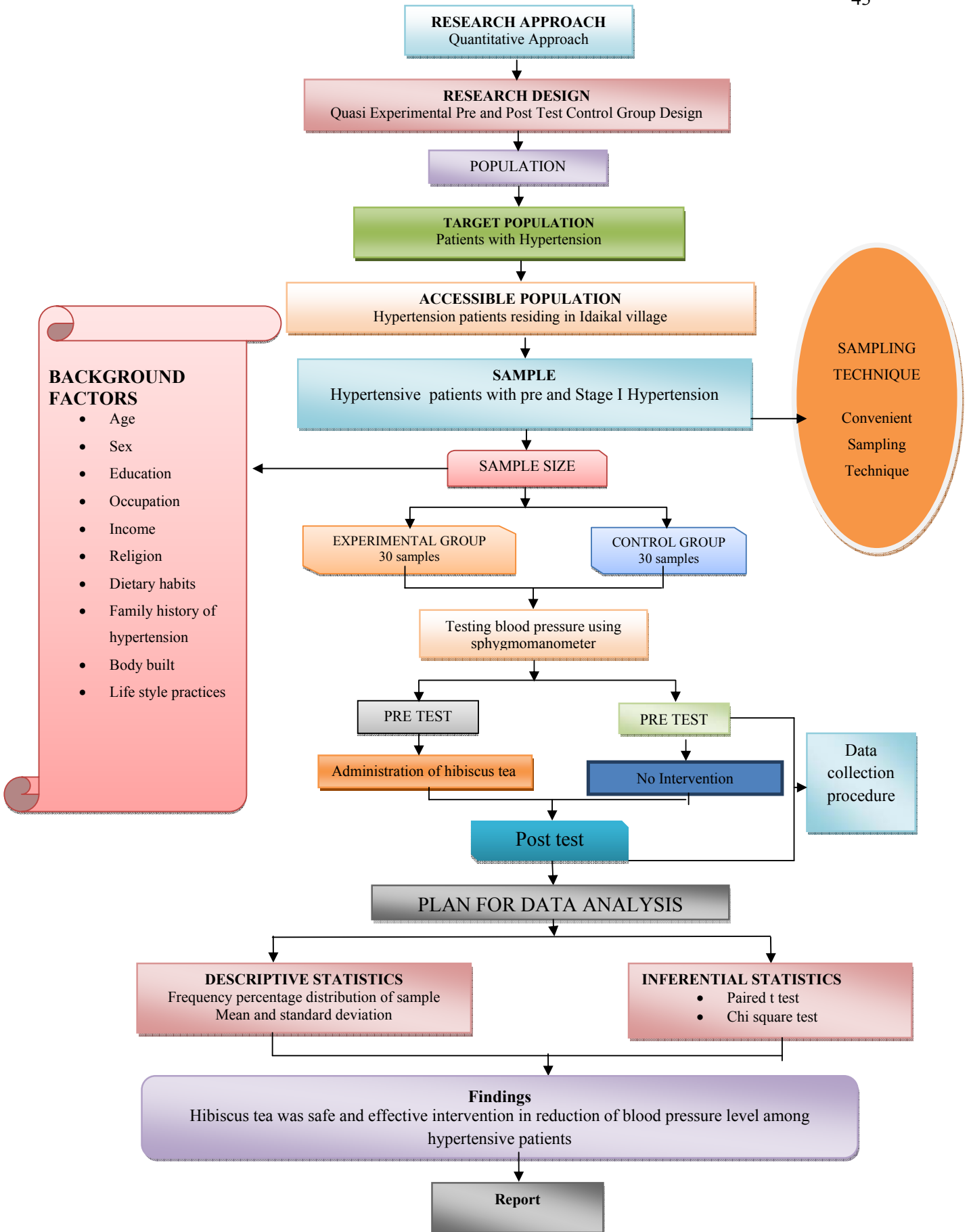
- ◆ Paired “t” test was used to assess the effectiveness of hibiscus tea on reducing hypertension both experimental and control group.
- ◆ Chi-Square test was used to analysis the association of post interventional level of blood pressure with selected demographic variables.

**PROTECTION OF HUMAN SUBJECTS**

Research proposal was approved by the dissertation committee, prior to the pilot study and the main study permission was obtained from the head of the department of medical surgical nursing, Sri.K.Ramachandran Naidu College of Nursing, Sankarankovil. An oral consent from each patient was obtained before starting the data collection. Assurance was given to the patients that confidentiality would be maintained.

**SUMMARY**

This chapter has dealt briefly with research methodology adapted for the study. It included research approach, research design, and variables in the study, setting of the study, population, sample size, sampling technique, criteria for selection of sample, research tool and technique, development and description of the tool, scoring key, content validity, reliability, pilot study, data gathering process and plan for data analysis and protection of human subjects.



**FIGURE 3: SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY**

## CHAPTER IV

### DATA ANALYSIS AND INTERPRETATION

This Chapter Deals with the analysis of the data interpretation of the data collected from the samples to assess the effectiveness of hibiscus tea in controlling blood pressure.

Analysis is the method of organizing scrutinizing and sorting the data in such a way that research questions can be answered [polit, Hungler (2009)]

The purpose of analysis is to find out the effectiveness so that the relation of the problem can be tested.

The analysis and interpretation of data is based on data collection the results are computed by using descriptive (mean, Frequency, percentage distribution and standard deviation) and inferential ( $t^2$ - test and chi square test) statistics. The data has been tabulated and organized as follows.

### ORGANIZATION OF DATA

#### Section I

Description of demographic variables of patient with hypertension.

#### Section II

Assessment of the level of systolic and diastolic blood pressure among patients with hypertension in the experimental and control group.

- Assessment of pre and post test level of systolic blood pressure among experimental group.

- Assessment of pre and post test level of systolic blood pressure among control group.
- Assessment of pre and post test level of diastolic blood pressure among experimental group.
- Assessment of pre and post test level of diastolic blood pressure among control group.

### **SECTION III**

- Comparison of post test level of blood pressure between the experimental and control group of hypertensive patients.
- Comparison of pre and post test level of blood pressure among experimental group.
- Comparison of pre and post test level of blood pressure among control group.

### **SECTION IV**

Association of post-test level of blood pressure with the selected demographic variables among experimental and control group.

- Association of the demographic variables and post test level of blood pressure in the experimental group.
- Association of the demographic variables and post test level of blood pressure in the control group.

**SECTION I: Data on Demographic Variables of Patients with Hypertension.****Table 1: Frequency and percentage distribution of the samples based on Demographic Variables such as Age, Sex, Religion, Education, Income, Occupation, Dietary habits, Family history, Body built and Life style practice.**

(N = 60)

S No	Demographic Variable	Experimental group		Control group	
		f	%	f	%
1	Age				
	a) 35-44 Years	15	50	10	33
	b) 45-54 Years	6	20	9	30
	c) 55-64 Years	9	30	11	37
2	a)Sex				
	b)Male	13	43	11	37
	c)Female	17	57	19	63
3	Religion				
	a)Hindu	6	20	6	20
	b)Muslim	14	47	20	67
	c)Christian	10	33	4	13
4	Education				
	a)Illiterate	10	33	6	20
	b)Primary Education	9	30	9	30
	c)Higher Education	9	30	11	37
	d)Graduate Education	2	7	4	13
5	Occupation				
	a)Sedentary Worker	13	43	16	53
	b)Moderate Worker	6	20	10	33
	c)Heavy Worker	11	37	4	14



table 1 continues....

S No	Demographic Variable	Experimental group		Control group	
		f	%	f	%
6	Dietary Habits				
	a)Vegetarian	11	37	14	47
	b)Non Vegetarian	19	63	16	53
7.	Income				
	a)Below Rs. 2000	3	10	6	20
	b)Between Rs. 2000-5000	10	33	7	23
	c)Above Rs. 5000	17	57	17	57
8.	Family History of Hypertension				
	a)Present	12	40	10	33
	b)Absent	18	60	20	67
9.	Body Built				
	a)Thin Body (< 40 kg)	12	40	5	17
	b)Moderate Body (<40 69kg)	7	23	15	50
	c)Obese (Above 70Kg)	11	37	10	33
10	Life Style Practice				
	a)Smoking	11	37	9	30
	b)Alcoholism	6	20	9	30
	c)Tobacco chewing	9	30	7	23
	d)None	4	13	5	17

Table 1 denotes the frequency and percentage distribution of the samples based on demographic variables such as age, sex, religion, occupation, education, dietary habits and income, family history of hypertension, body built and life style practice, in the experimental and control group.

While considering the age, in the experimental group out of 30 patients, 15(50%) of them were between the age group of 35-44 years 6(20%) of patients belongs to 45-54years and 9(30%) of patients belongs to 55-64 years.

With regard to sex in the experimental group, out of 30 patients, 13(43%) of the samples were males and majority 17(57%) of them were females, whereas in the control group out of 30 patients 11(37%) of them were males and 19(63%) of patients were females.

Based on the religion, in the experimental group out of 30 patients, 6(20%) of them were Muslim, 10(33%) of them were Christian, whereas in the control group out of 30 patients, 6(20%) of them were Hindu, 20(67%) of them were Muslim, 4 (13%) of the samples were Christian.

Based on the education in the experimental group out of 30 patients, 10(33%) of them had illiterate, 9(30%) of them had primary education, 9(30%) them had higher education 2(7%) of patients had graduates, whereas in the control group out of 30 patients, 6(20%) of them had illiterate, 9(30%) of them had primary education, 11(37%) of them had higher education, 4(13%) of patients had graduates education status.

In relation with occupation in the experimental group among the 30 patients with hypertension, 13(43%) of them had sedentary workers, 6(20%) of them had moderate workers, 11(37%) of patients had heavy workers, whereas in the control group out of 30 patients, 16(53%) of them had sedentary workers, 10(33%) of them had moderate workers, 4(14%) of patients had heavy workers.

With regard to dietary habits, in the experimental group out of 30 patients, 11(37%) of patients had vegetarian and 19(63%) of patients had non-vegetarian, whereas in the control group out of 30 patients 14(47%) of patients had vegetarian and 16(53%) of them had non vegetarian.

With regard to income, in the experimental group out of 30 patients 3(10%) of them had monthly income of below Rs2000,10(33%) of subjects had monthly income of between Rs2000-5000,17(57%) of them had monthly income of above Rs5000, Whereas in the control group out of 30 patients, 6(20%) of them had monthly income of below Rs2000, 7(23%) of them had monthly income of between Rs2000-5000, 17(57%) of subjects had monthly income of above RS 5000.

Regarding the family history of hypertension, in the experimental group out of 30 patients, 12 (40%) of them had family history of hypertension, 18(60%) of patients not had family history of hypertension, whereas in the control group out of 30 patients, 10(33%) of them had family history of hypertension, 20(67%) of them not had family history of hypertension.

With regard to body built in the experimental group out of 30 patients, 12(40%) of them had thin body built, 7(23%) of them had moderate body built, 11(37%) of them had obese, whereas in the control group out of 30 patients, 5(17%)

of them had thin body built, 15(50%) of them had moderate body built, 10(33%) of them had obese.

Regarding the life style practice in the experimental group out of 30 patients, 11(37%) of them were smokers, 6(20%) of them had Alcoholics, 9 (30%) of them were tobacco chewers,4(13%) of them not had any other life style practice, whereas in the control group 9(30%) of them had smokers, 9(30%) of had alcoholics and 7(23%) of them had tobacco chewers, 5(17%) of them not had any other life style practice.

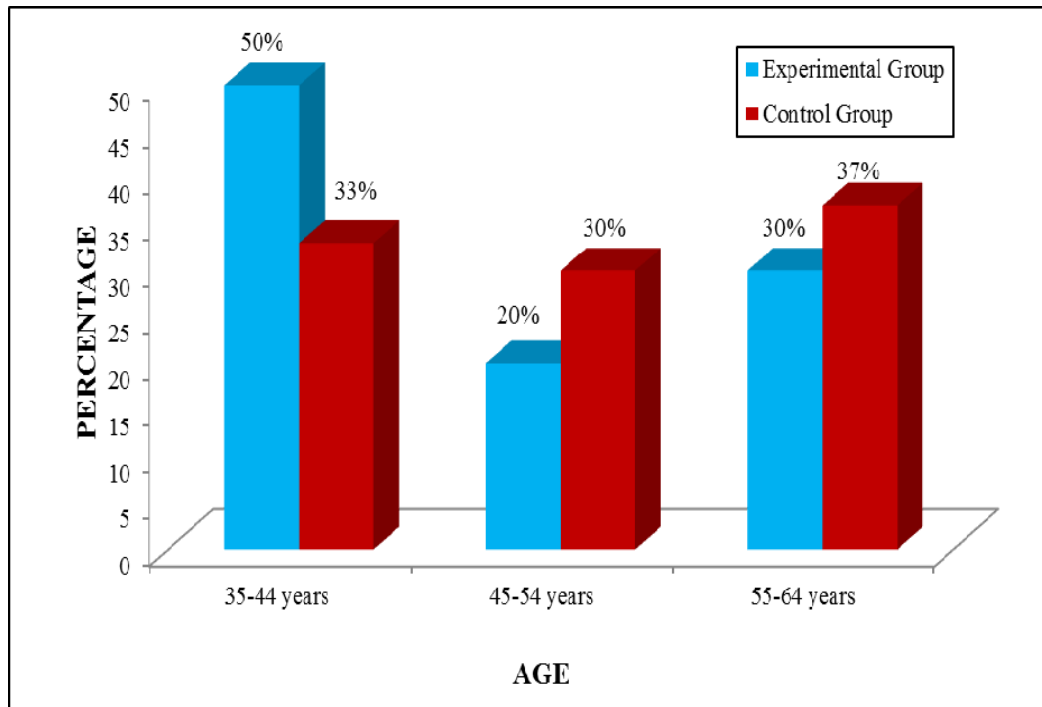


Figure 4 : Distribution of sample according to age

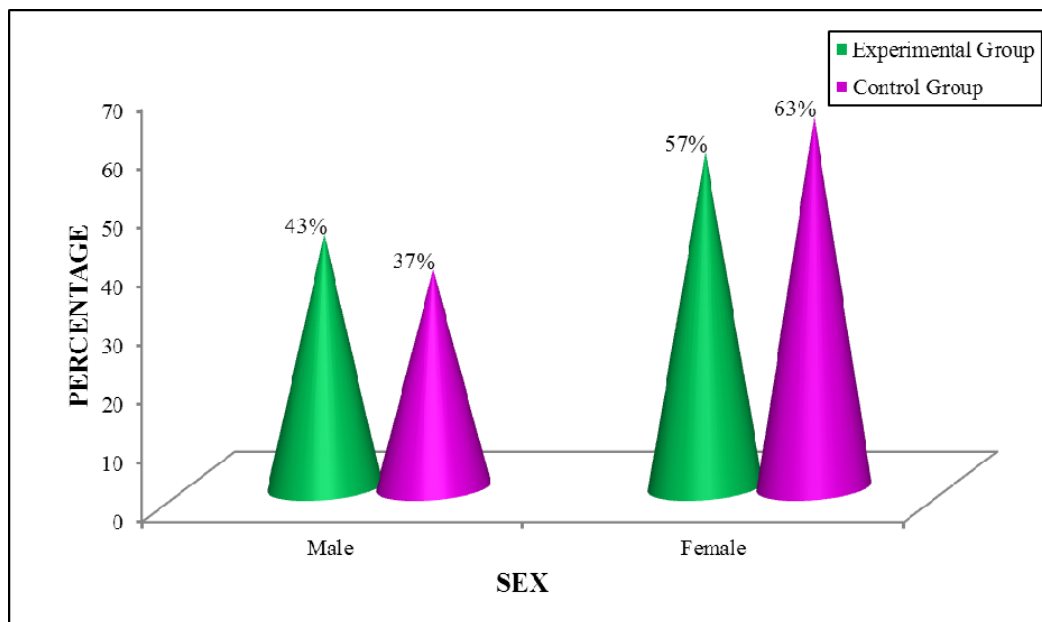
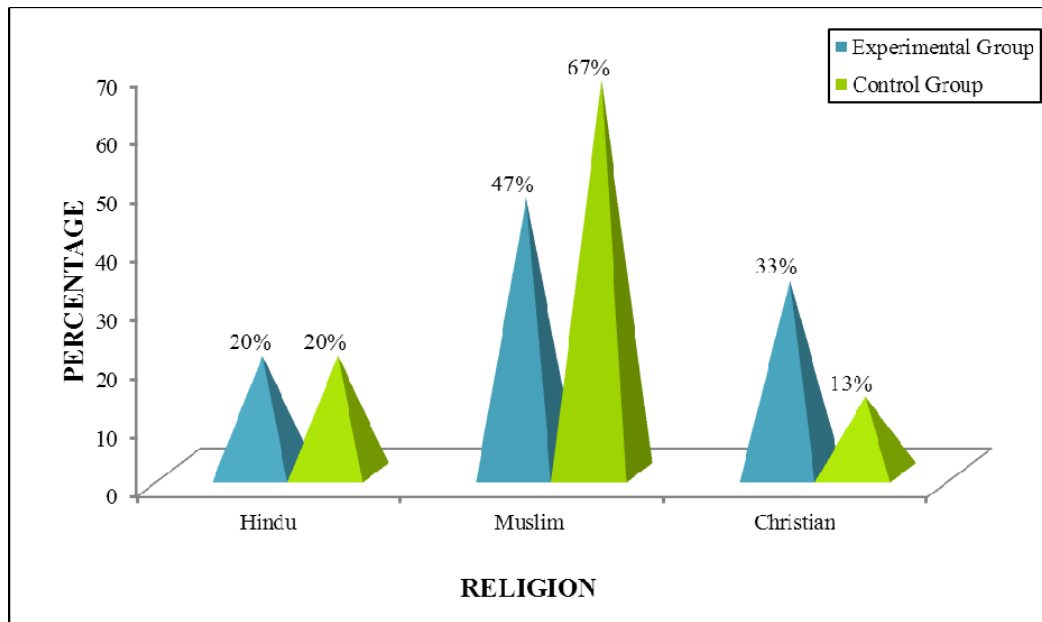
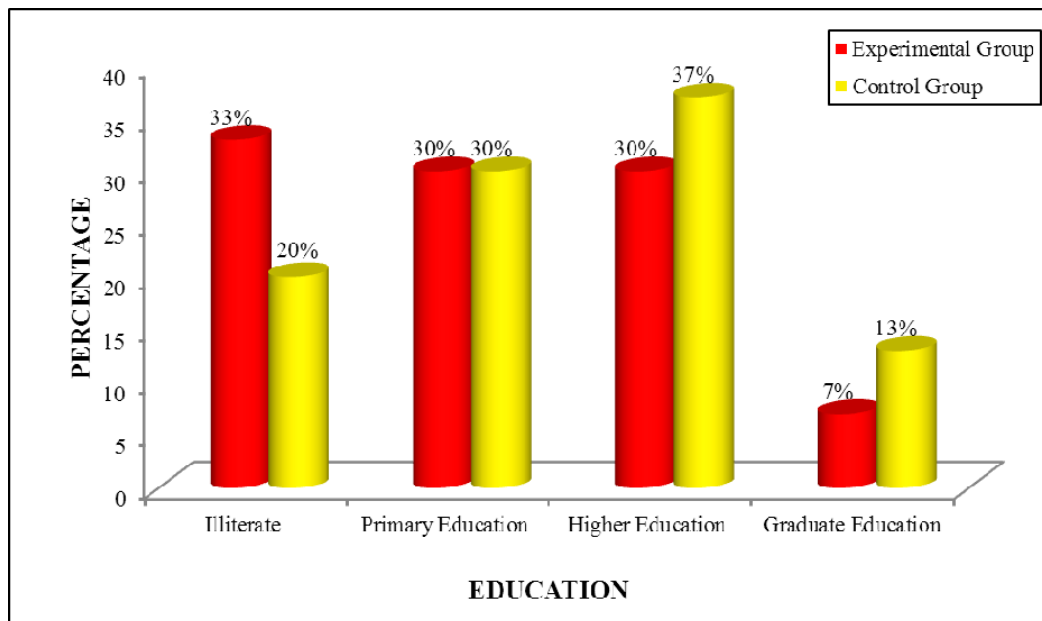


Figure 5: Distribution of sample according to sex.



**Figure 6: Distribution of sample according to religion**



**Figure 7: Distribution of sample according to education**

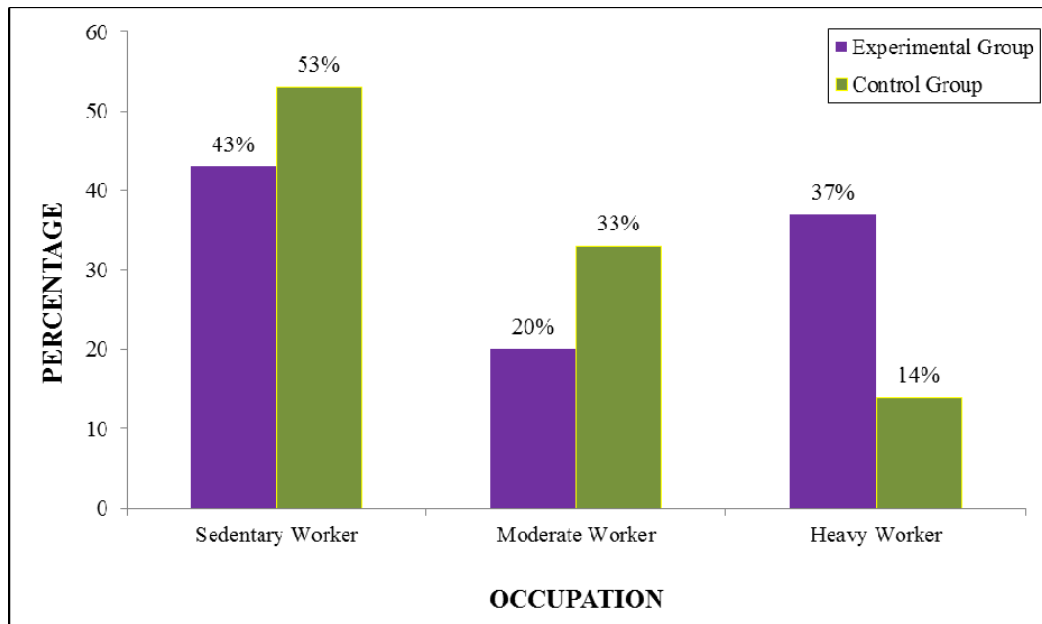


Figure 8 : Distribution of sample according to occupation.

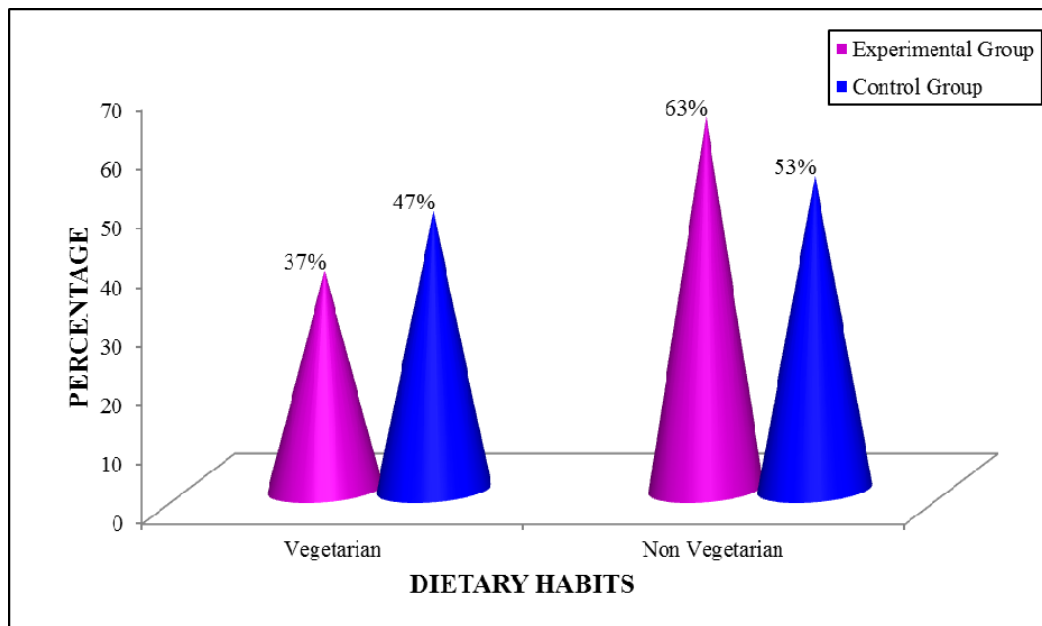
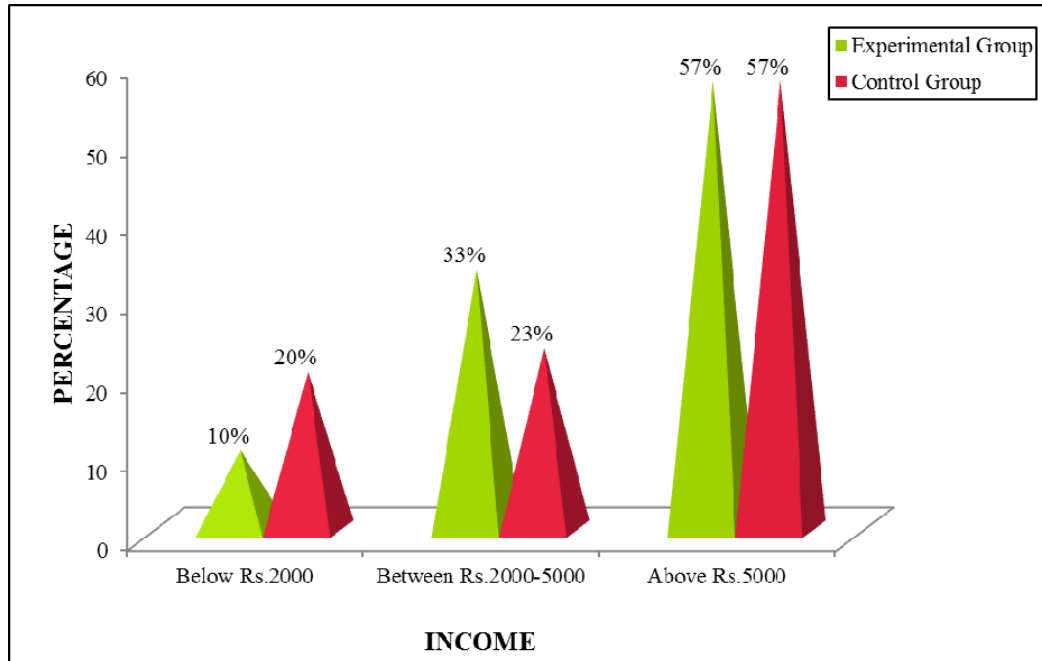
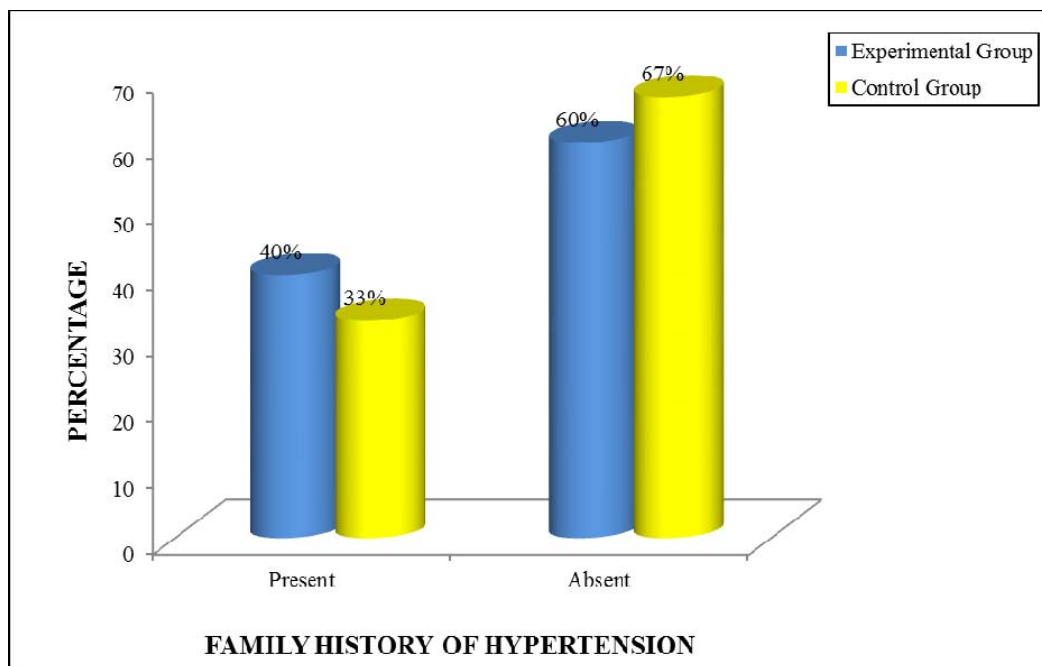


Figure 9 : Distribution of sample according to dietary habits.

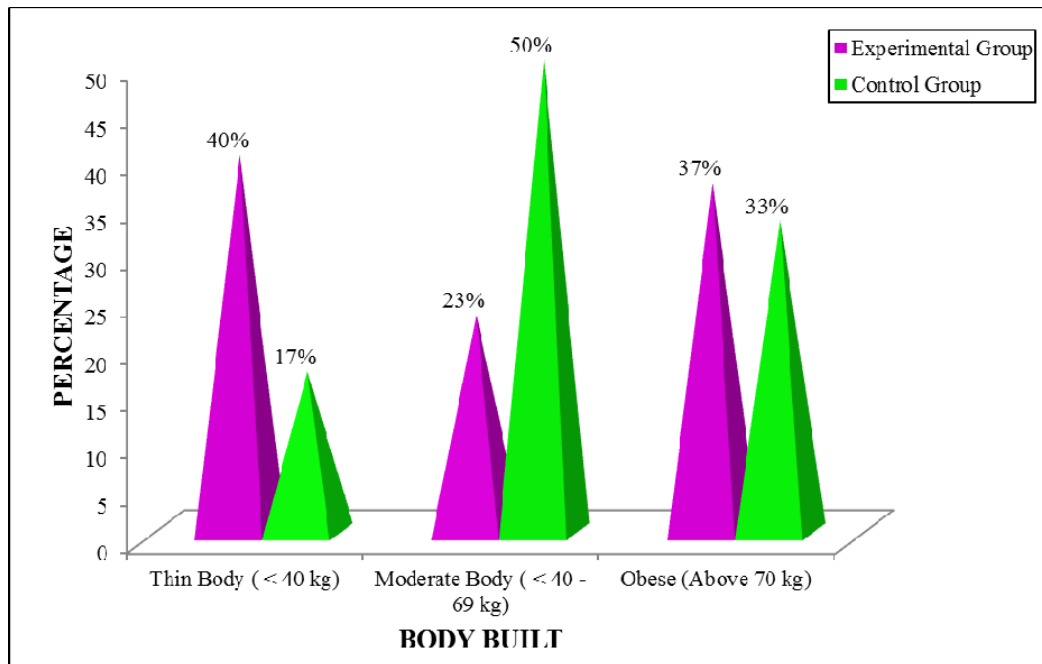


**Figure 10 : Distribution of sample according to Income.**

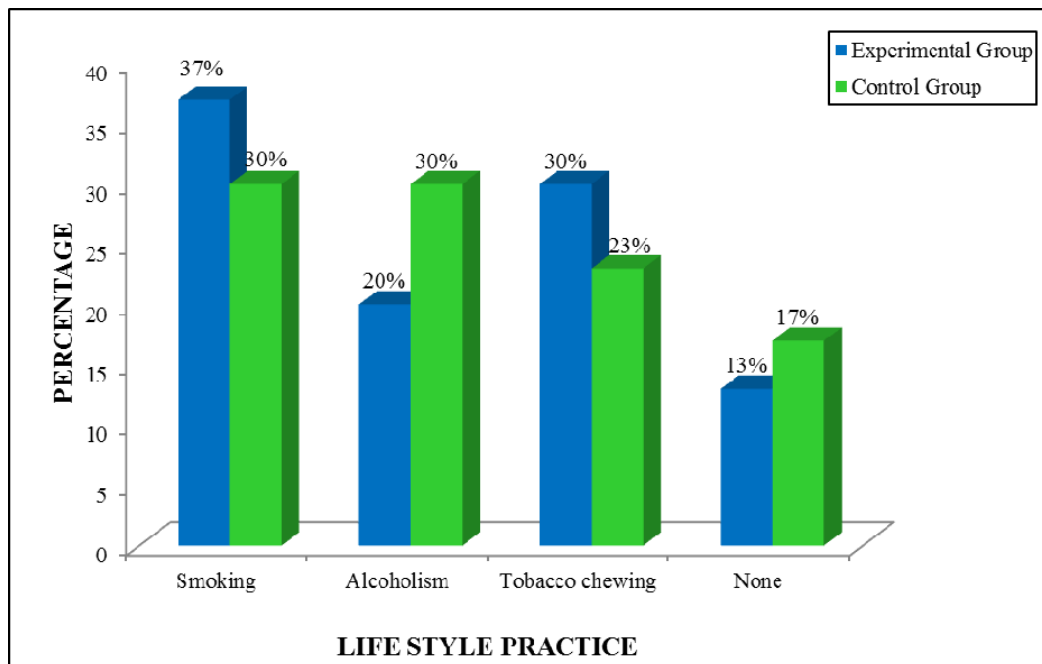


**Figure 11 : Distribution of sample according to Family History of Hypertension.**





**Figure 12: Distribution of sample according to Body built.**



**Figure 13 : Distribution of sample according to life style practice.**

## SECTION II

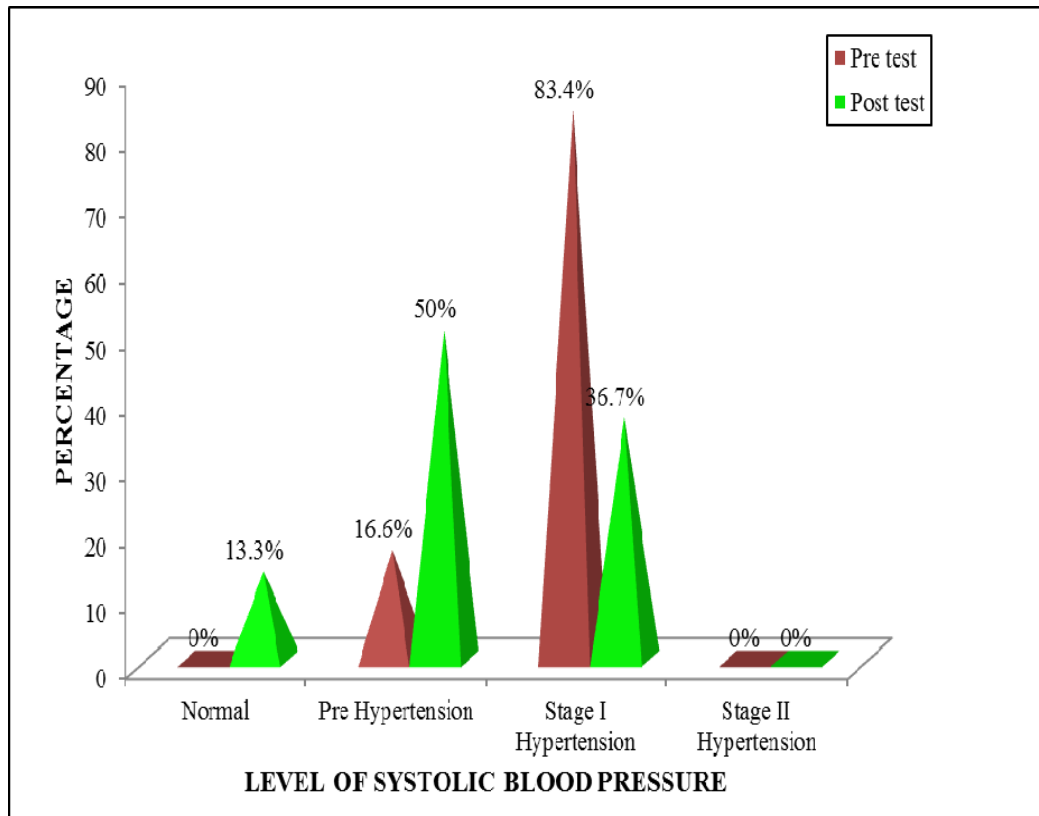
### ASSESSMENT OF THE LEVEL OF SYSTOLIC AND DIASTOLIC BLOOD PRESSURE FOR THE HYPERTENSIVE PATIENTS AMONG EXPERIMENTAL AND CONTROL GROUP.

**TABLE 2: Assessment of pre and post test level of systolic blood pressure among experimental group.**

(N = 30)

S.No	Level of systolic Blood pressure	Pre Test		Post Test	
		f	%	f	%
1	Normal	-	-	4	13.3
2	Pre Hypertension	5	16.6	15	50
3	Stage I Hypertension	25	83.4	11	36.7
4	Stage II Hypertension	-	-	-	-

Table 2 reveals the frequency and percentage distribution of pre and post test level of systolic blood pressure among experimental group. It is evident from the above table that in the pre test level of systolic blood pressure among the experimental group, none of the patients had normal blood pressure, 5(16.6%) of the patients had pre hypertension, 25(83.4%) of them had stage I hypertension, none of them had stage II hypertension, where as in the post test level of systolic blood pressure among the experimental group 4(13.3%) of the patients had normal blood pressure, 15(50%) of them had pre hypertension, 11(36.7%) of them had stage I hypertension and none of them had stage II hypertension.



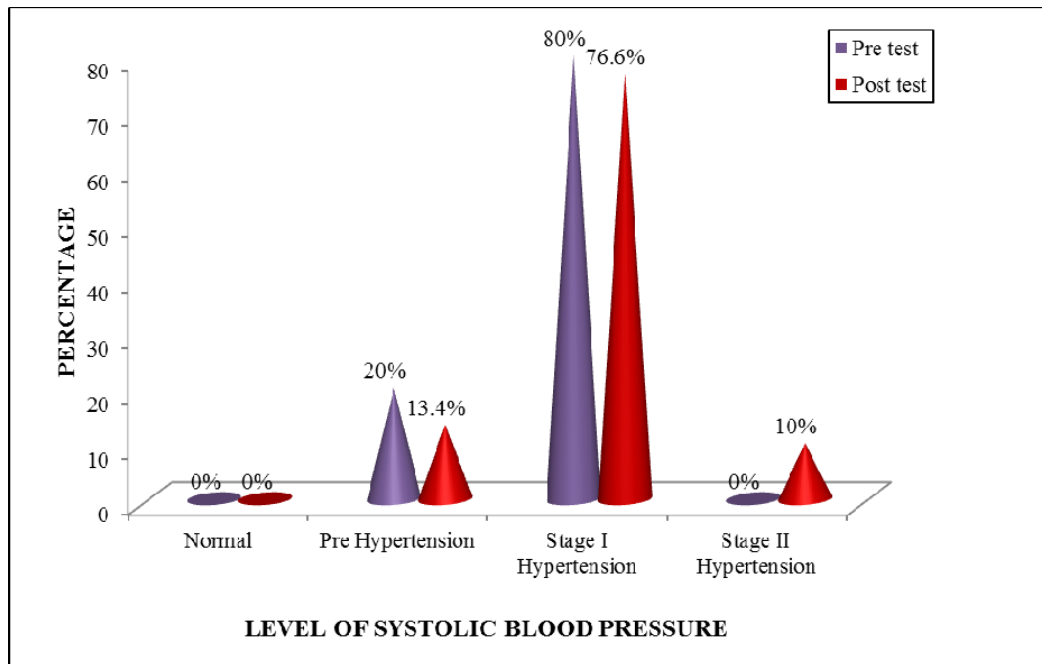
**Figure 14: Frequency and percentage of distributions of pre and post test level of systolic blood pressure among experimental group.**

**TABLE 3: Assessment of pre and post test level of systolic blood pressure among control group.**

(N = 30)

S.No	Level of Systolic Blood Pressure	Pre Test		Post Test	
		f	%	f	%
1	Normal	-	-	-	-
2	Pre Hypertension	6	20	4	13.4
3	Stage I Hypertension	24	80	23	76.6
4	Stage II Hypertension	-	-	3	10

Table 3 shows the frequency and percentage distribution of pre and post test level of systolic blood pressure among control group from the above table it is revealed that in the pre test level of systolic blood pressure among the control group, none of them had normal blood pressure, 6 (20%) of them had pre hypertension, 24(80%) of them had stage I hypertension and none of them had stage II hypertension, whereas in the post test level of systolic blood pressure among the control group, none of the patients had normal blood pressure, 4(13.4%) of them had pre hypertension, 23(76.6%) of them had stage I hypertension , 3(10%) of them had stage II hypertension.



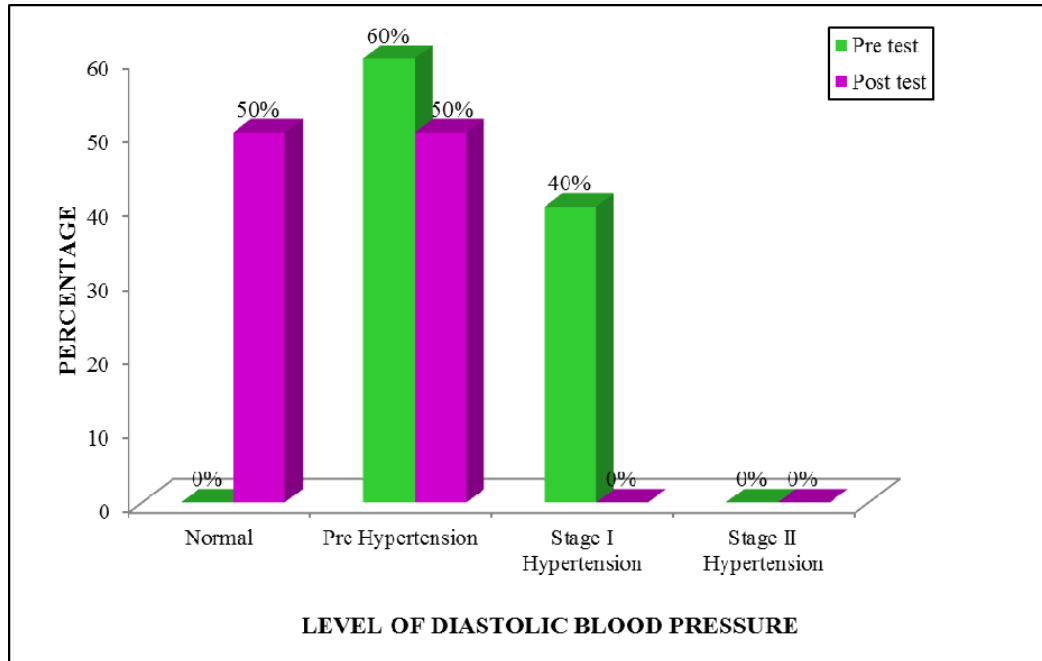
**Figure 15: Frequency and percentage of distributions of pre and post test level of systolic blood pressure among control group.**

**TABLE 4: Assessment of pre and post test level of diastolic blood pressure among experimental group**

(N = 30)

S.No	Level of Diastolic Blood Pressure	Pre test		Post test	
		f	%	f	%
1	Normal	-	-	15	50
2	Pre Hypertension	18	60	15	50
3	Stage I Hypertension	12	40	-	-
4	Stage II Hypertension	-	-	-	-

Table 4 shows the frequency and percentage distribution of pre and post test level of diastolic blood pressure among experimental group the above table reveals that in the pre test level of diastolic blood pressure among the experimental group none of the patients had normal blood pressure ,18(60%) of them had pre hypertension,12(40%) of them had stage I hypertension, none of them had stage II hypertension, where as in the post test level of diastolic blood pressure among the experimental group 15(50%) of the patients had normal blood pressure , 15(50%) of them had pre hypertension, none of them had stage I hypertension and stage II hypertension.



**Figure 16: Frequency and percentage of distributions of pre and post test level of diastolic blood pressure among experimental group.**

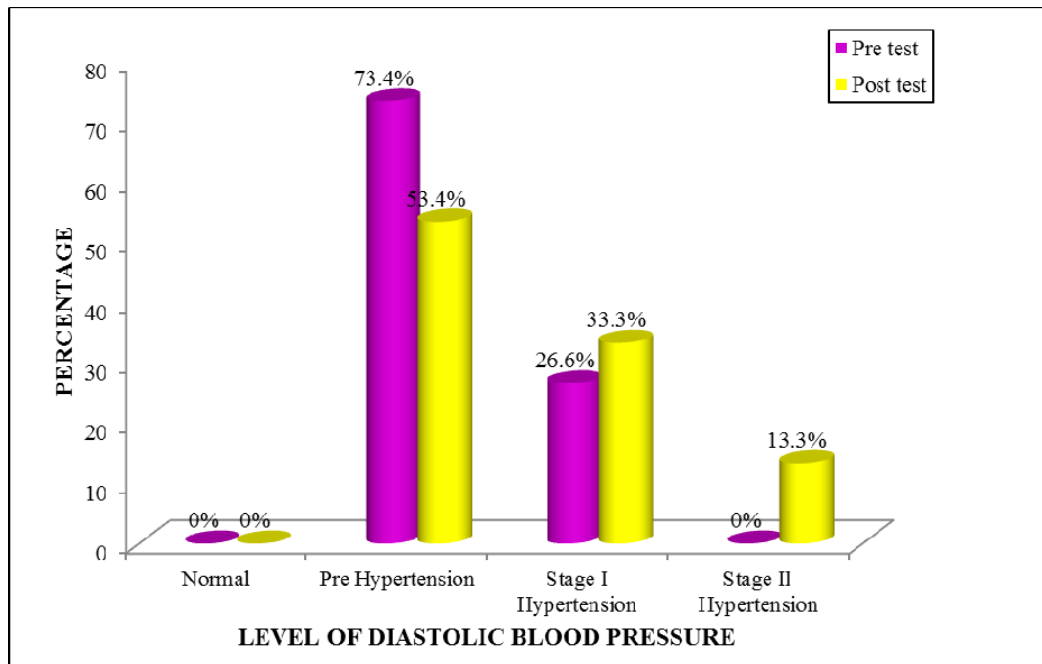
**TABLE 5: Assessment of pre and post test level of diastolic blood pressure among control group.**

(N = 30)

S.No	Level of Diastolic Blood Pressure	Pre Test		Post Test	
		f	%	f	%
1	Normal	-	-	-	-
2	Pre Hypertension	22	73.4	16	53.4
3	Stage I Hypertension	8	26.6	10	33.3
4	Stage II Hypertension	-	-	4	13.3

Table 5 shows the frequency and percentage distribution of pre and post test level of diastolic blood pressure among control group, the above table reveals that in the pre test level of diastolic blood pressure among the control group, none of the had normal blood pressure, 22(73.48%) of them had pre hypertension, 8(26.6%) of patients had stage I hypertension, none of the patients had stage II hypertension, whereas in the post test level of diastolic blood pressure among the control group, none of the patients had normal blood pressure and 16(53.4%) of them had pre hypertension, 10(33.3%) of them had stage I hypertension, 4(13.3%) of them had stage II hypertension.





**Figure 17: Frequency and percentage of distributions of pre and post test level of diastolic blood pressure among control group.**

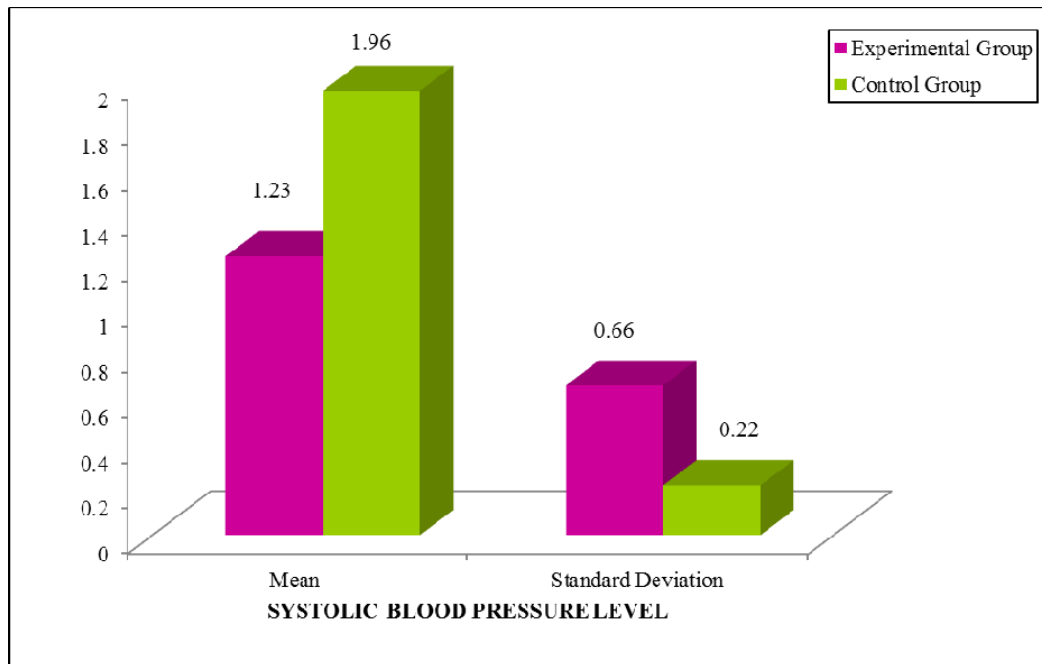
**TABLE 6: Comparison of post test level of blood pressure between the experimental and control group of hypertensive patients.**

(N = 30)

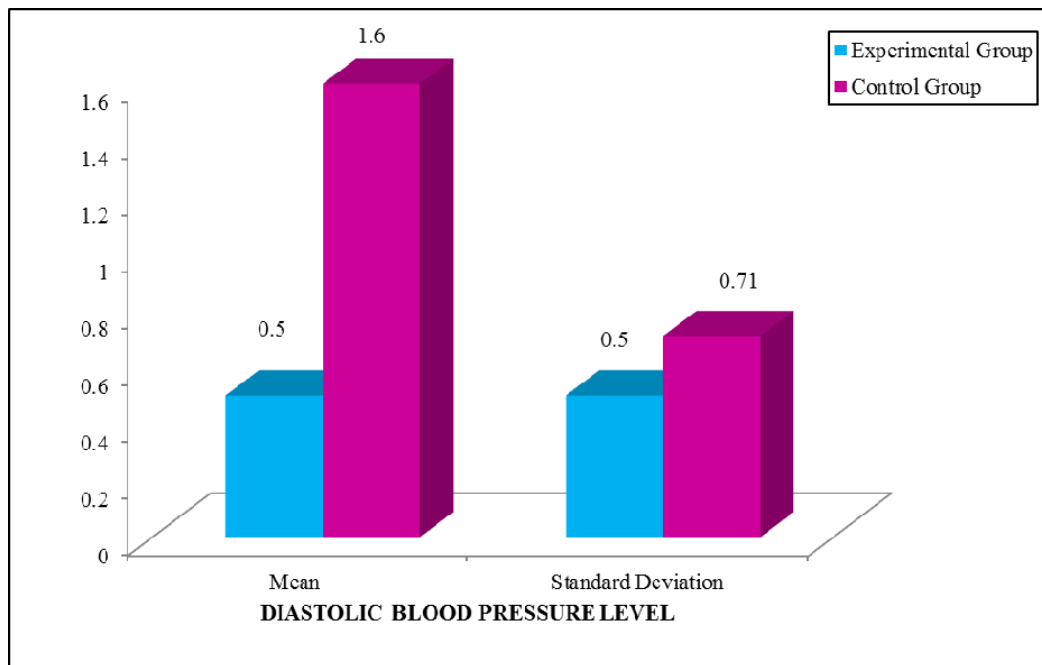
S.No	Blood Pressure	Experimental Group		Control Group		t Value
		Mean	Standard Deviation	Mean	Standard Deviation	
1	Systolic	1.23	0.66	1.96	0.22	9.12 S
2	Diastolic	0.5	0.5	1.6	0.71	10 S

**S = Significance**

Table 6 reveals the unpaired t test to compare the post test level of blood pressure between experimental and control group with regard to the post test level of systolic blood pressure between experimental and control group it was found that the t value was 9.12 and the diastolic blood pressure between experimental and control group it was found that the t value was 10 indicating that there is significant difference in post test level of blood pressure between the experimental and control group at  $p < 0.05$  level.



**Figure 18: Comparison of the post test level of systolic blood pressure between experimental and control group.**



**Figure 19: Comparison of the post test level of diastolic blood pressure between experimental and control group.**

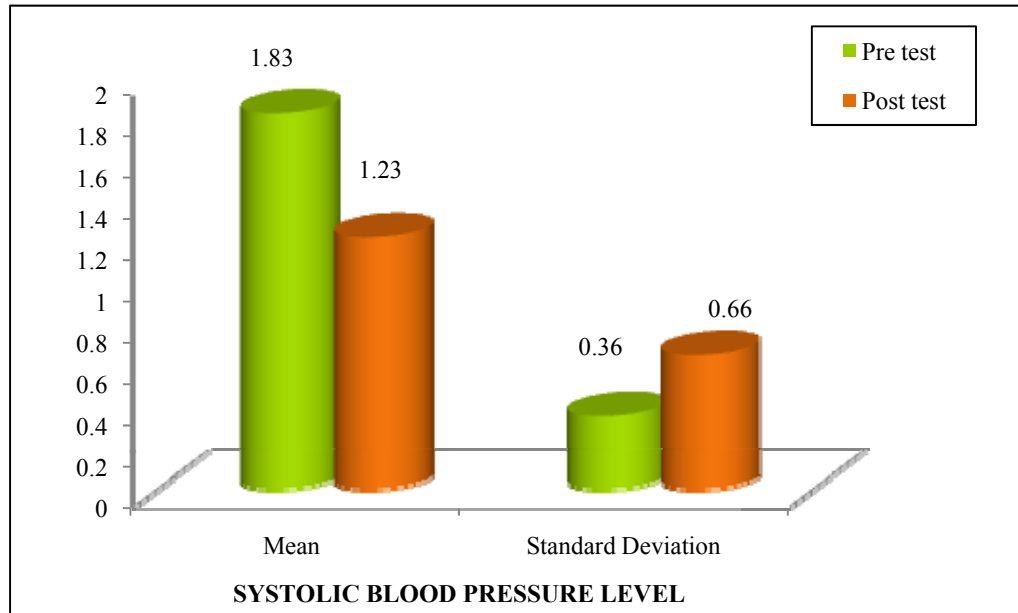
**TABLE 7 : Comparison of the pre and post test level of blood pressure among experimental group.**

(N = 30)

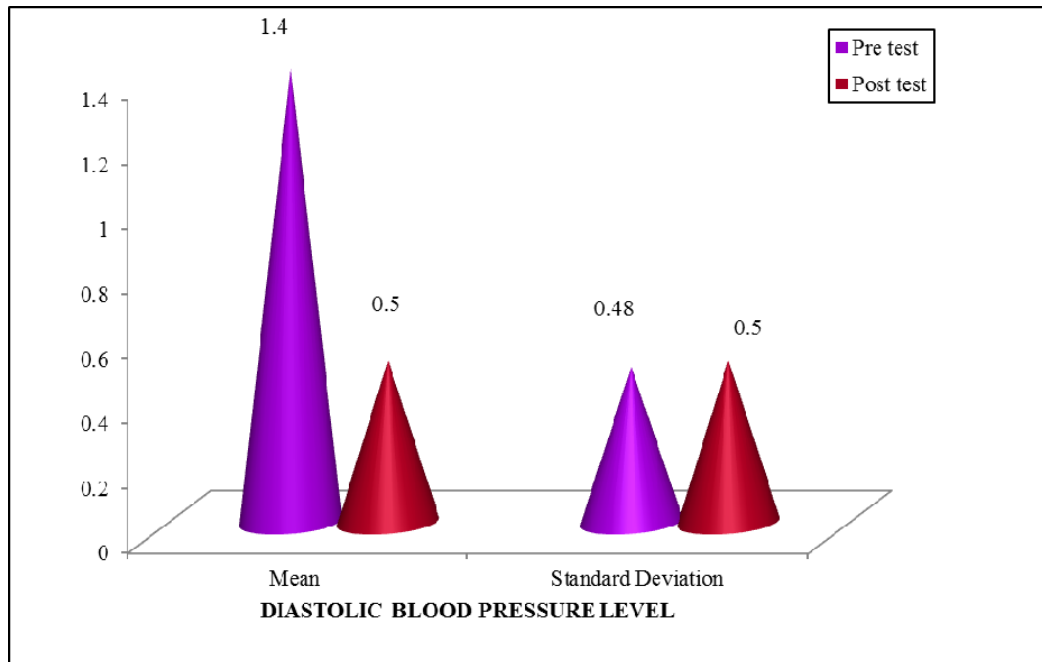
S.No	Blood Pressure	Pre Test		Post Test		Paired Difference		t Value
		Mean	Standard Deviation	Mean	Standard Deviation			
1	Systolic	1.83	0.36	1.23	0.66	0.6	0.56	5.86 S
2	Diastolic	1.4	0.48	0.5	0.5	0.9	0.40	12.3 S

**S = Significance**

Table 7 reveals the paired t test to compare the pre and post test level of blood pressure among experimental group. With regard to the pre and post test level of systolic blood pressure among experimental group it was found that the t value was 5.86, With regard to the pre and post test level of diastolic blood pressure among experimental group it was found that the t value was 12.3, indicating that there was a highly significant reduction in post test level of blood pressure among the experimental group at  $p < 0.05$  level.



**Figure 20: Comparison of the pre and post test level of Systolic blood pressure among experimental group.**



**Figure 21: Comparison of the pre and post test level of Diastolic blood pressure among experimental group.**

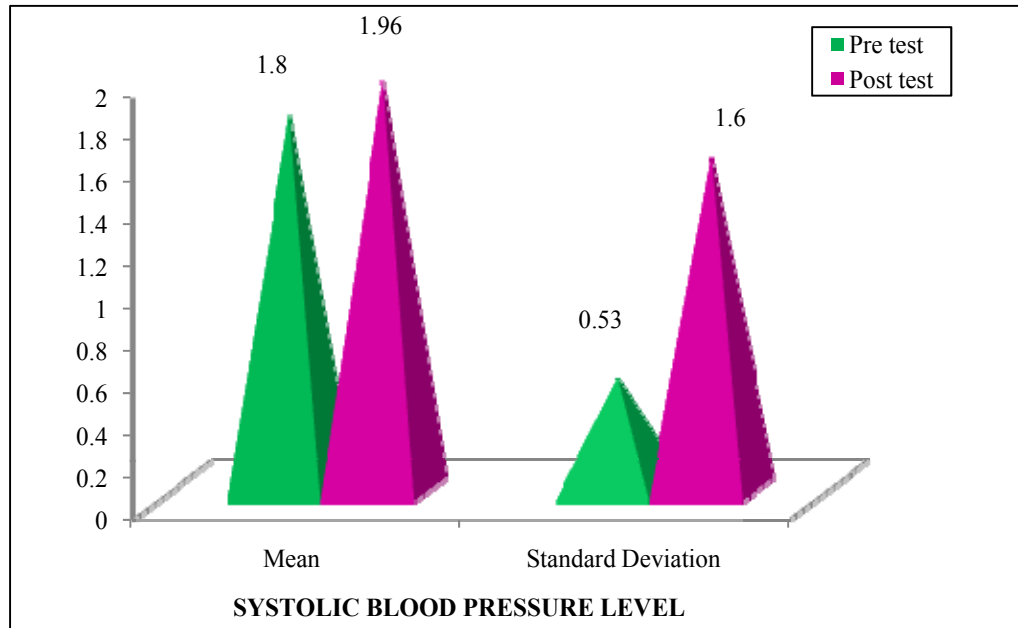
**TABLE 8 : Comparison of the pre and post test level of blood pressure among control group.**

(N = 30)

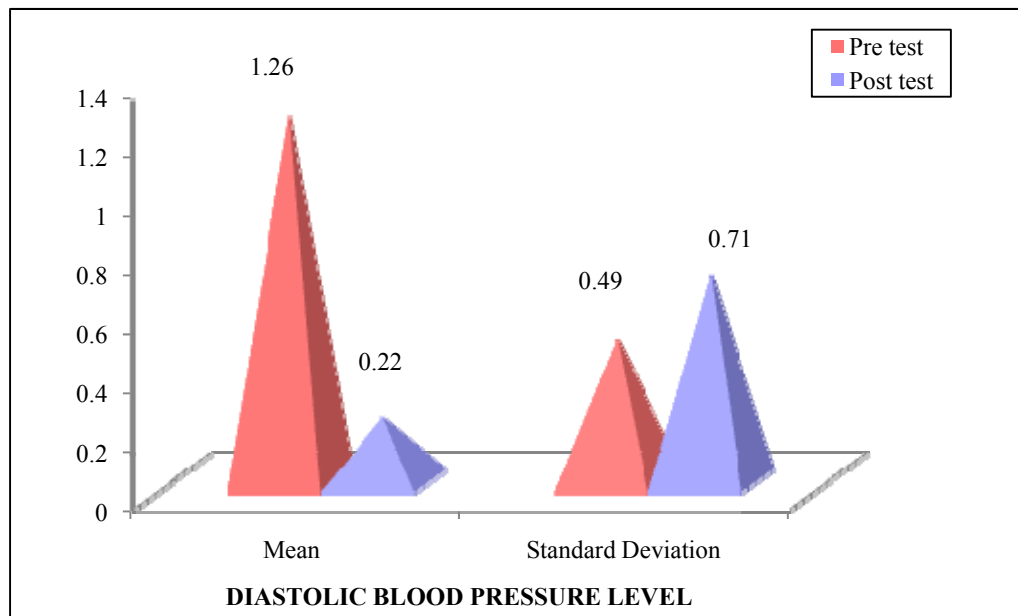
S. No	Blood Pressure	Pre Test		Post Test		Paired Difference		t Value
		Mean	Standard Deviation	Mean	Standard Deviation			
1	Systolic	1.80	0.53	1.96	1.6	0.16	0.37	2.35 NS
2	Diastolic	1.26	0.49	0.22	0.71	0.3	0.47	2.48 NS

**NS = Non Significance**

Table 8 reveals the paired t test to compare the pre and post test level of blood pressure among control group. With regard to the pre and post test level of systolic blood pressure among control group it was found that the t value was 2.35, With regard to the pre and post test level of diastolic blood pressure among control group it was found that the t value was 2.48, indicating that there was no significant reduction in post test level of blood pressure among the control group at  $p < 0.05$  level.



**Figure 22: Comparison of the pre and post test level of Systolic blood pressure among control group.**



**Figure 23: Comparison of the pre and post test level of Diastolic blood pressure among control group.**

## SECTION IV

## ASSOCIATION OF POST TEST LEVEL OF BLOOD PRESSURE IN EXPERIMENTAL AND CONTROL GROUP WITH DEMOGRAPHIC VARIABLES.

TABLE 9: Association of post test level of blood pressure in experimental group with demographic variables.

(N = 30)

S. No.	Demographic Variables	Level of Blood Pressure								$\chi^2$
		Normal		Pre Hypertension		Stage I		Stage II		
		f	%	f	%	f	%	f	%	
1	Age									
	a) 35 – 44 years	2	6	4	13	6	20	0	0	6.537
	b) 45 – 54 years	0	0	6	20	1	3.3	0	0	d(f) = 6
	c) 55 – 64 years	3	10	5	16	4	13	0	0	S
2	Sex									0.736
	a) Male	1	3.3	6	20	4	13	0	0	d(f) = 3
	b) Female	13	43.3	9	30	7	23.3	0	0	NS
3	Religion									
	a) Hindu	0	0	2	6	1	3.3	0	0	5.39
	b) Muslim	4	13	12	40	8	26.6	0	0	d(f) = 6
	c) Christian	0	0	1	3.3	2	6	0	0	S
4	Education									
	a) Illiterate	1	3.3	3	10	2	6	0	0	6
	b) Primary Education	2	6	9	30	4	13	0	0	d(f) = 9
	c) Higher Education	0	0	2	6	4	13	0	0	S
	d) Graduate	1	3.3	1	3.3	1	3.3	0	0	
5	Occupation									
	a) Sedentary worker	1	3.3	4	13	5	16.6	0	0	2.12
	b) Moderate worker	2	6	7	23.3	4	13	0	0	d(f) = 6
	c) Heavy worker	1	3.3	4	13	2	6	0	0	S



S. No.	Demographic Variables	Level of Blood Pressure								$\chi^2$
		Normal		Pre Hypertension		Stage I		Stage II		
		f	%	f	%	f	%	f	%	
6	Dietary Habits									4.838
	a) Vegetarian	0	0	2	6	0	0	0	0	d(f)=3
	b) Non-Vegetarian	4	13	12	40	12	40	0	0	S
7	Income									7.62
	a) <2000	0	0	0	0	1	3.3	0	0	d(f) = 6
	b) 2000 – 5000	1	3.3	6	20	2	6	0	0	S
	c) >5000	3	10	8	26.6	9	30	0	0	
8	Family History of Hypertension									2.901
	a) present	2	6	6	20	3	10	0	0	d(f) = 3
	b) Absent	2	6	6	20	11	36.6	0	0	S
9	Body Build									3.74
	a) Thin	2	6	8	26.6	4	13.3	0	0	d(f) = 6
	b) Moderate	2	6	3	10	4	13.3	0	0	S
	c) Obese	0	0	4	13.3	3	10	0	0	
10	Life style practice									8.83
	a) Smoking	1	3.3	4	13.3	2	6	0	0	d(f) =9
	b) Alcoholism	0	0	3	10	4	13.3	0	0	S
	c) Tobacco Use	0	0	0	0	2	6	0	0	
	d)None	3	10	6	20	5	20	0	0	

**S = Significance NS = Non Significance**

Table 9 reveals the chi-square test to associate the post test level of blood pressure with the selected demographic variables like age, gender, educational studies, occupation, income, dietary habits, religion, family history of hypertension, body built, life style practice in the experimental group. While analyzing the statistical significance at ( $P < 0.05$ ) level it shows that there was significant association of the post test level of blood pressure with the selected demographic variables at  $P < 0.05$  level. . Hence the research hypothesis was accepted.

**TABLE 10: Association of Post Test Level of Blood Pressure in Control Group with Demographic Variables.**

(N = 30)

S.No.	Demographic Variables	Level of Blood Pressure								$\chi^2$
		Normal		Pre Hypertension		Stage I		Stage II		
		f	%	f	%	f	%	f	%	
1	Age									
	a) 35 – 44 years	0	0	0	0	8	26.6	2	6	14.83
	b) 45 – 54 years	0	0	2	6	7	23.3	0	0	d(f) = 6
	c) 55 – 64 years	0	0	3	10	8	26.6	0	0	S
2	Sex									5.72
	a) Male	0	0	0	0	8	26.6	0	0	d(f) = 3
	b) Female	0	0	5	16.6	14	46.6	3	10	S
3	Religion									
	a) Hindu	0	0	0	0	7	23.3	0	0	6.99
	b) Muslim	0	0	3	10	13	43.3	2	6	d(f) = 6
	c) Christian	0	0	2	6	2	6	1	3.3	S
4	Education									
	a) Illiterate	0	0	0	0	6	20	0	0	15.6
	b) Primary Education	0	0	0	0	4	13.3	2	6	d(f) = 9
	c) Higher Education	0	0	2	6	10	33.3	1	3.3	S
	d) Graduate	0	0	3	10	2	6	0	0	
5	Occupation									
	a) Sedentary worker	0	0	1	3.3	5	16.6	0	0	7.98
	b) Moderate worker	0	0	4	13.3	11	36.6	2	6	d(f) = 6
	c) Heavy worker	0	0	0	0	7	23.3	0	0	S

table 10 continues....

S.No.	Demographic Variables	Level of Blood Pressure								$\chi^2$
		Normal		Pre Hypertension		Stage I		Stage II		
		f	%	f	%	f	%	f	%	
6	Dietary Habits									4.69
	a) Vegetarian	0	0	0	0	6	20	0	0	d(f)=3
	b) Non-Vegetarian	0	0	5	16.6	17	56.6	2	6	S
7	Income									7.31
	a) <2000	0	0	2	6	3	10	0	0	d(f) = 6
	b) 2000 – 5000	0	0	2	6	6	20	0	0	S
	c) >5000	0	0	1	3.3	13	43.3	3	10	
8	Family History of Hypertension									4.84
	a) present	0	0	0	0	6	20	0	0	d(f) = 3
	b) Absent	0	0	5	16.6	16	53.3	3	10	S
9	Body Build									6.34
	a) Thin	0	0	1	3.3	4	13.3	0	0	d(f) = 6
	b) Moderate	0	0	1	3.3	13	43.3	1	3.3	S
	c) Obese	0	0	3	10	5	16.6	2	6	
10	Life style practice									13.74
	a) Smoking	0	0	0	0	6	20	0	0	d(f) =9
	b) Tobacco Use	0	0	0	0	7	23.3	1	3.3	S
	c) Alcoholism	0	0	0	0	2	6	0	0	
	d)None	0	0	4	13.3	8	26.6	2	6	

**S = Significant, NS = Non Significant.**

Table 10 reveals the chi-square test to associate the post test level of blood pressure with the selected demographic variables like, age, sex, religion, education, Occupation, Dietary habits, Income, Family history of hypertension, Body build, life style practice in the control group. While analyzing the statistical significance at ( $P < 0.05$ ) level it shows that there was significant association of the post test level of blood pressure with the selected demographic variables which was significance at  $P < 0.05$  level.

## **CHAPTER V**

### **DISCUSSION**

This chapter deals with the discussion of the result of the data analysis to evaluate the effectiveness of Hibiscus tea on reduction of blood pressure among the hypertensive patients.

The discussion is based on the objectives of the study and the hypothesis specified in the study.

#### **MAJOR FINDINGS OF THE STUDY WERE**

On analysis of frequency and percentage of demographic variables, majority of Patients 15 (50%) were between the age group of 35 - 44 years among hypertensive patients in experimental group. With regard to sex classification, majority of patients 17 (57%) were female in the experimental group, With respect to dietary habits majority of the patients 19 (63%) were non vegetarian in the experimental group. With regard to occupation majority of patients 13 (43%) were belongs to sedentary worker in the experimental group.

With regard to income, majority of patients 17(57%) of them had monthly income of above Rs.5000, in the experimental group. Whereas in the control group 17(57%) of subjects had monthly income of above Rs.5000.Regarding the family history of hypertension, majority of patients 18(60%) of patients were absent, in the experimental group, whereas in the control group out of 30 patients, 20(67%) of them were absent.

With regard to body built, majority of patients 12(40%) of them were thin body built in the experimental group, whereas in the control group majority of patients, 15(50%) of them were moderate body built. Regarding the life style practice majority of patients, 11(37%) of them were smoking in the experimental group. whereas in the control group, majority of patients 9(30%) of them were smoking, 9(30%) of had alcoholism.

**The First Objective was to assess the pre test level of blood pressure among hypertensive patients in experimental and control group.**

On analysis of pre test level of systolic blood pressure among experimental group majority of patients 25 (83.4%) had stage I hypertension and in the control group majority of patients 24 (80%) had stage I hypertension. Pre test diastolic blood pressure among experimental group majority of patients 18(60%) had pre hypertension and in the control group majority of patients 22(73.4%) had stage I hypertension.

**The second objective was to find out the effectiveness of hibiscus tea on reduction of blood pressure among hypertensive patients in experimental and control group.**

On analysis of post test level of systolic blood pressure among experimental group majority of patients 15 (50%) had pre hypertension and in the control group majority of patients 23 (76.6%) had stage I hypertension.

Post test diastolic blood pressure among experimental group majority of patients 15(50%) had pre hypertension and in the control group majority of patients 16(53.4%) had pre hypertension.

On analysis of mean score of systolic blood pressure among experimental group 1.23 and control group 1.96 after intervention. Standard deviation of after intervention among experimental group 0.66 and control group was 0.22 and calculated t value was 9.12. Mean score of diastolic blood pressure among experimental group 0.5 and control group was 1.6, standard deviation of diastolic blood pressure among experimental group 0.5 and control group 0.71 in after intervention and calculated t value was 10. It shows reduction of blood pressure in experimental group.

**The third objective was to compare the pre and post test level of blood pressure among hypertensive patients in experimental group.**

On analysis of pre and post test level of systolic blood pressure among the experimental group, the mean systolic blood pressure score 1.83 and standard deviation 0.36 for the pre test and mean systolic blood pressure score 1.23 with standard deviation 0.66 for the post test and calculated t value was 5.86 . It shows the marked reduction in experimental group.

Regarding pre test level of diastolic blood pressure among the experimental group, the mean diastolic blood pressure score 1.4 and standard deviation 0.48. with regard to the post test level of mean diastolic blood pressure score 0.5 with standard deviation 0.5 was reduced from the pre test diastolic blood pressure and calculated t value was 12.3.

The above result was supported by **Hani Tarkhani et al (2001)** the study was conducted by the University of Medical Sciences and health services, Iran. This experimental study is to evaluate the effect of Hibiscus sabdariffa tea on essential hypertension. For this purpose, 31 and 23 patients with moderate essential hypertension were randomly assigned to an experimental and control group,

respectively. Systolic and diastolic blood pressures were measured before and 7 days after the intervention. In the experimental group, 45% of the patients were male and 55% were female, and the mean age was 52.6 +/- 7.9 years. In the control group, 30% of the patients were male, 70% were female, and the mean age of the patients was 51.5 +/- 10.1 years. Statistical findings showed an 11.2% lowering of the systolic blood pressure and a 10.7% decrease of diastolic pressure in the experimental group 7 days after beginning the treatment, as compared with the first day. The difference between the systolic blood pressures of the two groups, three days after stopping the treatment, systolic blood pressure was elevated by 7.9% and diastolic pressure was elevated by 5.6% in the experimental and control groups. This difference between the two groups was also significant. The study results showed that there was significant reduction of blood pressure during intake of hibiscus tea in experimental group.

**The fourth objective was to associate the post test level of blood pressure among hypertensive patients in experimental and control group with the selected demographic variables.(Age, Sex, Education, Occupation, Dietary pattern, Income, etc)**

Tables no(9,10) analysis revealed that there was statistical significant association between the post test level of blood pressure and demographic variables such as age, religion, education, occupation, dietary habits, income, family history of hypertension, body built, life style practice except sex. In experimental group, the calculated chi square value showed that there was an association between demographic variables and blood pressure respectively at  $p < 0.05$  level.



In control group, the calculated chi square value showed that there was an association between demographic variables and blood pressure respectively at  $p < 0.05$  level.

Hence, the research hypothesis ( $H_3$ ) stated that “there was significant association between the level of blood pressure in experimental and control group of hypertensive patients with selected demographic variables was accepted.

From the above analysis and interpretations, the hypothesis ( $H_1$ ), Mean post test level of blood pressure among the hypertensive patients in experimental group was significantly lower than the mean post test level of blood pressure in control group was accepted and the hypothesis ( $H_3$ ) “There was significant association between the level of blood pressure in experimental and control group of hypertensive patients with selected demographic variables” such as age, religion, education, occupation, dietary habits, income, family history of hypertension, body built and life style practice was accepted.

The above hypotheses of ( $H_3$ ) and ( $H_1$ ) acceptance were attributed to the effectiveness of Hibiscus tea on reduction of blood pressure among the hypertensive patients.

## **CHAPTER VI**

### **SUMMARY, CONCLUSION, IMPLICATION, LIMITATIONS AND RECOMMENDATIONS**

This chapter deals with summary, findings, conclusion, implications, limitations and recommendations, which creates a base for evidence based practice.

#### **SUMMARY**

Hypertension, a chronic illness is a growing condition in our society, due to lifestyle changes once it is diagnosed its control basically depends on adapting a healthy lifestyle and therapeutic compliance.

According to a survey conducted by the association of physicians of India in the urban areas in the counts had a significantly higher incidence of hypertension 27-37% As compared to rural area 2 to 8% (Agarwal 2001). In India about 20%of the adult population suffers from hypertension making if the country's biggest silent killer from this almost 90% of the cases fall into the category of primary as essential hypertension.

Hypertension is a medical condition in which constricted arterial blood vessel increase the resistance to blood flows causing the blood to exert excessive pressure against vessel walls the heart must work harder to pump blood through the narrowed arteries if the condition persists, it is damage for the heart and blood vessels, increasing the risk for stroke, heart attack and kidney failure often it causes no symptom until it reaches a life threatening stage , if we strive for better hearts for our

people, the holistic management of hypertension need to be preached as well as practiced (**Wasier 2003**).

A recent research showed that tea made from dark red and dried hibiscus petals effectively lowers high blood pressure. According to Taiwanese scientists, hibiscus tea can control cholesterol and thereby risks of heart disease. The extract can also be used to treat high blood pressure as well as liver disorder. It also improves blood circulation, reduces stress levels, protects body against bacterial attack, reduces weight and prevents bladder infection and constipation. This natural-colored tea has a delicious taste and a pleasant fragrance. Hibiscus tea is considered healthier and more valuable than conventional teas because it is rich in Vitamin C.

The study was undertaken to assess the effectiveness of Hibiscus tea in terms of blood pressure reduction among the hypertensive patients in Idaikal village.

**The Objectives of the study were:**

- To assess the pre test level of blood pressure among hypertensive patients in experimental and control group.
- To find out the effectiveness of hibiscus tea on reduction of blood pressure among hypertensive patients in experimental group and control group.
- To compare the pre and post test level of blood pressure among hypertensive patients in experimental group.
- To associate the post test level of blood pressure among hypertensive patients in experimental and control group with their selected demographic variables.(Age, Sex, Education, Occupation, Dietary pattern, Income, etc.)

**All Hypotheses formulated were:**

- H<sub>1</sub> Mean post test level of blood pressure among the hypertensive patients in experimental group was significantly lower than the mean post test level of blood pressure in control group.
- H<sub>2</sub> Mean post test level of blood pressure among the hypertensive patients was significantly lower than the mean pre test level of blood pressure in experimental group.
- H<sub>3</sub> There was significant association between the level of blood pressure in experimental and control group with their selected demographic variables. (Age, Sex, Education, Occupation, Dietary pattern, Income, etc.)

**The assumptions of the study were:**

- Hibiscus tea may reduce the blood pressure.
- Hibiscus tea is easy to administer.
- Hibiscus tea has no adverse effects.

The review of literature collected for the study provided a strong basis for the study. It provided the basis for creating conceptual frame work and formation of tool. It was categorized under three headings.

**Section A:** Literature related to risk factors and prevalence of hypertension.

**Section B:** Literature related to the effects of hibiscus tea on hypertension.

**Section C:** Literature related to effectiveness of hibiscus tea on other disease condition.

The conceptual frame work of this study was based on **Daniel L. Stufflebeam** CIPP Model and it provided a complete frame work for achieving the central purpose

of the study. The research methodology adopted for the study was quasi experimental pre test and post test control group design.

The Study was conducted in Idaikal PHC. The total population of the village is 7260. The Sample size for the study were 60, 30 persons were in experimental Group another 30 persons were in control Group. The Samples were selected based on the inclusive criteria.

Pilot study was conducted in Mangalapuram village, at Tirunelveli and the findings revealed that the tool was feasible, reliable and practicable to proceed with the main study.

Researcher selected the hypertension patients by using convenient sampling technique to select the samples for the study among the total population the investigator were selected 60 samples who met inclusive criteria.

The content validity of the tool was established by three experts from the medical surgical nursing department.

The main study was conducted in Idaikal PHC at Tirunelveli. The total sample size was sixty samples who fulfilled the inclusive criteria were allotted to experimental group ( $n = 30$ ) and in control group ( $n=30$ ) by convenient sampling technique. The collected data was analyzed and interpreted based on the objectives using descriptive and inferential statistics.

There was an association between the level of blood pressure in the experimental group and age, religion, education, occupation, dietary habits, income, family history of hypertension, body build and life style practice except sex. Obtained chi square value was significant at 0.05 level.

## **CONCLUSION**

This study assessed the effectiveness of Hibiscus tea in terms of blood pressure reduction among the hypertensive patients. The study findings revealed that there is a significant association on the level of blood pressure after administration of hibiscus tea in the experimental group. On the basis of the study, the researcher concluded that administration of hibiscus tea has a significant effect on reduction of blood pressure. Hibiscus tea is an effective, natural, easily available, easy to use and potentially risk free intervention.

## **IMPLICATION**

Investigator has derived from the study the following implications that are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

## **NURSING PRACTICE**

The nurses have a vital role in providing safe and effective nursing care to enhance blood pressure control among patients with hypertension. This can be facilitated by motivating the nurses to have an in depth knowledge in physiological considerations in blood pressure control. Develop skill in providing efficient nursing care for controlling blood pressure and teach the client about the effectiveness of various non-pharmacological measures for controlling blood pressure. Nurses need to practice evidence based approach while giving care to the hypertension patients.

## **NURSING EDUCATION**

Before nurses enter into for their practice, they need to have strong foundation in terms of education. Nurse educator not only have a role to educate the student but

also to educate the staff nurses in order to prepare them and update their knowledge, to enhance the application of theory in to practice. The education in the clinical area should be provided in the form of:

1. Educate the students about various complementary and alternative therapies for blood pressure control.
2. Encourage the students for effective utilization of evidence based practice.
3. Make use of available literature and studies related to non-pharmacological measures for controlling blood pressure.

### **NURSING ADMINISTRATION**

1. Conduct in service education programs and continuing education programs on hypertension and its control.
2. Arrange and conduct workshops, conferences, seminars on non pharmacological methods on blood pressure control.
3. Provide opportunities for nurses to attend training programs on complimentary and alternative therapies on hypertension and its control.

### **NURSING RESEARCH**

1. Nurse researcher should disseminate the findings of the studies through conference, seminar and publishing in professional journals to the Medical Surgical staff.
2. Nurse researcher should encourage and conduct further researches related to Hibiscus tea non pharmacological interventions prior to venipuncture.

3. The findings of the research study will help in building and strengthening the body of knowledge.
4. As a nurse researcher, promote more research on effective measures for blood pressure control.
5. Evidence based nursing practice must take higher profile in order to increase the knowledge about Hibiscus tea intervention for hypertension and its control.

## **LIMITATIONS**

During the period of study the limitations faced by the investigator were as follows,

1. Only limited literatures and studies were obtained from the Indian context.
2. Due to time constraints, the investigator was unable to take larger samples for the study.
3. Patients who are under other alternative therapies cannot be included in the study.

## **RECOMMENDATIONS**

Based on the findings of the present study the following recommendations are made:

1. Similar study can be conducted with large samples for better generalisation.
2. A study can be conducted to assess the effectiveness of other herbs such as cumin seeds, celery with grape juice and whole grains for effective blood pressure control.



3. The study can be conducted to assess the knowledge and practice of nurses with regard to nursing intervention for control of blood pressure in patients with hypertension.
4. A comparative study can be conducted by using hibiscus tea and laughter therapy in reduction of blood pressure in hypertension patients.
5. The Same study can be repeated by using the true experimental design.
6. The effectiveness of hibiscus tea can be tested for other disease condition also such as dysmenorrheal problem, obesity, renal problems.