A STUDY ON PRE-HYPERTENSION AND HYPERTENSION IN A RURAL AREA OF KANYAKUMARI DISTRICT

Dissertation

Submitted to

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

In partial fulfillment of the requirements for the award of the degree of

M.D. COMMUNITY MEDICINE

Branch XV

April 2016

CERTIFICATE

This is to certify that this dissertation entitled "**A STUDY ON PRE-HYPERTENSION AND HYPERTENSION IN A RURAL AREA OF KANYAKUMARI DISTRICT"** is a bonafide work done by **Dr. Krishna Prasad.C** during the period 2013-2016. This has been submitted in partial fulfillment of the award of M.D. Degree in Community Medicine Branch – XV by the Tamilnadu Dr. MGR Medical University Chennai.

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CONTENTS

A STUDY ON PRE-HYPERTENSION AND HYPERTENSION IN A RURAL AREA OF KANYAKUMARI DISTRICT

ABSTRACT

Background: The percentage of people affected by non-communicable diseases (NCDs) is increasing among adults in both high income and developing countries. Hypertension has been shown to be continuously and positively related to the risk of diseases in heart. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries **Aims &Objectives**: To find out the prevalence of pre-hypertension and hypertension among persons>18 yrs of age. and to find out factors associated with pre-hypertension and hypertension. **SUBJECTS & METHODS:** It is a cross sectional study where 435 persons of both sexes above 18 years of age were included. The study involved administration of pretested questionnaire, measurements of blood pressure ,measurements of anthropometry **. Results**: The Prevalence of Pre hypertension and hypertension was 32.4% and 24.1% . The factors which were significantly associated with Prehypertnsion and Hypertension are age, family history of hypertension, Inadequate physical activity, excess salt intake, tobacco smoking, alcoholism, BMI > 25kg//m2 and less consumption of fruits and vegetables. **Conclusion:** Prehypertension and hypertension are associated with inadequate physical activity and who are consuming excess salt intake.

Key words Prehypertension , Hypertension , BMI, Physical activity ,

1. INTRODUCTION:

The percentage of people affected by non-communicable diseases (NCDs) is increasing among adults in both high income and developing countries[1]. According to the world health statistics report 2015, analysis of the worldwide mortality data of the year 2012, of the 56 million deaths in that year, 38 million (68%) were due to non communicable diseases. The case load due to these diseases is increasing unequally in developing and underdeveloped countries. Out of the 38 million non communicable disease deaths of the year 2012 nearly 75% i.e. 28 million occurred in developing and underdeveloped countries. Most of these deaths occurred before 70 years of age in these countries.

Cardiovascular diseases causes most of the deaths(46%) due to non communicable diseases[2].Hypertension is a major risk factor for coronary heart disease, ischemic as well as hemorrhagic stroke. Hypertension has been shown to be continuously and positively related to the risk of diseases in heart. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries.[3] Analysis of worldwide data showed that in the year 2010, 9.4 million deaths and 3.7% of total DALYS were due to hypertension.[4]

The seventh report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of high blood pressure (JNC-7) defines hypertension as blood pressure ≥ 140/90mm Hg. Persons with blood pressure above optimal levels, but not clinical hypertension (systolic blood pressure of 120-139 mm Hg

or diastolic blood pressure of 80-89 mm Hg) are designated as having "pre-hypertension" .Pre-hypertension is not a disease category, it is a designation chosen to identify people with increased risk of developing hypertension. It alerts both patients and doctors to the risk of developing hypertension and motivates them to prevent hypertension from developing. Hypertension was diagnosed as per US Seventh Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC VII) criteria.[5]

The prevalence of hypertension is on a rise in India, both in urban and rural areas.[6] Review of epidemiological studies in India shows that the percentage of people affected by hypertension in the last 60years has increased from 2% to 25% among people living in urban areas and from 2% to 15% among people living in rural areas of India. Studies show that deaths due to cardiovascular disease are highly variable in various regions of India. Compared to Northern states it is higher among southern states. In India, hypertension awareness, treatment and control status is low, with about 50% of urban and 25% of rural hypertensive patients only are aware of its presence in India.[3] Essential hypertension, which is a grossly underestimated condition in rural communities is likely to be an important public health problem. As many interventional programmes for controlling high blood pressure were implemented the mean blood pressure has decreased in many developed countries.

My study will help to improve awareness about hypertension, its risk and control. My study details will help authorities to plan and implement

interventional programmes aimed at reducing the burden of hypertension and its complications in the study area.

2. AIMS AND OBJECTIVES

i) To find out the prevalence of pre-hypertension and hypertension among persons>18 yrs of age.

ii) To find out factors associated with pre-hypertension and hypertension.

3. REVIEW OF LITERATURE

3.1 Overview

The percentage of people affected by non-communicable diseases (NCDs) is increasing among adults in both high income and developing countries. NCDs are causing more mortality worldwide each year than all other causes togrther[1]. Non-communicable diseases (NCDs) include cardiovascular, renal, chronic non-specific respiratory diseases, cancer, obesity and diabetes[7]. Greater numbers of people living in old ages as a result of increasing life expectancy are at increased risk of chronic diseases of various kinds. Rapidly changing lifestyles and behavioral pattern of people is favorable for the onset of chronic diseases[8].

According to the world health statistics report 2015, analysis of the worldwide mortality data of the year 2012, of the 56 million deaths in that year, 38 million (68%) were due to non communicable diseases. The case load due to these diseases is increasing unequally in developing and underdeveloped countries. Out of the 38 million non communicable disease deaths of the year 2012 nearly 75% i.e. 28 million occurred in developing and underdeveloped countries. Most of these deaths occurred before 70 years of age in these countries[9].

Common risk factors for MCDs are tobacco use, unhealthy diet, hypertension, physical inactivity and obesity. The deaths and morbidity due to NCDs will reduce considerably by adapting policies and implementing programmes focused on reducing the load of these risk factors[10].

Figure:1 Deaths due to Non-communicable diseases worldwide,2012[11]

Deaths due to noncommunicable diseases: age-standardized death rate (per 100 000 population)
Both sexes, 2012

Death rate (per 100 000 pop)

- ≤400
- 401–500
- 501–600
- 601–700
- 701–800
- 801–900
- >900
- Data not available
- Not applicable

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Data Source: World Health Organization
Map Production: Health Statistics and
Information Systems (HSI)
World Health Organization

0   850   1 700   3 400 Kilometers

**World Health
Organization**

Figure:2 Deaths due to cardiovascular diseases worldwide,both sexes,2012[11]

Cardiovascular diseases mortality:
Age-standardized death rate per 100 000 population, both sexes, 2012

Death rate (per 100 000 population)
≤200
201–300
301–400
401–500
>500
Data not available
Not applicable

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3.2 HYPERTENSION

Systemic arterial hypertension is defined as a state of chronically elevated arterial blood pressure, as compared to what is normally expected.

Blood vessels carry blood from heart to every corner of body. With each heart beat, blood is pumped into the vessels and this exerts a force on the walls of the vessels. This creates blood pressure.

When the blood pressure is persistently high or raised it is known as hypertension.

As pressure in the arteries increases the heart has to work harder to overcome the pressure to pump out the blood. When hypertension is uncontrolled it can ultimately result in heart failure. Continuous pressure on the vessels can lead to weakening of the walls leading to rupture or aneurysm. Leaking of blood into brain due to increased pressure can lead to stroke. Hypertension may also lead to blindness, renal failure etc

Blood pressure is represented by two numbers; systolic the highest value and diastolic the lowest value and is measured in millimeters of mercury (mm Hg). The systolic blood pressure is peak pressure in blood vessels during systole. Diastolic pressure refers to the lowest pressure during diastole.

Systolic pressure of 120 mmHg and diastolic pressure of 80 mmHg is considered to be normal adult BP. However, the cardiovascular benefits of normal blood pressure extend to lower systolic (105 mm Hg) and lower diastolic blood

pressure levels (60 mm Hg). Blood pressure in normal levels is important for the proper functioning of vital organs and for overall health and wellbeing[12].

The definition of hypertension that is being followed worldwide is the one given by World Health Organization (**WHO**) and the VII report of the joint National committee on Prevention, Detection, Evaluation and Treatment of high blood pressure (**JNC-VII**) which defines hypertension as systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥ 90 mmHg.

Table 1 : Classification of blood pressure for adults (JNC VII) criteria

BLOOD PRESSURE CLASSIFICATION	SBP MMHG	DBP MMHG
NORMAL	<120	and <80
PREHYPERTENSION	120–139	or 80–89
STAGE 1 HYPERTENSION	140–159	or 90–99
STAGE 2 HYPERTENSION	≥160	or ≥100

SBP, systolic blood pressure; DBP, diastolic blood pressure

3.2.1 Pre-Hypertension

Pre- hypertension is defined as blood pressure more than normal levels, but below the levels of clinical hypertension i.e systolic blood pressure of 120-139 mm hg or diastolic blood pressure of 80-89 mm hg.

The term pre-hypertension is used to identify people at a high risk of developing hypertension. It alerts both patients and doctors to the risk of developing hypertension and motivates them to prevent hypertension from developing.

Compared with normotensive people with BP less than 120/80 mm Hg people with prehypertension have two times increased risk of deaths due to stroke and coronary heart disease [13].

Moreover, prehypertensives in their lives later lives have increased risk of developing hypertension and CVD. Within 4 years of diagnosis if life style changes are not made pre hypertensives have two times increased risk of developing hypertension[14].

3.2.2 Symptoms of Hypertension

Most hypertensives are asymptomatic. Occasionally hypertensives develop symptoms like dyspnoea, dizziness, headache, palpitations of the heart , chest pain and epistaxis. Although they are non specific to hypertension , these symptoms cannot be ignored.

3.2.3 Classification[15]

There are 3 different modes and classification of hypertension

3.2.3.1 According to blood pressure: This classification depends on blood pressure readings as described in Figure - 1.

3.2.3.2 According to identifiable cause:

It can be classified as primary and secondary hypertension depending on whether cause is known or not. When the causes are unknown is classified as "essential". 90% of all cases of hypertension are essential hypertension. When some other disease process is involved in the causation of hypertension it is known as secondary hypertension.

1. Essential Hypertension (>90%)

2. Secondary Hypertension

- ❖ Obesity

- ❖ Alcohol

- ❖ Renal disease

- Renal vascular disease

- Parenchymal renal disease, particularly glomerulonephritis

- Polycystic kidney disease

- ❖ Pregnancy(Pre-eclampsia)

- ❖ Drugs

- Oral contraceptives containing oestrogens

- Anabolic steroids

- ❖ Endocrine disorders

- Cushing's syndrome

- Hyperparathyroidism

- Phaeochromocytoma

- Acromegaly

- Thyrotoxicosis

- Primary hypothyroidism

- Primary hyperaldosteronism (Conn's syndrome)

- Liddle's syndrome

- 11-β-hydroxysteroid dehydrogenase deficiency

- Congenital adrenal hyperplasia due to 11-β-hydroxylase or 17-hydroxylase deficiency

3.2.3.3 According to the extent of target organ damage: Increased blood pressure can cause damage to various organs

- Heart : IHD, LVH, Heart Failure

- Brain : Stroke, TIC

- Chronic kidney disease

- Peripheral arterial disease

- Retinopathy

3.3 Magnitude of problem worldwide

One billion people in the whole world are affected by hypertension which has many risk factors. It is one of the most common, and controlable risk factor for myocardial infarction, heart failure,peripheral arterial disease and stroke,[16]. 54% of stroke and 47% of ischemic heart disease in the whole world is caused by

hypertension[17]. Hypertension is the leading cause of mortality in the whole world. Hypertension is one of the world's great public health problems[16].

Estimates show that more than 25% of the world's adult population had hypertension in the year 2000, and it would increase to 29% by the year 2025[18].Hypertension is the bio medical risk factor responsible for more mortality in the whole world[19].

A systematic review revealed that hypertension prevalence varied across the world with lowest value in India (6.8% among women and 3.4% among men) and the highest prevalence in Poland 72.5% among women and 68.9% among men [20].

Study done in Iran by Rahamanian et al found that the prevalence of pre-hypertension 33.7% and 35.4% respectively. Obesity/ overweight was most significantly associated with pre-hypertension[21].

A study done among college students by Al-Majed H et al (2009-2010) it found that the prevalence of pre-hypertension and hypertension to be 7%and 39.5% respectively[22].

Ferguson T et-al showed that prevalence of pre hypertension was 30% among Jamaicans [23].

Figure:3 Mean systolic blood pressure among females worldwide[11]

Mean systolic blood pressure (mm Hg), ages 18+, 2014 (aged standardized estimate)
Female

Mean systolic blood pressure (mm Hg)

- <120.0
- 120.0–124.9
- 125.0–129.9
- ≥130.0
- Data not available
- Not applicable

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Data Source: World Health Organization
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Figure:4 Mean systolic blood pressure among males worldwide [11]
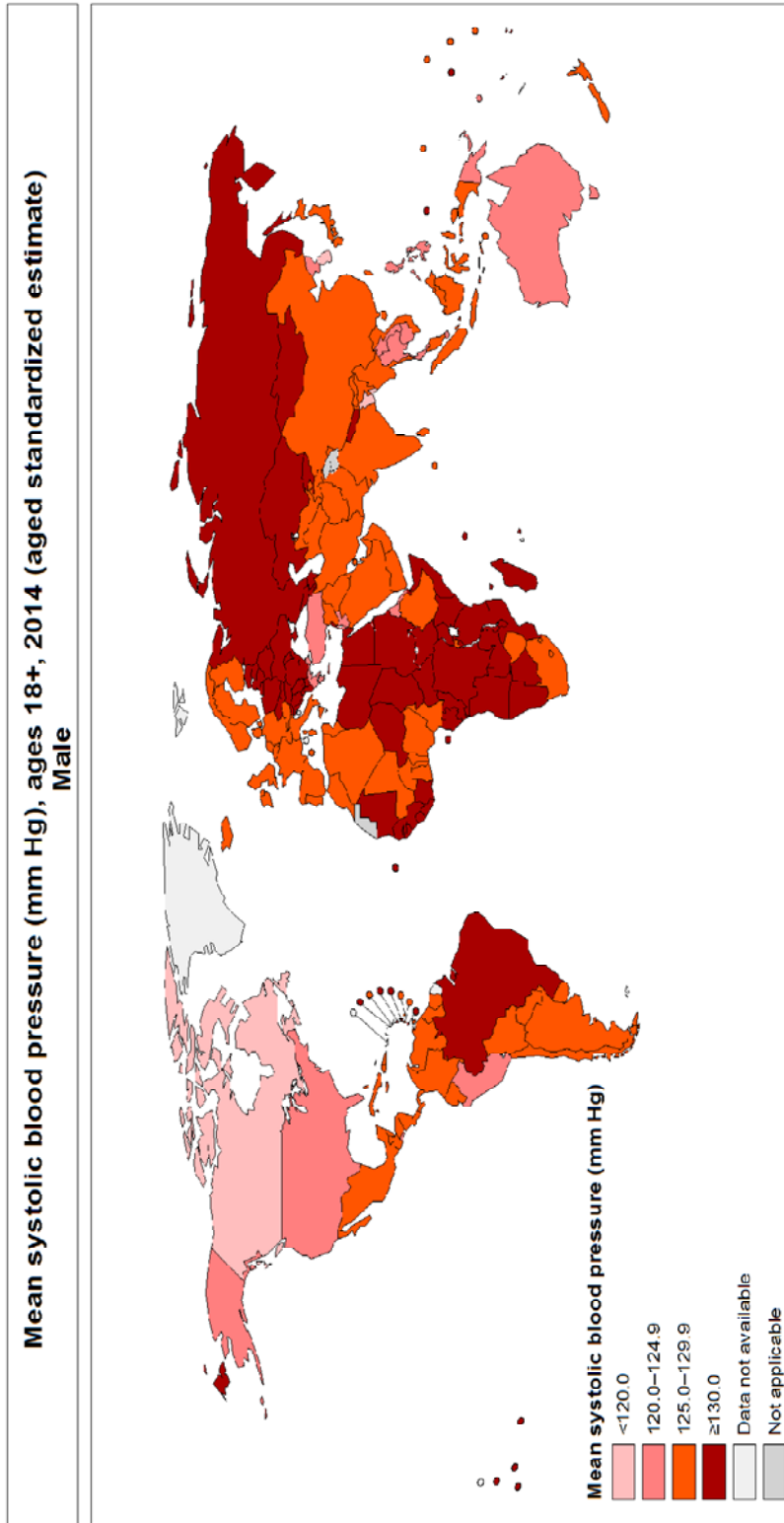
Mean systolic blood pressure (mm Hg), ages 18+, 2014 (aged standardized estimate)
Male

Mean systolic blood pressure (mm Hg)

- <120.0
- 120.0–124.9
- 125.0–129.9
- ≥130.0
- Data not available
- Not applicable

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3.4 INDIAN SCENARIO

Over the past decades, NCDs are contributing to increasingly higher mortality and morbidity in India [24]. In India the most common risk factor associated with non-communicable diseases (NCDs) is hypertension. Estimates show that hypertension attributable for nearly 10% of all mortality[25]. In India 24 % of all coronary artery disease and 57% of stroke mortality is caused by hypertension[26].

Meta analysis of various studies shows that it also contributes a fast growing epidemic of hypertension across India both in rural and urban populations[27].

World health statistics report 2015, shows that 25.9% males and 24.8% females in India have hypertension[28].

A community based survey was done by Indian Council of Medical Research (ICMR) (2007) under the Integrated Disease Surveillance Project Phase 1 to identify risk factors associated with NCDs. According to the survey report the prevalence of hypertension was 17 %to 21 % across the country with not much difference between urban and rural population[29].

But a meta- analysis of studies between 2000 to 2012 in India showed a larger difference 40.8% in the urban and 17.9% in rural population [30].

In India, studies published between 1969 and July 2011, reported a prevalence range between 13.9 to 46.3% and 4.5 to 58.8% in urban and rural areas of India respectively[31].

Another meta-analysis of studies published from 1950 to april 2013 on hypertension found that the overall prevalence of hypertension in India was 29.8% with significant urban and rural differences[32].

A multicentre from India on awareness, treatment, and control of hypertension showed that only about 25.6% of treated patients had their blood pressure under control[33].

Yadav S et al (2003) found that the prevalence of pre-hypertension was 32.3% and prevalence of hypertension was 32.2% in Lucknow[6].

Vimala A et al found that the prevalence of pre-hypertension was 41.7% and prevalence of hypertension was 47% in Trivandrum[34].

Esam MS et al (2012) conducted a study on pre-hypertension and hypertension in Bareilly. The prevalence of pre-hypertension was found to be 27.2% and prevalence of hypertension 27.4%[35].

According to Kokiwar PR et al the prevalence of pre-hypertension was and hypertension was 18.8% and 19.04% in Karimnagar[36].

Chythra R. Rao et-al conducted a study on hypertension in coastal Karnataka. The prevalence of of pre-hypertension and hypertension was found to be 38.7% and 43.3% respectively [37].

In Puducherry the prevalence of hypertension and pre -hypertension was 27.6% and 57% respectively according to Bharathi et-al[38].

3.5 Tamil Nadu

A community based survey was done by ICMR (2007) under Integrated Disease Surveillance Project Phase 1 to identify the risk factors associated with non-communicable diseases (NCDs). According to the survey report 44% were pre hypertensives and 18% hypertensives[39].

A study done in Chennai by Mohan et al showed the prevalence of pre-hypertension and hypertension to be 36.1% and 20% respectively.[40].

A study done by Santhirani et-al shows that overall prevalence of hypertension was 21.1%(males 22.8%, females 19.7%). Eight percent of the total study population was known to have hypertension, but only 50% were under treatment[41].

A study done by Pauline suganthy et-al on screening for hypertension in the selected rural areas of Tirunelveli district and a study on their lifestyle related risk factors shows the overall prevalence of hypertension was 28.7%(males 36.3%, females 63.7%). Age, Sex, physical activity, tobacco, alcohol, high salt intake and family history were significantly associated with hypertension[42].

A study done by John Jacob et-al found out that in the age group >50 prevalence of pre-hypertension is 33% while that of hypertension was 28%[43].

Manmohan gupta, Rajkumar patil et-al conducted an observational cross-sectional hospital based study on prevalence of obesity and hypertension in Salem

town of Tamilnadu. The prevalence of pre-hypertension was found to be 15.6% and prevalence of hypertension 43.3%.A significantly higher proportion of males were severely hypertensive than females[44].

According to Vikas kumar et al prevalence of pre-hypertension and hypertension in rural Tamilnadu was 47.27% and 20% respectively. The prevalence was more among females compared to males[45].

According to Rekha govindan et al (2013) in Tamilnadu the prevalence of pre hypertension and hypertension were 7.04% and 28.16% respectively[46].

According to   Kannan L, Sathyamoorthy T S the prevalence of pre hypertension and hypertension was comparatively high in an urban setting (Chennai) 65.26%.and 25.2% respectively[47].

3.6 Risk factors for hypertension

Hypertension is not only one of the major risk factor for most forms of cardiovascular diseases, but it has its own risk factors. WHO scientific group has reviewed risk factors for essential hypertension[48].

3.6.1 Non- Modifiable risk factors

❖ Family history of hypertension

❖ Age

3.6.2 Modifiable risk factors

❖ Alcohol

❖ Excess salt intake

❖ Tobacco

❖ Unhealthy diet

❖ Physical inactivity

❖ Overweight and Obesity

Most of the risk factors like physical inactivity, alcoholism, unhealthy diet , overweight/obesity , tobacco use can be prevented[49].

Figure: 5

Main contributory factors to high blood pressure and its complications

Social determinants and drivers	Behaviour risk factors	Metabolic risk factors	Cardiovascular disease
Globalization Urbanization Ageing Income Education Housing	Unhealthy diet Tobacco use Physical inactivity Harmfull use of Alcohol	High blood pressure Obesity Diabetes Raised blood lipids	Heart attack Strokes Heart failure
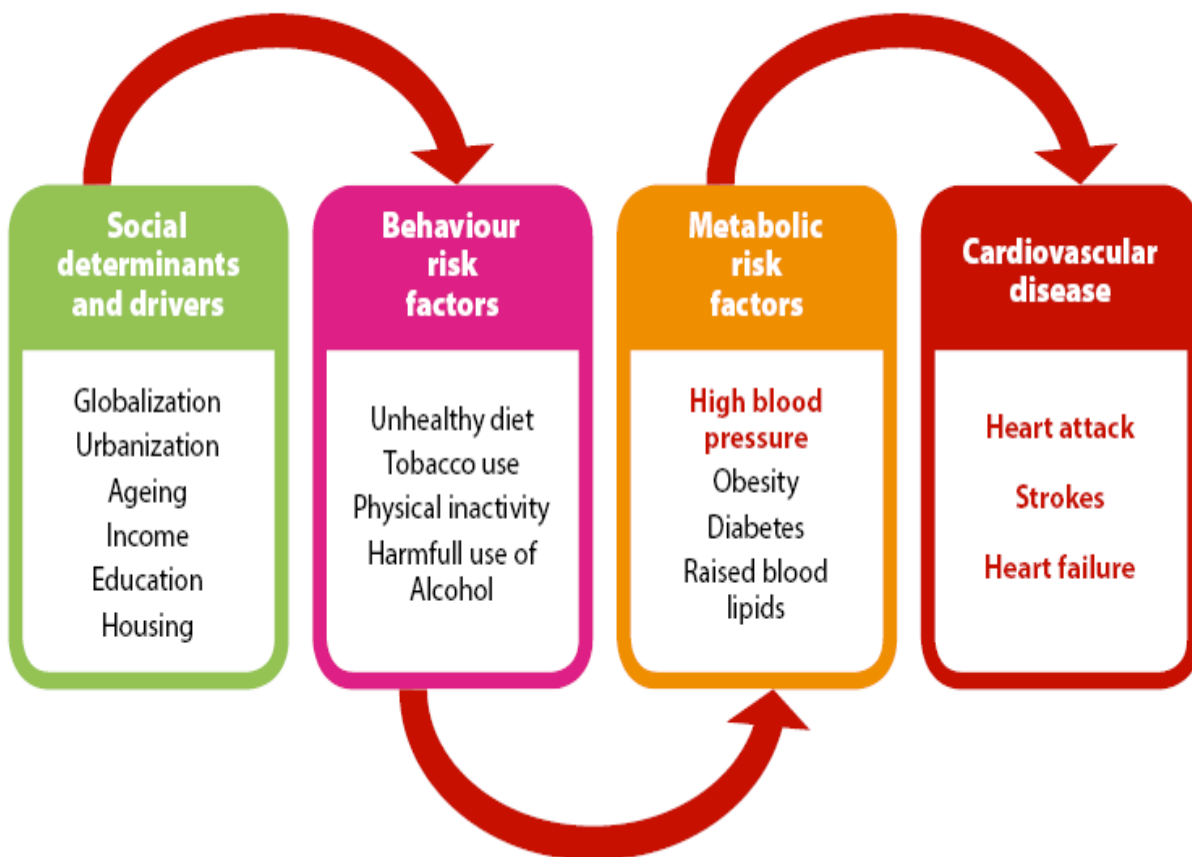
3.6.1.1 AGE

Age is considered to be an important non-modifiable risk factor for hypertension. Due to stiffening of blood vessels the risk of hypertension increases as age increases [12].There is a strong positive correlation between increasing age and increase in blood pressure. Persons with normal blood pressure at 55 years of age will have 90% risk of developing hypertension[5].

A study done by Yuvaraj et-al in Davangere found an increase in prevalence of hypertension with increasing age.The prevalence of hypertension increased from 4.9% in the 18-29 age group to 31.2% among those over 70 years.Both systolic and diastolic blood pressure was found to be increasing with age[50].

Mahanta et-al (2003-2004) conducted a study in Assam also found that increasing age is associated with higher prevalence of hypertension and this was true to both male and females[51].

Hasan I et-al conducted a study in Haridwar also found that the percentage of people affected by hypertension increased with age[52].

Das SK et-al found that people who were ≥40 years had 4 times higher risk of developing hypertension compared to those <20 years of age. The risk was 8 times for 50-59 years and 14 times for those >60 years [53].

3.6.1.2 Family history of hypertension

There is considerable epidemiological evidence that blood pressure levels are determined partly by genetic factors. A polygenic inheritance has been

postulated based on family and twin studies. If both the parents are hypertensives, off-springs have a 45% possibility of developing hypertension and if parents are normotensives , the possibility is only 3 percent[54].

Bartwal et-al (2013) found significant association between with family history of hypertension and hypertension[55].

Kotpalliwar   et-al (2010-2011)   found that there exists a positive correlation accounting to 30% between parental history of hypertension and prevalence of prehypertension in young healthy individuals[56].

Shetty S, Nayak A conducted a study amongst medical students in coastal Karnataka and found that 36.6% students had positive family history of hypertension and strong family history is an independent   risk factor for developing pre hypertension prematurely[57].

Mandal PK et al (2008) found that family history of hypertension as one of the risk factor for developing hypertension[58].

3.6.2.1 ALCOHOL

Alcohol consumption has been found to increase the risk of hypertension, atrial fibrillation and hemorrhagic stroke[59].Alcohol consumption reduces SBP more than DBP. It has been found that moderation of alcohol consumption will reduce SBP 2-4mmHg[5]. Excess alcohol intake can induce resistance to anti hypertensive therapy[60].

Todkar S et-al (2008) found that people who consumed alcohol were at 5.5 times increased risk of developing hypertension compared with people having no history of alcohol consumption(OR=5.5)[61].

Madhukumar et-al found that alcoholics had 21 times higher risk (OR=21) to hypertension compared to the non-alcoholics[62].

Kannan et-al found that alcoholics were 3.8 times at a greater risk for hypertension (OR=3.8) compared to non alcoholics[47].

Pooja, Mittal Y (2008) found that in Uttrakhand prevalence of hypertension among alcoholics was higher than that among non alcoholics ie 47.9% vs 33.7%. Alcohol consumption was significantly associated with prevalence of hypertension [63].

Bansal SK et-al found that alcoholics had 1.95 times higher risk (OR=1.95) of developing hypertension compared to the non –alcoholics[64].

3.6.2.2 **Excess Salt Intake**

Dietary sodium in excess is a risk factor for hypertension and cardiovascular disease[65-68]. Estimates show that in the year 2010, 1.7 million deaths worldwide were due to excess sodium intake[65]. Studies shows that lowering the sodium intake can reduce the blood pressure [69-72].

Decreased sodium intake can decrease the resting diastolic blood pressure by 1.5 mmHg and decrease the resting systolic blood pressure by 3.4 mmHg [72]. According to WHO the recommended salt intake is <5gm/day(sodium 2gm/day)[73]. The indicator for monitoring this target is age-standardized mean

population intake of salt (sodium chloride) in grams per day in persons aged 18 years and over[74].

A study done by Ganesh kumar et al (2012) on prevalence and risk factors of hypertension in Puducherry found that by multiple logistic regression consumption of extra salt was associated with hypertension[75].

Vimala A et al found that high salt diet had a significant association with hypertension[34] .

A study done by AK Srivastava et al (2009)in Dehradun found that 72% of hypertensives were consuming more than 5gm salt per day[76].

A study done by Subramanian G et al (2011) found added salt intake can lead to development of pre hypertension[77].

3.6.2.3 Tobacco

Tobacco products are products made entirely or partly of leaf tobacco as raw material, which are intended to be smoked, sucked, chewed or snuffed. All contain the highly addictive psychoactive ingredient, nicotine. Tobacco use is one of the main risk factors for a number of chronic diseases, including cancer, lung diseases, and cardiovascular diseases[78].

Smoking is known to increase the risk of developing hypertension. Smoking causes an immediate increase in blood pressure (both systolic and diastolic) and heart rate that persists for more than 15 minutes after one cigarette when compared to non-smokers[79].

A study done by pooja et-al (2008) shows that smoking and Body mass index were significantly related with systemic hypertension[80].

A study done by Guptha et-al showed that smoking and higher Body mass index were significantly associated with higher prevalence of systemic hypertension[81].

A study done by Guptha R ey-al (2011) showed significant association of smoking with hypertension[82].

3.6.2.4 Fruits and vegetables

Healthy diet is incomplete without Fruits and vegetables as they are main ingredient of healthy diet. Inadequate fruit and vegetable consumption leads to poor health and increased risk of non communicable diseases (NCDs). Risk of some NCDs can be reduced by regular intake of fruits and vegetables as part of the daily food intake.

In the year 2010 decreased fruits and vegetable intake accounted for about 6.7 million deaths all over the world.

Obesity which is a risk-factor for NCDs can be prevented when fruits and vegetables are consumed regularly.

Fruits and vegetables are rich sources of vitamins and minerals, dietary fibre and many beneficial non-nutrient substances like plant sterols, flavonoids and antioxidants. Consuming different types of fruits and vegetables helps to ensure an adequate intake of many of the above said essential nutrients.

WHO recommendations

As part of a healthy diet , WHO recommends eating more than 400 grams of fruits and vegetables per day to improve overall health and reduce the risk of certain NCDs[83].

A study done by Madhavikuttyamma GD et al found that those who are not eating fruits everyday are having 2 times more risk to have pre-hypertension/hypertension than those who have eaten fruits daily (OR=2.02)[84].

A systematic review and meta-analysis of prevalence of hypertension in India for studies published from 1950 to april 2013 found that consumption of low vegetables/fruits high consumption of dietry fat and salt and sedentary activity were significant risk factors for hypertension[32].

A study done on prevalence of hypertension among urban adult population in Nellore found that persons with vegetable intake less than five servings per day had 2.9 times higher risk (OR=2.91)of developing hypertension compared to people consuming vegetables more than five servings per day[85].

A study done by Prasad et-al shows that inadequate fruit intake is a significant predictor of hypertension[86].

3.6.2.5 PHYSICAL INACTIVITY

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Regular moderate intensity physical activity – like walking, cycling, or participating in sports – has significant benefits

for health. Regular physical activity can reduce the risk of cardiovascular diseases, diabetes, colon and breast cancer, and depression[87].

Inadequate physical activity is one of the risk factor for noncommunicable diseases (NCDs) such as cardiovascular diseases, hypertension, cancer and diabetes. Insufficient physical activity causes 3.2 million deaths each year. It is one of the ten leading risk factors for deaths worldwide[88].

Risk of death due to all causes increases 20-30% in adults who are inactive compared to those who undertake moderate physical activity as recommended by WHO[89].

A study conducted by Rashmi singh et al (2009-2010) on burden and vulnerability of hypertension in rural Bihar found that prevalence of hypertension was higher among subjects doing sedentary work. It was found to be statistically significant (p=0.007)[90].

Chokalingam et al (2003) conducted a study on prehypertension among urban adults found that sedentary lifestyle is a factor that predicts hypertension[91].

Anand sivaprasad et al found the prevalence of hypertension was significantly high among those with low physical activity (43.6%) than those having moderate or vigorous activity (p=0.01)[92].

Midha T et al found a significant correlation between subjects who are less physically active and hypertension[93].

3.6.2.6 Overweight and Obesity

Obesity has long been recognized as a risk factor for hypertension and appears to be a factor associated with the increasing incidence of hypertension seen with ageing[94].For every 1 kg loss in weight, there is an average decrease of 0.6mmHg in systolic and 0.34 mmHg in diastolic pressure[95]. Studies shows that compared to European population BMI is more strongly associated with blood pressure in South East Asian population[96].

Estimates shows that 3.4 million deaths in the year 2010 were due to overweight/obesity[97].

To achieve optimal health, the median BMI for adult populations should be in the range 21–23 kg/m2, while the goal for individuals should be to maintain a BMI in the range 18.5−24.9 kg/m2. The risk of comorbidities increases with a BMI in the range 25.0−29.9 kg/m2, and the risk is moderate to severe with a BMI greater than 30 kg/m2[98].

Aatif Qureshi et-al (2012) found that Body Mass Index(BMI) was significantly higher in elderly with hypertension compared to non-hypertensives[99].

Arjun Lakshman et-al (2008)conducted a study on prevalence and riskfactors of hypertension found that high BMI of more than 25kg/m^2 was associated with hypertension[100].

Sougat Ray[101] et-al (2005-2007) found that prehypertension has a significant association with BMI> 23kg/m$^{2.}$

3.7 Complications[3]

The complications of hypertension can be due to either hypertension or atherosclerosis. Level of organ damage may not always correlates with stage of hypertension. Hence these two should be evaluated separately. The various complications are :

1.7.1 Heart

The effect of hypertension on the heart is as follows

➢ increased risk of coronary artery disease,

➢ arrhythmias,

➢ left ventricular hypertrophy

➢ congestive cardiac failure

➢ and sudden death.

Most of the time left ventricular failure occurs along with diastolic dysfunction Though ventricular hypertrophy can be reversed by treatment of hypertension the reduction in morbidity and mortality is still not clear.

3.7.2. Brain

For most types of strokes hypertension is the most important modifiable risk factor. The risk of stroke is reduced by fourty percent with a reduction of every 5-6mm Hg of diastolic blood pressure. Among the elderly control of systolic blood pressure has shown significant benefit.

3.7.3. Kidney

Uncontrolled hypertension contributes to 20-25% of end stage renal failure. Damage to kidney starts with microalbuminuria, leading to proteinuria and finally kidney failure. Control of blood pressure particularly by ACE inhibitors and ARBs can lead to reduction of proteinuria.

3.7.4. Retina

Hypertension can cause a spectrum of retinal vascular damage together known as hypertensive retinopathy.

Table 2: Keith, Wagener and Barker classification for hypertensive retinopathy

Grade	Classification
Grade I	Mild generalized retinal arteriolar narrowing or sclerosis
Grade II	Definite focal narrowing and arteriovenous crossings Moderate to marked sclerosis of the retinal arterioles Exaggerated arterial light reflex
Grade III	Retinal hemorrhages, exudates and cotton wool spots Sclerosis and spastic lesions of retinal arterioles
Grade IV	Severe grade III and papilledema

Proper control of blood pressure can lead to regression of retinal changes.

3.7.5. Large Vessels

Hypertensives' are at increased risk of developing

➢ Aortic aneurysms

➢ Aortic dissection

➢ Intermittent claudication

3.7.6. Hypertensive crises

Hypertensive crises are classified as malignant hypertension and accelerated hypertension.

3.7.6.1 Malignant hypertension:

Malignant Hypertension is characterized by very high levels of blood pressure (>180/120 mm Hg) along with evidence of progressive target organ damage. It is an emergency and in order to prevent target organ damage the blood pressure must be immediately reduced with in 6-8 hours. Examples include intracerebral hemorrhage, hypertensive encephalopathy, angina pectoris, myocardial infarction etc.

3.7.6.2 Accelerated Hypertension:

Accelerated Hypertension is charecterised by very high blood pressure without target organ dysfunction. Eg blood pressure of 190/130 mmHg with dyspnoea, nose bleed severe headache.

3.8 Prevention of hypertension

The best time to prevent hypertension and control hypertension is before it occours. Strategies to prevent hypertension can be applied at the community level for everyone or only high risk group. Life style interventions are more likely to succeed and strategies focusing on high risk group are the most rewarding in terms of absolute reduction . In order to have a greatest long term impact in reducing the overall burden of hypertension, preventive strategies should be applied as early in life as possible.

Prevention strategies applied early in life provide the greatest long-term potential for avoiding the risk factors of hypertension and elevated blood pressure levels and for reducing the overall burden of blood pressure related complications in the community.

Approaches in the prevention of hypertension:

1. Primodial Prevention

2. Primary prevention

a) Population strategy

b) High-risk strategy

3. Secondary Prevention

4. Tertiary Prevention

3.8.1 Primodial Prevention

Primodial prevention is prevention of risk factors in population before they develop. Hypertension have its orgin in childhood when lifestyle and behavioral habits are formed . In primodial prevention strategies are focused on preventing harmful lifestyles from being adopted by children. As developing and developed countries are facing increased levels of hypertension this strategy for prevention of risk factors is most important. In other words health system must give more importance to primodial prevention.

3.8.2 Primary Prevention

3.8.2.1 Population strategy

The population strategy is directed towards the whole population, without any regard to individual risk . It aims to achieve a downward shift in the

overall prevalence of blood pressure in the general population. A small decrease in the mean blood pressure can lead to major decrease in the prevalence of hypertension related illness. This involves a multi factorial approach, based on the following nonpharmacotheraputic interventions

3.8.2.1.1 Nutrition

Dietary changes play a major role in control of hypertension. They are

i. Moderate fat intake

ii. Salt intake ≤5g per day

iii. Low alcohol consumption

iv. Overall energy consumption in line with the need

3.8.2.1.2 Weight Reduction

The prevention and control of overweight/obesity BMI> 25 is one of the proven strategies in prevention of hypertension.

3.8.2.1.3 Exercise Promotion

Regular physical activity can lead to fall in blood pressure.Hence regular physical activity should have a significant position in prevention of hypertension.

3.8.2.1.4 Behavioral modification

Lifestyle modification like cessation of smoking,stress reduction through yoga and meditation can lead to reduced blood pressure.

3.8.2.1.5 Health education

The general public needs to be educated on hypertension and all associated factors and the ways to prevent it through healthy living.

3.8.2.2 High risk strategy

People at high risk for hypertension are those with pre hypertension, history of smoking, alcoholism, sedentary lifestyle, a family history of hypertension, overweight or obesity, excess intake of dietary sodium. High risk strategy is aimed at these type of people. It can be used as a complement for population based approach or can be used individually in resource poor setting.

3.8.3 Secondary Prevention

Secondary prevention is aimed at early detection and control of hypertension. Modern anti-hypertensive drugs can lead to decrease in prevalence of hypertension related illness.

3.8.3.1 Early case detection

Screening is the only effective means of early detection of hypertensive patients. Ideally it should be done before the signd and symptoms of hypertension and its complications are seen. Screened patients must be followed up and given sustained care.

3.8.3.2 Treatment

In essential hypertension as cause is unknown we cannot treat the cause. Ideally treatment is aimed to bring the blood pressure below 120/80 mmHg. Control of risk factors such as smoking and dyslipidemia should occur concurrently.

3.8.4 Tertiary Prevention

Tertiary prevention includes prevention of development of complication of hypertension and proper rehabilitation for people debilitated by hypertension.

4. MATERIALS & METHODS

4.1 STUDY DESIGN

The study was done as a cross- sectional study

4.2 STUDY POPULATION

Persons aged >18 years of both sexes living in rural areas of Kanyakumari district.

4.3 STUDY SETTING

Study was conducted in a rural area of Kanyakumari district southern most district of Tamilnadu. The district has 9 blocks; each block consists of village panchayaths and town panchayaths. According to 2011 census total population of Kanyakumari district is 1870,734, in which 832,269 males and 843,765 females.

4.4 STUDY PERIOD

The Study was conducted from March 2014- May 2015

4.5 SAMPLING METHOD

Multi Stage Random Sampling.

4.6 SAMPLE SIZE

Based on a study conducted by Prashanth Kokiwar prevalence of pre hypertension is 18.8%. Sample size was calculated using the formulae

$$n= 4pq/d^2$$

Where p is the prevalence of pre hypertension(18.8%)

q = 100-p =100-18.8=81.2

d^2 = relative error (20% of p)= $(18.8 \times 20/100)^2$

by substituting the values in the above equation   **n= 432**

4.7 SAMPLE SELECTION

First stage by simple random sampling Thiruvattar block area was selected .The list of all village panchayaths obtained from Thiruvattar Block office.

Second Stage by simple random sampling five village panchayaths in the block area was selected.The selected village panchayaths are Aruvikkari , Kannanur , Kattathurai , Pechiparai , Yettacode.

Third stage – Study subjects were recruited by house to house visit. At each village all the streets and roads were listed out and allotted numbers are given .Using this four streets or roads were selected randomly using lot method. Starting from the first house each house was visited and adults present were invited to be part of the study.22 persons were included in the study from each

road or street. If the end of the road or street was reached without finding 22 adults the house visit was continued upto the adjacent street or road.

4.8 INCLUSION CRITERIA

- Adults aged >18 years of both sexes.

- Residents of the selected area for > 6 months.

4.9 EXCLUSION CRITERIA

- Persons not willing to participate in the study.

- Persons absent for more than 3 visits .

- Bedridden Patients

4.10 PARAMETERS STUDIED

- Blood pressure

- Height

- Weight

- Body Mass Index

4.11 DATA COLLECTION

After getting permission from the IRC and IHEC, the selected village was visited and specified numbers of study subjects were selected according to the sampling technique described above. Informed consent was taken from the participants. Pretested semi structured interview schedule was applied by the

investigator and their Blood pressure, Height & weight were recorded. Method for measuring blood pressure, weight and height is described below.

4.11.1 Height:

For measuring the height, a portable height measuring board was used. The participant was asked to remove the foot wear, head gear and to stand on the board facing me with feet together, heels against the back board and knees straight; to look straight ahead and not tilt their head up so that their eyes are the same level as the ears. The measure arm was moved gently down into the head of the participant and was asked to breathe in and stand still. Then the height in centimeters at the exact point was recorded.

4.11.2 Weight

The weight of the participant was measured using a portable weighing machine. Weighing machine was put on a firm, flat surface. The initial reading in the weighing machine was set to zero prior to each measurement. The participants were asked to remove their footwear and socks before weighing. The participants were asked to step into scale with one foot on each side of the scale. The reading was taken after ensuring that the participant is standing still, facing forward, with arms to his side. Then weight in kilograms was recorded.

4.11.3 Body Mass Index

It was calculated by using the formula weight in kg/height in m^2. BMI and was classified based on WHO BMI classification for analysis.

4.11.4 Blood pressure

Blood pressure was measured using a standard mercury sphygmomanometer. The participant was allowed to sit quietly and rest for at least 15 minutes in a room before measurement. The measurement was done in sitting position with patients arm fully supported at the level of heart. Left arm of the participant was placed on the table with the palm facing upward. Clothing on the arm was rolled up . The cuff was applied. Stethoscope earpieces was put to ear and set to bell. Pulse at either brachial or radial artery was palpated. Cuff was inflated until unable to feel pulse. Listen for pulse sounds while deflating cuff slowly. Systolic blood pressure was recorded when the pulse was first audible. The diastolic blood pressure was recorded when the pulse sound disappears. Three blood pressure measurements were taken. During data analysis the mean of the second and third readings was calculated. The participant was asked rest for three minutes between each of the readings.

4.12 Data Entry and Analysis-

Data was entered in Microsoft excel spreadsheet and analyzed using SPSS Version 20.0(trial version) Chisquare was used to find out the association between the factors influencing pre hypertension and hypertension.

4.13 Description of terms used in the study

4.13.1 Pre hypertension and hypertension

The participants having systolic blood pressure <120 mmHg and diastolic blood pressure <80 mmHg were classified as having normal blood pressure. The

participants having systolic blood pressure 120-139 mmHg and diastolic blood pressure 80-89 mmHg were classified as having pre hypertension and The participants having systolic blood pressure ≥140 mmHg and diastolic blood pressure ≥90 mmHg were classified as having hypertension.

4.13.2 Socioeconomic Status

Socioeconomic status of the study population was assessed using Modified BG Prasad classification Scale. The family income was modified was using All India Consumer Price Index for the year 2013.

Table 3: Modified BG Prasad classification Scale

Socio Economic Status: Class	BG Prasad's Classification of 1961	Modified BG Prasad's Classification for 2013
I	Rs 100 and above	Rs 5156 and above
II	Rs 50-99	Rs 2578-5155
III	Rs 30-49	Rs 1547-2577
IV	Rs 15-29	Rs 773-1546
V	Below Rs 15	Below Rs 773

4.13.3 Physical Activity

Persons who do moderate physical activity for 150 minutes per week or equivalent was considered as doing adequate physical activity and others were considered as having inadequate physical activity.

4.13.4 Over weight/ obesity

Based on WHO Classification over weight was considered as BMI (Body Mass Index) more than or equal to 25 kg/m^2. Pre-obese, obese class-I, Class –II, Class –III were taken together as obese.

5. RESULTS

Socio demographic charecteristics of the study population

Figure:6 Bar chart showing distribution of study population according to age
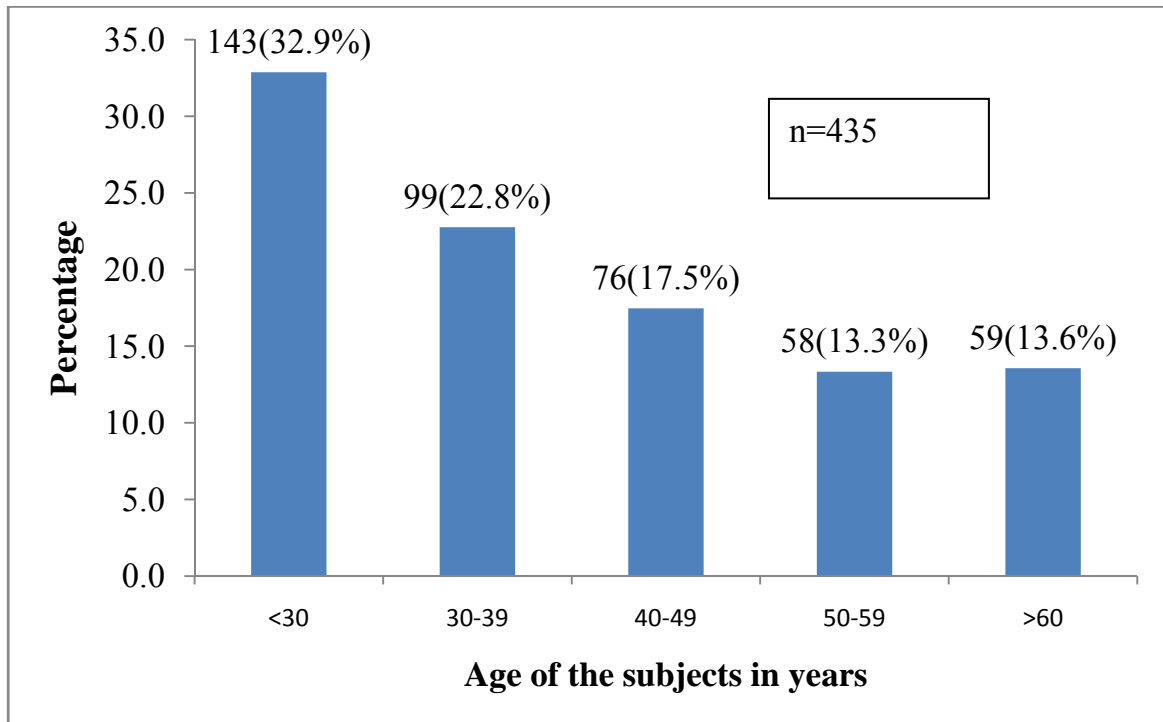
The study had a total of 435 participants. Out of that 143(32.9%) were less than 30 years of age 99 (22.8%) belonged to the age group 30-39, 76(17.5%) belonged to the age group 40-49.58(13.3%)belonged to the age group 50-59.59(13.6%) were more than 60 years of age.

Figure:7 Pie chart showing distribution of study population according to gender

Gender

n=435

Male
189(43.4%)
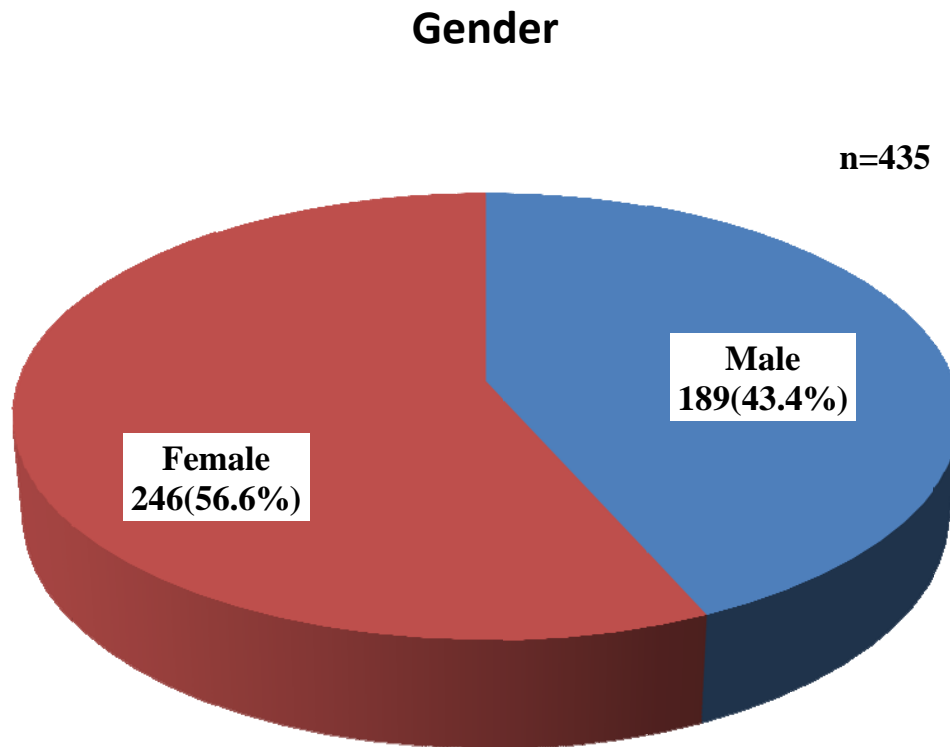
Female
246(56.6%)

Males constituted 189(43.4%), while females constituted 246 (56.6%) of the study population.

Figure 8: Pie chart showing distribution of study population according to religion

Religion

22(5%)

n=435

183(42.1%)

230(52.9%)

■ Hindu
■ Christian
■ Muslim
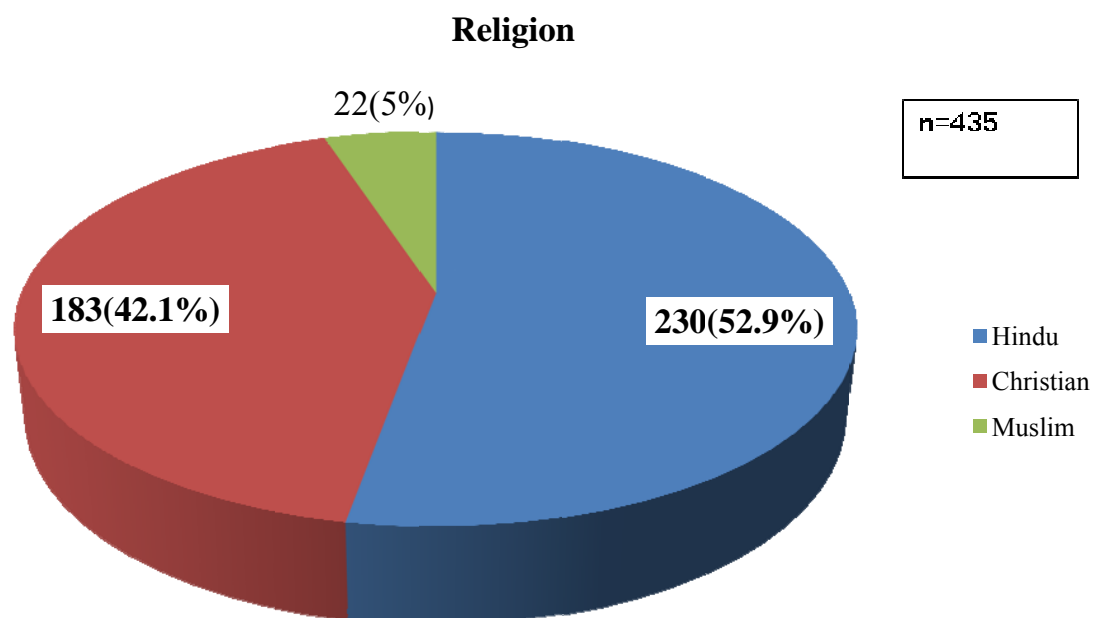
Out of the total 435 participants

183(42.1%) are Christians

230(52.9%) are Hindus and

22(5%) are Muslims

Figure 9: Bar chart showing distribution of study population according to socioeconomic status

Socioecnomic status
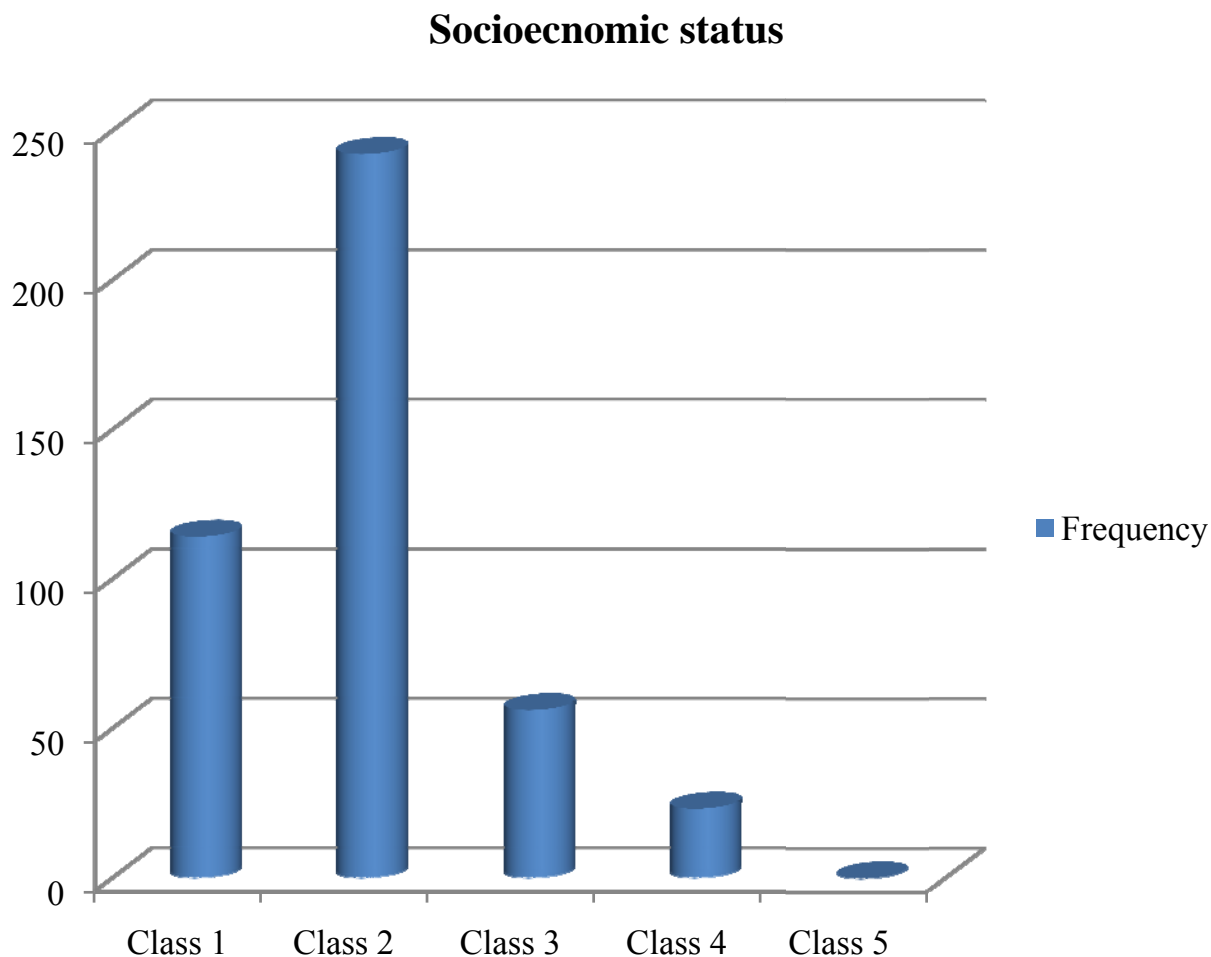
Out of the total 435 participants 114(26.2%) belonged to class 1, 242(55.6%) belonged to class 2, 56(12.9%) belonged to class 3, 23(5.3%) belonged to class 4 and there was no participant from class 5

Figure 10: Pie chart showing distribution of study population according to marital status

Marital Status

n=435

Widow
26(6.0%)

Single
85(19.5%)
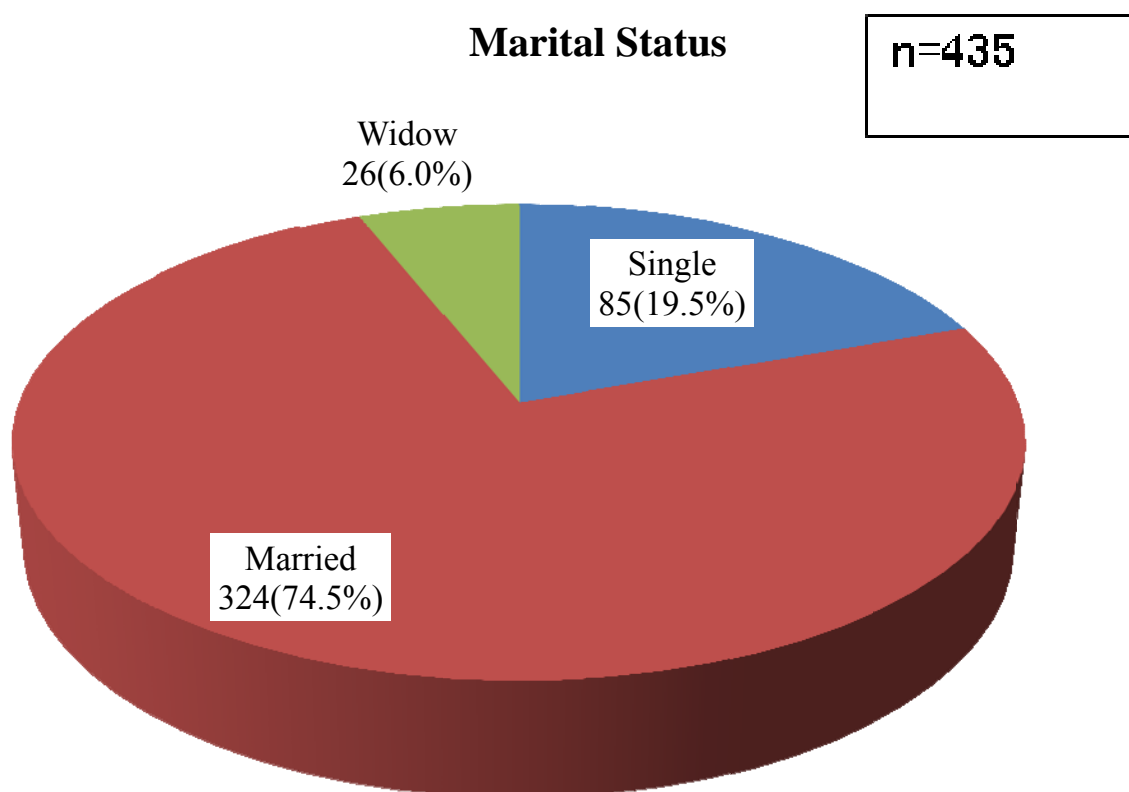
Married
324(74.5%)

Out of the total 435 participants

324(74.5%) were married

85(19.5%) were Single and

26(6%) were widowed

Figure 11: Pie chart showing distribution of study population according to family type
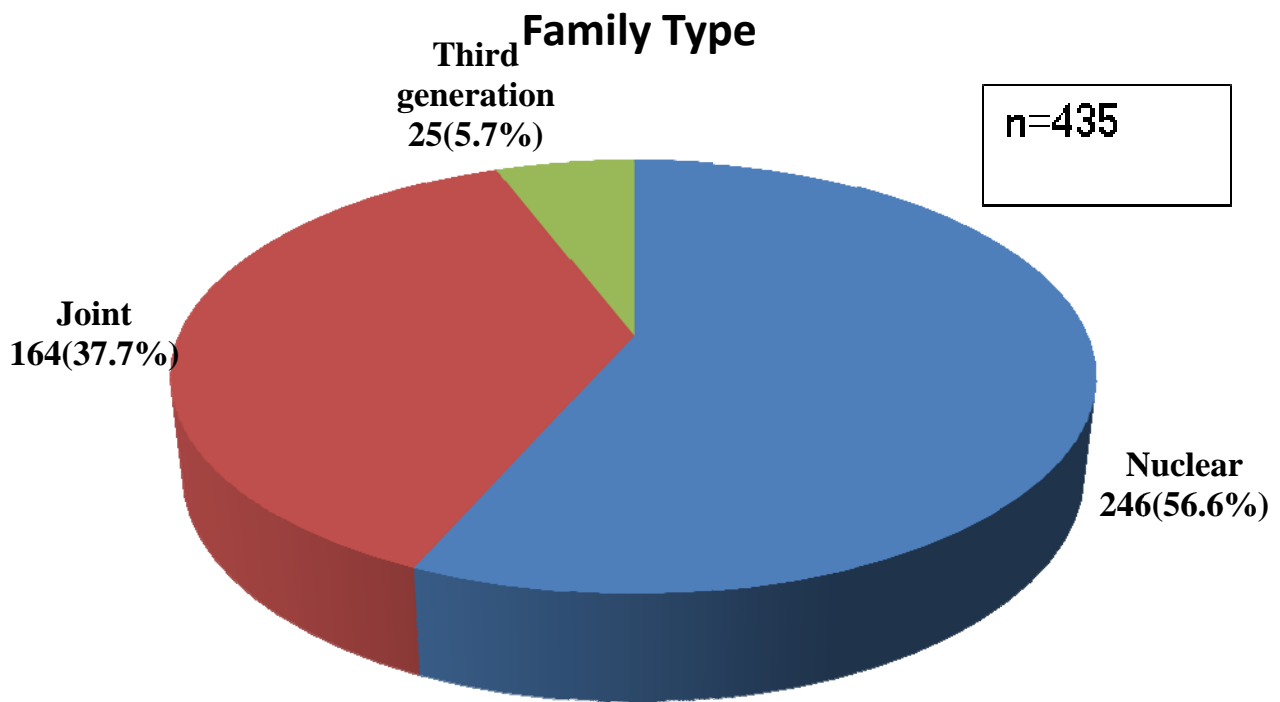
Most of the participants belonged to nuclear families 246 (56.6) , followed by

joint family 164(37.7) and third generation family 25(5.7)in the study.

Figure 12: Bar chart showing distribution of study population according to level of education
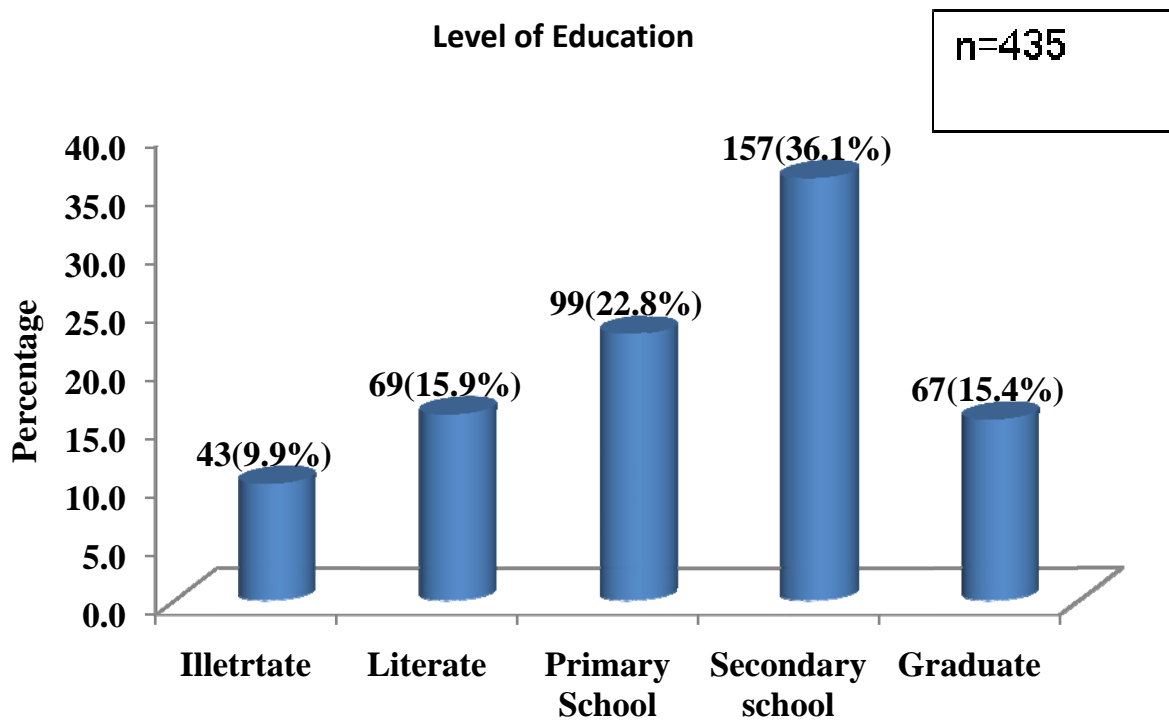
Out of the 435 participants most of them were educated upto secondary school level157 (36.1%) followed by primary school 99(22.8%) literate69 (15.9%) graduate 67(15.4%) and illeterate43 (9.9%)

Figure 13: Pie chart showing distribution of study population according to employment status

Employmentstatus

n=435

32(7.4%)

129(29.7%)

166(38.2%)

52(12.0%)

56(12.9%)

- Employed
- unemployed
- Student
- Housewife
- Retired

h
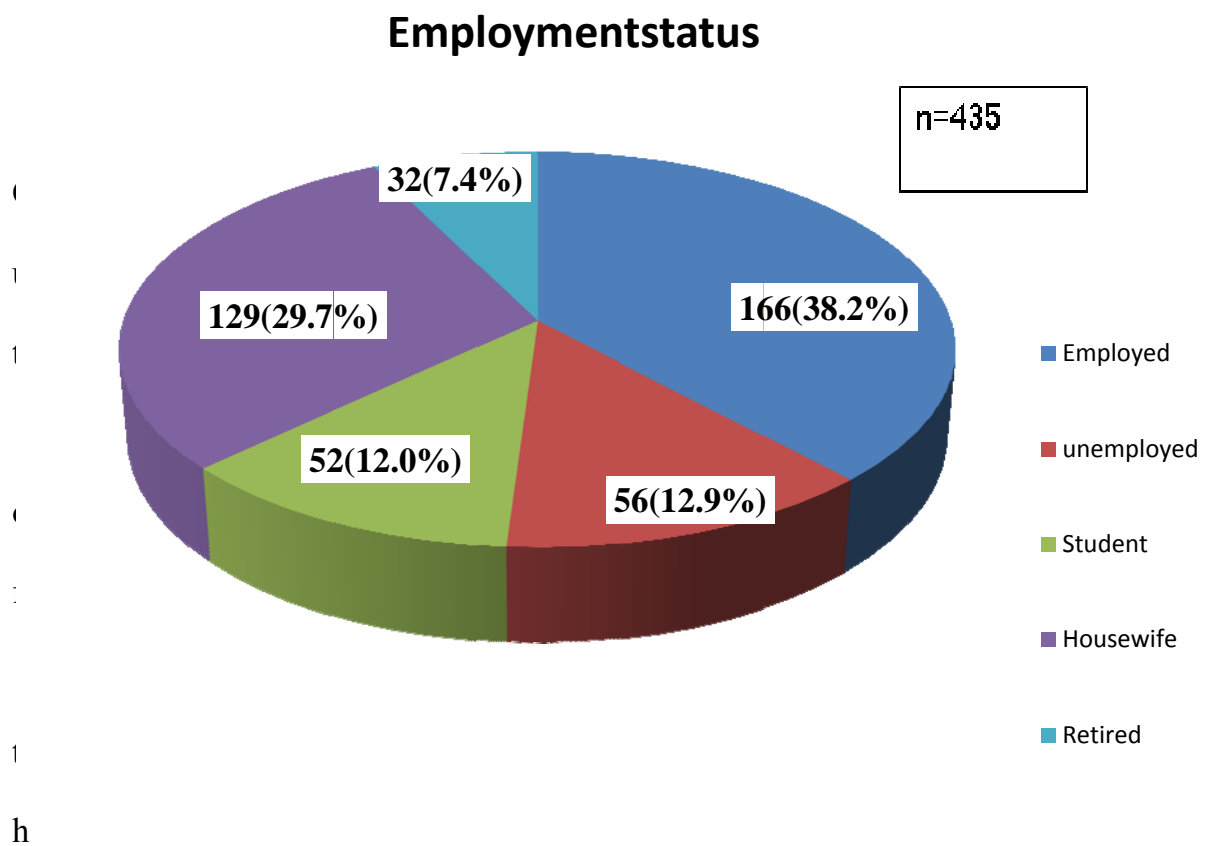
Out of the 435 participants 166(38.2%) Employed, 129(29.7%) Housewife, 56(12.9%) unemployed, 52(12.0%) Student, 32(7.4%) Retired.

Figure 14: Pie chart showing distribution of study population according to Body Mass Index(BMI)

BMI

n=435

21(4.8%)　　　　53(12.2%)

104(23.9%)

257(59.1%)

- Under weight
- Normal
- Over weight
- Obese
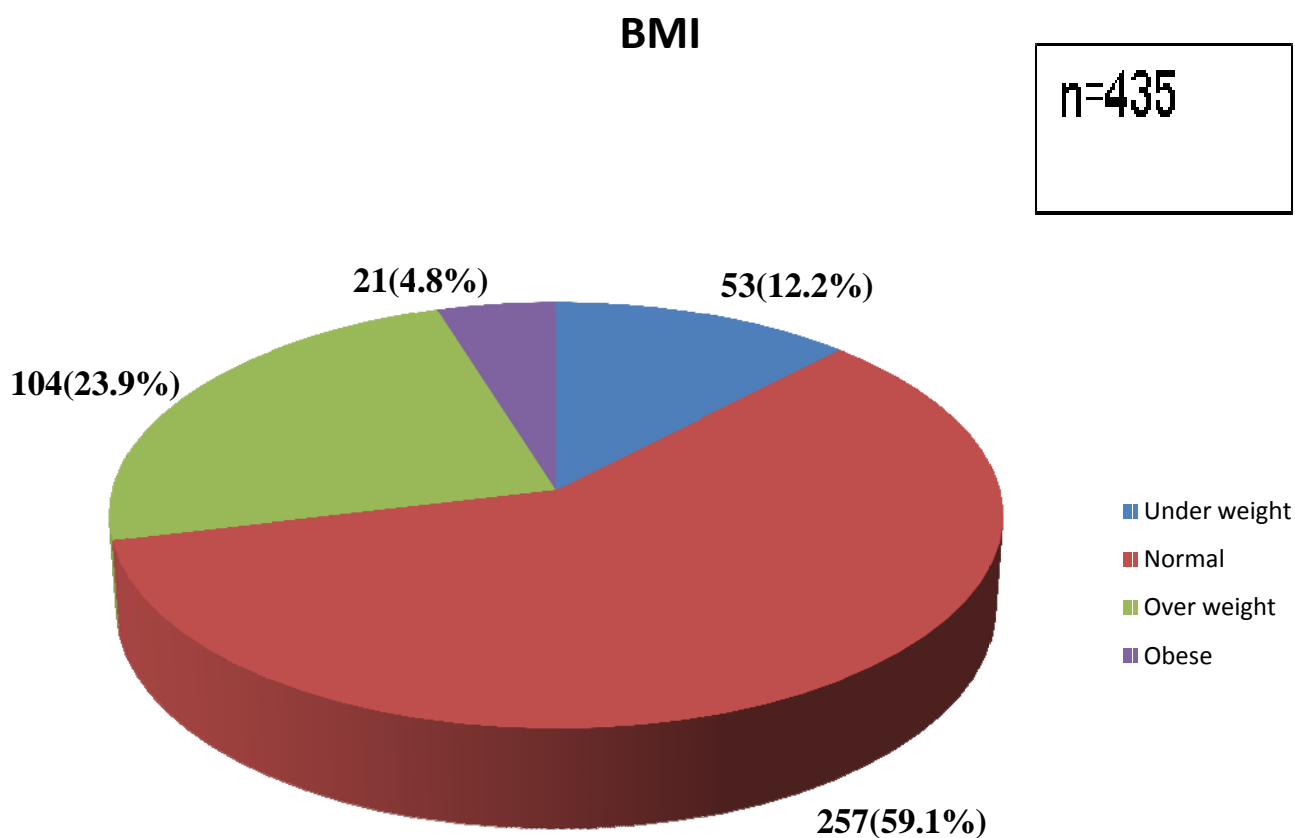
Prevalence of overweight and obesity in the study population was assessed by using WHO BMI Classification. The result were as follows As per the present study the prevalence of overweight is 23.9 %(104) and obesity is 4.8%(21). About 59.1% of the study populations were of normal weight and 12,2% were underweight.

Figure 15: Pie chart showing distribution of study population according to current smoking status

Smoking Status

Yes
75(17.2%)

No
360(82.8%)
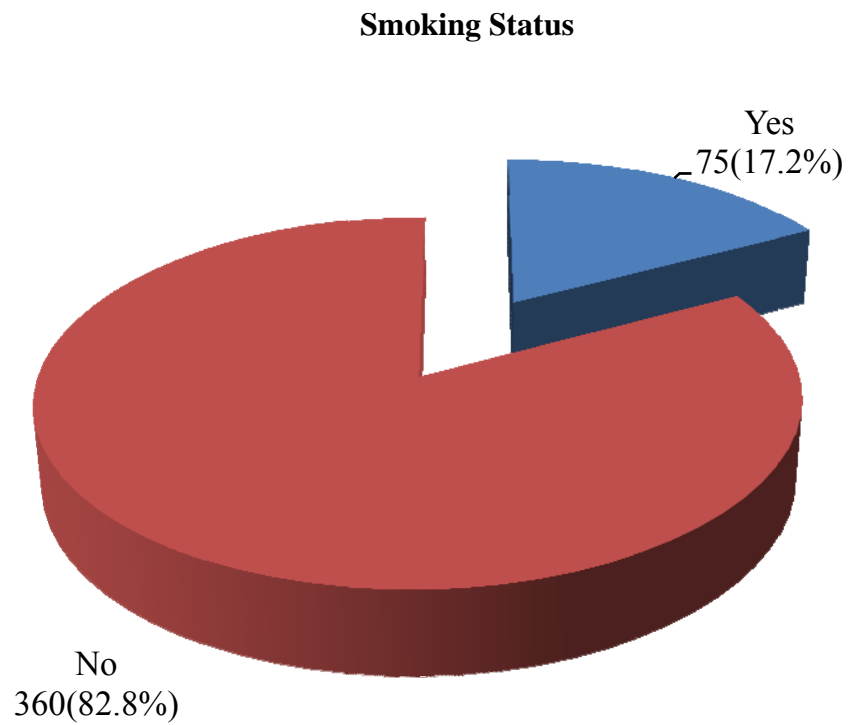
Most of the participants were non smokers 360(82.8%)and 75(17.2%) were current smokers

Figure 16: Pie chart showing distribution of study population according to the type of tobacco products used

Type of tobacco

n=75

13 (17.3%)

26 (34.6%)

36 (48%)

- Beedi
- Cigarette
- Smokeless Tobacco
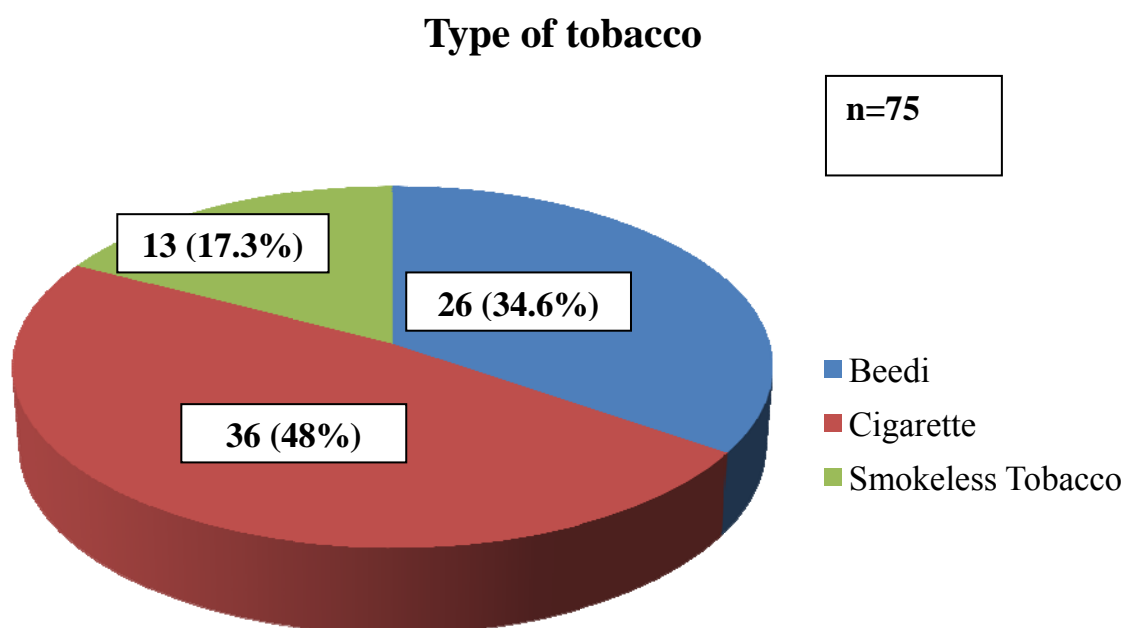
Out of the 75 participants who are current smokers, 36(48%) used cigarattes, 26(34.6%) used Beedi and 13(17.3%) used smokeless tobacco.

Figure 17: Pie chart showing distribution of study population according to alcohol intake status

Alcohol Intake
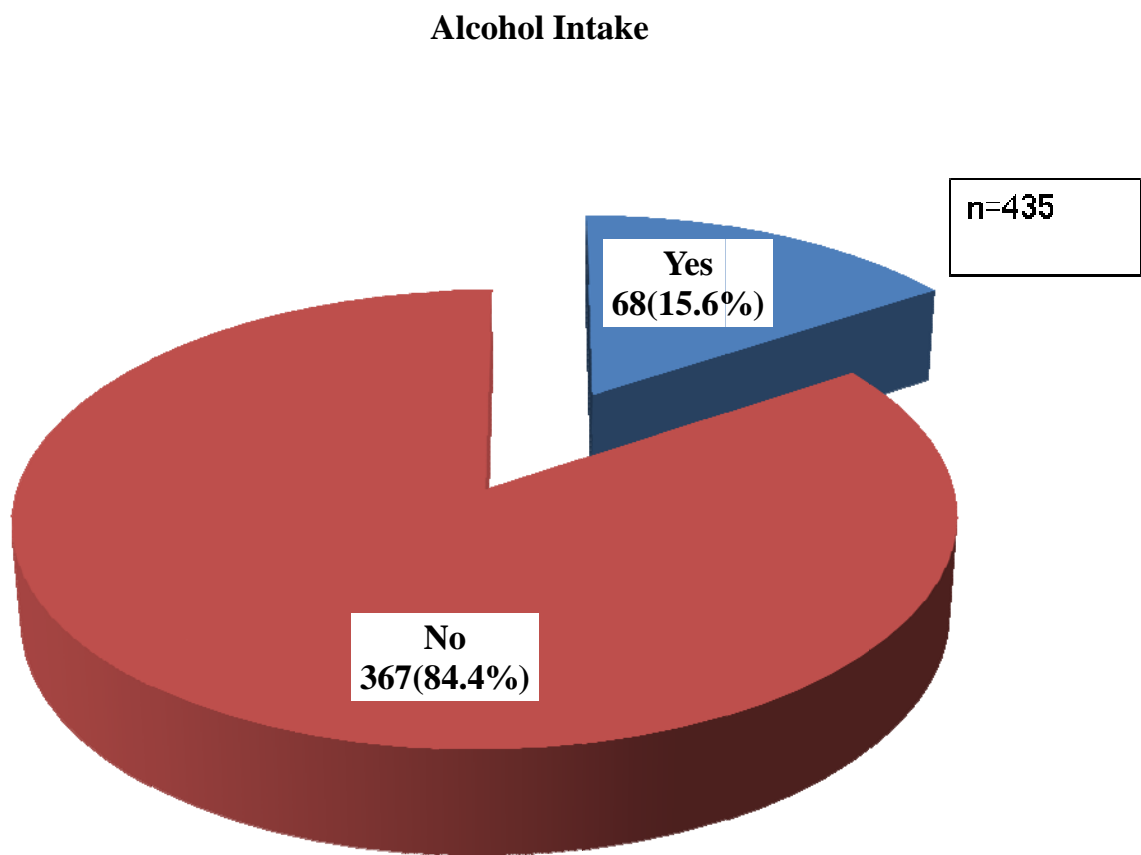
Among the 435 participants most were non alcoholics367(84.4%) and 68(15.6%)were current alcohol drinkers.

Figure 18: Pie chart showing distribution of study population according to level of physical activity

Level of Physical activity
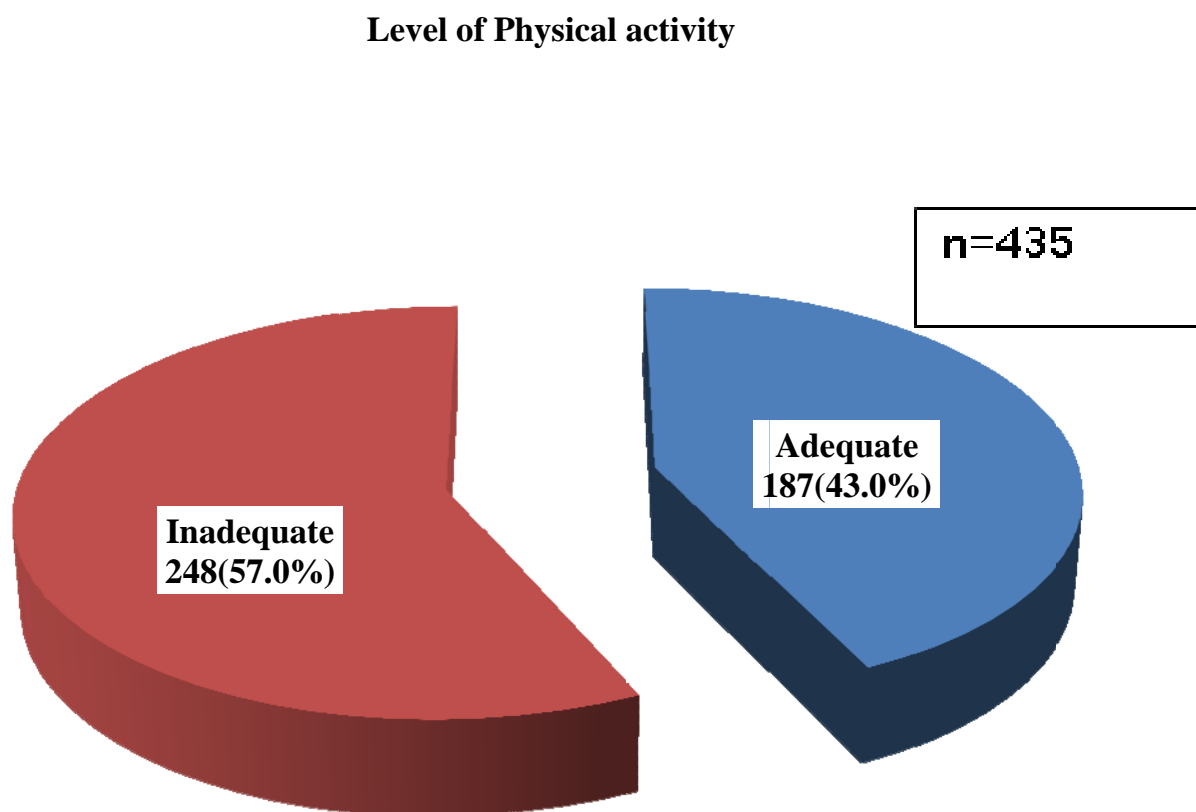
Among the 435 participants 248(57%) had inadequate levels of physical activity

and 187(43%) had adequate physical activity

Figure 19: Pie chart showing distribution of study population according to family history of hypertension

Family history of Hypertension
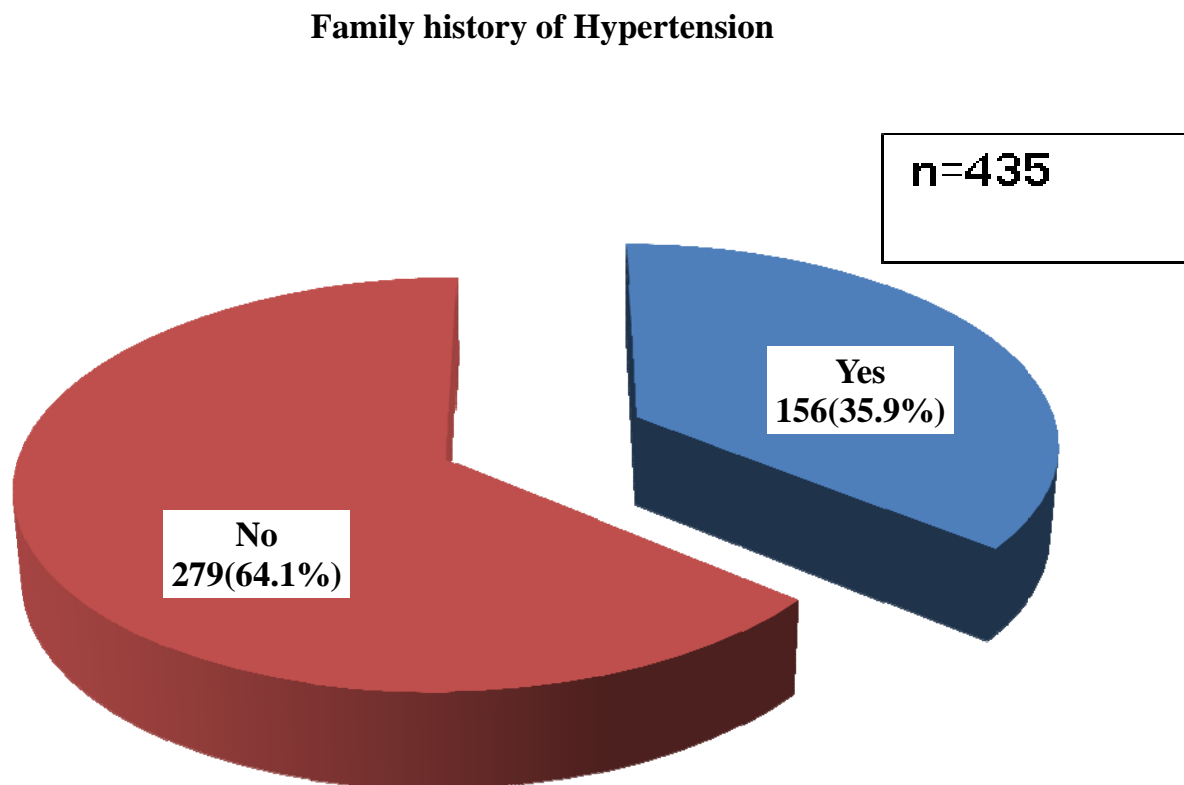
Among the 435 participants 35% (156) had family history of hypertension and 279(64.1%) had no family history of hypertension

Figure 20: Pie chart showing distribution of study population according to Fruit intake

Fruit and Vegetable Intake

More than Five times
113(26.0%)

n=435

Less than five times
322(74.0%)
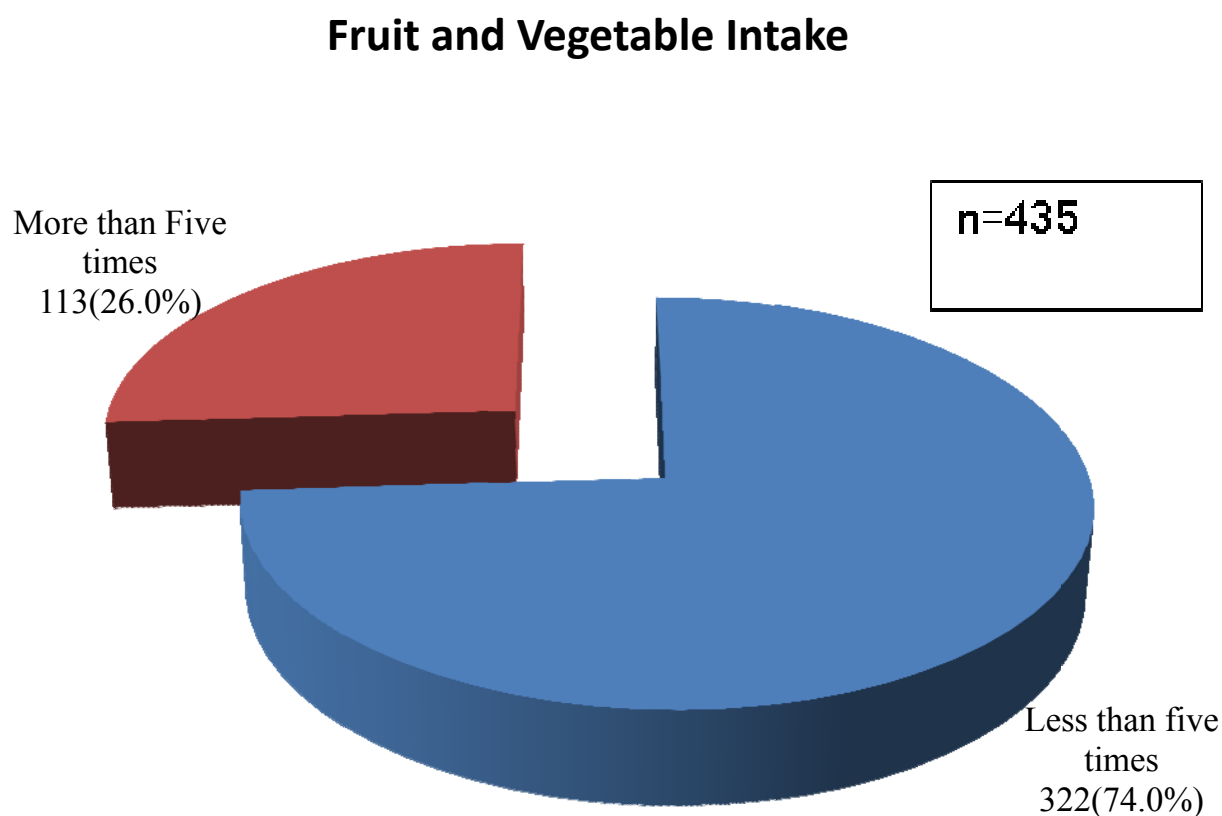
Out of the 435 participants an alarmingly 74% had fruit and vegetable intake less than 5 times a day and 26 % had intake of fruits and vegetables more than five times per day.

Figure 21: Pie chart showing distribution of study population according to salt intake status

Daily Salt Intake

n=435

Less than
5gm/day
216(49.7%)

More than
5gm/day
219(50.3%)
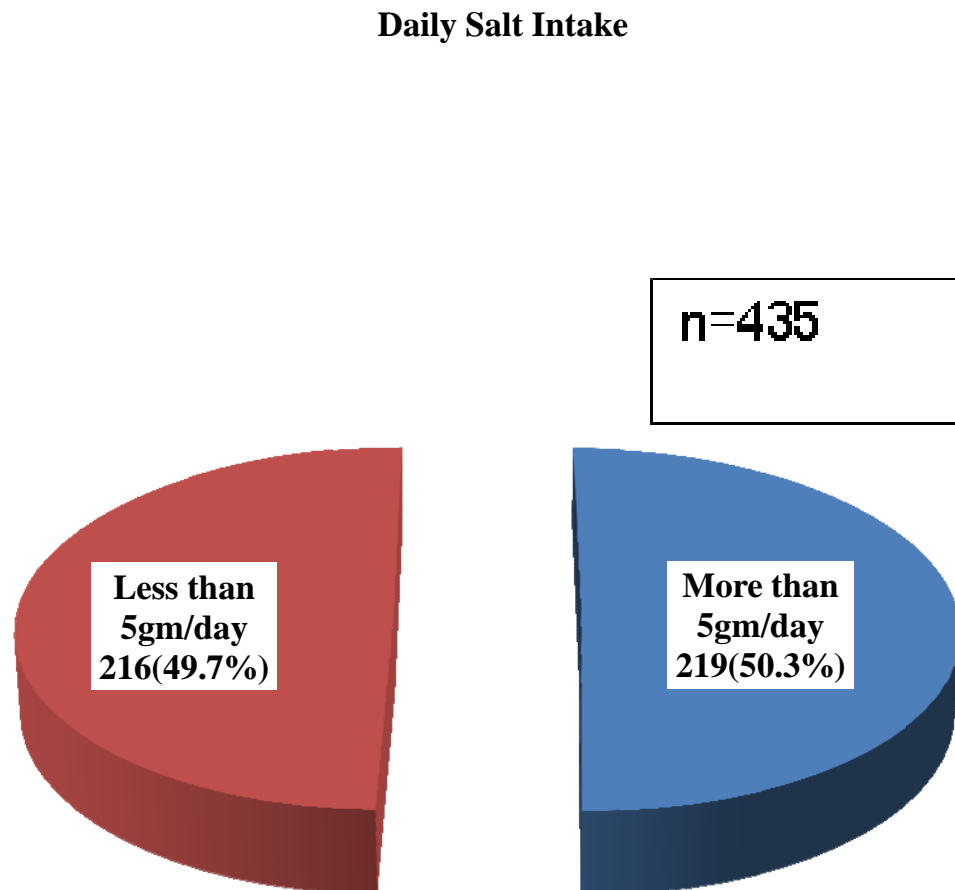
Among the participants 219(50.3%) took more than 5 gm salt per day and

216(49.7%) took less than 5gm salt per day

Figure 22: Pie chart showing distribution of study population according to added salt intake status

Added Salt Intake
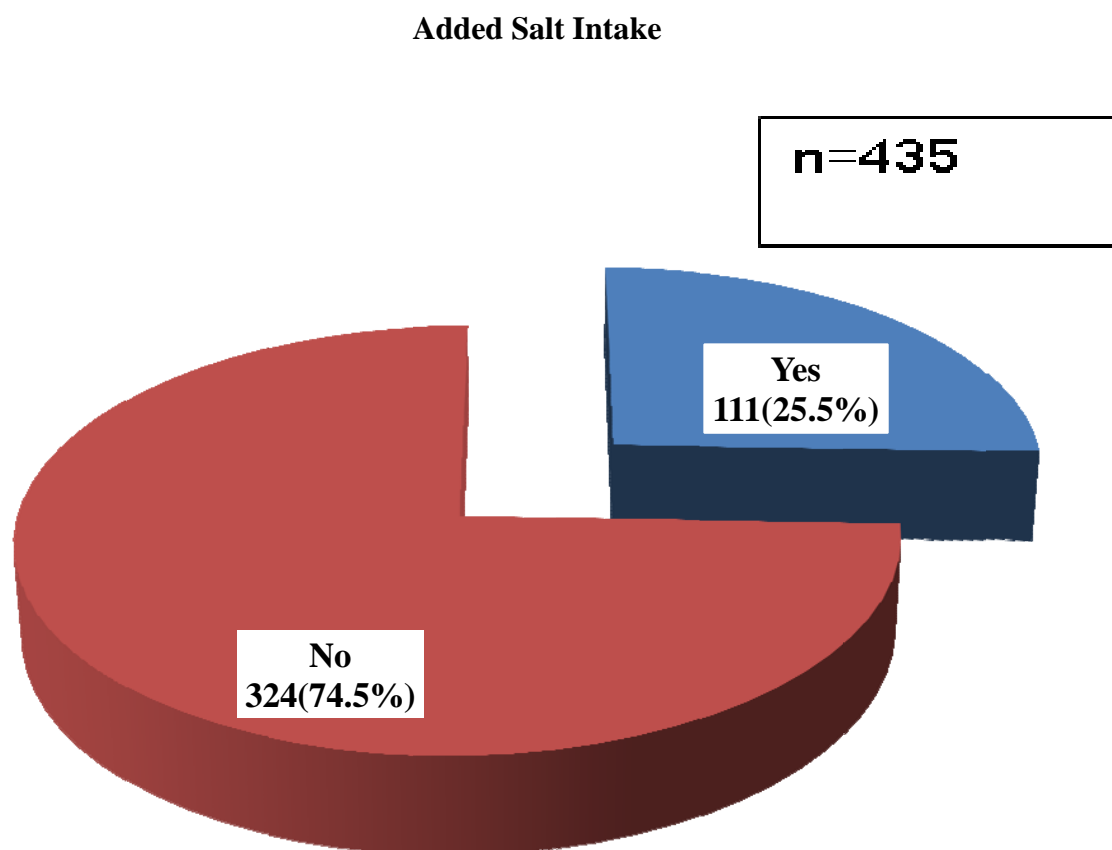
Among the 435 participants only 25.5% took extra salt while eating and 324(74.5%) didn't take extra salt while eating.

Figure 23: Pie chart showing distribution of study population according to Blood pressure status

Blood Pressure

n=435

Normal — 189(43.4%)
Pre HTN — 141(32.4%)
HTN — 105(24.1%)
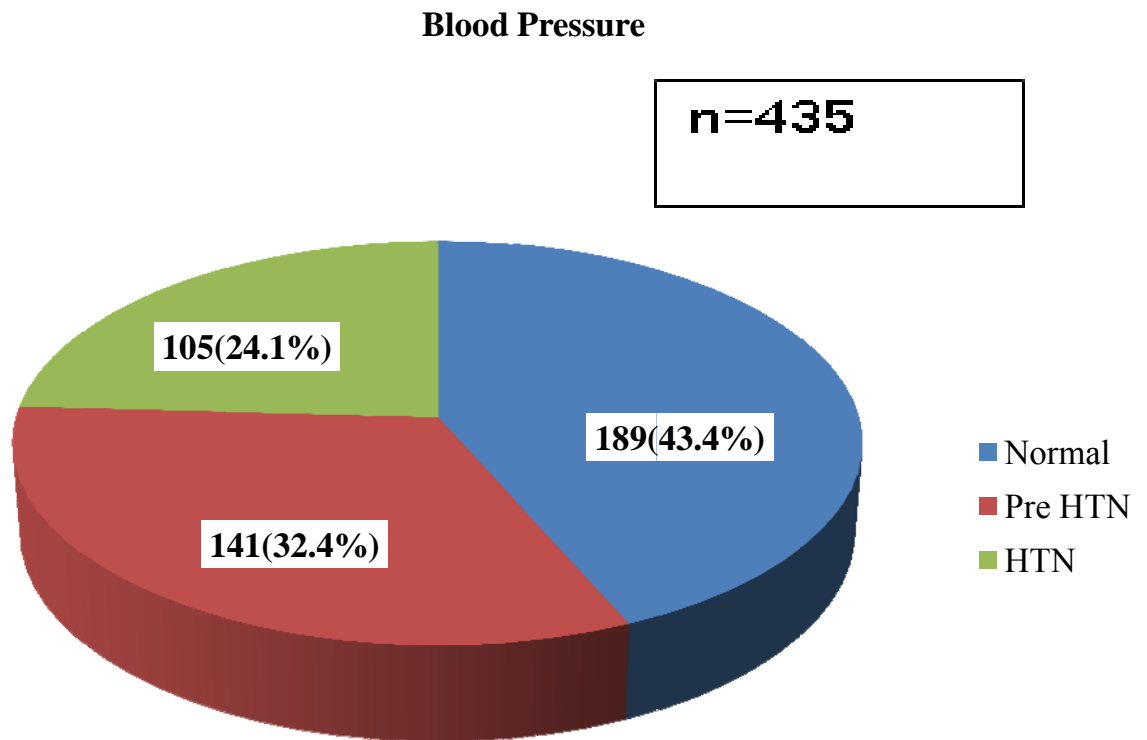
Prevalence of Pre Hypertension and Hypertension in the study population was assessed by using JNC 7 Classification. The result were as follows As per the present study the prevalence of Pre Hypertension is 32.4 %(141) and Hypertension is 24.1%(105). About 43.4% of the study population had normal blood pressure.

Table 4 : Distribution of participants according to blood pressure status and age

Age	Normal	Pre-Hypertension	Hypertension	Total
<30	90(62.9%)	41(28.7%)	12(8.4%)	143(100%)
30-39	53(53.5%)	35(35.4%)	11(11.1%)	99(100%)
40-49	24(31.6%)	34(44.7%)	18(23.7%)	76(100%)
50-59	9(15.5%)	24(41.4%)	25(43.1%)	58(100%)
>60	13(22%)	7(11.9%)	39(66.1%)	59(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =120.833   df =8   p<0.001

In the current study maximum proportion of pre hypertensives was found in the age group 40-49. As age increases the prevalence of hypertension is also increasing and this is statistically significant p=<0.001.

Table 5 : Distribution of participants according to blood pressure status and socio-economic status

SES	Normal	Pre-Hypertension	Hypertension	Total
Class 1	51 (44.7%)	49(43%)	14(12.3%)	114(100%)
Class 2	112(46.3%)	71(29.3%)	59(24.4%)	242(100%
Class 3	26(46.4%)	18(32.1%)	12(21.4%)	56(100%)
Class 4	0(0%)	3(13%)	20(87.0%)	23(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =62.314   df =6   p<0.001

In the current study the prevalence of hypertension was higher among the participants in class 4 and it is statistically significant p= < 0.001.

Table 6 : Distribution of participants according to blood pressure status and gender

Gender	Normal	Pre-Hypertension	Hypertension	Total
Male	57(30.2%)	79(41.8%)	53(28.0%)	189(100%)
Female	132(53.7%)	62(25.2%)	52(21.1%)	246(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =24.778   df =2   p = <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among the males and it is statistically significant p= <0.001

Table 7 : Distribution of participants according to blood pressure status and marital status

Marital Status	Normal	Pre-Hypertension	Hypertension	Total
Single	58(68.2%)	21(24.7%)	6(7.1%)	85(100%)
Married	123(38%)	113(34.9%)	88(27.2%)	324(100%)
Widow	8(30.8%)	7(26.9%)	11(42.3%)	26(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =32.686   df =4   p<0.001

In the current study the prevalence of pre hypertension was higher among married participants and hypertension was higher among the widows and it is statistically significant p= <0.001.

Table 8 : Distribution of participants according to blood pressure status and type of family

Type of Family	Normal	Pre-Hypertension	Hypertension	Total
Nuclear	114(46.3%)	90(36.6%)	42(17.1%)	246(100%)
Joint	64(39%)	37(22.6%)	63(38.4%)	164(100%)
Third generation	11(44%)	14(56%)	0(0%)	25(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

$\chi^2 = 36.707$ df = 4   p = <0.001

In the current study the prevalence of pre hypertension was higher among participants living in 3rd generation families and hypertension was higher among participants in joint family and it is statistically significant p= <0.001.

Table 9 : Distribution of participants according to blood pressure status and level of education

Level of Education	Normal	Pre-Hypertension	Hypertension	Total
Illiterate	5(11.6%)	17(39.5%)	21(48.8%)	43(100%)
Literate	35(50.7%)	16(23.2%)	18(26.1%)	69(100%)
Primary School	32(32.3%)	44(44.4%)	23(23.2%)	99(100%)
Secondary school	76(48.4%)	49(31.2%)	32(20.4%)	157(100%)
Graduate	41(61.2%)	15(22.4%)	11(16.4%)	67(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =42.061   df 8=   p = <0.001

In the current study the prevalence of pre hypertension was higher among participants educated up to primary level and hypertension was higher among illiterates and it is statistically significant p= <0.001.

Table 10 : Distribution of participants according to blood pressure status and employment status

Employment Status	Normal	Pre-Hypertension	Hypertension	Total
Employed	64(38.6%)	69(41.6%)	33(19.9%)	166(100%)
unemployed	21(37.5%)	21(37.5%)	14(25%)	56(100%)
Student	37(71.2%)	11(21.2%)	4(7.7%)	52(100%)
Housewife	61(47.3%)	34(26.4%)	34(26.4%)	129(100%)
Retired	6(18.8%)	6(18.8%)	20(62.5%)	32(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =52.426　　　　　　df =8　　　p = <0.001

In the current study the prevalence of pre hypertension was higher among the employed participants and hypertension was higher among the retired participants and it is statistically significant p= <0.001

Table 11 : Distribution of participants according to blood pressure status and current smoking habit

Smoking	Normal	Pre-Hypertension	Hypertension	Total
Yes	11(14.7%)	37(49.3%)	27(36%)	75(100%)
No	178(49.4%)	104(28.9%)	78(21.7%)	360(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =30.565   df =2   p <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among current smokers compared to non smokers and it is statistically significant   p= <0.001.

Table 12 : Distribution of participants according to blood pressure status and alcohol intake

Alcohol intake	Normal	Pre-Hypertension	Hypertension	Total
Yes	8(11.8%)	36(52.9%)	24(35.3%)	68(100%)
No	181(49.3%)	105(28.6%)	81(22.1%)	367(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =33.256   df =2   p = <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among the alcoholics compared to non alcoholics and it is statistically significant   p= <0.001.

Table 13 : Distribution of participants according to blood pressure status and physical activity

Physical activity	Normal	Pre-Hypertension	Hypertension	Total
Adequate	91(48.7%)	62(33.2%)	34(18.2%)	187(100%)
Inadequate	98(39.5%)	79(31.9%)	71(28.6%)	248(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

$\chi^2 = 6.929$ df = 2   p=0.031

In the present study physical activity didn't affect pre hypertension status. But hypertension was higher among participants with inadequate physical activity compared to participants with adequate physical activity.

Table 14 : Distribution of participants according to blood pressure status and family history of hypertension

Family history of hypertension	Normal	Pre-Hypertension	Hypertension	Total
Yes	41(26.3%)	54(34.6%)	61(39.1%)	156(100%)
No	148(53%)	87(31.2%)	44(15.8%)	279(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =39.425   df =2   p = <0.001

In the current study the prevalence of pre hypertension and hypertension were higher among the participants with family history of hypertension compared to participants without family history of hypertension and it is statistically significant p= <0.001

Table 15 : Distribution of participants according to blood pressure status and fruit and vegetable intake

Fruit and Vegetable intake	Normal	Pre-Hypertension	Hypertension	Total
Less than five times/day	108(33.5%)	121(37.6%)	93(28.9%)	322(100%)
More than Five times/day	81(71.7%)	20(17.7%)	12(10.6%)	113(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =49.761　　　　　　df =2　　　p = <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among the participants eating fruits and vegetables less than 5 times per day compared to participants who eat fruits and vegetables more than 5 times per day and it is statistically significant p= <0.001.

Table 16 : Distribution of participants according to blood pressure status and salt intake

Salt intake	Normal	Pre-Hypertension	Hypertension	Total
More than 5gm/day	41(18.7%)	105(47.9%)	73(33.3%)	219(100%)
Less than 5gm/day	148(68.5%)	36(16.7%)	32(14.8%)	216(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =110.337   df =2   p = <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among the participants consuming salt more than 5 times per day compared to participants who consume salt less than 5 times per day and it is statistically significant p= <0.001.

Table 17 : Distribution of participants according to blood pressure status and extra salt intake

Extra salt intake	Normal	Pre-Hypertension	Hypertension	Total
Yes	23(20.7%)	40(36%)	48(43.2%)	111(100%)
No	166(51.2%)	101(31.2%)	57(17.6%)	324(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =40.857   df =2   p = <0.001

In the current study the prevalence of pre hypertension and hypertension was higher among the participants who took added salt other than used for cooking compared to participants who didn't take added salt and it is statistically significant p= <0.001.

Table 18 : Distribution of participants according to blood pressure status and BMI

BMI Status	Normal	Pre-Hypertension	Hypertension	Total
Under weight	31(58.5%)	11(20.8%)	11(20.8%)	53(100%)
Normal	109(42.4%)	92(35.8%)	56(21.8%)	257(100%)
Over weight	46(44.2%)	27(26%)	31(29.8%)	104(100%)
Obese	3(14.3%)	11(52.4%)	7(33.3%)	21(100%)
Total	189(43.4%)	141(32.4%)	105(24.1%)	435(100%)

χ^2 =16.957 $\qquad$ df =6 $\qquad$ p=0.009

In the present study the prevalence of pre hypertension and hypertension was higher among the overweight and obese people compared to people with normal BMI and it is statistically significant p= <0.001

6. DISCUSSION

The current study was done to estimate the prevalence of pre hypertension and hypertension in a rural area of Kanyakumari district and compare some risk factors associated with pre hypertension and hypertension

A total of 435 persons greater than18 years of age were included from 5 village panchayaths of Thiruvattar block area. Most of the participants were below the age of 30 followed by 30-39 year age group. Males constituted 189(43.4%) and females 246(56.6%).

Majority of the participants belonged to the class 2 socio economic status.

Following JNC 7 classification the prevalence of pre hypertension in the study group was 32.4% and prevalence of hypertension was 24.1%.43.4% of participants had normal blood pressure readings. The finding of the study is comparable to the WHO estimates which gives the prevalence of hypertension in India as 24%.[34]

Community based survey done by ICMR to identify the risk factors for non –communicable diseases found 44% prevalence of pre hypertension which is higher than the current study finding.[46] Mohan et-al found the prevalence of pre hypertension to be 36.1% in Chennai which is comparable to the current study findings.[47] Vikas kumar et al found the prevalence of pre hypertension to be 47.27% which is higher compared to the current study.

The current study found age to be an important non modifiable risk factor for development of hypertension. The prevalence of hypertension was 8.4% in participants less than 30 years, which increased to 66.1% in adults more than 60 years. There was a sharp increase in prevalence of hypertension after the age of 50 years.

The main reason for increase in blood pressure with increase in age is that arteries and arterioles become less elastic due to atherosclerotic changes as people age.

Yuvarj BY [58] and Mahanta et al found a positive trend with increasing age with hypertension.[59] Hasan et al conducted a study on prevalence of hypertension in Haridwar and found that prevalence of hypertension increased with age.[60]

In the present study 35.9% participants had a family history of hypertension. The occurrence of hypertension was significantly higher in participants with family history of hypertension. Prevalence of hypertension was 39.1% among participants who had a family history of hypertension and 15.8% among who did not have family history of hypertension.

Similar finding was observed in a study done by Bartwal et al found family history to be significantly associated with hypertension.[63] Mandal et al also found family history of hypertension as a risk factor for developing hypertension [66].

In the present study 50.3% of the participants were consuming salt >5 gm/day. Extra salt intake is found to be an important risk factor for development of hypertension. The prevalence of pre hypertension was 47.9% among people consuming >5gm salt/day compared to 16.7% among people consuming <5gm salt/day. The prevalence of hypertension was 33.3% among people consuming >5gm salt/day compared to 14.8% among people consuming <5gm salt/day.

Similar finding was observed in a study conducted by Ganesh kumar et al in which consumption of extra salt was associated with hypertension.[83] A study done by AK Srivastava et al found that 72% of hypertensives were consuming more than 5gm salt per day.

In the present study 17.2% of the participants are current smokers. The prevalence of pre hypertension was 49.3% among smokers compared to 28.9% among non smokers. The prevalence of hypertension was 36% among smokers when compared with 21.7% among non smokers and this association was statistically significant.

Similar finding was observed in a study done by guptha et-al showed smoking was significantly associated with higher prevalence of systemic hypertension.[89] A study done shows that smoking was significantly related with systemic hypertension.[88]

In the present study alcohol consumption was found to be an important risk factor for development of pre hypertension and hypertension. The prevalence of pre hypertension was 52.9% among alcoholics compared to 28.6% among non

alcoholics. The prevalence of hypertension was 35.3% among alcoholics compared to 22.1% among non alcoholics and this association was statistically significant.

Pooja, Mittal Y conducted a study on prevalence of hypertension and its determinants in an urban area of Uttarkhand. They found Alcohol consumption was significantly associated with prevalence of hypertension (P value=0.008.[71]

The present study found that people who are engaged in regular physical activity (Engage in regular aerobic physical activity such as brisk walking at least 30 mints/day, at least 5days/week) had less chance of developing hypertension compared to people who rarely do any physical activity.

The prevalence of hypertension was 18.2% among participants who are physically active compared to 28.6% among participants who are inactive and this association was statistically significant.

Anand sivaprasad et al found the prevalence of hypertension was significantly higher among the subjects with low physical activity (43.6%) than those having moderate or vigorous activity (p=0.01).[100]

The current study found that people who consume fruits and vegetables >5 times/day had less chance of developing pre hypertension and hypertension compared to people who consume fruits and vegetables <5 times/day and this association was statistically significant.

A study done on prevalence of hypertension among urban adult population in Nellore found that persons with vegetable intake less than five servings per day had 2.9 times higher risk (OR=2.91)of developing hypertension compared to people consuming vegetables more than five servings per day.[93]

In the current study significant association was found between BMI and Pre hypertension and hypertension. The prevalence of pre hypertension was 52.4% among obese participants compared to 35.8% among participants with normal BMI. The prevalence of hypertension was 33.3% among obese participants compared to 21.8% among participants with normal BMI. This association was statistically significant.

7. SUMMARY AND CONCLUSION

The present study was done to estimate the prevalence of pre hypertension and hypertension in a rural area of Kanyakumari district and compare some risk factors associated with pre hypertension and hypertension.

A total of 435 adults >18 years of age were included from 5 village panchayaths of Thiruvattar block area. Most of the participants were below the age of 30 followed by 30-39 year age group. Males constituted 189(4.4%) and females 246(56.6%).Majority of the study population belonged to the class 2 socio economic status.

Following JNC 7 classification the prevalence of pre hypertension in the current study was 32.4% and prevalence of hypertension was 24.1%.43.4% of participants had normal blood pressure readings. The finding of the study is comparable to the WHO estimates which gives the prevalence of hypertension in India as 24%.

The factors identified as increasing the risk of developing hypertension were increasing age, family history of hypertension, Inadequate physical activity, excess salt intake, tobacco smoking, alcoholism, BMI > $25kg//m^2$ and less consumption of fruits and vegetables.

8. RECOMMENDATIONS

Based on the findings in the current study the following recommendations are suggested to prevent and control hypertension.

1. Primodial prevention plays an important role in the preventing hypertension. It is achieved by developing healthy habits in childhood as many risk factors of hypertension found in the current study originate during this stage in life. Primodial prevention must be included in school curriculum with participation of teachers.

2. Legislation for control of sale of tobacco and alcohol must be passed and stringently implemented as tobacco and alcohol are associated with hypertension.

3. Extra salt intake is a risk factor for hypertension. So government should make it mandatory for all processed foods to display calories, cholesterol and salt present in it.

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ANNEXURE-I

Sree Mookambika Institute of Medical Sciences
Kulasekharam (K.K District, TN) 629161
Phone No: 04651-280866, Fax No. 04651-280740

Institutional Human Ethics Committee

Registered under CDSCO with Reg No. ECR/446/Inst/TN/2013

Ref. No. SMIMS/IHEC/2013/C/19   Date: 27th December 2013

Certificate

This is to certify that the Research Protocol Ref. No. **SMIMS/IHEC/2013/C/19,** entitled "A Study on Pre-Hypertension and Hypertension in a Rural Area of Kanyakumari District" submitted by Dr. Krishna Prasad C, Postgraduate of Department of Community Medicine, SMIMS has been approved by the Institutional Human Ethics Committee at its meeting held on 19th of December 2013.

[This Institutional Human Ethics Committee is organized and operates according to the requirements of ICH-GCP/GLP guidelines and requirements of the Amended Schedule-Y of Drugs and Cosmetics Act, 1940 and Rules 1945 of Government of India.]

Dr. Rema Menon. N
Member Secretary
Institutional Human Ethics Committee
Professor of Pharmacology and HOD
SMIMS, Kulasekharam [K.K District]
Tamil Nadu -629161

ANNEXURE – II
CONSENT FORM
PART 1of 2
INFORMATION FOR PARTICIPANTS OF THE STUDY

Dear Participants,

  We welcome you and thank you for your keen interest in participation in this research project. Before you participate in this study, it is important for you to understand why this research is being carried out. This form will provide you all the relevant details of this research. It will explain the nature, the purpose, the benefits, the risk, the discomforts, the precautions and the information about how this project will be carried out. It is important that you read and understand the contents of the form carefully. This form may contain certain scientific terms and hence, if you have any doubts or if you want more information, you are free to ask the study personnel or the contact person mentioned below before you give your consent and also at any time during the entire course of the project.

1. Name of the Principal Investigator : Dr. Krishna Prasad.C,
    I year Post Graduate,
    Department of Community Medicine,
    Sree Mookambika Institute of Medical Sciences,
    Kulasekharam – 629 161.

2. Name of the Guide   : Dr. Usha Devi,
    Professor and Head,
    Department of Community Medicine,
    Sree Mookambika Institute of Medical Sciences,
    Kulasekharam – 629 161.

3. Name of the Co-guide   : Dr. Prashant Solanke,
    Associate Professor ,
    Department of Community Medicine,
    Sree Mookambika Institute of Medical Sciences,
    Kulasekharam – 629 161.

4. Institute   :   Sree Mookambika Institute of Medical Sciences, Kulasekaram, Kanyakumari District,Tamil nadu

5. Title   :   **"A STUDY ON PRE-HYPERTENSION AND HYPERTENSION IN A RURAL AREA OF KANYAKUMARI DISTRICT"**.

6. Background Information:

   Hypertension is a chronic medical condition in which blood pressure in the arteries is elevated. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths. Hypertension is a major risk factor for heart attacks, angina (chest pain) stroke and kidney failure. The high incidence of these diseases and high prevalence of high blood pressure in most societies make it the cause of many premature deaths. The situation in India is quite poor too. It is important to study about prevalence of hypertension in the community because it is a controllable disease and a reduction in blood pressure will avoid many premature deaths.

7. Aims and objectives:

   i. To find out the prevalence of pre-hypertension and hypertension among people>18 yrs of age

   ii. To find out factors associated with hypertension and pre-hypertension.

8. Scientific justification of the study:

   The prevalence of hypertension has been increasing in India, both in urban and rural regions. Review of epidemiological studies in India suggests that the prevalence of hypertension in the last six decades has increased from 2% to 25% among urban residents and from 2% to 15% among rural residents of India. Hypertension awareness, treatment and control status is low, with half of urban and quarter of rural hypertensive individuals aware of its presence in India. My study details will help authorities to plan and implement interventional programmes aimed at reducing the burden of hypertension and its complications. Essential hypertension, a grossly underestimated condition in rural communities is likely to be an important public health problem.

9. Procedure for the study:

   A questionnaire will be applied and their blood pressure, height and weight will be measured.

10. Expected risk for the participants : No risk

11. Expected benefits of research for the participants:

   We will provide the reports of their blood pressure and physical measurements with relevant advice. By participating in the study you are providing us valuable information regarding the burden of high blood pressure risk in the area.

12. Maintenance of Confidentiality: The information you provide, your blood pressure readings and physical measurements will be kept confidential and will not be shared with anyone expect for the investigators of this study and research team.

13. Why have I been chosen to be in this study:

> i.   Resident of study area
>
> ii. Age >18

14. How many people will be in the study?: 435

15. Agreement of compensation to the participants: No

16. Anticipated prorated payment, if any, to the participant's in the study: No payment

17. Can I withdraw from the study at any time during the study period? Yes

18. If there are any new findings/ information, would I be informed? Yes

19. Expected duration of the participant's participation in the study

> On an average 45 minutes

20. Any other pertinent information: No

21. Whom do I contact for further information?

<u>For any study related queries, you are free to contact</u>

Dr. Krishna Prasad.C,
I year Post Graduate,
Department of Community Medicine,
Sree Mookambika Institute of Medical Sciences,
Kulasekharam – 629 161,

Place :

Date :   *Signature of the Principal Investigator*

Signature of the Participant

CONSENT FORM

PART 2 of 2

PARTICIPANTS CONSENT FORM

The details of the study have been explained to me in writing and the details have been fully explained to me. I am aware that the results of the study may not be directly beneficial to me but will help in the advancement of medical sciences. I confirm that I have understood the study and had the opportunity to ask questions. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without the medical care that will normally be provided by the hospital being affected. I agree not to restrict use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have been given an information sheet giving details of the study. I fully consent to participate in the study title "**A STUDY ON PRE-HYPERTENSION AND HYPERTENSION IN A RURAL AREA OF KANYAKUMARI DISTRICT"**.

Serial No. :   O.P. No. :

Name of the Participant:

Address of the Participant;

Contact number of the participant:

Signature/ Thumb impression of the participant

Witnesses:

1.

2.

Date:

Place:

സമ്മത പത്രം

ഭാഗം – 1

ഈ പഠനത്തിൽ പങ്കാളികളാവുന്നവർക്കുള്ള അറിവിനായ് പ്രിയമുള്ള സേവനദാതാക്കളെ,

പ്രിയമുള്ള സേവനദാതാക്കളെ,

ഈ ഗവേഷണ പഠനത്തിൽ പങ്കെടുക്കാൻ അതീവതാല്പര്യം കാണിച്ച നിങ്ങളേവർക്കും സ്വാഗതം ഓതുന്നു, നന്ദി രേഖപ്പെടുത്തുന്നു.

ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതിനു മുൻപ് ഗവേഷണത്തിന്റെ ഉദ്ദേശമെന്താണ് നിങ്ങൾ എല്ലാവരും മനസ്സിലാക്കേ താണ്. ഇതോടൊന്നിച്ച് വച്ചിരിക്കുന്ന ഫാറത്തിൽ ഗവേഷണത്തിന്റെ രൂപവും, ഭാവവും വിവരങ്ങളും കാണിച്ചുട്ടു ്. ഗവേഷണത്തിന്റെ സ്വഭാവം, ഉദ്ദേശം, പ്രയോജനം, അപകടസാദ്ധ്യതകൾ, സ്വീകരിക്കേ മുൻ കരുതലുകൾ തുടങ്ങിയ വിവരങ്ങൾ ഈ പഠനത്തിൽ നിന്നും ഗ്രഹിക്കാവുന്നതാണ്. ഈ ഫാറം ശരിയായും ശ്രദ്ധാപൂർവ്വവും വായിച്ചു മനസ്സിലാക്കേ താണ് വളരെ അത്യാവശ്യമായ കാര്യമാണ്.

ഈ ഫാറത്തിൽ ചില ശാസ്ത്രീയ പദങ്ങൾ ഉള്ളതിനാൽ സംശയങ്ങൾ വന്നാൽ ചോദിച്ചു മനസ്സിലാക്കേ തും കൂടുതൽ വിവരങ്ങൾ പഠിതാക്കളോടൊ താഴെപറയുന്ന വ്യക്തിയോടൊ അതാതുസമയങ്ങളിൽ ചോദിച്ചു സംശയ നിവർത്തനം വരുത്തേ തുമാണ്.

1. പ്രധാന അന്വേഷകന്റെ പേര് : ഡോ. കൃഷ്ണപ്രസാദ്. സി.
ബിരുതാനന്തര വിദ്ധ്യാർത്ഥി,
ശ്രീ മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് മെഡിക്കൽ സയൻസ്,
കുലശേഖരം - 629 161.

2. മാർഗ്ഗദർശിയുടെ പേര് : ഡോ.ഉഷാദേവി
പ്രൊഫസർ & വകുപ്പ് മേധാവി,
ഡിപ്പാർട്ട്മെന്റ് ഓഫ് കമ്യൂണിറ്റി മെഡിസിൻ,
ശീ മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് മെഡിക്കൽ സയൻസസ്,
കുലശേഖരം- 629 161.

3. സഹ മാർഗ്ഗദർശിയുടെ പേര് : ഡോ.പ്രശാന്ത് സോളാങ്കി
അസോസിയേറ്റ് പ്രൊഫസർ,
ഡിപ്പാർട്ട്മെന്റ് ഓഫ് കമ്യൂണിറ്റി മെഡിസിൻ,
ശ്രീ മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് മെഡിക്കൽ സയൻസസ്,
കുലശേഖരം- 629 161.

4. സ്ഥാപനത്തിന്റെ പേര് : ശ്രീ. മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് മെഡിക്കൽ സയൻസസ്,
വി.പി.എം. ഹോസ്പിറ്റൽ കോംപ്ലക്സ്, പടനിലം,
കുലശേഖരം, കന്യുകുമാരിജില്ല, തമിഴ്നാട് – 629 161.

5. പഠനത്തിന്റെ പേര് :

കന്യാകുമാരി ജില്ലയിലെ ജനങ്ങളിലിടയിലുള്ള രക്ത സമ്മർദ്ദം ക ുപിടിക്കുന്നതിനുള്ള പഠനം.

6. വിവരം നൽകുന്നതിന്റെ പശ്ചാത്തലം

രക്തം സമ്മർദ്ദം എന്നുള്ളത് ധമനികളിലെ സമ്മർദം കൂടുതന്നതു കൊ ു ാവുന്ന അവസ്ഥയാണ്. മരണ കാരണങ്ങളിൽ വികസിത രാജ്യങ്ങളിൽ നാലാം സ്ഥാനവും പുരോഗമന രാജ്യങ്ങളിൽ ഏഴാം സ്ഥാനവുമാണ്. ആഗ്ലോള തലത്തിൽ രക്തസമ്മർദം കാരണം ഏകദേശം 7.5 മില്ല്യൻ ആളുകൾ മരണത്തിനിടയാകുന്നു. ഹൃദയാഹാദം, നെഞ്ചുവേദന, സ്തംഭനം, കിഡ്നി അസുഖങ്ങളുടെ പ്രധാന കാരണം രക്തസമ്മർദ്ദമാണ്. ഇന്ത്യയിലെ സ്ഥിതിയും വളരെ മോശമാണ്. അതുകൊ ് രക്തസമ്മർദ്ദത്തിന്റെ തോതിനെക്കുറിച്ച് പഠിക്കുന്നത് വളരെ പ്രധാനമാണ്.

7. ലക്ഷ്യങ്ങളും ഉദ്ദേശങ്ങളും

➢ 18 വയസ്സിനു മുകളിലുള്ളവരുടെ രക്തസമ്മർദ്ദം ക   ുപിടിക്കുന്നതിന്
➢ രക്തസമ്മർദ്ദവും അതുമായി ബന്ധപ്പെട്ട കാര്യങ്ങൾ ക   ുപിടിക്കുന്നതിന്.

8. ഈ പഠനത്തിന്റെ ശാസ്ത്രീയ ്യായീകരണം

ഇന്ത്യയിൽ ഗ്രാമങ്ങളിലും, നഗരങ്ങളിലും രക്തസമ്മർദ്ദത്തിന്റെ തോത് ഉയർന്നുവരികയാണ്. ഇന്ത്യയിലെ പഠനങ്ങൾ കാണിക്കുന്നത് കഴിഞ്ഞ 60 വർഷങ്ങൾക്കിടയിൽ രക്തസമ്മർദ്ദത്തിന്റെ തോത് നഗരങ്ങളിൽ 2% മുതൽ 25%വും, ഗ്രാമങ്ങളിൽ 2% മുതൽ 15%വരെയുമാണ്. രക്തസമ്മർദ്ദത്തിനെക്കുറിച്ചുള്ള ആളുകളുടെയിടയിലുള്ള അബബോധവും ചികിത്സയും വളരെ കുറവാണ്. എന്റെ ഈ പഠനം കൊ ് രക്തസമ്മർദത്തിന്റെ തോത് എത്രത്തോളമാണെന്ന് ക   ുപിടിക്കുവാനും അതിന്റെ കുഴപ്പങ്ങൾ കുറയ്ക്കുവാനും വേ ിയാണ്.

9. ഈ പഠനത്തിന്റെ നടപടിക്രമം

ചോദ്യാവലിയ്ക്ക് അനുസരിച്ചുള്ള ചോദ്യങ്ങൾ ചോദിക്കുകയും പങ്കെടുക്കുന്ന ആളിന്റെ രക്ത സമ്മർദ്ദത്തിന്റെ അളവും പൊക്കവും, തൂക്കവും നോക്കുന്നു.

10. പങ്കെടുക്കുന്നവർക്ക് വരാവുന്ന അപകടസാധ്യതകൾ

ഒന്നും തന്നയില്ല

11. പങ്കെടുക്കുന്നവർക്ക് ഗവേഷണഫലമായി ഉ   ാവുന്ന പ്രയോജനം

ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നവർക്ക്   ശരീരത്തിലെ രക്തസമ്മർദം ഏതുവിധത്തിലാണെന്ന് അറിയാൻ സാധിക്കും.

12. രഹസ്യ വിവരങ്ങൾ പുറത്തറിയിക്കാതെ സൂക്ഷിക്കൽ

തീർച്ചയായും

13. എന്നെ എന്തിനാണ് ഈ പഠനത്തിനായ് തെരഞ്ഞെടുത്തത്.

നിങ്ങൾ 18 വയസ്സിന് മുകളിൽ പ്രായമായ ആളായതുകൊ ്.

14. ഈ പഠനത്തിൽ എത്രപേർ പങ്കെടുക്കുന്നു ്?   – 435

15. ഈ പഠനം മൂലമു   ാകുന്ന ക്ഷതങ്ങൾക്ക് നഷ്പരിഹാരത്തിനുള്ള സമ്മതം

ബാധകമല്ല

16. പഠനത്തിൽ പങ്കാളികളാകുന്നവർക്ക് മുൻകൂർ കണക്കിൽ പ്രകാരം നൽകേ   പ്രതിഫലത്തിന്റെ തോത്   – ബാധകമല്ല

17. എനിക്ക് ഈ പഠനത്തിന്റെ കാലഘട്ടത്തിനിടയിൽ എപ്പോൾ വേണമെങ്കിലും പിൻമാറാൻ അവകാശമു   ാ ?   അതെ

18. പുതിയതായി എന്തെങ്കിലും ക   ുപിടിച്ചാൽ എന്നെ അറിയിക്കുമോ ?   അതെ

19. ഈ പഠനം എത്ര സമയമു   ാകും ? ഒരുമണിക്കൂർ

20. മറ്റെന്തെങ്കിലും വിവരം ? ഇല്ല

21. കൂടുതൽ വിവരങ്ങൾക്ക് ഞാൻ ആരോടാണ് സമ്പർക്കം പുലർത്തേ   ത്

താഴെ കൊടുത്തിരിക്കുന്ന വിലാസത്തിൽ

പ്രധാന അന്വേഷകന്റെ പേര്
ഡോ. കൃഷ്ണപ്രസാദ്. സി.
ബിരുതാനന്തര വിദ്യാർത്ഥി,
കമ്യൂണിറ്റി മെഡിസിൻ വിഭാഗം
ശ്രീ മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് മെഡിക്കൽ സയൻസ്,
കുലശേഖരം - 629 161.

സ്ഥലം: കുലശേഖരം

തീയതി :

പ്രധാന അന്വേഷകന്റെ കൈയ്യൊപ്പ്

പങ്കെടുക്കുന്ന ആളുടെ കൈയ്യൊപ്പ്

സമ്മതപത്രം

ഭാഗം – 2

പങ്കെടുക്കുന്നവരുടെ സമ്മത പത്രം

പങ്കെടുക്കുന്നവരുടെ സമ്മത പത്രം,

വാചികമായും, എഴുതിയും ഈ പഠനത്തെപ്പറ്റിയുള്ള വിവരങ്ങൾ എനിക്ക് പൂർണ്ണമായി മനസ്സിലാക്കി തന്നിട്ടു ്.

ഈ പഠനത്തിന്റെ ഫലങ്ങൾ എനിക്ക് വ്യക്തിപരമായി പ്രയോജനം ചെയ്യുകയില്ലെങ്കിലും വൈദ്യശാസ്ത്ര പരമായിട്ടുള്ള പ്രയോജനം ചെയ്യുകയില്ലെങ്കിലും വൈദ്യശാസ്ത്രപരമായിട്ടുള്ള പുരോഗതിക്ക് സഹായകരമാകുമെന്ന് എനിക്കറിയാം.

ഈ പഠനം മൂലം എനിക്ക് ചോദ്യങ്ങൾ ചോദിക്കുവാനുള്ള അവസരം നൽകുന്നു ്. ഈ പഠനത്തിൽ പങ്കാളിയാകുന്നത് എന്റെ സ്വമനസ്സാലെ ഞാൻ ചെയ്യുന്നതാണ്. ഈ പഠനത്തിൽ നിന്നും പ്രത്യേക കാരണങ്ങളൊന്നും പറയാതെ എന്റെ സമയത്തും പിൻമാറാൻ കഴിയുമെന്ന് എനിക്ക് ബോധ്യമു ്. ഇതുമൂലം ആശുപ്രതിയിൽ നിന്നും നൽകുന്ന വൈദ്യസാഹയത്തിന് കുറവു ാവുകയില്ലെന്നും എനിക്കറിയാം.

ഈ പഠനത്തിൽ നിന്നും ലഭിക്കുന്ന സ്ഥിതിവിവരണം കണക്കുകളോ, ഫലങ്ങളോ ശാസ്ത്രീയ പഠനങ്ങൾക്ക് വേ ി ഉപയോഗിക്കുന്നതിന് ഞാൻ തടസ്സം നിൽക്കുന്നതല്ല.

എനിക്കൊരു വിവരണ പ്രത്രിക ലഭിച്ചിട്ടുള്ളതിൽ ഈ പഠനത്തെപ്പറ്റിയുള്ള കൂടുതൽ വിവരങ്ങൾ അടങ്ങിയിട്ടു ്. സ്ൈ കന്യാകുമാരി ജില്ലയിലെ ജനങ്ങളിലിടയിലുള്ള രക്ത സമ്മർദ്ദം ക ുപിടിക്കുന്നതിനുള്ള പഠനം. എന്ന പഠനത്തിൽ പങ്കെടുക്കുന്നതിന് ഞാൻ പൂർണ്ണമായി സമ്മതിക്കുന്നു.

സീരിയൽ നമ്പർ

പങ്കെടുക്കുന്ന ആളിന്റെ പേര് :   പങ്കേടുക്കുന്നയാളുടെ മേൽവിലാസം

മേൽവിലാസം :

പങ്കെടുക്കുന ആളിന്റെ ഒപ്പ് / വിരലടയാളം

സാക്ഷി :

1.

2.

സ്ഥലം :

തീയതി :

ஒப்புதல் படிவம்

பகுதி -1

பங்கேற்பாளர்களுக்கு வேண்டி விவரங்கள்

அன்பார்ந்த நண்பர்களே,

நீங்கள் இவ்வாராய்ச்சியில் பங்கு பெறுவதற்காக காட்டிய ஆர்வத்திற்காக உங்களுக்கு நன்றி கூறி வரவேற்கிறோம். இவ்வாராய்ச்சியில் பங்கு பெறுவதற்கு முன்னர், எதற்காக இவ்வாராய்சி நடத்தப்படுகிறது என்பதைத் தெரிந்துகொள்வது மிகவும் அவசியம். இப்படிவத்தின் மூலம் இவ்வாராய்ச்சியைப் பற்றிய விவரங்கள் மற்றும் தகவல்கள் உங்களுக்கு தெரிவிக்கப்படும். இப்படிவத்தின் மூலம் இவ்வாராய்ச்சியை பற்றியும் இவ்வாராய்ச்சி எதற்காக நடத்தப்படுகிறது என்பதை பற்றியும், இதனால் வரும் நன்மைகள், பலன்கள், ஆபத்துகள், உபாதைகள், முன்னெச்சரிக்கைகள் மற்றும் இவ்வாராய்ச்சியின் வழிமுறைகள் உங்களுக்கு விளக்கப்படும். எனவே இதனை கவனமாக படித்து புரிந்து கொள்வது மிகவும் அவசியம். இப்படிவத்தில் ஆங்காங்கே அறிவியல் துறையைச் சார்ந்த வார்த்தைகள் உபயோகப்படுத்தப்படிருக்கலாம். எனவே, உங்களுக்கு ஏதாவது சந்தேகங்களோ, அல்லது விவரங்களோத் தேவைப்பட்டால், இவ்வாராய்ச்சிக்கு சம்மதம், தெரிவிக்கும் முன்னரோ அல்லது இவ்வாராய்ச்சியில் இருக்கும் எந்நேரமோ, கீழ்கண்ட நபர்களைத் தொடர்புகொண்டு சந்தேகங்களை தெளிவுபடுத்தி கொள்ளலாம்.

1, முதன்மை ஆய்வாளர் பெயர் : மருத்துவர். கிருஷ்ண பிரசாத்.ச
முதுநிலை பட்டதாரி,
சமூக மருத்துவியல்,
ஸ்ரீ மூகாம்பிகா மருத்துவக்கல்லூரி,
குலசேகரம் – 629 161.

2. வழி காட்டியின் பெயர் : மருத்துவர். உஷாதேவி
பேராசிரியர்,
சமூகமருத்துவியல்,
ஸ்ரீ மூகாம்பிகா மருத்துவக்கல்லூரி,
குலசேகரம் – 629 161.

3. துணை வழிகாட்டியின் பெயர் : மருத்துவர். பிரசாந்த் சோலங்கி,
இணைபேராசிரியர்,
சமூக மருத்துவியல்,
ஸ்ரீ மூகாம்பிகா மருத்துவக்கல்லூரி,
குலசேகரம் – 629 161.

4. படிக்கும் இடம் :

ஸ்ரீ மூகாம்பிகா மருத்துவக்கல்லூரி ,படநிலம், குலசேகரம் , கன்னியாகுமரி மாவட்டம், தமிழ்நாடு – 629 161.

5. ஆராய்ச்சியின் தலைப்பு :

கன்னியாகுமரி மாவட்ட கிராமப்புறங்களில் முன்உயர் இரத்த அழுத்தம் மற்றும் உயர் இரத்த அழுத்தம் பற்றிய ஆய்வு.

6. பின்புலத்தகவல் :

இரத்த அழுத்தம் என்பது நாட்பட்ட மருத்துவ நோய், இதில் இரத்த அழுத்தம் தமனியில் அதிகரித்துள்ளது. இந்த உயர் ரத்த அழுத்தம் நான்கு பகுதி இறப்பினை வளந்த நாடுகளிலும், ஏழு பகுதி இறப்பினை வளரும் நாடுகளிலும் விளைவிக்கிறது. உலகளவில் இரத்த அழுத்தம் 7.5 மில் யன் இறப்பினை விளைவிக்கிறது. இரத்த கொதிப்பு முக்கியமாக மாரடைப்பு, நெஞ்சுவ , பக்கவாதம், சிறுநீரக செய ழப்பினை விளைவிக்கிறது. நோயின் அதிகமான தாக்கமும் அதிகமான விளைவுகளும் அதிகமான இறப்பினை ஏற்படுத்தும். இந்தியாவிலும் இந்த நோய் அதிகளவில் உள்ளது. இரத்தகொதிப்பினை பற்றிய படிப்பு மற்றும் தாக்கம் முக்கியமானது. ஏனெனில் உயர் ரத்தஅழுத்தம் கட்டுப்படுத்தக்கூடிய நோயாகும். இதனால் அதிக மக்கள் இறப்பினை தடுக்கலாம்.

7. ஆய்வின் நோக்கம் :

➢ உயர் இரத்தக் அழுத்தம் மற்றும் முன் உயர் இரத்த அழுத்தம் ஆகியவற்றை நோய் தாக்கத்தை 18 வயதிற்கு மேற்பட்டவர்களிடம் கண்டறிதல்.

➢ உயர் இரத்த அழுத்தத்தினை சார்ந்ததை கண்டறிதல்.

8. ஆய்வின் பற்றிய அறிவியல் விளக்கம் :

உயர் இரத்த அழுத்தம் நோயின் தாக்கம் இந்தியாவில் உள்ள கிராமப்புறங்களிலும் நகரத்திலும் அதிகரித்து வருகின்றது. முந்தைய கணக்கெடுப்பின்படி இந்தியாவில் உள்ள கிராம புறங்களில் 2-15% மற்றும் நகரப்புங்களில் 2-25% இரத்த அழுத்தம் அதிகரித்துள்ளது. இரத்த அழுத்தத்திற்கான தடுப்பு முறைகள் விழிப்புணர்வு மற்றும் மருத்துவம் இந்தியாவில் அரை விழுக்காடு கிராமபுறங்களிலும், கால் விழுக்காடு நகரபுறங்களிலும் உள்ளது. என்னுடைய ஆராய்ச்சி தகவல்கள் மேல் அதிகாரிகளுக்கு சிறந்த திட்டங்களை வகுத்து இரத்த அழுத்தத்தையும், அதனுடைய விளைவுகளையும் தடுக்க உதவுகிறது. அடிப்படை இரத்த அழுத்தம் நகரப்புறங்களில் குறைத்து மதிப்பிடப்படுகிறது. எனவே இதனை கட்டாயமாக மக்களுக்கு விழுப்புணர்வு ஏற்படுத்த வேண்டும்.

9. ஆய்வின் வழிமுறை :

பங்கேற்பவர்களுக்கு வினாத்தாள் வழங்கப்படும். அதன் பின்பு அவர்களில் இரத்த அழுத்தம், உயரம், எடை கணக்கீடு கணக்கிடப்படும்.

10. பங்கேற்பவர்களுக்கு நேரிடக்கூடிய விளைவுகள் :

எந்த விளைவும் இல்லை

11. பங்கேற்பாளர்களுக்கு இவ்வாராய்ச்சியினால் எதிர்பார்க்கப்படும் பயன்கள் : நாங்கள் இரத்த அழுத்தம் மற்றும் இதர அளவுகளை அளந்து முறையான ஆலோசனை வழங்குவோம். இதன்மூலம் பங்கேற்பவர்க்கும் ஒரு அடிப்படை மற்றும் பயனுள்ளத் தகவல்களையும் விளைவுகளையும் தெரிவிப்போம்.

12. தகவல்கள் முறைபடி இரகசியமாக பாதுகாக்கப்படுமா ?   ஆம் பாதுகாக்கப்படும்.

13. இவ்வாராய்சிக்காக நீங்கள் தேர்ந்தெடுக்கப்பட்டுள்ள காரணம்:   நீங்கள் 18 வயதை கடந்தவர்கள்

14. எத்தனை பேர் இவ்வாராய்சியில் பங்கு கொள்வார்கள் ?   435

15. நஷ்டஈடு கொடுப்பதற்கான ஒப்பந்தம் :   சம்மதம்

16. இந்த ஆய்வில் பங்கு கொள்ள கொடுக்கப்படும் தொகை :   இல்லை

17. நான் இந்த ஆராய்ச்சியி   ருந்து எந்நேரத்திலும் வெளிவர இயலுமா ? ஆம்

18. ஏதேனும் புதிய தகவல்கள் கண்டுபிடிக்கப்பட்டால் என்னிடம் விவரம் தெரிவிக்கப்படுமா ?

                                                      ஆம்

19. இவ்வாராய்ச்சிக்கான கால வரையரை ?   ஒரு மணி நேரம்

20. இவ்வாராய்ச்சியை பற்றிய இதர தகவல்கள்   எதுவும் இல்லை

21. ஏதாவது சந்தேகத்திற்கோ, தகவலுக்கோ விவரங்களுக்கோ யாரை தொடர்பு கொள்ள வேண்டும் ?

    கீழ்கண்ட நபருக்கு

        மருத்துவர். கிருஷ்ண பிரசாத். ச

        முதுநிலை பட்டதாரி,

        மருத்துவியல்,

        ஸ்ரீ மூகாம்பிகா இன்ஸ்டிட்யூட் ஆப் மெடிக்கல் சயின்ஸ்,

        குலசேகரம்.

இடம் :

தேதி :   முதன்மை ஆய்வாளரின்
                                                  கையொப்பம்

                                                  பங்கேற்பவரின் கையொப்பம்

ஓப்புதல் படிவம் –2
பங்கேற்பாளரின் ஒப்புதல் படிவம்

இந்த் ஆராய்ச்சியின் தகவல்கள் அனைத்தும் என்னிடம் தெளிவாக எழுத்து மூலம் விளக்கப்பட்டுள்ளது. இந்த ஆராய்ச்சியின் முடிவுகள் எனக்கு நேரடியாக பயன் பெறாவிட்டாலும் மருத்துவத்துறையில் முன்னேற்றத்திற்கு பயன்படும் என்பதை அறிவேன். இவ்வாராய்ச்சியைப் பற்றி நான் தெளிவாக புரிந்து கொண்டுள்ளேன் மற்றும் இதைப்பற்றி என் சந்தேகங்களைத் தெளிவுபடுத்தியுள்ளேன். என்பதை அறிவேன். இதி ருந்து எந்நேரமும் எக்காரணமுமின்றி என்னால் வெளிவர இயலும் என்பதை அறிவேன் அவ்வாறு நான் வெளிவந்தாலும் இந்த மருத்துவமனையில் எனக்கு கிடைக்கும் மருத்துவ உதவி எவ்விதத்திலும் பாதிக்கப்படாது. என்பதையும் அறிவேன். இவ்வாராய்ச்சியின் மூலம் வரும் முடிவுகள் மற்றும் தகவல்களை அறிவியல் துறையின் பயன்பாடுகளுக்கு உபயோகப்படுதித்திக்கொள்ள சம்மதிக்கிறேன். எனக்கு இவாவாராய்ச்சியைப் பற்றி விரவான தகவல் அடங்கிய படிவம் தரப்பட்டுள்ளது கன்னியாகுமரி மாவட்ட கிராமப்புறங்களில் முன்உயர் இரத்த அழுத்தம் மற்றும் உயர் இரத்த அழுத்தம் பற்றிய ஆய்வு பற்றிய படிப்பில் பங்கு கொள்வதற்கு எனக்கு முழு சம்மதம்.

வரிசை எண் :

<div align="center">பங்கேற்பவரின் முகவரி</div>

பங்கேற்பவரின் பெயர் :

பங்கேற்பவரின் தொலைபேசி எண்:

<div align="center">கையொப்பம்/ பாதுகாவலர் அல்லது
பங்கேற்பவரின் கை பெருவிரல் அடையாளம்</div>

சாட்சி

1.
    ய
2

நாள் :
இடம் :

ANNEXURE – III

QUESTIONNAIRE

1. Name :

   Address:

2. Age:

   House No:

3. Sex   1.Male   2.Female

   Panchayath:

4. Religion   1.Hindu   2.Christian   3.Muslim   4.Others

5. Marital status 1.Single 2.Married   3.Widow/Widower   4.Separated/Divorced

6. Total number of members in the family:

7. Type of Family 1.Nuclear 2.Joint   3.3generation

8. Educational Status : 1.Illiterate 2.Literate 3.Primary school 4.Secondary school 5.Graduate

9. Employment Status : 1.Employed 2.Un employed 3.Student 4.Housewife 5.Retired

10. percapita income per month

11. Do you currently smoke any tobacco products or use oral tobacco? 1.yes 2.no

12. What you smoke 1.Beedi 2. Cigarette 3.Others (Smokeless Tobacco)

13. On average, how many you smoke each day?

14. For how long are you smoking?

15. Do you currently consume any alcoholic beverage? 1.Yes/No)

16. How many standard drinks containing alcohol do you have on a day when drinking?

    1. >2 drinks/day   2. < 2drinks/day

17. For how long are you consuming alcoholic beverage ?

PHYSICAL ACTIVITY

WORK

24. Does your work involve vigorous-intensity activity like[carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously (Yes/No)

25. In a typical week on how many days do you do vigorous-intensity activities as part of your work ? ……………days

26. How much time do you spend doing vigorous-intensity activities at work on a typical day?

☐ Hrs   ☐ Mins

27. Does your work involve moderate-intensity activity like[brisk walking or carrying light loads] for at least 10 minutes continuously (Yes/No)

28. In a typical week on how many days do you do moderate-intensity activities as part of your work ? ……………days.

29. . How much time do you spend doing vigorous-intensity activities at work on a typical day?

☐ Hrs   ☐ Mins

TRAVEL TO AND FROM PLACES

30. Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? (Yes/No)

31. In a typical week,, on how many days do you walk or bicycle for atleast 10 minutes continuously to get to and from places?   ☐ Days

32. How much time do you spend walking or bicycling for travel on a typical day?

☐ Hrs   ☐ Mins

RECREATIONAL ACTIVITIES

33. Do you do any vigorous – intensity sports, fitness or recreational activities like (running or football) for at least 10 minutes continuously? (Yes/No)

34. In a typical week, on how many days do you do vigorous- intensity sports, fitness or recreational activities?   ☐ Days

35. How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?

☐ Hrs   ☐ Mins

36. Do you do any moderate – intensity sports, fitness or recreational activities like (brisk walking,swimming,volleyball) for at least 10 minutes continuously? (Yes/No)

37. In a typical week, on how many days do you do moderate - intensity sports, fitness or recreational activities? ☐ Days

38. How much time do you spend doing moderate -intensity sports,fitness or recreational activities on a typical day?

☐ Hrs   ☐ Mins

HYPERTENSION AWARENESS

39. Have you ever had blood pressure measured by a doctor or other health worker? (Yes/No)

40. Have you been ever told by a doctor or other health worker that you have raised blood pressure or hypertension?

41. In the past, have you taken any drugs for raised blood pressure prescribed by a doctor or other health worker? (Yes/No)

FAMILY HISTORY

42. Do any of your family members have hypertension? (Yes/No)

DIET

43. How many servings of fruit/vegetable do you eat on one day?
    1. < 5 times   2. > 5 times

44. How much salt do you use in your home for cooking?
    1. > 5 gm/day   2. < 5gm/day

45. Do you use extra salt other than that used for cooking?
    1. Yes   2.no

PHYSICAL MEASURMENTS
BLOOD PRESSURE

Reading 1 ……………………..mmHg

Reading 2………………………mmHg

Reading 3………………………mmHg

HEIGHT ……………cm

WEIGHT ………………………kg\

ANNEXURE - IV

s.no	age	sex	Religion	Marital	Family	Education	Emp	Ses	smoke	type	wma	wlo	alcohol	anda	duration	hysic	know	rembe	fruit	salt	extra	bp	height	weight
1	20	1	1	1	1	1	1	5000	1				2			2	2	1	1	1	1	2	1.6	57
2	32	2	3	2	3	5	4	7000	2				2			2	2	2	1	2	2	1	1.7	80
3	42	2	2	2	1	4	4	4000	2				2			2	2	1	1	1	1	3	1.6	62
4	45	1	1	2	1	3	1	3000	1	1	10	20	1	1	20	1	1	1	1	1	2	3	1.6	75
5	35	2	2	2	1	2	2	6000	2				2			2	2	2	2	2	2	1	1.54	59
6	39	2	1	2	1	3	1	4000	2				2			2	2	2	1	2	2	1	1.56	47
7	65	2	1	3	2	1	5	3000	2				2			2	1	1	1	2	1	2	1.46	45
8	40	1	2	2	1	4	1	6000	2				2			2	2	2	1	2	2	1	1.65	75
9	22	2	2	1	3	5	3	5000	2				2			2	2	2	1	2	2	1	1.49	45
10	58	2	1	2	3	2	4	6000	2				2			2	2	2	2	2	2	1	1.57	55
11	32	2	1	2	1	2	4	4000	2				2			2	2	2	1	1	2	2	1.45	40
12	37	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.48	46
13	32	2	1	2	1	2	4	4000	2				2			2	2	2	1	2	2	1	1.47	43
14	58	1	1	2	3	1	1	3000	1	1	5	20	1	2	20	1	2	2	1	1	2	2	1.55	50
15	70	2	2	2	1	3	5	2000	2				2			2	2	2	1	2	2	1	1.55	55
16	58	1	2	3	2	1	5	3000	2				2			2	1	1	1	1	1	3	1.64	50
17	75	2	2	2	2	1	5	1000	2				2			2	1	1	1	1	1	3	1.46	45
18	29	2	1	2	3	5	1	20000	2				2			2	2	1	2	1	2	1	1.52	50
19	42	2	1	2	1	3	1	3000	2				2			1	2	2	1	1	2	1	1.52	52
20	21	1	1	1	1	3	1	3000	2				1	2	4	2	2	2	1	1	2	1	1.68	52
21	45	1	1	2	1	1	1	3000	1	2	20	30	1	1	30	1	2	2	1	1	2	2	1.6	51
22	53	2	2	2	2	1	1	3000	2	3	10	7	2			1	2	2	1	1	1	3	1.38	38
23	25	1	2	1	1	5	3	50000	2				1	1	2	1	2	2	1	2	2	1	1.7	68
24	43	2	2	2	2	4	4	3000	2				2			2	2	2	2	2	2	1	1.48	52
25	76	1	2	2	2	1	5	1000	2				2			2	1	1	1	1	2	3	1.65	49
26	38	2	2	2	2	2	4	1000	2				2			1	2	1	1	1	1	3	1.5	65
27	43	1	1	2	1	3	1	4000	2				1	2	5	1	2	1	1	1	2	2	1.69	48
28	56	2	2	2	3	2	4	3000	2				2			2	2	2	1	1	2	2	1.47	50
29	42	2	1	2	1	3	4	3000	2				2			2	2	2	1	2	1	1	1.47	60
30	63	1	1	2	1	2	1	4000	1	1	5	20	2			1	2	2	1	2	2	1	1.7	45
31	54	2	2	2	1	4	1	5000	2				2			2	2	1	2	1	2	1	1.6	60

32	40	2	2	2	1	3	4	5000	2				2			1	2	1	1	2	2	1	1.6	53	
33	36	2	2	2	1	3	1	3500	2				2			1	2	2	2	1	1	2	1.64	56	
34	58	2	1	2	1	4	4	5000	2				2			2	2	2	1	1	1	3	1.5	64	
35	48	2	1	2	1	2	1	3000	2				2			1	2	2	1	2	2	1	1.55	52	
36	40	2	2	2	1	4	4	3000	2				2			2	2	2	2	2	2	1	1.5	60	
37	19	1	2	1	1	4	3	3000	2				2			1	2	2	1	2	2	1	1.69	50	
38	67	2	2	2	2	2	4	1000	2				2			2	1	1	1	1	2	3	1.45	41	
39	56	2	1	2	2	1	4	2000	2				2			2	1	2	1	2	1	3	1.6	50	
40	50	2	1	2	2	1	4	1500	2				2			2	2	2	1	1	1	2	1.5	65	
41	55	2	2	3	1	1	5	1000	2				2			2	1	2	1	1	1	3	1.65	85	
42	57	2	1	2	2	2	4	2000	2				2			2	1	1	1	2	2	3	1.52	60	
43	36	2	1	2	2	4	4	3000	2				2			1	1	1	1	1	2	3	1.5	60	
44	25	2	1	2	2	5	4	3000	2				2			2	2	1	1	2	2	1	1.6	60	
45	21	2	2	1	1	4	3	13000	2				2			1	2	2	1	2	2	1	1.5	50	
46	31	2	1	2	2	3	4	2000	2				2			1	1	2	1	2	2	1	1.55	45	
47	44	2	1	2	2	4	4	5000	2				2			2	2	2	2	2	2	1	1.46	60	
48	61	2	1	2	1	3	4	1000	2				2			2	2	1	1	1	2	2	1.45	60	
49	24	1	2	1	1	5	1	10000	2				2			2	2	1	1	1	1	2	1.75	61	
50	53	1	1	2	2	2	1	5000	1	1	5	5	1	2	5	2	1	2	1	1	1	3	1.66	72	
51	42	2	2	2	2	4	1	5000	2				2			2	2	2	2	2	2	2	1.62	71	
52	35	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.4	38	
53	39	1	1	2	1	3	1	5000	1	2	10	10	1	1	10	1	2	2	2	2	2	1	1.56	45	
54	20	1	1	1	1	4	1	5000	2				2			2	2	2	2	2	2	1	1.7	65	
55	24	1	2	1	2	4	1	5000	2				2			2	2	1	2	2	2	1	1.75	52	
56	58	1	1	2	2	1	1	4000	1	1	5	20	1	1	20	1	2	2	1	1	2	2	1.68	50	
57	57	1	2	2	1	3	1	7000	1	2	10	30	1	1	20	2	2	2	2	1	1	2	1.73	65	
58	46	1	1	2	1	4	1	6000	2				2			2	2	2	1	1	2	2	1.65	68	
59	33	2	2	2	1	4	4	6000	2				2			1	2	2	2	2	2	1	1.49	55	
60	26	1	2	1	1	5	1	5000	2				2			1	2	2	1	2	2	1	1.6	59	
61	34	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.61	70	
62	31	1	2	2	2	4	1	10000	2				2			1	2	2	1	2	2	1	1.61	68	
63	30	1	1	2	1	4	1	4000	1	3	5	2	1	1	2	2	2	2	1	1	1	2	1.78	64	
64	32	2	1	2	1	2	4	4000	2				2			1	2	2	2	2	2	1	1.67	45	

65	28	2	2	2	1	4	4	3000	2				2			1	2	2	2	2	2	1	1.6	50	
66	70	2	1	2	2	1	4	1000	2				2			2	1	1	1	2	1	3	1.48	50	
67	29	1	1	2	3	5	3	6000	2				2			2	2	2	2	1	2	2	1.76	76	
68	54	1	1	2	1	4	1	4000	2				2			1	2	2	1	2	2	2	1.65	68	
69	39	1	2	2	2	4	1	5000	2				2			1	2	1	1	1	1	2	1.78	76	
70	70	1	1	2	1	4	5	5000	1	1	5	30	2			2	2	2	1	2	2	1	1.58	60	
71	46	1	2	2	1	4	1	6000	2				1	2	20	1	2	1	1	1	1	2	162	75	
72	75	1	1	2	2	1	2	3000	2				2			2	1	2	1	1	1	3	1.56	55	
73	35	2	2	2	2	3	4	6000	2				2			2	2	1	1	2	2	2	1.6	57	
74	45	1	2	2	2	4	1	1250	1	2	1	10	2			1	1	1	1	2	2	3	1.55	55	
75	50	1	1	2	1	2	1	4000	2				2			2	1	1	2	2	2	3	1.67	65	
76	25	2	1	2	1	5	1	5000	2				2			2	2	2	2	2	2	1	1.55	60	
77	65	1	1	2	2	2	5	3000	2				2			2	2	2	2	2	2	1	1.61	45	
78	70	2	1	2	2	1	5	1000	2				2			2	2	2	1	2	1	3	1.4	51	
79	85	2	1	3	2	1	4	2000	2	3	3	30	2			2	2	2	1	2	1	1	1.4	36	
80	62	2	2	2	1	2	4	3000	2				2			1	1	2	1	2	2	3	1.58	62	
81	67	2	2	2	1	1	4	2000	2				2			2	2	2	1	2	1	1	1.3	38	
82	54	2	1	2	2	3	1	3000	2				2			1	2	2	1	1	2	2	1.63	65	
83	23	1	1	1	1	5	3	7000	1	2	4	3	1	1	3	2	2	2	2	1	1	2	1.77	95	
84	23	1	2	2	2	2	3	4000	2				2			2	2	1	1	2	2	1	1.63	69	
85	23	2	2	1	1	5	3	8000	2				2			1	2	1	1	2	2	1	1.51	44.5	
86	63	2	1	2	2	1	4	2000	2				2			2	2	2	1	2	2	3	1.6	45	
87	49	2	2	2	1	4	4	2000	2				2			1	2	2	1	2	2	2	1.73	75	
88	57	2	2	2	1	3	4	2000	2				2			2	1	1	1	2	2	2	1.48	75	
89	54	2	1	2	2	3	4	2500	2				2			1	2	2	1	2	2	1	1.45	55	
90	23	2	1	1	1	5	3	7000	2				2			2	2	1	1	1	2	1	1.73	70	
91	65	1	1	2	2	3	5	2500	1	1	6	50	1	2	50	2	1	2	1	2	2	2	1.5	58	
92	19	2	1	1	1	4	3	15000	2				2			2	2	1	1	1	2	1	1.65	48	
93	76	2	1	2	2	3	5	2000	2				2			2	1	2	1	2	1	2	1.42	35	
94	32	1	1	2	1	4	1	5000	2				2			1	2	2	2	2	2	1	1.8	68	
95	20	2	2	1	1	4	3	25000	2				2			1	2	1	1	2	2	1	1.7	75	
96	48	1	1	2	2	2	1	10000	1	1	5	20	1	2	20	1	2	2	1	1	1	3	1.72	60	
97	40	2	1	2	1	4	1	4000	2				2			2	2	1	1	1	2	2	1.58	78	

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
98	22	1	1	1	1	5	3	2500	2				2			1	2	1	2	2	1	1	1.81	74
99	75	1	1	2	1	1	5	2000	2				2			2	2	2	1	1	2	2	1.7	53
100	20	2	1	1	2	4	3	30000	2				2			2	2	1	1	2	2	1	1.54	43
101	26	1	1	2	1	5	1	40000	2				2			2	2	1	2	2	2	2	1.5	54
102	25	1	1	2	1	5	1	50000	2				2			1	1	2	1	1	2	3	1.9	106
103	26	2	2	2	1	4	4	60000	2				2			2	2	2	2	2	2	1	1.59	51
104	40	2	2	2	1	4	4	6000	2				2			2	1	2	1	1	1	3	1.6	78
105	28	1	2	2	2	3	1	5000	1	2	2	5	1	2	5	1	2	1	1	1	1	3	1.65	74
106	65	2	1	2	1	4	4	1000	2				2			2	1	1	1	1	1	3	1.46	60
107	20	1	1	1	1	4	3	7000	1	2	2	1	1	2	1	2	2	2	2	1	2	2	1.83	74
108	19	1	1	1	1	4	3	6000	2				1	2	3	1	2	2	1	2	2	1	1.65	55
109	20	2	1	1	1	4	3	15000	2				2			1	2	2	1	1	2	2	1.59	67
110	20	2	1	1	1	4	3	11000	2				2			1	2	2	1	1	2	1	1.53	47
111	28	1	2	1	1	4	1	4000	2				2			2	2	2	1	1	2	2	1.72	65
112	86	1	2	2	2	1	5	7000	2				2			2	1	1	1	1	1	3	1.57	51
113	35	2	2	2	1	4	1	3000	2				2			1	2	2	2	2	2	1	1.54	50
114	67	1	1	2	2	2	1	4000	2				2			2	1	1	1	2	1	3	1.63	75
115	21	2	1	1	1	4	3	5000	2				2			1	2	1	1	1	2	3	1.59	73
116	20	2	2	1	1	4	3	10000	2				2			1	2	2	1	1	2	2	1.63	58
117	55	1	2	2	2	1	1	5000	1	1	10	10	1	2	10	2	2	2	1	1	1	3	1.75	90
118	31	1	2	2	1	2	1	5000	1	2	5	6	1	2	6	1	2	2	1	1	1	2	1.6	79
119	56	2	2	2	1	2	4	2000	2				2			2	1	2	1	1	1	2	1.53	56
120	21	2	2	2	1	3	4	3000	2				2			2	2	2	1	2	2	1	1.5	84
121	80	1	1	2	1	3	5	3000	1	3	4	20	2			2	1	1	1	1	2	3	1.53	60
122	19	1	1	1	1	5	2	5000	2				2			1	2	2	2	2	2	1	1.72	68
123	24	1	1	1	1	5	1	2000	2				2			2	2	2	1	1	1	1	1.72	62
124	21	2	1	1	1	4	3	11000	2				2			2	2	2	1	1	2	1	1.56	38
125	45	2	1	2	1	3	4	3000	2				2			1	2	2	2	2	2	1	1.53	53
126	19	1	1	1	2	5	2	4000	2				2			1	2	2	2	2	2	1	1.56	54
127	23	2	1	1	1	5	2	5000	2				2			1	2	2	2	2	2	1	1.69	56
128	20	2	3	1	1	4	3	2500	2				2			1	2	1	1	1	2	1	1.54	65
129	50	2	2	2	1	1	4	3000	2				2			2	1	2	1	1	1	2	1.5	56
130	50	2	1	2	2	2	1	4000	2				2			2	2	2	2	2	2	1	1.6	65

131	21	1	1	1	1	4	3	4000	2				2			1	2	2	2	1	1	2	1.74	55	
132	20	2	1	1	1	4	3	12000	2				2			1	2	2	1	1	1	2	1.65	59	
133	50	1	1	2	2	2	1	500	1	1	20	10	1	2	10	2	1	2	2	2	2	3	1.7	55	
134	35	1	1	2	2	4	1	4000	2				2			2	2	1	1	1	1	3	1.71	70	
135	52	2	1	2	2	2	1	3000	2				2			1	2	2	2	2	2	1	1.48	50	
136	19	1	1	1	1	4	3	3000	2				2			1	2	2	2	1	1	1	1.48	45	
137	71	1	1	2	1	2	5	3000	1	1	5	20	1	2	20	2	1	2	1	1	1	3	1.77	62	
138	37	1	1	2	2	4	1	5000	2				2			2	1	2	1	1	1	3	1.65	65	
139	19	2	2	1	1	4	3	3000	2				2			1	2	1	2	2	2	1	1.6	44	
140	31	2	2	2	1	4	1	10000	2				2			1	2	2	1	1	2	1	1.5	58	
141	38	2	1	1	3	3	4	5000	2				2			2	2	2	2	2	2	1	1.53	70	
142	21	1	1	1	2	4	3	10000	2				2			1	2	2	1	2	2	1	1.73	63	
143	33	1	1	2	2	5	1	5000	1	2	7	9	2			2	2	1	1	1	2	1	1.77	73	
144	25	2	2	2	2	4	1	3000	2				2			2	2	1	1	2	2	1	1.5	42	
145	63	1	2	2	2	3	2	3500	1	2	8	35	1	1	35	1	1	1	1	1	2	3	1.67	64	
146	23	2	2	1	1	2	1	7000	2				2			2	2	1	2	2	2	2	1.3	45	
147	33	1	1	2	2	5	1	3000	2				2			2	1	1	2	2	2	3	1.7	44	
148	17	2	2	1	2	4	3	2000	2				2			1	2	1	1	2	1	1	1.48	50	
149	26	1	1	2	1	4	2	3000	2				2			2	2	2	2	2	2	1	1.6	61	
150	30	2	1	2	1	4	1	3000	2				2			2	2	1	2	2	2	1	1.59	71	
151	23	2	2	2	2	2	4	2500	2				2			1	2	2	1	1	1	2	1.54	60	
152	28	1	3	2	2	4	1	4000	2				2			1	2	2	1	1	2	2	1.77	78	
153	27	2	1	2	1	2	1	20000	2				2			2	2	2	1	2	2	1	1.65	65	
154	35	1	1	2	1	5	1	15000	2				2			2	2	1	1	2	2	2	1.62	63	
155	71	1	1	2	1	2	5	3000	1	1	5	20	1	2	20	2	1	2	1	1	1	3	1.77	62	
156	89	2	1	3	2	1	2	1000	2				2			2	1	1	1	1	2	3	1.43	28	
157	40	2	2	2	2	5	1	2000	2				2			2	2	1	1	1	1	1	1.54	55	
158	37	1	1	2	2	4	1	5000	2				2			2	1	2	1	1	1	3	1.65	65	
159	21	1	1	1	1	4	3	2000	2				2			1	2	1	1	1	2	1	1.8	80	
160	57	1	3	2	1	4	1	3000	2				2			2	2	2	1	1	2	3	1.6	60	
161	24	2	1	2	1	4	1	7000	2				2			1	2	1	1	2	1	2	1.64	54	
162	41	2	2	2	1	4	4	6000	2				2			2	1	1	1	2	2	2	1.62	53	
163	24	1	2	1	1	5	1	10000	2				2			2	2	1	1	1	1	2	1.75	61	

164	20	2	1	1	2	4	3	30000	2				2			2	2	1	1	2	2	1	1.54	43
165	40	1	2	2	2	3	2	5000	1	2	3	4	1	2	15	1	2	2	1	2	2	2	1.5	48
166	24	1	2	1	1	4	1	6000	1	2	3	5	1	2	5	1	1	1	2	1	2	3	1.65	65
167	47	2	2	3	1	2	1	7000	2				2			1	2	2	1	1	1	1	1.5	67
168	68	2	2	3	2	3	4	5000	2				2			2	1	1	1	1	2	3	1.62	79
169	59	1	2	2	1	5	2	12000	2				1	2	35	2	1	2	1	2	2	3	1.62	64
170	48	1	1	2	1	4	1	3000	1	2	12	25	1	2	25	1	1	2	1	1	1	3	1.58	58
171	48	1	1	2	1	3	2	8000	1	2	6	25	1	2	25	1	2	2	2	1	2	2	1.56	59
172	55	1	1	2	1	4	5	4000	1	2	3	30	1	1	35	2	2	2	2	1	2	3	1.55	60
173	24	1	2	2	1	3	2	7000	2				2			1	2	1	2	2	2	2	1.72	66
174	39	1	2	2	1	3	2	5000	1	2	5	18	1	2	18	1	2	2	1	2	2	2	1.52	50
175	36	1	2	2	2	3	2	6000	1	1	10	3	1	2	15	1	2	1	1	2	2	2	1.48	46
176	21	2	2	3	2	3	4	8000	2				2			2	1	1	1	1	1	3	1.49	40
177	23	2	1	2	1	2	4	6000	2				2			1	2	2	1	2	2	1	1.6	51
178	51	1	1	2	1	2	1	5000	1	1	2	1	2	1	1	2	2	2	1	1	2	2	1.62	58
179	24	1	1	1	1	5	3	4000	2				2			2	1	2	1	1	1	3	1.76	68
180	30	1	2	2	2	5	1	3000	2				2			1	2	2	1	2	2	2	1.87	84
181	30	1	2	1	1	3	2	4000	1	1	10	4	1	2	2	1	2	1	2	1	2	2	1.71	64
182	32	1	2	1	1	3	2	3000	1	2	8	5	1	2	2	1	2	1	1	1	2	2	1.7	68
183	64	1	1	2	1	1	2	4000	1	2	25	10	1	2	1	2	2	2	1	1	1	3	1.64	58
184	48	2	1	2	2	5	1	5000	2				2			2	1	1	1	2	2	3	1.67	64
185	50	2	1	2	2	5	1	2000	2				2			2	1	1	1	2	2	3	1.64	63
186	44	2	2	2	2	4	1	4000	2				2			2	2	1	1	1	1	2	1.54	62
187	27	2	2	2	2	4	1	7000	2				2			1	2	2	1	2	2	1	1.64	72
188	42	2	2	2	2	3	4	2000	2				2			2	2	2	1	1	2	2	1.6	52
189	22	2	2	2	2	5	4	3000	2				2			2	2	1	2	1	2	1	1.53	56
190	19	2	1	1	1	4	3	4000	2				2			1	2	2	1	2	2	1	1.56	47
191	38	1	2	2	2	5	1	7000	2				2			2	2	1	1	1	2	1	1.58	64
192	30	1	1	2	1	4	1	5000	1	3	6	2	2			2	2	2	1	2	2	1	1.63	78
193	25	2	3	2	3	4	3	3000	2				2			2	2	2	1	1	2	1	1.5	60
194	39	2	3	3	3	4	4	2000	2				2			1	2	2	1	1	2	2	1.5	70
195	45	2	2	3	1	3	2	3000	2				2			1	2	2	1	1	2	2	1.5	65
196	42	1	2	2	1	4	1	4000	2				2			1	2	2	1	2	1	3	1.63	55

197	28	1	3	2	2	4	2	4000	2				2			1	2	2	1	1	2	1	1.63	50
198	30	2	2	2	2	5	2	5000	2				2			2	2	2	1	1	2	1	1.52	60
199	23	2	2	2	2	4	2	2000	2				2			2	2	2	1	1	2	1	1.6	58
200	66	2	2	3	2	3	2	2000	2				2			1	2	1	1	1	2	3	1.5	60
201	58	1	1	2	2	3	1	5000	2				2			2	2	1	1	2	2	1	1.69	56
202	40	2	1	2	1	3	4	7000	2				2			2	2	1	1	1	1	3	1.6	75
203	31	1	3	1	2	2	1	10000	2				2			1	2	2	1	1	2	2	1.65	69
204	28	1	2	2	1	4	1	4000	2				2			1	2	1	1	1	2	2	1.66	67
205	47	1	2	2	1	5	1	5000	2				2			2	2	2	1	1	2	1	1.66	67
206	43	2	2	2	1	5	1	6000	2				2			2	2	2	2	2	2	1	1.63	75
207	54	2	2	2	2	2	4	2000	2				2			2	2	2	1	1	2	3	1.65	60
208	30	2	1	2	1	5	1	8000	2				2			1	2	2	2	2	2	1	1.6	52
209	30	1	2	2	2	4	2	2000	2				2			1	2	2	1	1	1	2	1.5	68
210	71	2	2	3	2	3	2	2000	2				2			2	1	1	1	1	2	3	1.5	65
211	24	2	3	1	1	4	2	2000	2				2			2	2	2	1	1	2	1	1.5	60
212	45	2	2	3	1	3	5	3000	2				2			2	2	2	1	1	2	2	1.6	60
213	30	2	2	2	2	3	4	2000	2				2			2	1	1	1	1	2	3	1.58	58
214	25	2	2	2	2	3	2	3000	2				2			2	2	2	1	1	2	2	1.64	58
215	20	2	1	2	1	3	3	2000	2				2			2	2	2	1	1	1	1	1.55	55
216	36	2	1	2	1	3	4	4000	2				2			2	2	1	2	2	2	1	1.6	62
217	24	1	2	1	1	3	1	6000	1	2	5	2	1	2	2	1	2	2	1	2	2	1	1.6	58
218	23	2	2	2	2	5	4	10000	2				2			2	2	2	1	2	2	1	1.54	87
219	21	2	2	2	1	5	4	6000	2				2			2	2	1	1	2	2	2	1.58	45
220	63	2	1	2	2	3	5	1000	2				2			2	2	2	1	2	2	3	1.63	45
221	21	1	1	2	2	5	4	3000	2				2			2	2	2	1	1	2	1	1.58	58
222	25	2	3	2	2	4	2	4000	2				2			1	2	2	1	1	2	1	1.55	62
223	34	2	2	2	2	3	4	6000	2				2			2	2	1	1	1	1	2	1.63	60
224	24	1	1	1	1	5	3	4000	2				2			2	2	1	2	2	2	3	1.75	86
225	57	2	1	2	1	3	4	3000	2				2			2	2	2	1	1	1	2	1.59	87
226	49	1	2	2	1	4	1	3000	1	1	10	20	1	2	20	1	2	2	1	2	2	2	1.59	45
227	63	1	2	2	2	1	1	2000	1	3	10	30	2			1	2	2	1	1	2	2	1.54	46
228	29	2	1	2	1	2	1	6000	2				2			2	2	2	1	1	2	2	1.56	50
229	56	2	2	3	2	1	4	3000	2				2			2	2	2	1	1	2	1	1.42	47

230	40	1	1	2	3	3	1	3000	1	1	6	3	1	2	3	2	2	1	1	1	2	2	1.61	58
231	48	2	1	2	3	2	4	5000	2				2			1	2	2	2	2	1	1	1.53	50
232	38	1	1	2	2	2	1	4000	2				2			1	2	1	1	1	1	2	1.76	90
233	31	2	1	2	1	3	4	4000	2				2			1	2	2	2	2	2	1	1.69	52
234	28	2	1	2	2	4	1	3000	2				2			1	2	2	2	2	2	1	1.6	54
235	32	2	2	1	2	5	1	3000	2				2			1	2	2	2	2	1	1	1.5	49
236	26	1	2	1	2	4	2	3000	2				2			1	2	1	1	2	1	1	1.57	50
237	40	2	1	2	3	1	4	6000	2				2			1	2	2	1	1	2	2	1.4	58
238	58	2	1	2	1	3	4	4000	2				2			2	2	2	1	1	2	3	1.57	56
239	37	1	1	2	2	3	1	6000	2				2			2	2	1	1	1	2	2	170	78
240	39	2	1	2	1	3	4	4000	2				2			2	2	2	2	2	2	1	1.53	50
241	58	2	2	2	3	2	4	5000	2				2			2	2	2	1	2	2	2	1.68	68
242	30	2	1	2	1	2	1	4000	2				2			2	2	2	1	2	2	1	1.47	38
243	29	1	1	1	1	4	1	5000	2				2			2	2	1	2	2	2	1	1.66	70
244	33	2	2	2	1	4	4	6000	2				2			2	2	1	1	1	2	2	1.6	56
245	37	2	1	2	1	2	1	7500	2				2			2	2	2	2	2	2	1	1.5	60
246	51	1	2	2	1	1	1	8000	1	2	2	20	1	2	20	1	2	2	1	1	1	2	1.65	90
247	68	1	1	2	2	2	5	3000	1	3	5	20	1	2	20	1	1	1	1	1	1	3	1.63	54
248	30	2	1	2	1	4	1	4000	2				2			1	2	2	1	2	2	1	1.54	51
249	38	2	1	2	2	2	1	5000	2				2			2	2	2	2	2	2	1	1.73	49
250	49	1	2	2	1	2	1	5000	2				2			1	2	2	2	2	2	1	1.76	65
251	60	2	1	2	1	4	4	4000	2				2			2	1	1	1	2	2	3	1.48	54
252	67	1	1	2	2	4	5	3000	2				2			1	1	1	2	2	2	3	1.67	66
253	35	2	1	2	1	3	4	3000	2				2			2	2	1	1	1	2	2	1.61	69
254	45	1	2	2	1	4	1	5000	2				2			2	2	2	1	1	2	2	1.7	60
255	42	2	1	3	1	3	4	4000	2				2			1	2	2	2	2	2	1	1.59	41
256	20	1	1	1	1	4	1	4000	2				2			1	2	2	2	2	2	1	1.73	49
257	35	1	3	2	3	4	1	2000	2				2			2	2	1	1	1	1	2	1.6	55
258	40	1	3	2	1	4	1	5000	2				2			2	2	1	1	1	2	2	1.5	48
259	43	2	2	2	2	4	2	5000	2				2			1	1	1	1	1	2	3	1.58	70
260	24	2	2	2	2	4	2	3000	2				2			2	2	2	1	1	2	2	1.6	62
261	48	1	3	2	2	3	1	7000	1	2	4	3	2			1	1	1	1	1	2	3	1.7	68
262	20	2	2	2	1	3	4	2000	2				2			2	2	2	1	1	2	2	1.62	65

263	75	1	2	2	2	4	2	3000	1	2	2	20	1	2	40	2	1	1	1	1	1	3	1.58	75
264	40	2	1	2	2	3	1	3000	2				2			1	2	2	1	1	2	2	1.6	58
265	25	1	2	2	1	4	2	3000	2				2			1	2	2	1	1	2	2	1.58	59
266	39	2	1	2	1	4	1	4000	2				2			1	2	2	1	2	2	2	1.58	45
267	58	1	1	2	1	4	1	4000	1	1	20	20	1	2	20	2	2	2	1	1	2	2	1.69	57
268	26	1	2	2	1	3	1	7000	1	2	6	5	1	1	3	1	2	1	1	1	1	2	1.65	60
269	38	2	2	2	2	5	1	2000	2				2			2	2	2	2	1	2	1	1.5	55
270	26	2	2	2	2	4	1	6000	2				2			1	2	2	2	2	2	1	1.5	46
271	57	2	2	2	2	4	4	3000	2				2			2	1	1	1	1	1	3	1.48	45
272	27	2	1	2	1	4	4	5000	2				2			1	2	1	1	1	2	2	1.55	54
273	25	2	3	2	2	4	2	2000	2				2			2	2	2	1	1	2	2	1.6	70
274	1	1	1	1	1	1	1	5000	1				2			2	2	1	1	1	1	2	1.6	57
275	32	2	3	2	3	5	4	7000	2				2			2	2	2	1	2	2	1	1.7	80
276	42	2	2	2	1	4	4	4000	2				2			2	2	1	1	1	1	3	1.6	62
277	45	1	1	2	1	3	1	3000	1	1	10	20	1	1	20	1	1	1	1	1	2	3	1.6	75
278	35	2	2	2	1	2	2	6000	2				2			2	2	2	2	2	2	1	1.54	59
279	32	2	1	2	1	2	4	4000	2				2			2	2	2	1	1	2	2	1.45	40
280	37	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.48	46
281	32	2	1	2	1	2	4	4000	2				2			2	2	2	1	2	2	1	1.47	43
282	58	1	1	2	3	1	1	3000	1	1	5	20	1	2	20	1	2	2	1	1	2	2	1.55	50
283	70	2	2	2	1	3	5	2000	2				2			2	2	2	1	2	2	1	1.55	55
284	45	1	1	2	1	1	1	3000	1	2	20	30	1	1	30	1	2	2	1	1	2	2	1.6	51
285	53	2	2	2	2	1	1	3000	2	3	10	7	2			1	2	2	1	1	1	3	1.38	38
286	25	1	2	1	1	5	3	50000	2				1	1	2	1	2	2	1	2	2	1	1.7	68
287	43	2	2	2	2	4	4	3000	2				2			2	2	2	2	2	2	1	1.48	52
288	76	1	2	2	2	1	5	1000	2				2			2	1	1	1	1	2	3	1.65	49
289	38	2	2	2	2	2	4	1000	2				2			1	2	1	1	1	1	3	1.5	65
290	43	1	1	2	1	3	1	4000	2				1	2	5	1	2	1	1	1	2	2	1.69	48
291	56	2	2	2	3	2	4	3000	2				2			2	2	2	1	1	2	2	1.47	50
292	42	2	1	2	1	3	4	3000	2				2			2	2	2	1	2	1	1	1.47	60
293	63	1	1	2	1	2	1	4000	1	1	5	20	2			1	2	2	1	2	2	1	1.7	45
294	55	2	2	3	1	1	5	1000	2				2			2	1	2	1	1	1	3	1.65	85
295	57	2	1	2	2	2	4	2000	2				2			2	1	1	1	2	2	3	1.52	60

296	36	2	1	2	2	4	4	3000	2				2			1	1	1	1	1	2	3	1.5	60	
297	25	2	1	2	2	5	4	3000	2				2			2	2	1	1	2	2	1	1.6	60	
298	21	2	2	1	1	4	3	13000	2				2			1	2	2	1	2	2	1	1.5	50	
299	31	2	1	2	2	3	4	2000	2				2			1	1	2	1	2	2	1	1.55	45	
300	44	2	1	2	2	4	4	5000	2				2			2	2	2	2	2	2	1	1.46	60	
301	61	2	1	2	1	3	4	1000	2				2			2	2	1	1	1	2	2	1.45	60	
302	24	1	2	1	1	5	1	10000	2				2			2	2	1	1	1	1	2	1.75	61	
303	53	1	1	2	2	2	1	5000	1	1	5	5	1	2	5	2	1	2	1	1	1	3	1.66	72	
304	34	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.61	70	
305	31	1	2	2	2	4	1	10000	2				2			1	2	2	1	2	2	1	1.61	68	
306	30	1	1	2	1	4	1	4000	1	3	5	2	1	1	2	2	2	2	1	1	1	2	1.78	64	
307	32	2	1	2	1	2	4	4000	2				2			1	2	2	2	2	2	1	1.67	45	
308	28	2	2	2	1	4	4	3000	2				2			1	2	2	2	2	2	1	1.6	50	
309	70	2	1	2	2	1	4	1000	2				2			2	1	1	1	2	1	3	1.48	50	
310	29	1	1	2	3	5	3	6000	2				2			2	2	2	2	1	2	2	1.76	76	
311	54	1	1	2	1	4	1	4000	2				2			1	2	2	1	2	2	2	1.65	68	
312	39	1	2	2	2	4	1	5000	2				2			1	2	1	1	1	1	2	1.78	76	
313	70	1	1	2	1	4	5	5000	1	1	5	30	2			2	2	2	1	2	2	1	1.58	60	
314	65	2	1	2	1	4	1	4000	2				2			2	2	2	1	2	2	1	1.5	58	
315	46	1	2	2	1	4	1	6000	2				1	2	20	1	2	1	1	1	1	2	162	75	
316	75	1	1	2	2	1	2	3000	2				2			2	1	2	1	1	1	3	1.56	55	
317	35	2	2	2	2	3	4	6000	2				2			2	2	1	1	2	2	2	1.6	57	
318	45	1	2	2	2	4	1	1250	1	2	1	10	2			1	1	1	1	2	2	3	1.55	55	
319	50	1	1	2	1	2	1	4000	2				2			2	1	1	2	2	2	3	1.67	65	
320	25	2	1	2	1	5	1	5000	2				2			2	2	2	2	2	2	1	1.55	60	
321	65	1	1	2	2	2	5	3000	2				2			2	2	2	2	2	2	1	1.61	45	
322	70	2	1	2	2	1	5	1000	2				2			2	2	2	1	2	1	3	1.4	51	
323	85	2	1	3	2	1	4	2000	2	3	3	30	2			2	2	2	1	2	1	1	1.4	36	
324	62	2	2	2	1	2	4	3000	2				2			1	1	2	1	2	2	3	1.58	62	
325	67	2	2	2	1	1	4	2000	2				2			2	2	2	1	2	1	1	1.3	38	
326	54	2	1	2	2	3	1	3000	2				2			1	2	2	1	1	2	2	1.63	65	
327	23	1	1	1	1	5	3	7000	1	2	4	3	1	1	3	2	2	2	2	1	1	2	1.77	95	
328	23	1	2	2	2	2	3	4000	2				2			2	2	1	1	2	2	1	1.63	69	

329	23	2	2	1	1	5	3	8000	2				2			1	2	1	1	2	2	1	1.51	44.5
330	63	2	1	2	2	1	4	2000	2				2			2	2	2	1	2	2	3	1.6	45
331	49	2	2	2	1	4	4	2000	2				2			1	2	2	1	2	2	2	1.73	75
332	57	2	2	2	1	3	4	2000	2				2			2	1	1	1	2	2	2	1.48	75
333	54	2	1	2	2	3	4	2500	2				2			1	2	2	1	2	2	1	1.45	55
334	20	2	1	1	2	4	3	30000	2				2			2	2	1	1	2	2	1	1.54	43
335	26	1	1	2	1	5	1	40000	2				2			2	2	1	2	2	2	2	1.5	54
336	25	1	1	2	1	5	1	50000	2				2			1	1	2	1	1	2	3	1.9	106
337	26	2	2	2	1	4	4	60000	2				2			2	2	2	2	2	2	1	1.59	51
338	40	2	2	2	1	4	4	6000	2				2			2	1	2	1	1	1	3	1.6	78
339	28	1	2	2	2	3	1	5000	1	2	2	5	1	2	5	1	2	1	1	1	1	3	1.65	74
340	65	2	1	2	1	4	4	1000	2				2			2	1	1	1	1	1	3	1.46	60
341	20	1	1	1	1	4	3	7000	1	2	2	1	1	2	1	2	2	2	2	1	2	2	1.83	74
342	19	1	1	1	1	4	3	6000	2				1	2	3	1	2	2	1	2	2	1	1.65	55
343	20	2	1	1	1	4	3	15000	2				2			1	2	2	1	1	2	2	1.59	67
344	80	1	1	2	1	3	5	3000	1	3	4	20	2			2	1	1	1	1	2	3	1.53	60
345	19	1	1	1	1	5	2	5000	2				2			1	2	2	2	2	2	1	1.72	68
346	24	1	1	1	1	5	1	2000	2				2			2	2	2	1	1	1	1	1.72	62
347	21	2	1	1	1	4	3	11000	2				2			2	2	2	1	1	2	1	1.56	38
348	45	2	1	2	1	3	4	3000	2				2			1	2	2	2	2	2	1	1.53	53
349	19	1	1	1	2	5	2	4000	2				2			1	2	2	2	2	2	1	1.56	54
350	23	2	1	1	1	5	2	5000	2				2			1	2	2	2	2	2	1	1.69	56
351	20	2	3	1	1	4	3	2500	2				2			1	2	1	1	1	2	1	1.54	65
352	50	2	2	2	1	1	4	3000	2				2			2	1	2	1	1	1	2	1.5	56
353	50	2	1	2	2	2	1	4000	2				2			2	2	2	2	2	2	1	1.6	65
354	38	2	1	1	3	3	4	5000	2				2			2	2	2	2	2	2	1	1.53	70
355	21	1	1	1	2	4	3	10000	2				2			1	2	2	1	2	2	1	1.73	63
356	33	1	1	2	2	5	1	5000	1	2	7	9	2			2	2	1	1	1	2	1	1.77	73
357	25	2	2	2	2	4	1	3000	2				2			2	2	1	1	2	2	1	1.5	42
358	63	1	2	2	2	3	2	3500	1	2	8	35	1	1	35	1	1	1	1	1	2	3	1.67	64
359	23	2	2	1	1	2	1	7000	2				2			2	2	1	2	2	2	2	1.3	45
360	33	1	1	2	2	5	1	3000	2				2			2	1	1	2	2	2	3	1.7	44
361	17	2	2	1	2	4	3	2000	2				2			1	2	1	1	2	1	1	1.48	50

362	26	1	1	2	1	4	2	3000	2				2			2	2	2	2	2	2	1	1.6	61
363	30	2	1	2	1	4	1	3000	2				2			2	2	1	2	2	2	1	1.59	71
364	24	2	1	2	1	4	1	7000	2				2			1	2	1	1	2	1	2	1.64	54
365	41	2	2	2	1	4	4	6000	2				2			2	1	1	1	2	2	2	1.62	53
366	24	1	2	1	1	5	1	10000	2				2			2	2	1	1	1	1	2	1.75	61
367	20	2	1	1	2	4	3	30000	2				2			2	2	1	1	2	2	1	1.54	43
368	40	1	2	2	2	3	2	5000	1	2	3	4	1	2	15	1	2	2	1	2	2	2	1.5	48
369	24	1	2	1	1	4	1	6000	1	2	3	5	1	2	5	1	1	1	2	1	2	3	1.65	65
370	47	2	2	3	1	2	1	7000	2				2			1	2	2	1	1	1	1	1.5	67
371	68	2	2	3	2	3	4	5000	2				2			2	1	1	1	1	2	3	1.62	79
372	59	1	2	2	1	5	2	12000	2				1	2	35	2	1	2	1	2	2	3	1.62	64
373	48	1	1	2	1	4	1	3000	1	2	12	25	1	2	25	1	1	2	1	1	1	3	1.58	58
374	48	1	1	2	1	3	2	8000	1	2	6	25	1	2	25	1	2	2	2	1	2	2	1.56	59
375	55	1	1	2	1	4	5	4000	1	2	3	30	1	1	35	2	2	2	2	1	2	3	1.55	60
376	24	1	2	2	1	3	2	7000	2				2			1	2	1	2	2	2	2	1.72	66
377	39	1	2	2	1	3	2	5000	1	2	5	18	1	2	18	1	2	2	1	2	2	2	1.52	50
378	36	1	2	2	2	3	2	6000	1	1	10	3	1	2	15	1	2	1	1	2	2	2	1.48	46
379	21	2	2	3	2	3	4	8000	2				2			2	1	1	1	1	1	3	1.49	40
380	23	2	1	2	1	2	4	6000	2				2			1	2	2	1	2	2	1	1.6	51
381	51	1	1	2	1	2	1	5000	1	1	2	1	2	1	1	2	2	2	1	1	2	2	1.62	58
382	24	1	1	1	1	5	3	4000	2				2			2	1	2	1	1	1	3	1.76	68
383	30	1	2	2	2	5	1	3000	2				2			1	2	2	1	2	2	2	1.87	84
384	38	1	2	2	2	5	1	7000	2				2			2	2	1	1	1	2	1	1.58	64
385	30	1	1	2	1	4	1	5000	1	3	6	2	2			2	2	2	1	2	2	1	1.63	78
386	25	2	3	2	3	4	3	3000	2				2			2	2	2	1	1	2	1	1.5	60
387	39	2	3	3	3	4	4	2000	2				2			1	2	2	1	1	2	2	1.5	70
388	45	2	2	3	1	3	2	3000	2				2			1	2	2	1	1	2	2	1.5	65
389	42	1	2	2	1	4	1	4000	2				2			1	2	2	1	2	1	3	1.63	55
390	28	1	3	2	2	4	2	4000	2				2			1	2	2	1	1	2	1	1.63	50
391	30	2	2	2	2	5	2	5000	2				2			2	2	2	1	1	2	1	1.52	60
392	23	2	2	2	2	4	2	2000	2				2			2	2	2	1	1	2	1	1.6	58
393	66	2	2	3	2	3	2	2000	2				2			1	2	1	1	1	2	3	1.5	60
394	24	2	3	1	1	4	2	2000	2				2			2	2	2	1	1	2	1	1.5	60

395	45	2	2	3	1	3	5	3000	2				2			2	2	2	1	1	2	2	1.6	60	
396	30	2	2	2	2	3	4	2000	2				2			2	1	1	1	1	2	3	1.58	58	
397	25	2	2	2	2	3	2	3000	2				2			2	2	2	1	1	2	2	1.64	58	
398	20	2	1	2	1	3	3	2000	2				2			2	2	2	1	1	1	1	1.55	55	
399	36	2	1	2	1	3	4	4000	2				2			2	2	1	2	2	2	1	1.6	62	
400	24	1	2	1	1	3	1	6000	1	2	5	2	1	2	2	1	2	2	1	2	2	1	1.6	58	
401	23	2	2	2	2	5	4	10000	2				2			2	2	2	1	2	2	1	1.54	87	
402	21	2	2	2	1	5	4	6000	2				2			2	2	1	1	2	2	2	1.58	45	
403	63	2	1	2	2	3	5	1000	2				2			2	2	2	1	2	2	3	1.63	45	
404	48	2	1	2	3	2	4	5000	2				2			1	2	2	2	2	1	1	1.53	50	
405	38	1	1	2	2	2	1	4000	2				2			1	2	1	1	1	1	2	1.76	90	
406	31	2	1	2	1	3	4	4000	2				2			1	2	2	2	2	2	1	1.69	52	
407	28	2	1	2	2	4	1	3000	2				2			1	2	2	2	2	2	1	1.6	54	
408	32	2	2	1	2	5	1	3000	2				2			1	2	2	2	2	1	1	1.5	49	
409	26	1	2	1	2	4	2	3000	2				2			1	2	1	1	2	1	1	1.57	50	
410	40	2	1	2	3	1	4	6000	2				2			1	2	2	1	1	2	2	1.4	58	
411	58	2	1	2	1	3	4	4000	2				2			2	2	2	1	1	2	3	1.57	56	
412	37	1	1	2	2	3	1	6000	2				2			2	2	1	1	1	2	2	170	78	
413	39	2	1	2	1	3	4	4000	2				2			2	2	2	2	2	2	1	1.53	50	
414	60	2	1	2	1	4	4	4000	2				2			2	1	1	1	2	2	3	1.48	54	
415	67	1	1	2	2	4	5	3000	2				2			1	1	1	2	2	2	3	1.67	66	
416	35	2	1	2	1	3	4	3000	2				2			2	2	1	1	1	2	2	1.61	69	
417	45	1	2	2	1	4	1	5000	2				2			2	2	2	1	1	2	2	1.7	60	
418	42	2	1	3	1	3	4	4000	2				2			1	2	2	2	2	2	1	1.59	41	
419	20	1	1	1	1	4	1	4000	2				2			1	2	2	2	2	2	1	1.73	49	
420	35	1	3	2	3	4	1	2000	2				2			2	2	1	1	1	1	2	1.6	55	
421	40	1	3	2	1	4	1	5000	2				2			2	2	1	1	1	2	2	1.5	48	
422	43	2	2	2	2	4	2	5000	2				2			1	1	1	1	1	2	3	1.58	70	
423	24	2	2	2	2	4	2	3000	2				2			2	2	2	1	1	2	2	1.6	62	
424	24	1	2	1	2	4	1	5000	2				2			2	2	1	2	2	2	1	1.75	52	
425	58	1	1	2	2	1	1	4000	1	1	5	20	1	1	20	1	2	2	1	1	2	2	1.68	50	
426	57	1	2	2	1	3	1	7000	1	2	10	30	1	1	20	2	2	2	2	1	1	2	1.73	65	
427	46	1	1	2	1	4	1	6000	2				2			2	2	2	1	1	2	2	1.65	68	

428	33	2	2	2	1	4	4	6000	2				2			1	2	2	2	2	2	1	1.49	55	
429	26	1	2	1	1	5	1	5000	2				2			1	2	2	1	2	2	1	1.6	59	
430	34	2	1	2	1	2	4	5000	2				2			1	2	2	2	2	2	1	1.61	70	
431	31	1	2	2	2	4	1	10000	2				2			1	2	2	1	2	2	1	1.61	68	
432	30	1	1	2	1	4	1	4000	1	3	5	2	1	1	2	2	2	2	1	1	1	2	1.78	64	
433	32	2	1	2	1	2	4	4000	2				2			1	2	2	2	2	2	1	1.67	45	
434	45	1	2	2	1	4	1	5000	2				2			2	2	2	1	1	2	2	1.7	60	
435	42	2	1	3	1	3	4	4000	2				2			1	2	2	2	2	2	1	1.59	41	