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Hypertension Care Assessment: Unveiling Effect of Medication Adherence, Diet, and Lifestyle A-Cohort Investigation

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ABSTRACT

Hypertension is a major risk factor for cardiovascular diseases in developing countries. Hence, managing high blood pressure is crucial in reducing associated complications and improving the quality of life. Along with antihypertensive therapy non-pharmacological approaches like lifestyle changes and dietary restrictions help in controlling high blood pressure levels. Lifestyle changes involve physical activity, alcohol abstinence, and cessation of smoking whereas dietary restrictions include salt restriction, consumption of vegetables and fruits, and reduced dairy products. Strict adherence to both medication and nonpharmacological modifications will result in good high-blood pressure control and can prevent high BP-associated complications, thereby improving QoL in Hypertensive individuals. This cohort investigation aims to assess the potential impact of nonpharmacological management along with medication adherence in controlling blood pressure.

INTRODUCTION

Systolic blood pressure of 140 mm Hg or higher and diastolic blood pressure of 90 mm Hg or higher is hypertension. One of the main cardiovascular risk factors and the main contributing cause to fatalities worldwide is thought to be hypertension [1]. It is commonly known that hypertension is a modifiable and preventable risk factor for cardiovascular disease [2]. The greatest worldwide risk factor for death and disability across all age groups is hypertension [3]. Although high blood pressure (BP) is frequently asymptomatic, it is responsible for around half of all cases of stroke and ischemic heart disease globally [4]. Since patients with hypertension rarely exhibit distinct symptoms in the early stages of the disease, it can be challenging to diagnose the condition until medical concerns arise. Effective management of hypertension and maintaining treatment after diagnosis are especially difficult because of patient noncompliance and lack of information [5].

The force with which the heart pumps blood throughout the body is measured by blood pressure or BP. It is expressed as the ratio of systolic blood pressure to diastolic pressure [6]. The increased incidence of hypertension in both industrialized and emerging nations can be attributed to a variety of factors. These include population aging, dietary modifications, physical inactivity, increasing body mass index (BMI), and alcohol use [7]. The utilization of ambulatory blood pressure monitoring (ABPM) in clinical settings has enabled the identification of indicators beyond the 24-hour average that may have potential benefits for enhancing prognostic precision [8].

Follow-up services (FUS) are continuing medical care for individuals with a diagnosis of hypertension, according to Sun et al. [9]. A summary of the patient's condition is included, along with information about illness prevention, medication instructions, blood pressure monitoring, physical examination, and symptom control techniques. However, Tang et al. [10] reported in a study that there is proof of the efficacy of FUS treatment when it comes to controlling blood pressure in hypertensive individuals. A primary obstacle to the management of hypertension is inadequate adherence to antihypertensive medication [11]. Noncompliance affects patients' quality of life and costs money while undermining public confidence in healthcare institutions [12].

A key component of antihypertensive therapy is changing one's lifestyle. A substantial, changeable environmental component that can affect people's health and the progression of diseases is their nutrition [13]. A heart-healthy diet like the DASH is advised by the American College of Cardiology/American Heart Association's 2017 guidelines for the prevention, detection, evaluation, and

management of high blood pressure in adults [14]. The DASH dietary pattern is high in fruits, vegetables, whole grains, and low-fat dairy products, although it has relatively low recommended intakes of total and saturated fats. The DASH diet can help reduce DBP by 3 mm Hg and SBP by 11 mm Hg [15,16]. Since the best course of treatment for hypertension entails taking into account the patient's age, sex, race, diet, exercise, use of tobacco products, coexisting disorders, usage of antihypertensive medication, compliance, and attainment of blood pressure control, lifestyle plays a critical role in controlling the condition [17].

METHODOLOGY

A cohort study was conducted in rural areas of Guntur for 5 months with a sample size of 200. The patients who met the inclusion criteria were selected and followed up for study.

Inclusion criteria:

- Age between 25-80 years of both sexes.
- Patients who are newly diagnosed and previously diagnosed.
- Patients following nonpharmacological approaches along with medication adherence.

Exclusion criteria:

- Pregnant women diagnosed with hypertension.
- Individuals less than 25 years.
- Individuals diagnosed with Secondary hypertension.
- Patients with poor medication adherence.

DATA COLLECTION:

Data was collected using a data collection form with questions like patient history which included their demographic details like age, gender, BMI, education, profession, and medical history i.e, diagnosis of hypertension, how long they have been diagnosed with hypertension, and adherence to antihypertensive medication. The data collection form also included questions regarding patient counseling and their adherence to lifestyle changes, DASH diet, and medication adherence. Patients who are adherent to lifestyle changes, DASH diet, and medication adherence were followed up for 5 months, their Blood pressure was measured every month and was observed for BP control at the end of the study. The collected data was analysed by using a Two-way ANOVA.

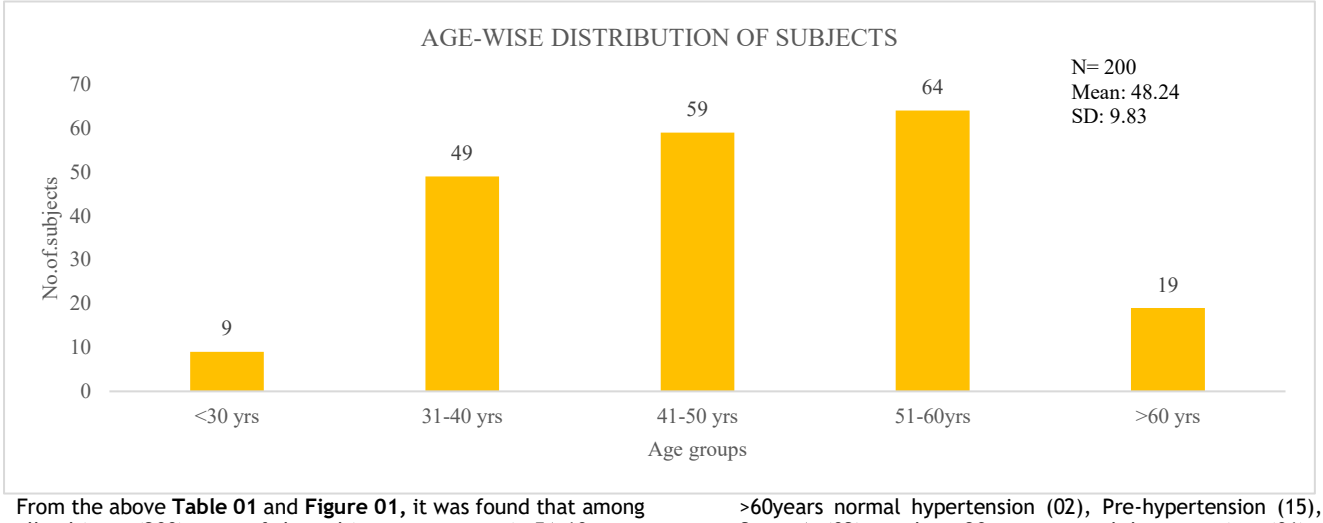
RESULTS:

200 subjects met the inclusion criteria and were included in the study. The following results are tabulated and analyzed using specific statistical tools. Descriptive data were expressed as percentage, mean, and standard deviation, and the ANOVA test was used for continuous data. Two-way ANOVA was used, and the significance level was set at $p<0.05$ with a 95% confidence interval. The results of the present study include the demographic distribution of patients, the role of clinical pharmacists in lifestyle modification, and disease outcomes. Statistical analysis proved the influence of the clinical pharmacist's role on disease outcome and reducing the complications associated with uncontrolled blood pressure.

TABLE 01: AGE-WISE DISTRIBUTION OF SUBJECTS

S. No	Age groups	No. of subjects n=200	Normal	Pre-HTN	Stage-1	Stage-2	Percentage (%)
01.	<30 years	09	03	06	0	0	4.5%
02.	31-40 years	49	22	22	05	0	24.5%
03.	41-50 years	59	19	35	05	0	29.5%
04.	51-60 years	64	18	40	06	0	32%
05.	>60 years	19	02	15	02	0	9.5%

FIGURE 01: AGE-WISE DISTRIBUTION OF SUBJECTS



From the above **Table 01** and **Figure 01,** it was found that among all subjects (200) most of the subjects were seen in 51-60 years with 64 subjects in which normal (18), Prehypertension (40), and stage-1 (06) were higher among all age groups were observed. Followed by 41-50 years with normal hypertension (19), Pre-hypertension (35), and Stage 1 (05) and 31-40 years normal hypertension (22), Pre-hypertension (22), and stage-1 (05), under >60years normal hypertension (02), Pre-hypertension (15), and Stage-1 (02), under <30years normal hypertension (06), pre-hypertension (06). No patients were reported as having stage-2 hypertension among all age groups. The mean group is 48.24 years and the standard deviation (SD) is 9.83.

TABLE 02: DISTRIBUTION OF SUBJECTS BASED ON OCCUPATION

S. No	Occupation	No. of subjects n=200	Normal	Pre-HTN	Stage-1	Stage-2	Percentage(%)
01.	Homemaker	70	24	40	06	0	35%
02.	Farming	62	16	42	04	0	31%
03.	Worker	45	17	24	04	0	22.5%
04.	Employee	23	04	16	04	0	11.5%

From the above **Table 2** and **Figure 2** it was found that among all subjects (200) most of the sample falls under the occupation of housewives with 70 (35%) subjects in most of them are with Prehypertension (40) subjects, in the farmer group with 62(31%) subjects more subjects are with Prehypertension (42), in workers group with 45(22.5%) subjects most of them are again with Prehypertension (24), in the employee's group with 23 (11.5%) subjects more subjects are with prehypertension (16) no stage 1 hypertensive patient was observed.

FIGURE 02: DISTRIBUTION OF SUBJECTS BASED ON OCCUPATION

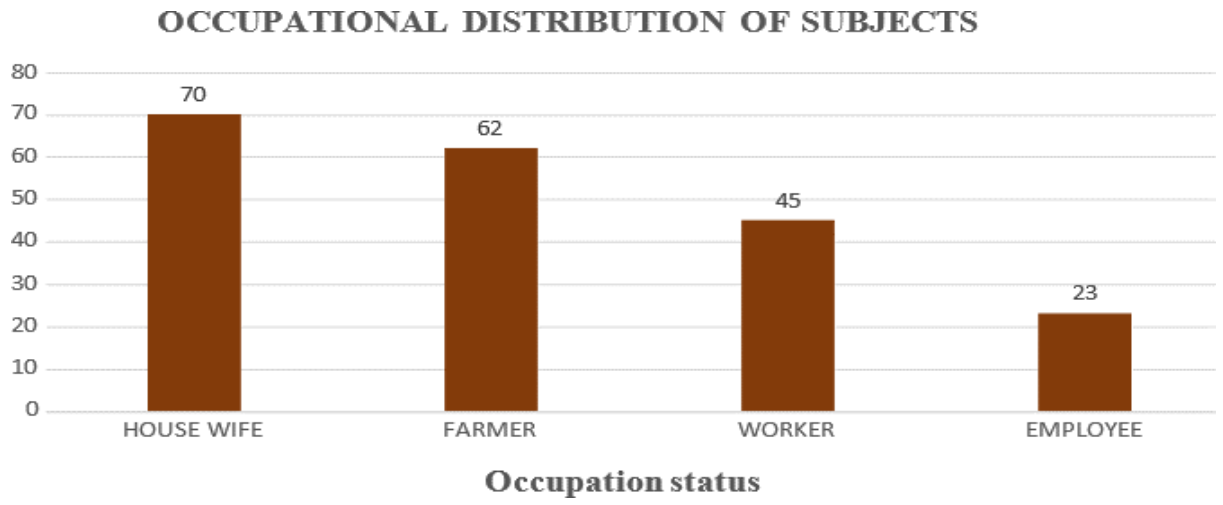


TABLE 03: SUBJECT DISTRIBUTION ACCORDING TO BMI CATEGORIES

S. No	BMI category	BMI Range (kg/m^2)	No. of. Subjects
1.	Underweight	<18.5	0
2.	Normal	18.6-24.9	103
3.	Overweight	25-29.9	83
4.	Obesity (1st class)	30-34.9	10
5.	Obesity (2nd class)	35.0-39.9	4
6.	Extreme Obesity	>/=40	0

FIGURE 03: DISTRIBUTION OF SUBJECTS BASED ON BMI CATEGORIES

From the above **Table 03** and **Figure 03,** most of the subjects fall in the normal BMI group with 103 subjects, followed by 83 subjects with overweight, 10 subjects with Obesity (1st class), and 4 subjects with Obesity (2nd class). No subjects were found under extremely Obese

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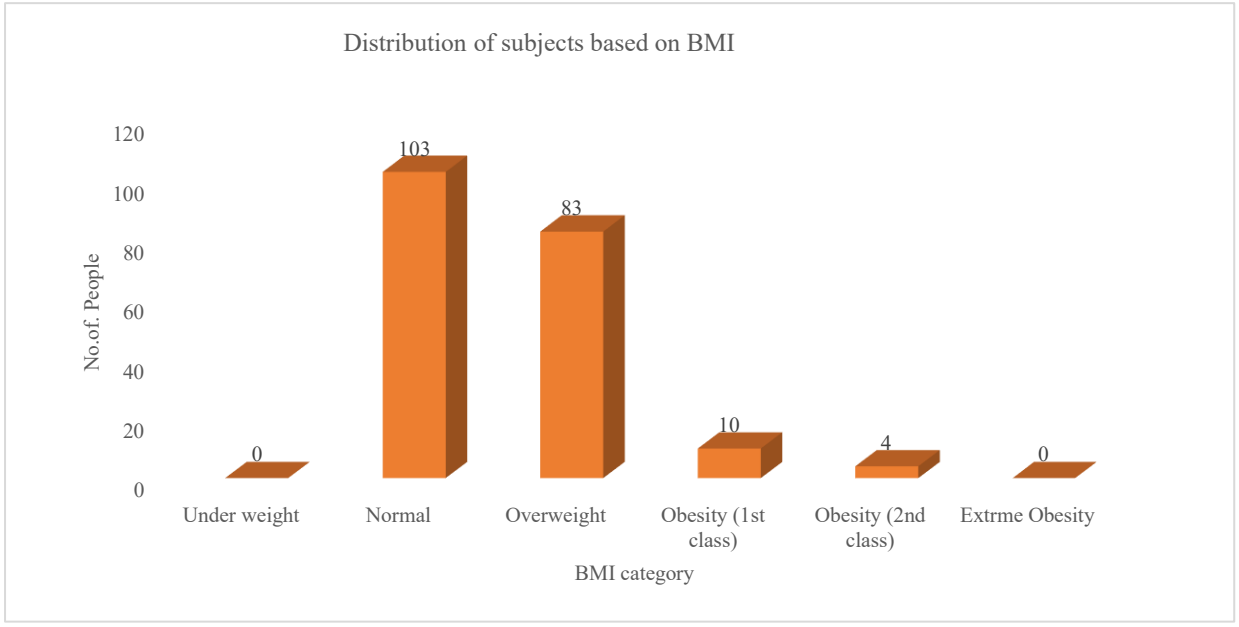


FIGURE 04: DISTRIBUTION OF SUBJECTS BASED ON EDUCATION

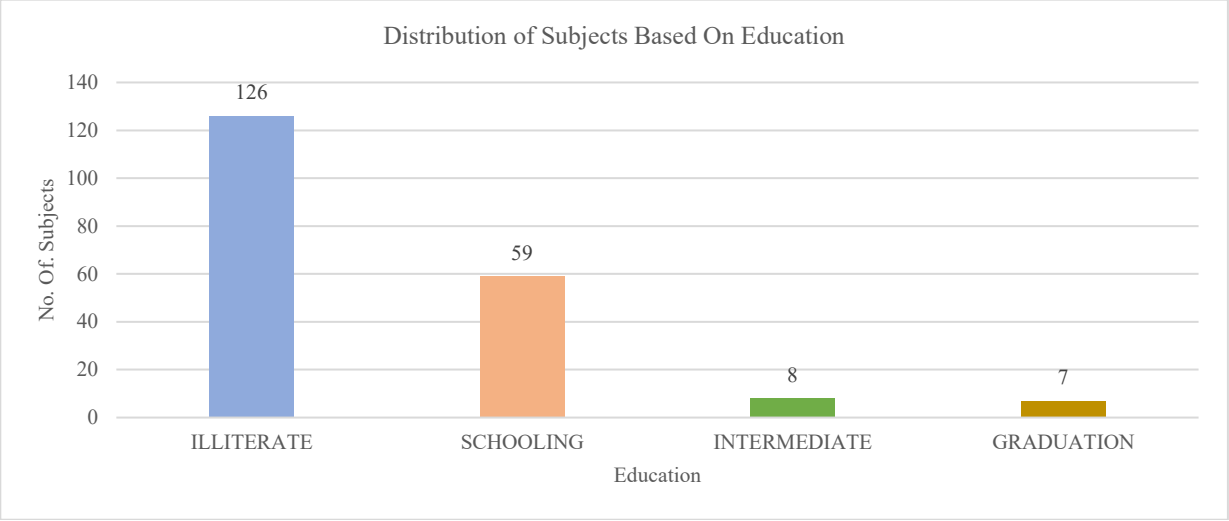
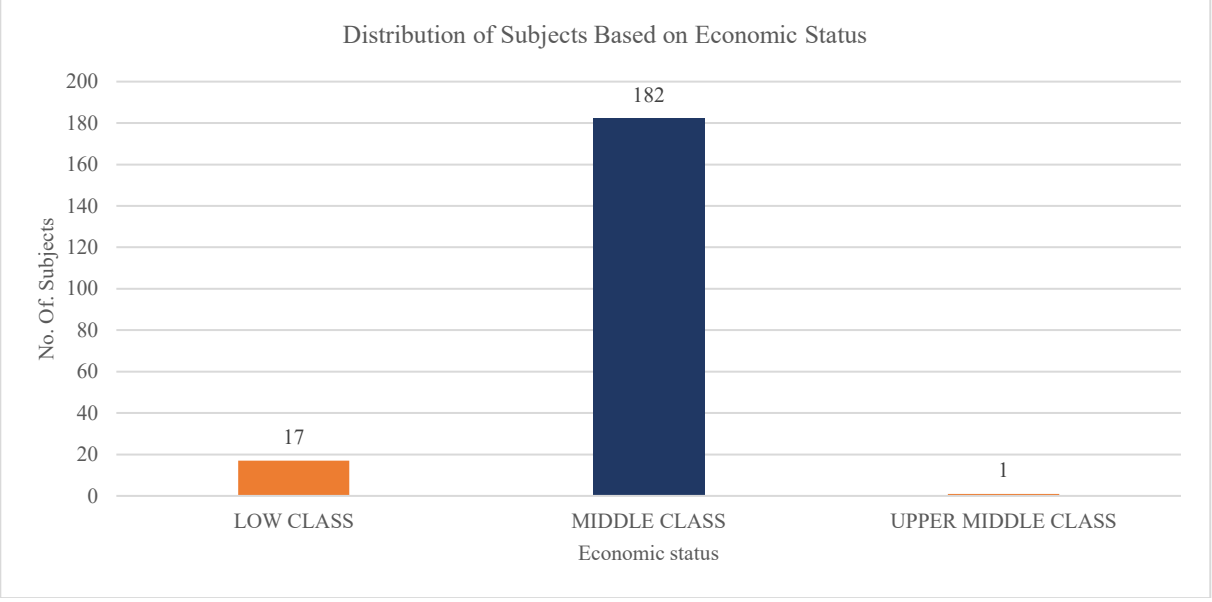


Figure 04 shows that most of the subjects fall under the illiterate group with 123 (63%), followed by 59 (29.5%) subjects under schooling, 8(4%) falls under the intermediate group, and 7(3.5%) falls under the graduation group.

FIGURE 05: DISTRIBUTION OF SUBJECTS BASED ON ECONOMIC STATUS

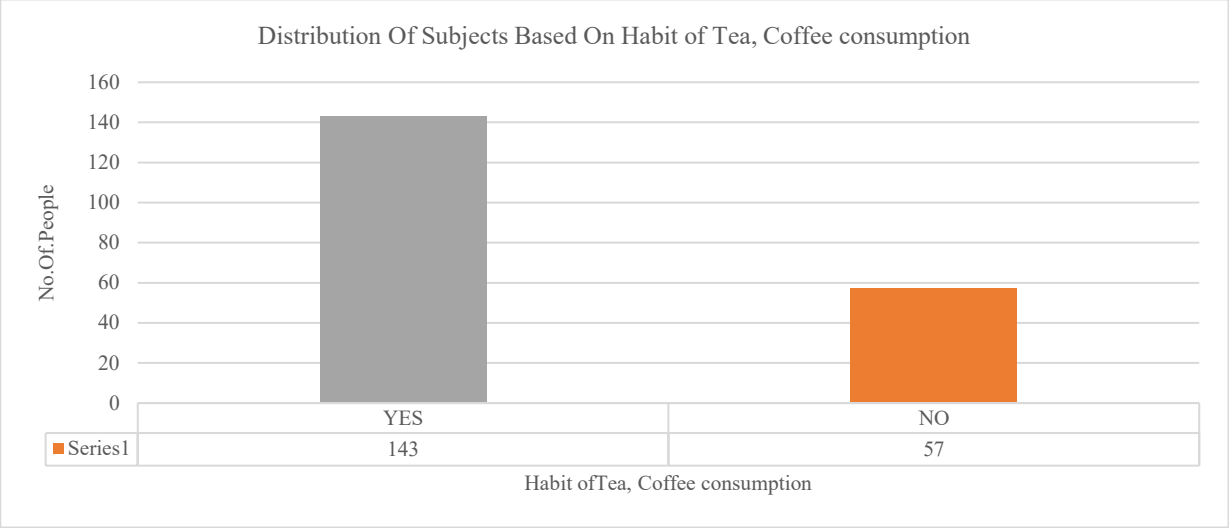


The above **figure 05** shows that most subjects fall under the middle class 182(91%) group, followed by17 (8.5%) low class group. 1(0.5%).

TABLE 04: DISTRIBUTION OF SUBJECTS BASED ON SOCIAL HABITS

S. no	Tea, Coffee	No. of Population n=200	Normal	Pre-HTN	Stage-1	Stage-2	Percentage (%)
01.	**YES**	179	56	108	15	0	89.5%
02.	**NO**	21	07	12	2	0	10.5%

FIGURE 06: DISTRIBUTION OF SUBJECTS BASED ON HABIT OF TEA, COFFEE CONSUMPTION



From **Table 04 and Figure 06** shows that most of the subjects fall under the tea consumption group 180 (90%) subjects in which normal hypertension was (56), Prehypertension was (108), and stage-1 was (15), followed by 21(10.5) under the tea non-consumption group, among which 07 are normal, 12 were pre hypertension,and 2 were stage-1 hypertension.

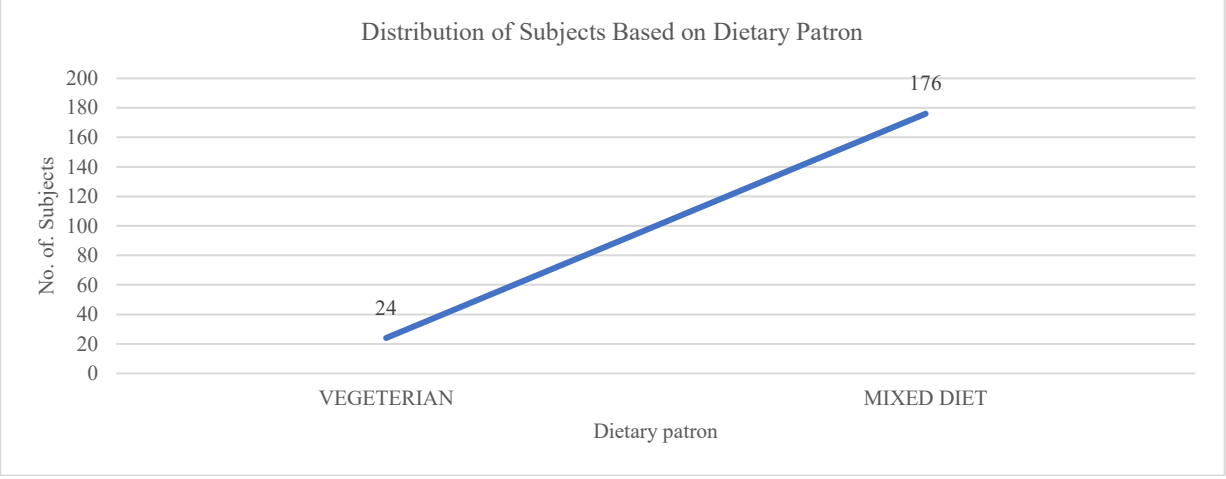


FIGURE 07: DISTRIBUTION OF SUBJECTS BASED ON DIETARY HABITS

The above **figure 07** shows that most of the subjects are on mixed diets whose number is 176 (88%) in normal (55), Prehypertension (125), and stage-1 (16) followed by 24 (12%) pure vegetarians in normal (10), prehypertension (14) and stage-1 (0). No subjects were under stage 2.

TABLE 05: DISTRIBUTION OF SUBJECTS BASED ON HISTORY OF SMOKING

S. No	Smoking groups	No. of population n=200	Normal	Pre-HTN	Stage-1	Stage-2	Percentage (%)
01.	Nonsmoker	143	47	81	15	0	71.5%
02.	Heavy smoker	05	05	02	03	0	2.5%
03.	Light smoker	20	05	12	03	0	10%
04.	Current smoker	04	01	03	0	0	2%
05.	Former smoker	28	05	22	01	0	14%

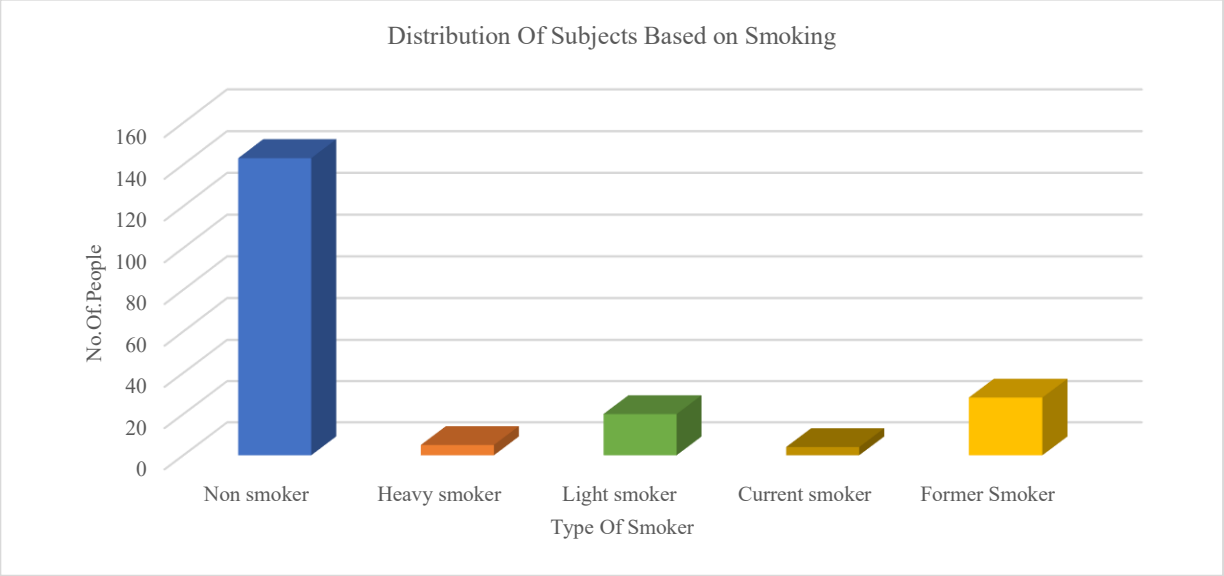


FIGURE 08: DISTRIBUTION OF SUBJECTS BASED ON HISTORY OF SMOKING

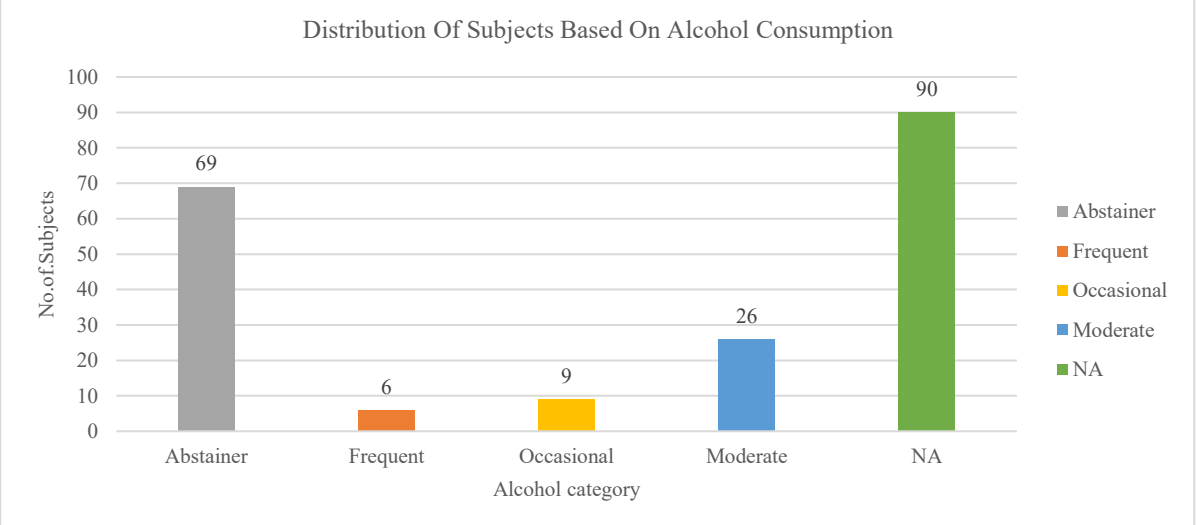
Figure 08 and **Table 05** demonstrate that most of the subjects are non-smokers 143 (71.5%) which include both men and women. This was followed by a group of former smokers with 28 subjects (14%), light smokers 20 (10%), heavy smokers 5 (2.5%), and current smokers 4 (2%) respectively. Among non-smokers, 47 subjects had normal blood pressure followed by 81 subjects with Pre-Hypertension and 15 subjects with Stage I hypertension. Out of all subjects, the non-smokers grouphad good blood pressure values and this was statistically proved by using TWO-WAY ANOVA at a significance level of <0.05. The p-value is 0.02775.

TABLE 06: DISTRIBUTION OF SUBJECTS BASED ON ALCOHOL CONSUMPTION

S. No	Alcohol category	No. of Population n=200	Normal	Pre-HTN	Stage1	Stage2	Percentage (%)
01.	Abstainer	69	21	40	8	0	34.5%
02.	Frequent	06	2	3	1	0	3%
03.	Occasional	09	1	7	1	0	4.5%
04.	Moderate	26	8	18	0	0	13%
05.	NA	90	31	51	8	0	45%

Table 06 and **Figure 09** above show that most subjects come under the not applicable group 90(45%). This group includes both females and males who are not at all an alcoholic, followed byan abstainer
group with 69 (34.5%) subjects, followed by 26 (13%) moderate group subjects, and 9(4.5%) occasional group subjects, 6 (3%) members with frequent group subjects. Among abstainer subjects, 21 subjects had normal blood pressure values, 40 subjects with prehypertension, and 8 with stage 1, followed by a frequent excessive drinking group with normal 2 subjects, prehypertension 3 subjects, and stage 1 subject, followed by occasional excessive drinkers with normal 1 subject,prehypertension 7 subjects, and stage-1 1 subject, followed by moderate drinking group with normal 8 subjects, prehypertension 18 subjects, followed by not applicable group with normal 31 subjects, prehypertension 51 subjects and stage1 8 subjects. Out of all subjects, the group with no alcohol consumption had good blood pressure values and this was statistically proved by using TWO-WAY ANOVA at a significance level of <0.05. The p-value is 0.008379.

FIGURE 09: DISTRIBUTION OF SUBJECTS BASED ON ALCOHOL CONSUMPTION



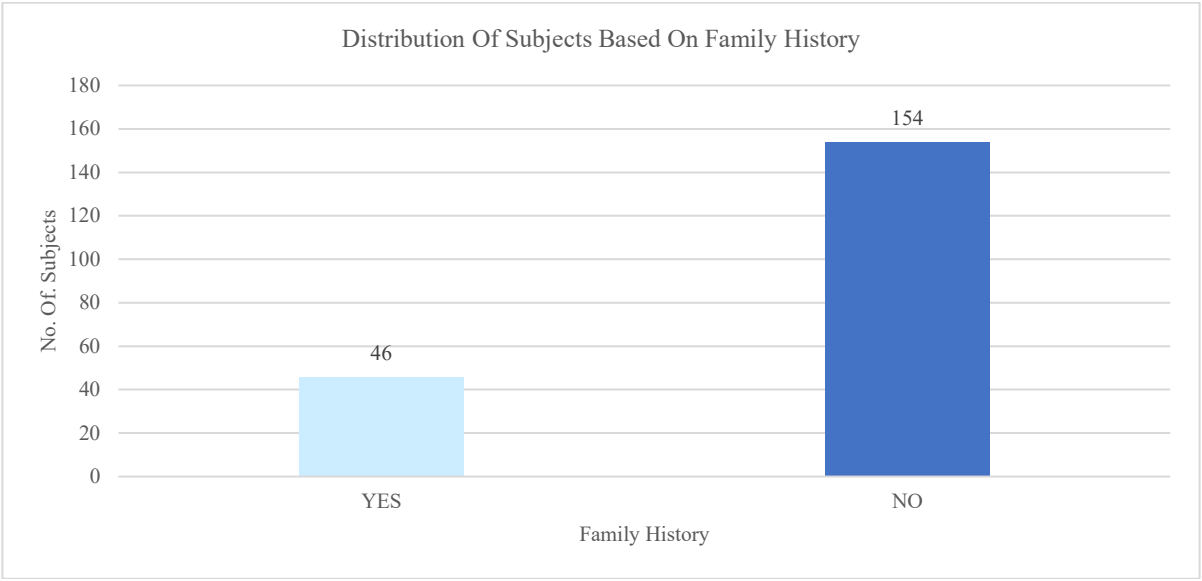


FIGURE 10: DISTRIBUTION OF SUBJECTS BASED ON FAMILY HISTORY

The above **figure 10** shows that most of the subjects (154) come under the group without a familyhistory of hypertension, followed by 46 subjects in the group with a family history of Hypertension.

TABLE 07: DISTRIBUTION OF SUBJECTS BASED ON LENGTH OF HYPERTENSION

S. No	Duration of HTN	No. of Population n=200	Normal	Pre-HTN	Stage 1	Stage 2	Percentage (%)
01.	**>1 year**	10	06	06	0	0	5%
02.	**1-5 yrs**	126	42	72	12	0	63%
03.	**6-10 yrs**	47	10	35	2	0	23.5%
04.	**11-15 yrs**	11	2	7	2	0	5.5%
05.	**16-20yrs**	3	1	1	1	0	1.5%
06.	**>25yrs**	3	1	1	1	0	1.5%

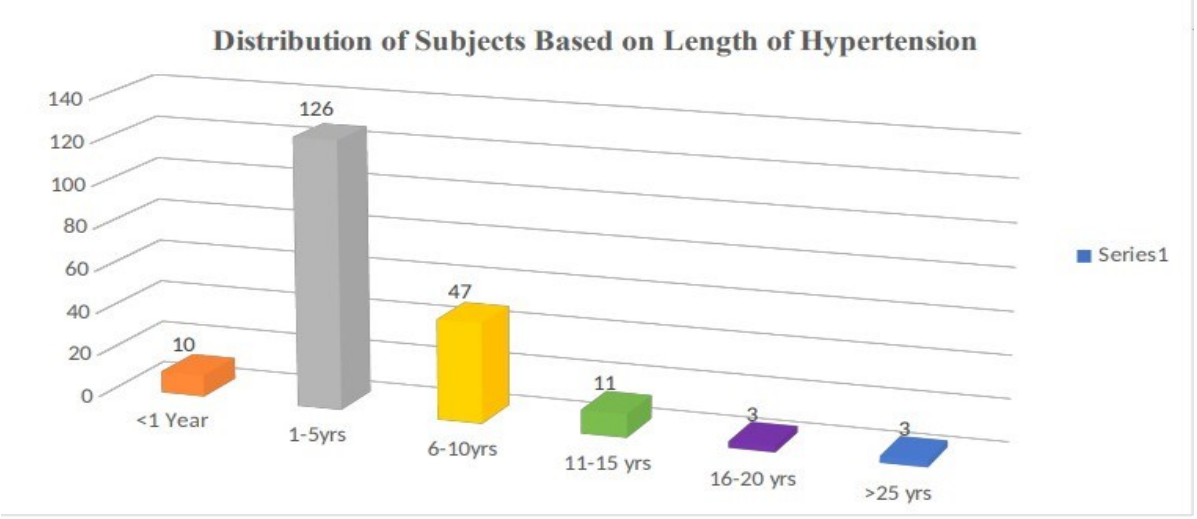


FIGURE 11: DISTRIBUTION OF SUBJECTS BASED ON DURATION OF HYPERTENSION

From **Table 07 and Figure 11** above shows that most of the subjects (131) come under 1-5yrs duration of hypertension, followed by 44 subjects in the 6-10 years duration group, 15 subjects come under >10 years duration, 10 subjects come under <1yr duration of Hypertension. 3 subjects under both 16-20 years and >25yrs duration group. Most of the subjects with a length of 1-5 years duration group had good blood pressure values and this was statistically proved by using Two-way ANOVA. The p-value is 0.2735.

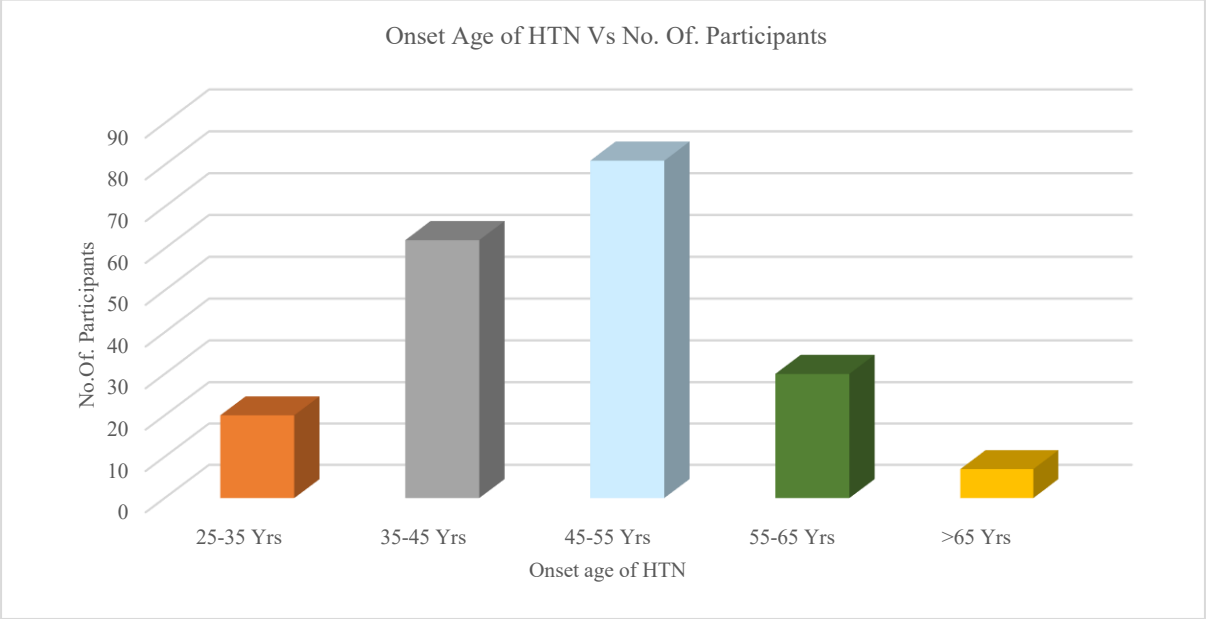


FIGURE 12: DISTRIBUTION OF SUBJECTS BASED ON ONSET AGE OF HYPERTENSION

Figure 12 shows most of the subjects 81(40.5%) were diagnosed in the age 45-55 years age group, followed by 62 (31%) subjects who were diagnosed in the age group of 35- 45 years, 30(15%) subjects diagnosed in the age group of 55-65 years, 20 (10%) subjects diagnosed in the age group of 25-35 years, 7(3.5%) subjects diagnosed in the age group of >65 years.

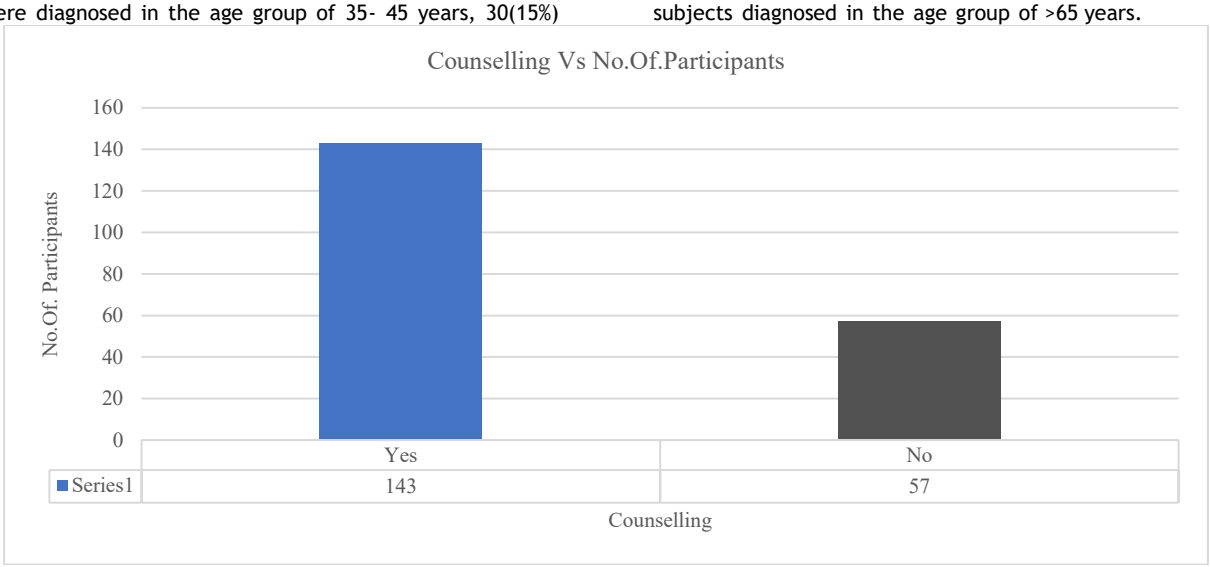


FIGURE 13: DISTRIBUTION OF SUBJECTS BASED ON COUNSELING

Figure 13 shows that 143 (71.5%) subjects were provided with patient counseling and 57 (28.5%) subjects were not provided with patient counselling

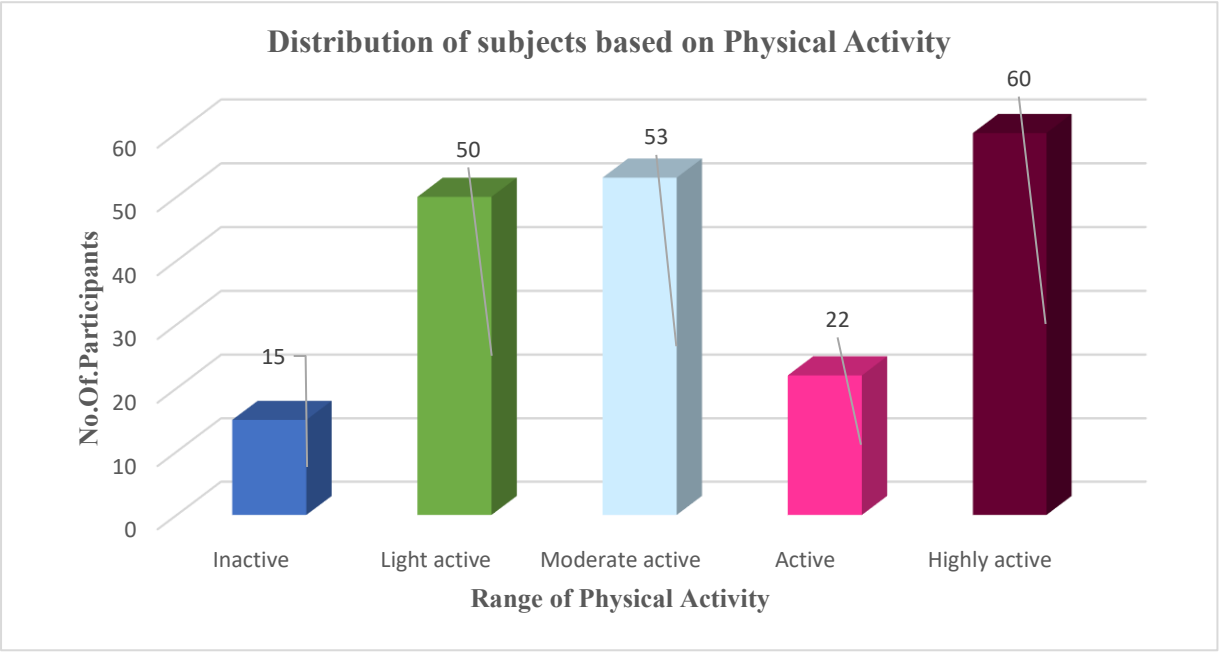


FIGURE 14: DISTRIBUTION OF SUBJECTS BASED ON PHYSICAL ACTIVITY

TABLE 08: DISTRIBUTION OF SUBJECTS BASED ON PHYSICAL ACTIVITY

S. No	Physical Activity	No. of Subjects n=200	Normal	Pre-HTN	Stage1	Stage2	Percentage(%)
01.	Inactive	15	05	08	02	0	7.5%
02.	Lightactive	50	12	11	27	0	25%
03.	Moderate active	53	25	26	02	0	26.5%
04.	Active	22	07	13	02	0	11%
05.	Highly active	60	31	29	0	0	30%

The above **Table 08** and **Figure 14** show that most of the subjects 60 (30%) fall under the group of Highly active, followed by the moderately active group with 53 (26.5%) subjects, the light active group with 50 (25%) subjects, active group with 22 (11%), and inactive group with 15 (7.5%). Among all subjects, a group with highly active had good blood pressure values and it was statistically proved by using TWO-WAY ANOVA at a significant level of 0.05. The p-value is 0.0347.

TABLE 09: DISTRIBUTION OF SUBJECTS BASED ON SALT INTAKE

S. No	Salt intake	No. of Population	Normal	Pre-HTN	Stage1	Stage2	Percentage (%)
01.	Low	36	10	23	3	0	18%
02.	Normal	121	42	65	14	0	60.5%
03.	Recommended	36	10	25	1	0	18%
04.	High	07	01	06	0	0	3.5%
05.	Very	0	0	0	0	0	0%
06.	Extremely	0	0	0	0	0	0%

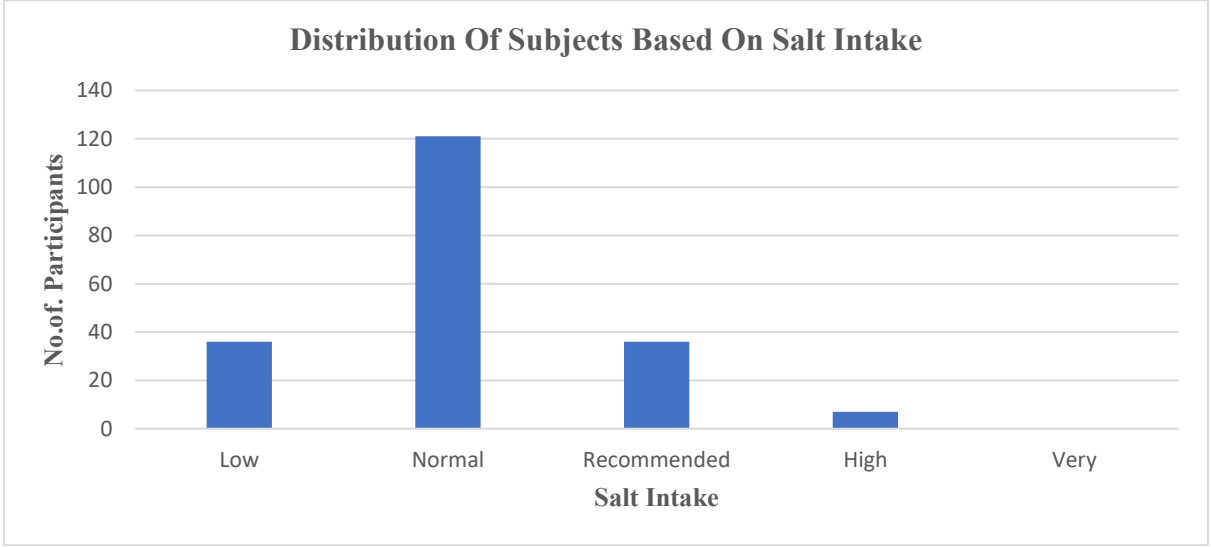


FIGURE 15: DISTRIBUTION OF SUBJECTS BASED ON SALT INTAKE

Table 09 and **Figure 15** show that most of the subjects 121(60.5%) fall under the normal salt intake group, followed by low 36 (18%) and recommended 36 (18%) subjects, and 07 (3.5%) subjects come under high intake. Out of all groups, subjects with normal salt intake had good blood pressure levels with normal (42), prehypertension (65), and stage 1 (14), and this was statistically proved by using TWO-WAY ANOVA at a significance level of <0.05. The p-value is 0.0127. No subjects were under Stage 2.

S. No	Fruits and vegetables intake	No. of Population n=200	Normal	Pre-HTN	Stage 1	Stage 2	Percentage(%)
01.	No	06	03	03	0	0	03%
02.	Occasionally	36	20	14	2	0	18%
03.	Thrice in a Week	64	40	21	3	0	32%
04.	Daily	94	47	37	10	0	47%

TABLE 10: DISTRIBUTION OF SUBJECTS BASED ON DIET

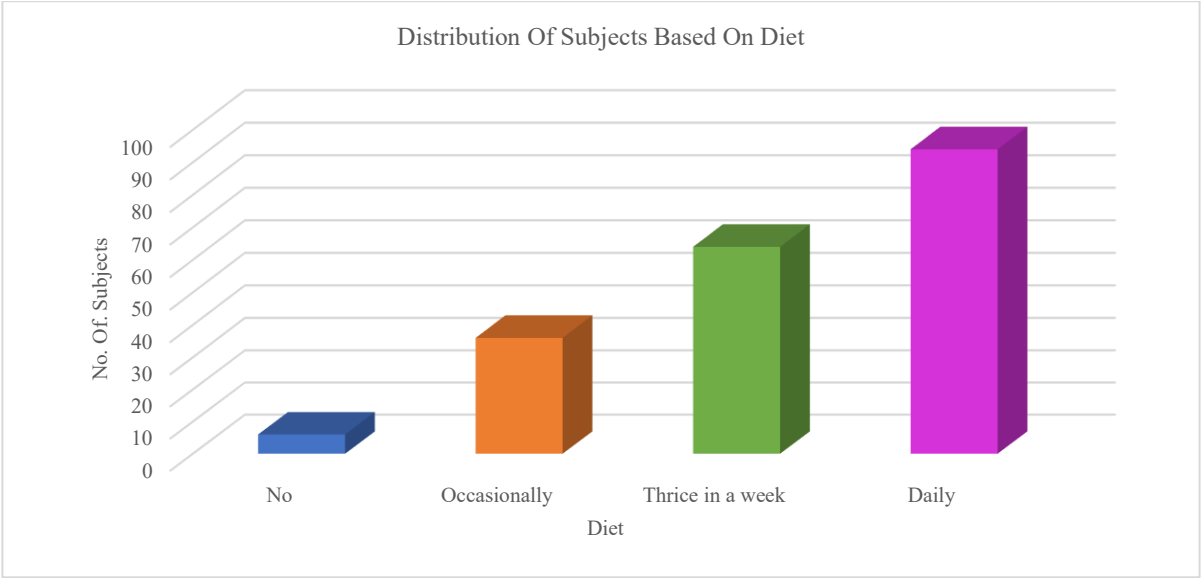


FIGURE 16: DISTRIBUTION OF SUBJECTS BASED ON DIET

Table 10 and **Figure 16** show that most of the subjects 94 (47%) come under the group who were taking fruits and leafy vegetables daily, followed by thrice in a week group with 64 (32%) subjects, occasionally group with 36 (18%) subjects, and group not following the diet with 6 (35%) subjects. Among all groups, subjects with a daily intake of fruits and vegetables had good blood pressure values with normal (47), prehypertension (37), and stage- 1(10), and this was statistically analyzed by using TWO-WAY ANOVA at a significance level of <0.05. The p-value is 0.007984. No subjects under stage-2 hypertension.

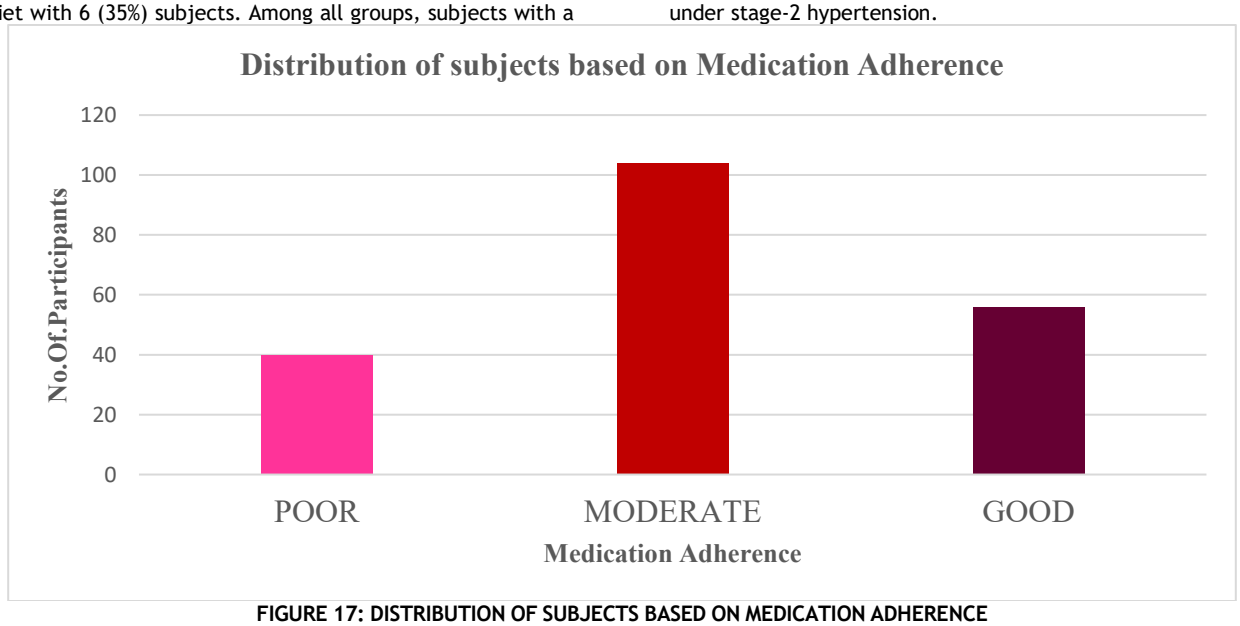


FIGURE 17: DISTRIBUTION OF SUBJECTS BASED ON MEDICATION ADHERENCE

Figure 17 shows that most of the subjects 104 (52%) come under the moderate medication adherence group, followed by 56 (28%) subjects in the good medication adherence group, and 40(20%) subjects in the poor medication adherence group.

TABLE 11: DISTRIBUTION OF SUBJECTS BASED ON HYPERTENSION DURINGFOLLOW-UP

S. No	Stage	No. of Population	1st month	2nd month	3rd month	4th month	5th month
01.	Normal	107	01	02	11	23	70
02.	Prehypertension	434	30	55	99	138	112

03.	Stage-1	410	139	127	87	39	18
04.	Stage-2	49	30	16	03	0	0

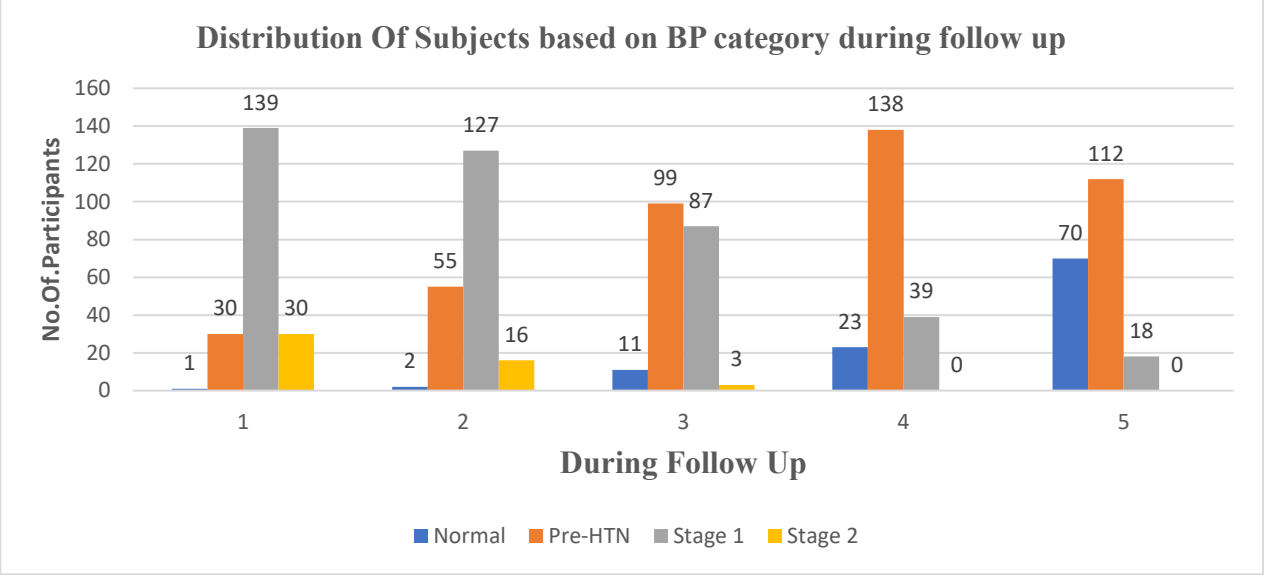


FIGURE 18: DISTRIBUTION OF SUBJECTS BASED ON BP CATEGORY DURING FOLLOW-UP

The above **Table 11** and **Figure 18 above** show that the blood pressure values are improved after patient counseling with a strict diet, medication adherence, and lifestyle modifications. This was statistically analyzed and proved by using TWO-WAY ANOVA at a significant p-value <0.05 and the p-value is 0.0298.

DISCUSSION:

Several factors are responsible for the increase in blood pressure, multiple mechanisms cumulatively result in hypertension. The condition may not be cured but can be managed effectively with both pharmacological and non-pharmacological management; hence, clinical pharmacists play a pivotal role in effectively managing the disease. Along with using mono or combination antihypertensive therapy, non-pharmacological approaches also help in reducing high blood pressure.

Our study focused on the non-pharmacological approach to manage high blood pressure. This is a cohort investigation that was carried out with the title **"Hypertension Care Assessment- Unveiling effect of Medication Adherence, Lifestyle Modifications, and Diet"**. 200 subjects met the inclusion criteria and were included in the study. The data obtained was calculated, tabulated, and analyzed.

According to our study, most subjects aged 51-60 were diagnosed with high blood pressure (n=200, 32% in Figure 08). The mean age of the patients was 48.24 years. A great India blood pressure survey by Sivasubramanian Ramakrishna et al, in 2019 reported [18] a mean age of 40.6 ± 14.9 years. The present study includes the majority of males (n=106, 53%) followed by females (n=94, 47%). Raza Mohammad et al in a study reported the overall prevalence of hypertension in India was higher in men (24.1%) than women (21.2%) [19]. In this study, the subjects have been grouped based on Body Mass Index (BMI) < 18.5kg/m^2 to >40.0 kg/m^2. The mean BMI of the patients was 25 ± 4.62 kg/m^2. The majority of subjects with a normal BMI range of 18.5-24.9 kg/m^2 (n=103, 51.5% from Figure 10).

A study from the University of Ghana **the Role of Lifestyle Factors in Controlling Blood Pressure among Hypertensive Patients in Two Health Facilities in Urban Ghana: A Cross-Sectional Study** concludes that among patients diagnosed and on antihypertensive medication, increased physical activity, abstaining from alcohol and smoking, increased intake of fruits and vegetables, and reduced intake of carbohydrates, meat, and fat have a positive influence on blood pressure control [20].

Physical activity is one more factor that helps in the regulation of high blood pressure. A study from the University of Ghana stated that individuals who exercised for up to an hour each week had almost five times the odds of having their blood pressure under control than individuals who did not exercise at all. In our study subjects with high physical activity had good blood pressure values (n=60 30% Figure 22, Normal hypertension- 32, pre-HTN- 39, Table 11). This was statistically analyzed and proved by using Two-way ANOVA. The p-value is 0.0347 [21].

Effect of dose and duration of reduction in dietary sodium on blood pressure levels: systematic review and meta-analysis of a Srandomized trial by Liping Huang et al in 2020 showed that systolic blood pressure decreases significantly with a reduction in sodium intake in adults, both males and females, all ethnic groupings, and both hypertensive and normotensive populations. Our study showed that subjects with normal salt intake (<2.5) had good blood pressure values (n=121, 60.5% figure 23, normal hypertension -42, pre-HTN-65, stage-1 HTN-14, stage-2 HTN-0), followed by low intake (<0.25) group subjects (n=36, 18% figure 23, normal hypertension-1o. pre-HTN-23, stage-1-03, stage 2-0 table 12), recommended intake (<5) subjects (n= 36, 18% figure 23, normal hypertension -10, pre-HTN- 25, stage-1-1, stage-2 0, Table 11). This was statistically analyzed by using Two-way ANOVA at a level of significance <0.05. The p-value is 0.0127 [22].

Dietary Patterns and Blood Pressure in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials by Rhod N Ndanuko et al concluded that Significant drops in blood pressure were observed when individuals followed dietary patterns that were high in fruits, vegetables, whole grains, legumes, seeds, nuts, fish, and dairy products and low in meat, sweets, and alcohol. Our present study revealed that daily intake of fruits and vegetables has potential effects on reducing blood pressure levels. Group with a daily intake of fruits and vegetables 94 (47%) in which normal hypertensives were (47), prehypertension (37), and stage-1 (10) had good blood pressure values. This was statistically analyzed by using Two-way ANOVA at a significance level of <0.05. The p-value is 0.007984 [23].

Medication adherence plays an important role in the effective management of high blood pressure. Regular administration of prescribed antihypertensive therapy would help in the control of high blood pressure. Our present study revealed that subjects with good (4) and moderate (2 or 3) medication adherence according to the Morisky Medication Adherence Scale (MMAS-4) had better blood pressure values than subjects with poor medication adherence (0-1).

CONCLUSION:

Based on the results obtained, our cohort study concludes that 51-60 years age group subjects are more likely to get diagnosed with hypertension and the disease can occur in both males and females. Effective management of the disease requires both pharmacological and non-pharmacological management. Along with antihypertensive therapy; strict diet control, weight

reduction, ideal BMI, regular physical activity, and good medication adherence can effectively control the blood pressure. Our study mainly focused on non-pharmacological management of the disease. Subjects with ideal BMI had shown a better reduction in high blood pressure. The goal BP value can vary with age groups, special populations, and comorbid conditions. In our investigation, the BP Values lie within the range of normal to prehypertension according to JNC-8 guidelines. The majority of the subjects in our study are middle-aged adults and their BP values lie within the normal range of prehypertension with strict follow-up of non-pharmacological management. Our study aims to prioritize the role of the clinical pharmacist in the effective management of Hypertension through patient counseling and patient education about the disease, medication use, lifestyle, dietary changes, and salt restriction. With this, we conclude that regular physical activity, good medication adherence, dietary (DASH), and salt restrictions can effectively contribute to the management of Hypertension (HTN).

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Conflict of Interest

None

References

- WHO. *Global non-communicable diseases target: reduce high blood pressure*. Geneva, Switzerland: World Health Organization, 2016.
- K. N. Karmali and D. M. Lloyd-Jones, "*Global risk assessment to guide blood pressure management in cardiovascular disease prevention*," *Hypertension*, vol. 69, no. 3, pp. e2–e9, 2017.
- Institute for Health Metrics and Evaluation (IHME), *Findings from the Global Burden of Disease Study 2017*, IHME, Seattle, WA, USA, 2017.
- Bromfield S, Muntner P. *High blood pressure: the leading global burden of disease risk factor and the need for worldwide prevention programs*. Curr Hypertens Rep. 2013; 15:134–136.
- Kim CY, Lee KS, Khang YH, Yim J, Choi YJ, Lee HK, et al. *Health behaviors related to hypertension in the rural population of Korea*. Korean J Prev Med 2000; 33:56-68.
- Flynn JT, Kaelber DC, Baker-Smith CM, et al. *Clinical practice guideline for screening and management of high blood pressure in children and adolescents*. *Pediatrics*. 2017; 140(3):e20171904.
- Petersen L, Schnohr P, Sørensen T. *Longitudinal study of the long-term relation between physical activity and obesity in adults*. *Int J Obes*. 2004;28(1):105-112.
- Farmer C, Goldsmith D, Cox J, Dallyn P, Kingswood J, Sharp stone P. *An investigation of the effect of advancing uremia, renal replacement therapy, and renal transplantation on blood pressure diurnal variability*. *Nephrol Dial Transplant*.1997;12(11):2301-2307.
- Sun X, Feng Z, Zhang P, Shen X, Wei L, Tian M. *Association between the time of pay-for-performance for patients and community health services used by chronic patients*. *PLoS One*. 2014;9(2): e89793.
- Tang S, Bishwajit G, Ji L, et al. *Improving the blood pressure control with the proactive attitude of hypertensive patients seeking follow-up services: evidence from China*. *Med*. 2016;95(14): e3233.
- Ong KL, Cheung BM, Man YB, Lau CP, Lam KS. *Prevalence, awareness, treatment, and control of hypertension among United States adults 1999–2004*. *Hypertension*. 2007;49(1):69-75.
- Balkrishnan R. *The importance of medication adherence in improving chronic-disease-related outcomes: what we know and what we need to further know*. *Med Care*. 2005; 43(6):517-520.
- Tuttolomondo A, Simonetta I, Daidone M, et al. *Metabolic and vascular effect of the Mediterranean diet*. Int J Mol Sci. 2019; 20: 4716.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/ AGS/APhA/ASH/ASPC/NMA/PCNA *Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines*. Hypertension. 2018; 71: 1269-1324.
- Ding M, Bhupathiraju SN, Satija A, et al. *Long-term coffee consumption and risk of cardiovascular disease: a systematic review and a dose-response meta-analysis of prospective cohort studies*. Circulation. 2014; 129: 643-659.
- Li G, Zhang Y, Thabane L, et al. *Effect of green tea supplementation on blood pressure among overweight and obese adults: a systematic review and meta-analysis*. J Hypertens. 2015; 33: 243-254.
- Trilling JS, Froom J. An urgent need to improve hypertension care. Arch Fam Med 2000; 9:794-801.
- Ramakrishnan S, Gupta K. *Prevalence of hypertension among Indian adults: Results from the great India blood pressure survey*. Indian Heart J. 2020 May-Jun;72(3):217. doi: 10.1016/j.ihj.2020.04.013. Epub 2020 May 12. PMID: 32768029; PMCID: PMC7411092.
- Raza Mohammad, Dhananjay W. Bansod. *Hypertension in India: A Gender-based Study of Prevalence and Associated Risk Factors*, 29 April 2024, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-4303137/v1]
- Modey Amoah E, Esinam Okai D, Manu A, Laar A, Akamah J, Torpey K. *The Role of Lifestyle Factors in Controlling Blood Pressure among Hypertensive Patients in Two Health Facilities in Urban Ghana: A Cross-Sectional Study*. Int J Hypertens. 2020 Sep 7; 2020:9379128. doi: 10.1155/2020/9379128. PMID: 33005451; PMCID: PMC7508215.
- Modey Amoah, Emefa, Esinam Okai, Darlene, Manu, Adom, Laar, Amos, Akamah, Joseph, Torpey, Kwasi, *The Role of Lifestyle Factors in Controlling Blood Pressure among Hypertensive Patients in Two Health Facilities in Urban Ghana: A Cross-Sectional Study*, International Journal of Hypertension, 2020, 9379128, 8 pages, 2020. https://doi.org/10.1155/2020/9379128.
- Huang L, Trieu K, Yoshimura S, Neal B, Woodward M, Campbell NRC, Li Q, Lackland DT, Leung AA, Anderson CAM, MacGregor GA, He FJ. *Effect of dose and duration of reduction in dietary sodium on blood pressure levels: systematic review and meta-analysis of randomized trials*. BMJ. 2020 Feb 24;368:m315. doi: 10.1136/bmj.m315. PMID: 32094151; PMCID: PMC7190039.
- Ndanuko RN, Tapsell LC, Charlton KE, Neale EP, Batterham MJ. *Dietary Patterns and Blood Pressure in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials*. Adv Nutr. 2016 Jan 15;7(1):76-89. doi: 10.3945/an.115.009753. PMID: 26773016; PMCID: PMC4717885.