PREVALENCE OF CARDIOVASCULAR DISEASE RISK FACTORS AMONG ADULTS IN RURAL KOLAR-A CROSS SECTIONAL STUDY

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M.D. IN **COMMUNITY MEDICINE**

By

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UNDER THE GUIDANCE OF

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LIST OF ABBREVIATIONS

CVD	-	Cardiovascular diseases
CHD	-	Coronary heart disease
DALY	-	Disability adjusted life years
WHO	-	World Health Organisation
CDC	-	Centre for disease control
NCD	-	Non communicable diseases
CVA	-	Cerebrovascular accident
ICMR	-	Indian Council of Medical Research
CAD	-	Coronary artery disease
IHD	-	Ischaemic heart disease
IDSP	-	Integrated disease surveillance project
IDDM	-	Insulin dependent diabetes mellitus
NIDDM	-	Non insulin dependent diabetes mellitus
BMI	-	Body mass index
B.P.	-	Blood pressure
NPCDCS	-	National Programme for Prevention of Cancer, Diabetes, Cardiovascular Diseases and Stroke

ABSTRACT

INTRODUCTION AND OBJECTIVES

Cardiovascular diseases (CVD) are an important public health problem. It leads to significant mortality, morbidity and disability.

There is a need for surveillance of CVDs and their risk factors to:

i. Recognize cases or their clusters so as to mount an appropriate response,

ii. Identify trends of diseases and their risk factors based on previously collected information,

iii. Monitor the effectiveness of intervention programs/policies,

iv. Map out the distribution of cases and risk factors and pick up regional and sub-group differences,

v. Identify new research issues based on the findings of surveillance and to strengthen it, and

vi. Facilitate advocacy, policy guidance, prioritization of allocation of resources.

Hence this study was undertaken with the above mentioned objectives.

METHODOLOGY

The study was conducted from December 2010 to October 2012.

The study population was comprised of around 250 individuals each in the age group of 25-44 years and 45-64 years in each gender.

Out of 343 villages in Mulbagal taluq 20 were selected by probability proportional to size.

The prevalence of risk factors were found out using WHO STEPS tool which consisted of questionnaire, anthropometry and biochemical measurements.

RESULTS AND INFERENCES

- Prevalence of tobacco usage was 46%.
- Prevalence of alcohol consumption was 8.7%.
- Around 99% of the study population showed inadequate consumption of fruits and vegetables.
- Prevalence of physical inactivity was 98.8%.
- Prevalence of hypertension was 21.9%.
- Prevalence of obesity was 32.4%.
- Prevalence of known cases of Diabetes Mellitus was 3.1%.
- Prevalence of fasting glucose levels suggestive of diabetes mellitus in the sub sample was 9.6%.
- Prevalence of high levels of cholesterol in the sub sample was 3.5%.

CONCLUSION

This study found that CVD risk factors are common in rural Kolar region. Diabetes and hypertension are common in the rural people and comparable with urban people. Comparing with previous studies reveal that the risk factor of physical inactivity, hypercholesterolemia and obesity/overweight are increasing in the rural areas of the country. Poor intake of vegetables and fruits are a problem. Usage of tobacco and alcohol has not declined as pre the trends. Hence this study highlights the need to further understand the influence of the social and economic conditions in the rural society on the CVD risk factors and cardiovascular diseases. It becomes imperative to initiate and strengthen measures to reduce CVD risk factors in the rural society so as to reduce the rising burden of CVD morbidity and deaths. The recent efforts made by the Government of India initiating IDSP and NPCDCS are in the right direction. Similar studies using WHO STEPS approach reveal the time trends in CVD risk factors and the assessment of the program.

Keywords : ***Cardiovascular disease, risk factor, rural, WHO STEPS.***

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURE

INTRODUCTION

Cardiovascular diseases (CVD) are an important public health problem. It leads to significant mortality, morbidity and disability. In the South-East Asia region, cardiovascular diseases cause an estimated 3.6 million deaths or a quarter of all deaths annually. Cardiovascular diseases are killing people at a relatively younger age in the region; 27% of all deaths due to cardiovascular diseases in the region occur before the age of 60 years compared to 16% in the rest of the world.[1]

In India- NCD like cancer, diabetes, cardiovascular diseases, stroke, chronic respiratory diseases, etc. have achieved the status of dominant cause of death in (about 8 out of 10adult deaths in urban areas and 6 out of 10 deaths in rural areas, for example, are now due to NCD).[2] Among the major health transitions witnessed in the second half of the twentieth century, the most globally pervasive change has been the rising burden of non communicable diseases (NCDs).[3]

STATEMENT OF THE PROBLEM:

Worldwide, CVDs are the number one cause of death globally: more people die annually from CVDs than from any other cause. An estimated 17.3 million people died from CVDs in 2008, representing 30% of all global deaths. Of these deaths, an estimated 7.3 million were due to coronary heart disease and 6.2 million were due to stroke. Low- and middle-income countries are disproportionally affected: Over 80% of CVD deaths take place in low- and middle-income countries and occur almost equally in men and women.[4]

Countries where the epidemic began early are showing a decline due to major public health interventions. On the other hand, cardiovascular diseases are contributing towards an ever-increasing

proportion of the non-communicable diseases in the developing countries.[5-7]

Cardiovascular diseases have assumed epidemic proportions in India as well. The Global Burden of Diseases (GBD) study reported the estimated mortality from coronary heart disease (CHD) in India at 1.6 million in the year 2000.[6] A total of nearly 64 million cases of CVD are likely in the year 2015, of which nearly 61 million would be CHD cases. NCDs account for 53 and 44% of all deaths and disability-adjusted life years (DALYs) respectively in India. According to World Health Report 2002, CVDs will be the largest cause of death and disability by 2020 in India.[7] Currently Indians experience CVDs deaths at least a decade earlier than their counterparts in countries with established market economies (EME). The Global Burden of Disease(GBD) study estimates that 52% of CVD deaths occur in young and middle aged people in India as compared to 23% in EME, resulting in a profound adverse impact on the economy.[8]

Surveys conducted across the country over the past two decades have shown a rising prevalence of major risk factors for CVD in urban and rural populations[9]. The rapidly growing epidemic of non-communicable diseases is related to changes in life styles. These changes include risks that are more commonly associated with affluent societies.

RISK FACTORS OF CVD:

Risk factors of CVD include high blood pressure, tobacco use and excessive alcohol consumption, overweight, obesity and physical inactivity. These risk factors increases risk for NCDs through independent mechanism, and also are interrelated to each other. The presence of one factor paves the way for the other, there by leading to the development of NCDs.[10] The risks and the diseases linked to NCDs are becoming more prevalent in the developing world. Studies to estimate the

prevalence of CVD in our country have been mainly undertaken in the urban areas and the findings have been generalized.[11]

Worldwide several surveillance systems have addressed the risk factors of CVD. The Behavioral Risk Factor Surveillance Systems (BRFSS) established in 1984 by the Centers for Disease Control (CDC, Atlanta, USA) as a state-based system of health surveys collects information on health risk behaviours, preventive health practices, and health care access primarily related to chronic disease and injury.[12]

The World Health Organization (WHO) formulated the Global STEP wise approach for NCD risk factor surveillance is aimed at collecting data on risk factors in a stepwise manner according to the complexities involved that would be comparable across variable sites in the world. The need for CVD surveillance arises from the demographic transition being accompanied by a "risk transition". In the context of public health, population measurements of these risk factors are used to describe the distribution of future disease burden in a population, rather than predicting the health of a specific individual. Knowledge of risk factors can then be applied to shift population distributions of these factors. Information on disease occurrence is important in assisting health services planning, determining public health priorities, and monitoring the long term effectiveness of disease prevention activities.[13]

Risk factors are present for a long period of time during the natural history of CVD. It is now well established that a cluster of major risk factors namely (tobacco, alcohol, inappropriate diet, physical inactivity, obesity, hypertension, diabetes and dyslipidaemias) govern the occurrence of CVDs much before these are firmly established as diseases. Collecting data on these and monitoring their trends is a good beginning towards disease surveillance. It helps in making projections of trends of disease prevalence. Since these risk factors are amenable to interventions,

efforts to tackle these would reduce the overall disease burden and promote health.[13]

Majority of the Indian population is resided in the rural areas and there is insufficient credible information on the burden of the risk factors of CVDs. An accurate estimate of these risk factors will facilitate planning and policy making to initiate programmes to tackle the burden of the CVD.[14]

NEED FOR THE STUDY

There is a need for surveillance of CVDs and their risk factors to:

i. Recognize cases or their clusters so as to mount an appropriate response,
ii. Identify trends of diseases and their risk factors based on previously collected information,
iii. Monitor the effectiveness of intervention programs/policies,
iv. Map out the distribution of cases and risk factors and pick up regional and sub-group differences,
v. Identify new research issues based on the findings of surveillance and to strengthen it, and
vi. Facilitate advocacy, policy guidance, prioritization of allocation of resources.

Hence there is a need to study the risk factors for cardio vascular diseases in the present scenario especially in neglected rural population.

OBJECTIVES

This study attempts to find the modifiable risk factors in people aged between 25-64 years of rural Kolar with the following objectives:

1) To estimate the prevalence of hypertension, hypercholesterolemia, hyperglycemia and obesity as risk factors for cardiovascular disease.
2) To find the prevalence of already diagnosed cardiovascular disease and diabetes mellitus.
3) To estimate the prevalence of consumption of tobacco and alcohol.
4) To find out the dietary practice with respect to fresh vegetables and fruits consumption.
5) To assess the physical activity status of population.

LITERATURE REVIEW

CARDIOVASCULAR RESEARCH.

The clustering of cardio-metabolic risk factors was first pointed out by Kylin more than eight decades ago when he described the association between hypertension, hyperglycemia and gout. Later the Spanish endocrinologist Maranon specifically stated that hypertension and obesity was a prediabetic condition.[15] In 1951, the Framingham Heart Study established the nature of CHD risk factors and their relative importance[16]. In 1972, the Stanford three community Study was done in three northern California towns to determine whether community health education can reduce the risk of cardiovascular disease.[12]

In 1972, the North Kerelia Project, was undertaken at a multiple risk factor intervention trial. The project aims were to reduce the high levels of risk factors for cardiovascular disease and to promote the early diagnosis, treatment and rehabilitation of patients with CVDs.[17]

In 1977 and 1978, Gerald B. Phillips developed the concept that risk factors for myocardial infarction concur to form a constellation of abnormalities that is associated not only with heart disease, but also with ageing, obesity and other clinical states.[13]

THE HEALTH TRANSITION:

The second half of the twentieth century witnessed major health transitions in the world, propelled by socio-economic and technological changes which profoundly altered life expectancy and ways of living while creating an unprecedented human capacity to use science to both prolong and enhance life. Among these health transitions, the most globally pervasive change has been the rising burden of NCDs. Epidemics of non-communicable diseases NCD are presently emerging or

accelerating in most developing countries. Even as infections and nutritional deficiencies are receding as leading contributors to death and disability, CVDs, cancers, diabetes, neuropsychiatric ailments, and other chronic diseases are becoming major contributors to the burden of disease. India too illustrates this health transition, which positions NCDs as a major public health challenge of growing magnitude in the twenty-first century.

Even the underdeveloped countries are not exempted from this trend. In Ethiopia 28 million people died in 2005 from a chronic disease among which majority was because of cardiovascular disease.[18] And the young people are affected more recently. The economy of the country depends on the young working population, and when they are affected , that too in a under developed country, the ill effects are severe. The reasons are epidemiological transition, harmful lifestyles like physical inactivity, unhealthy diet, smoking and drinking. Health transition includes demographic transition and epidemiological transition.[19]

Demographic transition: It is characterised by the drop in fertility rate, decrease in mortality and increase in life expectancy. Population pyramid of India is changing its shape from pyramid to more columnar. Along with demographic factors, there are changes in economic factors and social factors. The Indian economy is growing at 7% per year. With increasing life expectancy, the proportion of the population older than 35years is expected to rise from 28% in 1981 to 42% in 2021. During the decade 1991 - 2001, the population grew by 18% in the rural areas and 31% in urban regions. Urbanisation and industrialisation are changing the patterns of living in ways that increase behavioural and biological risk factor levels in the population.

Epidemiological transition: The increasing burden of Non Communicable Diseases (NCD), particularly in developing countries including India, threatens to overwhelm already stretched health services. At the onset of 20th century, communicable diseases including maternal and perinatal causes were the leading killers. The scenario at the onset of 21st century has changed drastically, making NCDs the major killer all over the world. This whole process of shift in disease pattern is levelled as epidemiological transition.

EPIDEMIOLOGY OF NON COMMUNICABLE DISEASES

Non-communicable diseases (NCDs) include:

1. Cardio Vascular Diseases (CVDs)
2. Diabetes
3. Obesity disorders
4. Hypertension
5. Cancers
6. Chronic non-specific respiratory

Diseases (e.g., chronic bronchitis, asthma, emphysema)

7. Mental Disorders and nervous disorder
8. Accidents
9. Blindness and Deafness
10. Metabolic and degenerative

MAGNITUDE OF THE PROBLEM

World:

Chronic diseases represent a huge proportion of human illness. They include cardiovascular disease (30% of projected total worldwide deaths in 2005), cancer (13%), chronic respiratory diseases (7%), and diabetes (2%). An estimated total of 58 million deaths worldwide in a

year, heart disease, stroke, cancer, and other chronic diseases will account for 35 million, more than 15 million of which will occur in people younger than 70 years. Approximately four out of five of all deaths from chronic disease now occur in low – income and middle - income countries, and the death rates are highest in middle - aged people in these countries.[20]

Cardiovascular diseases are the leading cause of mortality among all the non-communicable diseases. Among CVDs, coronary heart disease (CHD) is the single largest killer and being referred to as the "modern epidemic".[21]

Prevalence of the hypertension in most of the countries is around 8%. There is no significant difference in the distribution of hypertension between the developed and the developing countries. Hypertension is also behaves as an underlying disorder that leads to CHDs and cerebrovascular accidents (CVAs).[18] To make matters worse, NCDs like hypertension follow the rule of halves. According to it ,only about half[22] of the hypertensive subjects in the general population of most developed countries were aware of the condition, only about half of those aware of the problem were being treated and only about half of those treated were considered adequately treated.

India:

India is experiencing a rapid health transition, with large and rising burdens of chronic diseases, which were estimated to account for 53% of all deaths in 2005. Earlier estimates projected that the number of deaths attributable to chronic diseases would rise from 3·78 million in 1990 (40·4% of all deaths) to 7·63 million in 2020 (66·7% of all deaths). Many of these deaths occur at relatively early ages. Compared with all other countries, India suffers the highest loss in potentially productive years of

life, due to deaths from cardiovascular disease in people aged 35 - 64 years (9·2 million years lost in 2000). By 2030, this loss is expected to rise to 17·9 million years - 940% greater than the corresponding loss in the USA, which has a population a third the size of India's. The estimated prevalence of coronary heart disease is around 3 - 4% in rural areas and 8 -10% in urban areas among adults older than 20 years, representing a two - fold rise in rural areas and a six - fold rise in urban areas over the past four decades. The prevalence of stroke is thought to be 203 per 1,00,000 population among people older than 20 years.[17]

Data on cancer mortality are available from six centers across the country, which are part of the National Cancer Registry Programme of the Indian Council of Medical Research (ICMR). About 8 Lac new cases of cancer are estimated to occur every year.

The age - adjusted incidence rates in men vary from 44 per 1, 00,000 in rural Maharashtra to 121 per 1, 00,000 in Delhi. The major cancers in men are mostly tobacco - related (lung, oral cavity, larynx, esophagus, and pharynx). In women, the leading cancer sites include those related to tobacco (oral cavity, esophagus, and lung), and cervix, breast, and ovary cancer. India has the largest number of oral cancers in the world, due to the widespread habit of chewing tobacco.[17]

India also has the largest number of people with diabetes in the world. The prevalence of type 2 diabetes in urban Indian adults has been reported to have increased from less than 3·0% in 1970 to about 12·0% in 2000. On the basis of recent surveys, the CMR estimates the prevalence of diabetes in adults to be 3·8% in rural areas and 11·8% in urban areas.[17]

The prevalence of hypertension has been reported to range between 20 - 40% in urban adults and 12 - 17% among rural adults. The number of people with hypertension is expected to increase from 118·2 million in

2000 to 213·5 million in 2025, with nearly equal numbers of men and women.[17]

Socio-Economic Impact of NCDs

Death or disability from NCDs in the productive middle ages results in major economic burdens on the affected individuals, their families, and society as a whole. The management of established NCDs (diagnosis and therapy) is often technology-intensive and expensive. Individual as well as societal resources are already being drained, at a disproportionately high level, by the tertiary care management of NCDs, often drawing scarce resources away from the unfinished agenda of infectious disease and nutritional disorder control. Though NCD epidemics usually originate in the upper socio-economic strata, they diffuse across the social spectrum, with the social gradient ultimately reversing and the poor becoming predominantly afflicted.

Indeed, in the more mature stages of these epidemics, the poor are the often worst afflicted in terms of disease and usually the most marginalized in terms of care. This historical experience of the developed countries, where the NCD epidemics matured over the past half-century, is likely to be replicated in the developing countries in the coming half-century.

There is recent evidence from some Indian studies that the social gradient for CVDs has already begun to reverse in some population groups in India, especially in 1arge urban settings.[1]

Tobacco consumption is also higher in rural as compared to urban populations and in the poor as compared to the rich population groups. The future risk of tobacco-related NCDs is, therefore, likely to be higher in these groups. A comparison of per capita income profile and death rates in Punjab, Maharashtra, Andhra Pradesh, and Orissa in 1988 reveals

that as per capita income profile progressively declines from Punjab to Orissa, the probability of death between the ages of 15 and 60 years progressively rises (19 per cent, 27 per cent, 34 per cent, and 38 per cent respectively). NCDs are a major contributor to deaths in this age group.

The risk of cardiovascular diseases accumulates with age and is influenced by factors acting at all stages of the life span.[23,24]

The development of cardiovascular disease starts during fetal development and is influenced by factors acting at different stages- infancy and childhood, adolescence and adult life .

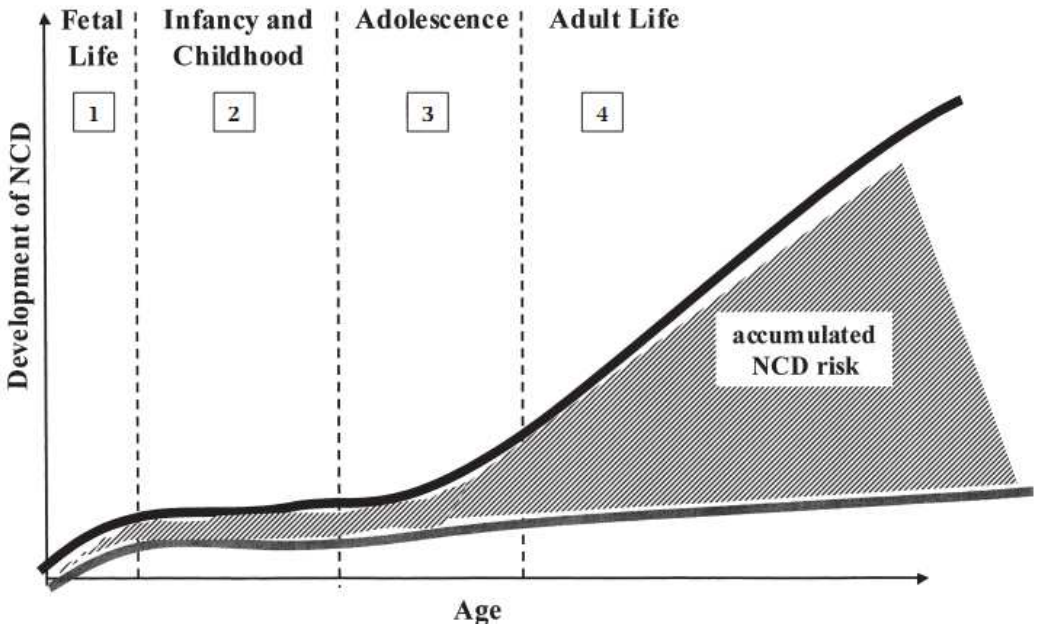
Sex differences in CVD

Previously it was believed that coronary artery disease (CAD) is less common and less severe in women. During the fertile age they do have a lower incidence of CAD, but after menopause the incidence is the same or higher. They tend to be 10-year-older than men when they first experience ischaemic episode. A 50-year-old woman's risk of dying from coronary artery disease is 10 times greater than her mortality risk from hip fracture and breast cancer combined. Although mortality from ischaemic heart disease (IHD) has declined in the recent years, the decline observed is of lesser magnitude in women as compared to men of a similar age.[25]

Previous studies have reported that elderly patients and women receive less evidence-based treatments than younger counterparts and men.[26,27]This is due to a number of factors, including less-convincing evidence for the safety and efficacy of these medicines in the elderly and women, co-morbidities among the elderly, physician attitudes toward treating the elderly apart from multiple socioeconomic issues.[28] The gender based differences in the age of manifestation, risk factors, pathophysiology, clinical manifestations, and diagnosis of CAD need to

be understood by the treating physician so that appropriate and timely treatment can be given.

Figure 1. Life course approach to NCD prevention[29]



To explain the possible ways in which factors over the life course may act to cause chronic disease, so far only a few theoretical models have been advanced.[20]

One of the most famous is that of Barker's hypothesis. Twenty years ago, he showed for the first time that people who had low birth weight are at greater risk of developing coronary heart disease. In 1995, the British Medical Journal named this the "Barker Hypothesis." It is now widely accepted. Dr. Barker's work is relevant to both Western countries and the Developing World. In the Western world, many babies remain poorly nourished because their mothers eat diets that are unbalanced in macronutrients and deficient in micronutrients, or because their mothers are excessively thin or overweight. In the Developing World, many girls and young women are chronically malnourished.[30]

However, the most firmly established associations between cardiovascular disease and factors in life span are those between disease and the major known adult risk factors: tobacco use, obesity, physical inactivity, cholesterol, high blood pressure, and alcohol.

These diseases are unfortunately regarded as “Silent killers” as they produce end organ damage without much of symptoms in the earlier stages. Primary prevention aims at diagnosing these diseases at a very early stage as well as identifies disease modifiers like Obesity, Dyslipidemia and Smoking. Education on life style modification goes a long way in disease control.[31] So controlling these risk factors will be very crucial in controlling the CVDs.

So one of the important steps would be to find out the risk factors in the population.[32]

RISK FACTORS OF NON COMMUNICABLE DISEASES:

Risk factor definition

A 'risk factor' refers to any:

- attribute
- characteristic
- exposure of an individual

Which increases the likelihood of developing a chronic non communicable disease.

Risk factors of CVD

Traditionally, risk factors for CVDs have been categorized as behavioural, anthropometric and biochemical. Several epidemiological studies conducted on the prevalence of CVD risk factors have indicated to an increasing trend.[33] These studies have been done at several locations across the country, in different time periods and using varying study

methodologies. But the one which was done meticulously and according to proper methodology was, 'The WHO-ICMR NCD risk factor surveillance'. Recognizing the lack of a national NCD surveillance system in the country, the Indian Council of Medical Research (ICMR) planned and coordinated a six-site pilot study, from 2003 to 2006, which provided the experience for developing a national strategy for the country. This was a collaborative effort of the WHO and ICMR to develop a sustainable system for NCD risk factor surveillance in India using the WHO STEPS approach. The national NCD risk factor surveillance was conducted in six different geographical locations namely Ballabgarh and Delhi (North), Chennai (South), Trivandrum (South), Dibrugarh (East) and Nagpur (Central).[34]

Some of the results from the study are as follows,

Smoking: Smoking was most common among peri-urban/slum men (34.3%) compared to their rural (26.7%) and urban (26.5%) counterparts.

Alcohol: Alcohol consumption was more prevalent among men. About 33% of urban men, 49.3% of peri-urban/slum men and 40.5% of rural men were found to be current users of alcohol.

Physical activity: More than 50% of the urban residents, 41.4% of peri-urban/slum residents and 35% of rural residents had a sedentary lifestyle while 25.4% of rural residents, 14.2% of peri-urban/slum residents and 7.4% of urban residents were involved in vigorous physical activity.

Fruit consumption: The proportion of subjects who never consumed fruits (in the last week) were 24% in urban, 29% in peri-urban/slum and 41% in rural area.

Obesity: Obesity and abdominal obesity were more common in urban residents, followed by peri-urban/slum and lowest among rural residents.

Generalized obesity: Urban (men: 30.7%, women: 38.8%), peri-urban/slum: (men: 16.7%, women: 26.1%) and rural (men: 9.4%, women: 14.1%). Abdominal obesity: Urban (men: 30.9%, women: 57.8%), peri-urban/slum: (men: 17.9%, women: 41.1%) and rural (men: 12.2%, women: 29.6%).

Diabetes: Diabetes was diagnosed based on self-reported diabetes diagnosed by a physician. The lowest prevalence of self-reported diabetes was recorded in rural (3.1%) followed by peri-urban/slum (3.2%) and the highest in urban areas (7.3%).

Hypertension: The prevalence of hypertension was highest among urban residents (self-reported: 15.1%, newly-diagnosed: 19.3%), followed by peri-urban/slum (self-reported: 9.9%, newly diagnosed: 20.8%) and rural residents (self-reported: 7.2%, newly diagnosed: 17.4%).

The ICMR was identified by the Ministry of Health and Family Welfare, Govt. of India as the nodal agency to implement the NCD risk factor surveys under the World Bank supported Integrated Disease Surveillance Project (IDSP) in 29 states and Union Territories in 3 phases.

Some of the findings are as follows[35]:

Tobacco: Prevalence of tobacco use in any form (smoking or smokeless) was high in Mizoram (68%) followed by Madhya Pradesh (47%), Maharashtra (37%) and Uttarakhand (27%).

Alcohol: The alcohol consumption at least once in last one year among males varied from a high 37% in Andhra Pradesh to a low 21% in Mizoram. The alcohol consumption among females was low in all the states.

Physical activity: The proportion of subjects in low category of physical activity were 42% in Madhya Pradesh, 66% in Tamil Nadu, 67% in

Uttarakhand, 68% in Andhra Pradesh, 81% in Maharashtra, 71% in Mizoram and 76% in Kerala.

Fruits consumption: The proportion of subjects consuming less than five servings of fruits or vegetables per day were 99% in Tamil Nadu, 89% in Uttarakhand, 88% in Andhra Pradesh, 87% in Kerala, 85% in Mizoram, 83% in Madhya Pradesh and 76% in Maharashtra, which was inadequate as per WHO recommended standards.

Obesity: The prevalence of overweight was high in Kerala (27%) followed by Tamil Nadu (23%) and Andhra Pradesh (19%). The prevalence of central obesity was 43% in Kerala, 25% in Tamil Nadu, 18% in Uttarakhand, 14% in Andhra Pradesh and Maharashtra, 12% in Mizoram and 11% in Madhya Pradesh.

Diabetes: Self-reported cases of diabetes were reported to be low - 1% in Mizoram, Madhya Pradesh and Maharashtra and high (6%) in Kerala.

Hypertension: The self-reported cases of hypertension ranged from 2% in Madhya Pradesh to 9% in Kerala.

Several studies have been undertaken to estimate the prevalence of CVD risk factors in rural India. The findings of some of the studies are as follows:

Tobacco usage was 19.9% in Andhra Pradesh[36] , 12.5% in Dibrugarh[37], 17.8% in Kumarokam[38].

Alcohol usage was 36.4%37 and 13.4%38. Physically inactive was 25.5%37. Obese were 4.4%36. Hypertension was up to 33.3% in Dibrugarh. 12.3% and 3.7% were people with high total cholesterol and diabetics respectively.[36] All these findings show that there is not much significant difference in the occurrence of risk factors between the urban and rural areas. Still the number of studies conducted in rural India is way lesser, when compared to urban areas. Considering that almost 3/4th of our country is still rural, it underlines the fact that more studies have to be

carried out to know the burden of cardiovascular disease risk factors in the village population.

CLASSIFICATION OF RISK FACTORS:

A. **Non-modifiable risk factors**:

Non-modifiable determinants include those factors that are beyond the control of the individual, such as

Age

Over 80 percent of all cardio-vascular deaths occur in United States of America in the age group of 65 years and above. Thus, age, per se, is the major risk factor for cardiovascular disease. Clinical manifestations and prognosis of these cardiovascular diseases likely become altered in older persons with advanced age because interactions occur between age-associated cardiovascular changes in health and specific pathophysiologic mechanisms that underlie a disease.[39]

Family history

If a first-degree male relative has suffered a heart attack before the age of 55, or if a first-degree female relative has suffered it before the age of 65, that person is at greater risk of developing heart disease. If both parents have suffered from heart disease before the age of 55, that person's risk of developing heart disease can rise to 50% compared to the general population.

The risk of having a stroke is slightly increased if first-degree relatives have had strokes. If they were young when they had their stroke, then the risk is slightly higher. Studies have shown that the risk increases if the is a woman and her mother has suffered a stroke. It is also believed that inheriting hypertension is the key factor in the familial link of ischemic stroke.

Studies have shown a genetic component for both hypertension and abnormal blood lipids, factors related to the development of cardiovascular disease. One of the inherited factors is high cholesterol level, known as familial hypercholesterolemia. If that person has inherited this condition then he/she will experience a build up of low-density lipoprotein cholesterol in the blood. This can lead to coronary heart disease.

Type 2 diabetes is another risk factor for the development of cardiovascular disease.

Type 2 diabetes also has a genetic component, so if one of their parents developed the condition then they are at a greater risk of developing it too.[40]

B. Modifiable risk factors:

The major (modifiable) behavioural risk factors identified in the World Health Report 2002[41] are:

PHYSIOLOGICAL RISK FACTORS

Raised blood pressure

- Worldwide, raised blood pressure is estimated to cause 7.1 million deaths, about 13% of the total. This accounts for 64.3 million DALYs or 4.4% of the total. [22]
- Raised blood pressure is a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke.[30]
- Blood pressure levels have been shown to be positively and continuously related to the risk of stroke and coronary heart disease. The risk of cardiovascular disease doubles for each increment of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg.[42]

- Complications of raised blood pressure include heart failure, peripheral vascular disease, renal impairment, fundal hemorrhages, and papillodema.
- Treating systolic blood pressure and diastolic blood pressure to targets that are less than 140/90 mmHg is associated with a decrease in cardiovascular complications.[32]

Hypertension can be classified according to the joint national committee-7 report as follows:

Grade	SBP & DBP
Normal	<120 & <80
Pre hypertension	120-139 or 80-89
Hypertension, Grade – I	140-159 or 90-99
Hypertension, Grade – II	> 160 or > 100

CLASSIFICATION OF HYPERTENSION[32]:

1. Primary Hypertension or Essential Hypertension
2. Secondary Hypertension

1. Essential Hypertension:

A type of hypertension for which there is no identifiable cause is called primary or essential hypertension. About 90%-95% of hypertension are belongs to this group.

2. Secondary Hypertension:

Hypertension for which there are specific causes is called as secondary hypertension. About 5-10% of total hypertensions belong to this group.

E.g. a. Induced by exogenous substances or drugs (Hormonal contraceptives, corticosteroids, sympathomimetic, cocaine, MAO Inhibitors, NSAIDS)

b. Secondary to Renal Disease (Renal parenchymatous disease, Reno vascular hypertension, Renin producing tumors)

c. Associated with endocrine disorders (Acromegaly, thyroid disease, adrenocortical diseases, carcinoid tumors).

d. Pregnancy Induced

e. Coarctation of Aorta.

Increased blood glucose:

This can lead to diabetes mellitus.

- Diabetes Mellitus is defined as a metabolic abnormality characterized by hyperglycaemia and disturbances of carbohydrate, fat and protein metabolism that are associated with absolute or relative deficiency in insulin secretion and / or insulin action.[32]
- As per estimates of WHO, the number of people affected worldwide with diabetes are approximately 150 million, of which two-third are in developing countries.
- The total number of people with diabetes is predicted to rise above 300 million by 2025.[43]
- The cause specific mortality from diabetes ranges from 7-48 per lakh in different countries.24 According WHO India is likely to have half (75million) of the world diabetics by the year 2025.
- The prevalence is more in urban area compared to rural area. Indians and South Asians are more predispose to develop diabetes mellitus.[32]

- It is estimated that 20 per cent of the current global diabetic population resides in the South-East Asia Region.
- The number of diabetic persons in the countries of the Region is likely to triple by the year 2025. 12 It has been noted that presence of diabetes carries a very high risk for IHD (RR of 3.5 to 4 times), hypertension, dyslipidaemia, obesity and metabolic syndrome.
- In fact, diabetes is listed among the five most important determinants of the cardiovascular disease epidemic in Asia.[32,44]

CLASSIFICATION[45]:

1. Type-1 Diabetes Mellitus
2. Type-2 Diabetes Mellitus

1. Type-1 Diabetes Mellitus

This comprises 5 to 10% of all diabetes. It is due to absolute insulin deficiency as a result of pancreatic beta cell destruction. It is also called as IDDM (Insulin Dependent Diabetes Mellitus).

2. Type-2 Diabetes Mellitus

It forms the majority of the problem from lifestyle and non - communicable diseases point of view, comprising 85 to 90% of all diabetes cases. It is also called as NIDDM (Non-Insulin Dependent Diabetes Mellitus).

Abnormal blood lipids.

- Raised cholesterol is estimated to cause 18% of the global cerebrovascular disease and 56% of global ischemic heart disease. Overall this amounts to about 4.4 million deaths (7.9% of total) and 40.4 million DALYs (2.8% of total).[22]

- Raised total cholesterol is a major cause of disease burden in both the developed and developing world as a risk factor for Ischemic heart disease and Stroke.[46]
- A 10% reduction in serum cholesterol in men aged 40 can result in a 50% reduction in heart disease within 5 years, while an average of 20% reduction in heart disease occurs within 5 years in men aged 70 years.[47]
- A 4.6% reduction of population mean of total cholesterol had the greatest impact of all risk factors in decreasing CHD mortality in Ireland; a full 30 % reduction in mortality was attributable to this reduction alone.[34]

Overweight and obesity:

- At least 2.6 million people die each year as a result of being overweight or obese.
- Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Risks of coronary heart disease, ischemic stroke and type 2 diabetes mellitus increase steadily with increasing BMI.
- Raised BMI also increases the risks of cancer of the breast, colon, prostate, endometrium, kidney and gall bladder.
- Mortality rates increase with increasing degrees of overweight, as measured by BMI.[48]
- To achieve optimum health, the median BMI for an adult population should be in the range of 21 to 23 kg/m^2, while the goal for individuals should be to maintain BMI in the range 18.5 to 24.9 kg/m^2.
- .There is slightly increased risk of co morbidities for BMI 25.0 to 29.9, and moderate to severe risk of co morbidities for BMI greater than 30.[49]

HAZARDS OF OBESITY:

Causes of Obesity[50]:

Obesity results from an excess of dietary energy intake as compared to energy expenditure and thus both an increase in intake and a decrease in energy expenditure will lead to excess calories being stored as fat and, ultimately to obesity.

Increased energy intake : An increased energy intake due to lifestyle changes and affluence as seen in urban areas seems to be fuelling the obesity epidemic.

Passive overeating : The term passive overeating is applied to the practice of eating without a biological need, and not expanding the calories thus gained. Such a situation is commonly seen in the urban setting today where one relishes French fries, wafers and other high calorie snacks while watching TV or using a computer.

Binge eating : It is the practice of overindulging in eating in a short time. This might occur in a party, on a weekend or with drinks. In the binge eating occasions become rather frequent; it certainly is a cause of obesity.

Decreased energy expenditure : There is a rapid decline in energy expenditure i.e. in manual labor resulting from vehicle ownership, availability of labor - saving devices, shunning outdoor sports and watching television and computer use for long hours. These factors contribute to obesity.

Metabolic factors : In some individuals endocrine disorders such as Cushing's syndrome and hypothyroidism, Prader – Willi syndrome etc. are the cause of obesity.

Genetic factors : Obesity tends to run in families. Obesogenic genes are under study, which alter the metabolism or alter the response to obesity limiting hormones like Leptins etc.

Fetal programming[21] : The Barker's hypothesis proposes that under nutrition during pregnancy may increase the susceptibility of that individual to obesity in adulthood.

MEASUREMENT OF OBESITY:

Body Mass Index: (BMI)

Body mass index or BMI is promulgated by the World Health Organization as the most useful epidemiological measure of obesity/ overweight. It is a relationship of the person's weight to his height, that is, weight in kilograms divided by the square of the height in meters.[51]

BMI is computed by taking the body weight in kilograms and dividing it by the square of the height in meters. BMI does not measure the body fat but relates well with the degree of obesity.

Calculated by the equation;

BMI (kg/m^2) = Weight (in kg)/ $Height^2$ (in m).

The individuals can be distributed into different stages of nutritional status as follows :

Nutritional status	**Range (in kg/m^2)**
Underweight	> 18.5
Normal	18.5 – 24.99
Overweight	25 – 29.99
Obese	> 30

BEHAVIOURAL RISK FACTORS

- Tobacco use
- Harmful alcohol consumption
- Unhealthy diet (low fruit and vegetable consumption)
- Physical inactivity.

a) **Tobacco:** Smoking, which is believed to be the number one major single known cause of non-communicable diseases , is widespread around the world. Estimate of the World Health Organization (WHO) indicates that roughly about 30% of the global adult male populations are smokers.[52]

- Tobacco is the fourth most common risk factor for disease and the second major cause of death worldwide. It is currently responsible for the death of one in ten adults worldwide (about 4.9 million deaths each year).[21]
- It is estimated that tobacco-related deaths exceed 4 million annually. It has been estimated that by 2030, diarrhoeal diseases and lower respiratory infections will have been surpassed by chronic obstructive airways diseases as causes of mortality.[53]
- If the current smoking pattern continues, it is estimated that deaths from tobacco consumption will be about 10 million people per year by 2020.[21]
- Smokers have markedly increased risk of multiple cancers, particularly lung cancer, and are at far greater risk of heart disease, stroke, Chronic Obstructive Pulmonary Disease (COPD), diabetes, and other fatal and non-fatal diseases.
- People who chew tobacco risk cancer of the lip, tongue and mouth.[54]
- Intra Uterine Growth Retardation, spontaneous miscarriages and low birth weight babies are known outcomes of smoking during pregnancy .

b) Harmful alcohol consumption:

- In 2000, alcohol use caused 3.2% of deaths (1.8 million) worldwide, and 4% of the global disease burden.[22]
- Alcohol consumption is the leading risk factor for disease burden in low mortality developing countries and the third largest risk factor in developed countries.[55]
- The proportion of disease burden attributable to alcohol use in the developing world is between 2.6% to 9.8% of the total burden for males and 0.5% to 2.0% of the total burden for females.[25]
- Besides the direct toxic effects of intoxication and addiction, alcohol use causes about 20% to 30% of each of esophageal cancer, liver disease, homicide, epileptic seizures, and motor vehicle accidents worldwide.[25]
- Heavy alcohol use increases the risk of cardiovascular disease (19-24) and stroke.

c) Unhealthy diet:

- About26.7 million (1.8%) DALYs worldwide are attributable to low fruit and vegetable intake.[22]
- Of the burden attributable to low fruit and vegetable intake, about 85% was from cardiovascular diseases and 15% from cancers .
- Low intake of fruits and vegetables is estimated to cause about 19% of gastrointestinal cancer, 31% of ischemic heart disease and 11% of stroke worldwide.
- Adequate consumption of fruit and vegetables reduces the risk for cardio vascular diseases [56], stomach cancer[57] and colorectal cancer.[26]

- It is well recognized that diet can affect cardiovascular health and risk factors for cardiovascular disease. The American Heart Association recommends that individuals consume a diet containing a variety of fruits, vegetables, whole grains, low-fat dairy, lean sources of protein including legumes, poultry and lean meats, as well as consume fish, preferably oily fish, at least twice a week (Lichtenstein et al., 2006). The consumption of these foods promotes the following: an increase in consumption of fiber, vitamins, and phytochemicals; an increased consumption of omega-3 fatty acids; and a decreased consumption of saturated fat.[58]
- Focusing on fruits and vegetables, Joshipura et al. (2001) evaluated the impact of fruit and vegetable intake in 84,251 women and 42,148 men participating in either the Nurses' Health Study or the Health Professionals Follow-up study and of whom were followed for eight consecutive years. Diet was assessed using food frequency questionnaires. Individuals were divided into quintiles of fruit and vegetable intake. Compared with individuals in the lowest quintile of fruit and vegetable intake, individuals with the highest quintile of fruit and vegetable intake had a relative risk for coronary heart disease of 0.80. In addition, as servings of fruit and vegetables increased by one serving per day, coronary heart disease risk decreased by 4%.[59]
- There is convincing evidence that high intake of high-energy foods such as processed foods high in fats and sugars promote obesity compared to low-energy foods such as fruits and vegetables.[26]
- While evidence exists that fruits and vegetables have cardioprotective effects, contradictory evidence exists. Bazzano et al. (2002) studied 9,608 adults ages 25-74 years evaluating the

relationship between fruit and vegetable intake and cardiovascular disease risk. An inverse correlation was found between fruit and vegetable intake and risk for cardiovascular disease but results were not significant.[60]

- Evidence suggests that fruits and vegetables have cardioprotective effects, but results are not conclusive. Pan and Pratt (2008) found no significant association between prevalence of metabolic syndrome, which has implications for heart disease, and vegetable intake. Bazzano and associates (2002) found no significant associations between cardiovascular disease risk and fruit and vegetable intake, differing from findings made by Joshipura (2001). Additional studies evaluating the impact of fruit and vegetable intake are warranted.[61]
- The American Heart Association recommends the following healthy diet goals for adults consuming 2000 kcal/day to maintain a healthy heart. At least 4 ½ cups of fruits and vegetables should be consumed per day. Fish should be eaten at least twice a week at a serving size of 3.5 ounces. Fiber-rich whole grains should be consumed daily at the amount of three one-ounce servings or more. Sodium should be kept to less that 1,500 mg per day and sugar sweetened beverages to no more than 450 calories per week. Additional dietary measures include consuming at least four servings per week of nuts, legumes, and seeds. Processed meats should be consumed no more than two times per week and less than 7% of total energy intake should come from saturated fat.[62]

d) Physical inactivity:

- Physical inactivity causes about 1.9 million avoidable deaths per year worldwide.[22]

- Physically inactive persons have a 20% to 30% increased risk of all-cause mortality as compared to those who adhere to 30 minutes of moderate intensity physical activity on most days of the week.[63]
- Globally, physical inactivity accounts for 21.5% of ischemic heart disease, 11% of ischemic stroke, 14% of diabetes, 16% of colon cancer and 10% of breast cancer.[64]
- Physical inactivity is a major risk factor in promoting obesity, which itself is a risk factor for other chronic diseases.[28]
- Pan and Pratt (2008), examined adolescents for metabolic syndrome. Physical activity levels were evaluated and examined for association with metabolic syndrome. Physical activity was ranked in all subjects (n=4,450) and divided into tertiles for evaluation. The tertile with the lowest levels of physical activity showed the highest prevalence of metabolic syndrome and the tertile with the highest levels of physical activity showed the lowest prevalence of metabolic syndrome, although there was no significant difference.[65]
- A review study done by Ignarro et al. (2006) also evaluated the impact of physical activity on cardiovascular health. Three studies examined in this review showed a reduced rate of coronary heart disease in physically active people. Physical activity is important for overall general health in individuals with and without cardiovascular disease. Limited research exists on the impact physical activity has on cardiovascular health in children.[66]
- Physical activity may have a protective effect against development of cognitive impairment and dementia, and reduces severity of symptoms among the depressed.[27]

PSYCHOLOGICAL RISK FACTORS

The occurrence of psychological alterations and cardiac disease in many patients exemplifies the complexity of psychosomatic and somatopsychic effects. Psychological factors including depression, anxiety and hostility influence the development, clinical expression and prognosis of heart disease. Accordingly, it is critical that clinically significant levels of distress are identified, both in hospital and after discharge, to target patients who require specific psychological intervention, in addition to conventional cardiac rehabilitation. Ameliorating distress has been shown to improve adherence to treatment advice, such as modifying psychological defence mechanisms, compliance with medication regimens and attendance at exercise programmes.[67]

SOCIOECONOMIC STATUS

Cardiovascular diseases (CVD) are the leading cause of death and disability in both developed and developing countries. In developed countries socio-economic mortality differentials have been studied extensively showing that the low socio-economic group suffers the highest mortality. As the epidemiological transition is taking place against a background of economic globalization, CVD risk factors among the urban poor and middle class are rapidly increasing in India. Recent evidences from India also suggest reversal of social gradient with excess burden of CVD morbidity in the low socio-economic group. Understanding the social determinants of environmental and behavioural exposures, in determining the risk factors for cardiovascular disease is an important challenge for public health professionals as well as communities. Socio-economic disadvantage is not simply a proxy for poor cardiovascular risk factor status, but also an indication of the likely

trajectory that an individual or a community may follow in the course of their life.[68] Disparities in CHD mortality result from multiple factors, including early life environment and material disadvantage,social and behavioral risk factors, access to care, and systematic underestimation of risk among persons with lower socio economic status in clinical care.[69]

RATIONALE FOR INCLUSION OF CORE RISK FACTORS:

The rationale for including these eight core risk factors in STEPS surveillance activities is that:

- They have the greatest impact on chronic disease mortality and morbidity
- Modification is possible through effective prevention
- Measurement of risk factors has been proven to be valid.
- Measurements can be obtained using appropriate ethical standards.[70]

GLOBAL STRATEGY TO TACKLE NCDS.

Concern is growing about the escalating global burden of non communicable diseases (NCDs) such as cardiovascular diseases, cancer, diabetes and chronic respiratory diseases. The concern is not just epidemiological but also economic. NCDs, which are often accompanied by long-standing disabilities, have a direct economic impact on households and communities, both through the uptake of health services and goods that diverts expenditure, but also on levels of income or labour productivity). Various efforts are being made throughout the world by the governments, non governmental organizations etc. WHO has formulated a tool which aims to help in financial planning (over the period 2011-2025) that can be used to forecast resource needs at national and sub-national levels. The tool can enhance traditional budgeting mechanisms in

countries and provide new information to development agencies about the resources needed to tackle the growing burden of NCDs.[71]

World health assembly adopted a global strategy to tackle the problem of non communicable diseases. The objectives are[72]:

1. To raise the priority accorded to non communicable disease in development work at global and national levels, and to integrate prevention and control of such diseases into policies across all government departments.
2. To establish and strengthen national policies and plans for the prevention and control of NCDs.
3. To promote interventions to reduce the main shared modifiable risk factors for non communicable diseases: tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol.
4. To promote research for the prevention and control of non communicable diseases.
5. To promote partnerships for the prevention and control of non communicable diseases.
6. To monitor non communicable diseases and their determinants and evaluate progress at the national, regional and global levels.

Working closely with Member States, WHO has, therefore, developed this Action Plan to prevent NCDs from occurring and to help the millions who are already affected to cope with these lifelong illnesses. This Action Plan, endorsed at the Sixty first World Health Assembly in May 2008, is based on the sound vision of the Global Strategy for the Prevention and Control of Non communicable Diseases, endorsed at the Fifty-third World Health Assembly in May 2000.[73]

RURAL HEALTH CARE

In a span of a little over a decade, India has made significant strides in economic development maintaining an average annual growth of a little over 7.5 percent. Yet India has been lagging on other measures of human development as health . The public health system, in existence since 1946 (Bhore committee) and strengthened after the Alma Ata declaration in 1978, plays a dominant role in healthcare delivery to rural India. All the government sponsored programs are delivered through this system. The public health system is a three tier network of sub centres, primary health centre and community heatlh centres. There are a total of 147,069 sub centers, 23,673 primary health centres and 4535 community health centres.[74] While this infrastructure is extensive, accessibility, quality and affordability of care is still a major problem for a majority of the rural population. Shortage of skilled human resources, absenteeism is some of the major causes.[75] Not satisfied with the quality and availability of care in the public health system, people who can afford to will seek care from private providers. Those who can't afford are still dependent on the government sector completely.

Studies relevant to risk factors for CVD among Indian populations

	Bharadwaj et al[76]	**Nath et al[77]**	**Nawi et al[78]**	**Thankappan et al[38]**	**Hazarika et al[37]**	**Chow et al[36]**
Site	Rural	Urban	Urban, Rural	Rural	Rural	Rural
Year	2008	2009	2001	2006	2004	2007
No. of subjects	3771	2234	2963		3180	345
Illiterates (%)	M: 17.4 F: 30	M:25.1 F:75.5				
Tobacco usage		M:52.6 F:17.7		17.8	12.5	19.9
Smoking (%)	Men -20.5 Women -0	18.4	M: 53.9 F:1.7			
Smokeless	M: 62.6 F: 32.8					
Alcohol (%)	37.7	8.9		13.4	36.4	
Sedentary (%)	M: 7.7 F: 9.6	40.3		M:14.8 F:55	25.5	
Obesity (%)	Overweight M: 5.7 F:7.2 Obese: M: 0.3 F: 0.7		M:4.8 F:12	M: 16 F: 21.9	Overweight: 27.4 Obese: 0.9	Overweight: 25 Obese: 4.4
Diabetes (%)						3.7
Hypertension	M: 14.8 F:15.9		M:22.4 F: 21.9	36.7	33.3	20.3
Cholesterol						12.3

*Percentages here are representative of the rural population.

METHODOLOGY

The study to find the prevalence of CVD risk factors in the adult population is conducted in Mulbagal taluq, Kolar district in Karnataka state.

Figure 2. Karnataka state

Figure 3 Kolar district

The study was undertaken in Mulbagal taluk area, which is one of the five taluks in Kolar district, located 25 kms from the district head quarters. The word Mulbagal (*Mudalabagilu)* means the eastern-door in Kannada language. Kolar district (lat. 13° 2' - 13° 20' N and long. 77° 56' – 78° 17' E) is a semiarid and a drought prone district. The district is located in the southern region of the State and is the eastern-most district of the Karnataka State. The district is bounded by the Bangalore Rural district in the west Chikballapur district in the north, Chittoor District of Andhra Pradesh in the east and on the south by Krishnagiri and Vellore district of Tamil Nadu.

Less than 14% of the land is under forest cover. More than 90% of the drinking water requirements are met by ground water resources. Also, around 16% of the villages in Kolar district are affected by excess fluoride concentration in groundwater ranging from 1.5 to 4.05 mg/L, leading to endemic fluorosis. The main occupations in these communities are agricultural activities. Marketing of milk to dairy is an additional source of income to a large proportion of the population. There is intense

cultivation of mulberry for silk worms rearing, floriculture and horticulture farming. Quarrying, stone crushing and bricks and roof tiles manufacturing are major unorganized sectors in Kolar[79].

STUDY POPULATION:

People aged 25-64 years are selected from 20 villages.

SAMPLE SIZE: It was calculated using the following formula

Sample size= $(Z^2 * p * q)/ e^2$

Where , Z = confidence interval.

\p= prevalence of risk factor in the population.

Q =1-p

e= margin of error.

A sample size of 250 each was considered in the age group of 25-44 and 45-64 years in both the sex.

Inclusion criteria: People aged between 25-64 years.

Exclusion criteria: None.

STUDY PERIOD:

The population was studied between December 2010 to October 2012.

TOOLS USED:

- Structured and pre tested questionnaire (Annexure-3).
- Digital weighing scale, with an accuracy of 50 gm (Salter).
- Stadiometer.
- Non stretchable measuring fibre tape.
- Automatic blood pressure monitor (Omron).

- Glucometer (Accu-chek).
- Blood collecting tubes (BD vacutainer).
- Syringes (Dispovan disposable).

STUDY DESIGN:

Study was designed as community based cross sectional study.

COLLECTION OF DATA:

The data was collected using multi stage sampling technique. The study population was comprised of around 250 individuals each in the age group of 25-44 and 45-64 years in each gender.

Out of 343 villages in Mulbagal taluq 20 were selected based on probability proportion to size. Around 50 individuals were selected for the survey in each of the 20 villages. As the sampling is independent for each age and gender group, 13 individuals from each of the 4 groups had to be selected from each village.

In each selected village, a random direction from the centre of the village was chosen to start the survey. In that direction every nth house (n = sampling interval = total no. of households in the village/52) was surveyed. In each house one person was supposed to be interviewed from any of the 4 age/gender groups randomly. If the person was not available at that moment, then the house was re-visited for a maximum of 2 more times to contact the person.

All individuals in the sample were informed about the purpose of the study. After obtaining the written informed consent they were interviewed using a structured, pretested questionnaire adopted from WHO STEPS approach for non-communicable diseases risk factors surveillance.[80]

The following data was collected as per the WHO STEPS approach.

STEP 1:

- Core demographic information
- Socio demographic information
- Tobacco and alcohol use
- Nutritional status
- Physical activity

STEP 2:

Taking physical measurements to build on core data in Step 1 and determine the proportion of adults that:

- Are overweight and obese
- Have raised blood pressure.

MEASUREMENTS:

Weight: Measured using digital weighing scale of Salter make with an accuracy of 50 gm.

Procedure:

The participant was asked to remove their footwear.

The participant was asked to step onto scale with one foot on each side of the scale.

The participant was asked to:

- Stand still
- Face forward
- Place arms on the side and

- Wait until asked to step off.
- The weight was recorded in the kilograms.

2) Height: Measured using stadiometer.

The participant was asked to remove their:

- Footwear (shoes, slippers, sandals, etc)
- Head gear (hat, cap, hair bows, comb, ribbons, etc).
- The participant was asked to stand on the board facing us.

They were asked to stand with:

- Feet together
- Heels against the back board
- Knees straight.
- Look straight ahead and not tilt their head up.
- Care was taken to make sure that their eyes are at the same level as their ears.
- The measure arm was moved gently down onto the head of the
- Participant and asked the participant to breathe in and stand tall.
- The height was recorded in centimetres (to the nearest 0.1cm).

3) Blood Pressure:

- Preparing the participant: The participant was asked to sit quietly and rest for 15 minutes with his/her legs uncrossed.
- Three blood pressure measurements were taken. During data entry the mean of the second and third readings was taken. The participant had rested for three minutes between each of the readings.

- The left arm of the participant was placed on the table with the palm facing upward.
- Clothing on the arm was removed or rolled up.
- The cuff was positioned above the elbow (the lower edge of the cuff was placed 1.2 to 2.5 cm above the inner side of the elbow joint), aligning the mark ART on the cuff with the brachial artery.
- The level of the cuff was placed at the same level as the heart.
- The cuff was snugly wrapped onto the arm and securely fasten with the Velcro.
- The monitor was started and the reading was noted in mm of Hg. This whole procedure was repeated two more times.

STEP 3:

- Taking fasting blood samples for biochemical measurements
- To measure prevalence of diabetes or raised blood glucose
- And to measure serum cholesterol levels.

PROCEDURE FOR BIOCHEMICAL MEASUREMENTS:

To obtain accurate results, participants had to fast for at least 12 hours before blood collection. This was particularly important for the measurements of blood glucose. All blood samples were taken in the morning. This means participants should not have had anything to eat or drink anything (except plain water) from about 8 pm the night before.

Diabetic patients on medication were required to bring their tablets with them and were advised to take them after their blood measurement if possible .

MEASURING THE FASTING BLOOD GLUCOSE:

- Gloves were put on by the one performing the test.
- Glucose test strip was removed and put in the glucometer.
- Fingertip was rubbed and knead to help withdraw blood .
- Fingertip was wiped by using a sterile swab.
- The massaged place on the fingertip was lanced with a lancing device.
- Hanging blood drop was allowed to form without applying too much pressure.
- The drop of blood was carefully applied to the test field on top of the strip without touching the test field directly to the finger.
- The participant was given a cotton ball to press on the puncture.
- After the reading is displayed in the glucometer, the fasting blood sugar is recorded in mg/dl.
- The lancets which were used was kept in a poly-bag after usage and disposed appropriately afterwards.

BLOOD COLLECTION FOR THE MEASUREMENT OF SERUM CHOLESTEROL.

Soon after measuring the fasting blood sugar, intravenous blood was collected, transported to laboratory at R.L.Jalappa Hospital, Kolar, immediately centrifuged, serum separated and tests for the estimation of serum cholesterol were performed.

ETHICAL ISSUES:

Ethical clearance for the study was obtained by the ethical committee of Sri Devaraj Urs Medical College, Kolar.

STATISTICAL ANALYSIS

The collected data was entered daily in Microsoft Excel sheet. The prevalence of CVD risk factors is expressed as frequency and proportions according to the two age groups and gender. The association between the CVD risk factors and the age groups and gender is tested with X^2 test. Student t-test is used to test the difference among the gender and age group for quantitative measurement. $p < 0.05$ was considered as statistically significant. Logistic regression analysis was done between CVD risk factors and prevalence of hypertension and diabetes mellitus. All the analysis was done with software open epi (version 2.3) and Minitab (version 16).

RESULTS

I. Socio demographic information of study population in Mulbagal:

Table 1. Age and Gender distribution of Study population in Mulbagal.

Age groups	Males	Females	Total
	No. (%)	No. (%)	No. (%)
25-44 years	246 (49.5)	251 (50.5)	497 (50.8)
45-64 years	253 (52.4)	229 (47.5)	482 (49.2)
Total	**499 (50.9)**	**480 (49.0)**	**979 (100)**

A total of 1024 persons were enumerated and selected for the study. Out of the 1024 identified persons, 979 individuals could be contacted and further interviewed and examined. The remaining could not be contacted after a total of 3 attempts. There was no significant difference in the socio demographic variables between the interviewed and those who could not be contacted. There were 499 males and 480 females in the study sample. Distribution of study population among the two age groups was also similar.

Table 2. Distribution of study population in Mulbagal according to education status.

Education status	Males	females	Total
	No. (%)	No. (%)	No. (%)
No schooling	211 (42.3)	229 (47.8)	440 (44.9)
Primary school[1]	139 (27.9)	163 (33.9)	302 (30.9)
High school[2]	90 (18.0)	66 (13.8)	156 (15.9)
Pre university college and above[3]	59 (11.8)	22 (4.5)	81 (8.3)
Total	**499 (100)**	**480 (100)**	**979 (100)**

1- 1st to 7th standard. 2- 8th to 10th standard. 3- Includes graduate and post graduate degrees.

Around 45% of those studied had not undergone any schooling. There is a difference between the number of females who had not gotten any schooling and the males belonging to same group. But this difference is not statistically significant (χ^2 value: 2.90, p value: 0.088). The proportion of study population with higher education status decreased as age increased. Around 11.8% of men had attended college and above compared to females (4.5%). There is a marked difference between the number of females who attended college when compared to males. It is highly significant (χ^2 value: 16.89 and p value: <0.001).

Table 3. Distribution of study population in Mulbagal according to religion and caste.

Religion and caste	**Males**	**Females**	**Total**
Hindus			
	N=489 (%)	N=459 (%)	N=948 (%)
OBC	265 (54.2)	283 (61.7)	548 (57.8)
General category	134 (27.4)	91 (19.8)	225 (23.7)
Scheduled caste	77 (15.7)	73 (15.9)	150 (15.8)
Scheduled tribe	13 (2.7)	12 (2.6)	25 (2.7)
Muslims			
	N=10 (%)	N=21 (%)	N=31 (%)
OBC	7 (70)	8 (38)	15 (48.4)
General category	3 (30)	13 (62)	16 (51.6)

OBC: Other backward classes

The study population comprised of Hindus and Muslims. Majority of the studied were Hindus (96.83%).

OBCs constituted to 54.2% among the Hindu and similarly among Muslims (48.4%). In general category among Hindus males were more than females and among Muslims females were more than males.

Table 4. Distribution of study population in Mulbagal based on marital status.

Marital status	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Currently married	430 (86.1)	392 (81.7)	822 (84)
Unmarried	54 (10.8)	23 (4.8)	77 (7.9)
Widow/widower	11 (2.3)	50 (10.4)	61 (6.2)
Divorced/staying separately	4 (0.8)	15 (3.1)	19 (1.9)
Total	**499 (100)**	**480 (100)**	**979 (100)**

Around 84% of the study population was currently married. Among the unmarried females were less compared to males. The difference is highly significant (χ^2 value: 12.27 and p value : <0.001). There were more widows compared to widowers.

Table 5. Distribution of study population in Mulbagal based on occupation.

Occupation	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Government job	35 (7)	12 (2.5)	47 (4.8)
Other job	75 (15)	48 (10)	123 (12.6)
Self employed	305 (61.1)	251 (52.3)	556 (56.8)
Income less	9 (1.8)	7 (1.5)	16 (1.6)
Student	13 (2.6)	4 (0.8)	17 (1.7)
House work	48 (9.7)	145 (30.2)	193 (19.7)
Unemployed	14 (2.8)	13 (2.7)	27 (2.8)
Total	**499 (100)**	**480 (100)**	**979 (100)**

Majority of the population were self employed (56.8%). As per the type of employment majority were in the agricultural sector. Among students majority were males. This difference between the two genders was significant (χ^2 value: 4.5 and p value: 0.03). The difference between

the males and females were significant even in the house work category (χ^2 value: 10.9 and p value: 0.001).

Table 6. Distribution based on the income range per month.

Income Range per month (In Rupees)	Freq.	Percent
<1000	46	4.7
1000-3000	536	54.6
3001-5000	241	24.7
5001-10000	115	11.8
>10000	41	4.2

Majority of the households of the studied population had an income of 1000-3000 rupees per month. Only 4.29% of the population had an income of more than 10000 rupees per month.

II. Risk factors for cardiovascular diseases in Mulbagal.

Table 7. Distribution of study population in Mulbagal based on the mode of tobacco usage

Mode of tobacco usage	Males	Females	Total
	N=244* (%)	N=206* (%)	N=440* (%)
Smoking form	123 (50.4)	4 (1.9)	127 (28.9)
Cigarettes	17 (3.4)	0 (0)	17 (3.9)
Beedies	93 (18.6)	4 (1.9)	96 (21.8)
Smokeless form	168 (68.9)	204 (99)	372 (84.5)
Gutka	31 (6.2)	8 (3.9)	19 (4.3)
Khaini	46 (9.2)	78 (37.9)	124 (28.2)
Tobacco dust	96 (19.2)	120 (58.3)	216 (49.1)

** The total number exceeds number of study subjects as multiple forms of tobacco were used by some.*

44.94% of study population had used tobacco either in smoking or smokeless form or both. Around 85% of tobacco users had used it in smokeless form. In that tobacco dust was the more popular form among

the study population. This was used more commonly by the females.The association with females was not significant though (χ^2 value: 0.10, p value : 0.744). Tobacco in the form of khaini was more commonly used in females than men.

Among smokers males comprised the majority compared to the females . The difference was significant (χ^2 value: 122.91 and p value: <0.001). Beedies were the commonly smoked form. Four women smoked beedies.

Table 8. Mean amount of tobacco consumption per day.

	Males	**Females**
Cigarettes[1]	4.5	0
Beedies[1]	12.5	8
Smokeless[2]	8	8

1- Quantity is considered.

2- No. of times consumed per day is considered.

Smoked forms of tobacco were used more often by males. The mean frequency and consumption of smokeless tobacco was 8 times in both men and women. Around seven men and women altogether had quit smoking in the past. 96 out of 127 current smokers could answer the age of initiation of smoking. The average age of initiation of smoking was 24.86 years.

Table 9. Distribution of alcohol consumption in the past 30 days among study population in Mulbagal.

Age group	Males	Females	Total
	No. (%)	No. (%)	No. (%)
25-44	49 (42.6)	0 (0)	49 (39.8)
45-64	66 (57.4)	8 (100)	74 (60.2)
Total	**115 (100)**	**8 (100)**	**131 (100)**

13.38% of the study population had consumed alcohol in the past 30 days. Males comprised of the majority among them. There was a significant difference between the two genders (χ^2 value: 101.79 and p value : <0.001). Eight women in the age group of 45-64yrs had consumed alcohol in past 30 days. More men in the age group of 45-64 yrs were consuming alcohol in the last 30 days compared to 25-44 yr group. There was a significant difference between the two groups(χ^2 value: 6.72 and p value : 0.01).

Table 10. Distribution of study population in Mulbagal according to frequency of alcohol consumption frequency (per week).

Frequency and alcohol consumption	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Lifetime abstainer	384 (77)	472 (98.3)	856 (87.4)
Occasional*	26 (5.2)	1(0.2)	27 (2.8)
2-4	77 (15.4)	6 (1.3)	83 (8.5)
5-7	12 (2.4)	1 (0.2)	13 (1.3)
Total	**499 (100)**	**480 (100)**	**979 (100)**

** Includes those who consume alcohol at least once in a month but not more that once per week.*

Around 87% of the study population had not consumed alcohol in the past 30 days. The number of people who consumed alcohol almost alternate day (2-4 times per week) were more in number among those who consumed alcohol in past 30 days, followed by the occasional

drinkers. Occasional users had consumed alcohol once or not at all in a week. The number of females in all the categories of drinking were much lesser compared to males.

Mean quantity of consumption per occasion is 6.13 standard drinks.

One standard drink is one single measure of spirits (30ml) or 1 standard bottle of regular beer (285 ml).

Table 11. Alcohol consumption in the study population at Mulbagal.

Category	Males	Females	Total
	No (%)	No (%)	No (%)
Heavy[1]	74 (86)	2 (100)	8 (96.6)
Intermediate	9 (10.5)	0 (0)	0 (0)
Moderate[2]	3 (3.5)	0 (0)	3 (3.4)
Total	**86 (100)**	**2 (100)**	**88 (100)**

1- Men- More than 4 drinks on any day or more than 14 per week.

Women- More than 3 drinks on any day or more than 7 per week.

2- Men- up to 2 drinks per day.

Women- up to 1 drink per day.

(According to American dietary guidelines-2010)

Among those who had consumed alcohol in the past 30 days, majority had taken more than 3 drinks per occasion. This kind of habit is called heavy or high risk drinking. Moderate and heavy drinking are the categories provided by the American dietary guidelines 2010. Those who did not meet the criteria for both the groups were included under intermediate.

Thirty five people out of 123 who were consuming alcohol did not give details on the quantity of drinks consumed. Also six out of eight women did not give details on their drinking habits.

Table 12. Fruits and vegetable consumption pattern among the study population in Mulbagal.

	Males (Mean + S.D.)	Females (Mean + S.D.)
No. of fruit days	1.71 + 1.63	1.75 + 1.60
No.of veg days	6.846 + 0.383	6.927 + 0.276
No. of fruit servings*	1.297 + 0.946	1.271+0.856
No. of veg servings*	1.503+0.785	1.519+0.923

* *Approximates 80 grams.*

The average vegetable serving was less than 2 per day and there was no difference between males and females. Vegetables were consumed by both the genders almost every day in a week. Fruits were consumed on less than 2 days a week. The information about the servings were obtained by showing the cup which had the holding capacity of almost 80 gms. The amounts of servings were almost similar with both fruits and vegetables.

Table 13. Adequacy of fruits and vegetable intake among study population in Mulbagal.

Pattern of consumption	Males	Females	Total
	No. (%)	**No. (%)**	**No. (%)**
Yes	3 (0.6)	9 (1.9)	12 (1.2)
No	496 (99.4)	471 (98.1)	967 (98.8)
Total	**499 (100)**	**480 (100)**	**979 (100)**

A person was considered to have consumed adequate fruits or vegetables if that person has consumed fruits/vegetables all the days in a week and every day has consumed five or more servings of the same. Less than 2% of the studied men and women consumed five or more servings of fruits and vegetables in a day.

Table 14. Distribution of study population in Mulbagal based on adequate physical activity.

Adequate physical activity*	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Yes	291 (58.4)	237 (49.4)	528 (53.9)
No	208 (41.6)	243 (50.6)	451 (46.1)
Total	**499 (100)**	**480 (100)**	**979 (100)**

**Those occupied with any physical work for > 30 minutes at least for 5 days in a week.*

Around 50% of the study population performed an adequate physical activity. More men (58.4%) were engaged in adequate physical activity compared to women .

Table 15. Physical activity profile among study population in Mulbagal.

Males	Females	Total
Minutes/day (Mean + S.D.)	**Minutes/day (Mean + S.D.)**	**Minutes/day (Mean + S.D.)**
344.3 + 107.5	338.3 + 112.3	341.3 + 109.9
Median (Q1 & Q3)	**Median (Q1 & Q3)**	**Median (Q1 & Q3)**
420 (240-420)	300 (240-420)	360 (240-420)
Days/wk (Mean + S.D.)	**Days/wk (Mean + S.D.)**	**Days/wk (Mean + S.D.)**
4.8 + 1.8	5.2 + 1.9	4.9 + 1.8
Median (Q1 & Q3)	**Median (Q1 & Q3)**	**Median (Q1 & Q3)**
4 (3-7)	6 (3-7)	5 (3-7)

It is evident from the table that on a single day, males work for a longer duration compared to females. Regarding the duration there is no significant difference between the genders (t value: 0.84 and p value : 0.39). But the number of working days is more for women. It is almost every day a week. The difference between women and men is significant (t value : -3.0 and p value: 0.003). The combined average number of working days is almost five days a week and working hours is almost six hours a day.

Table 16. Description of leisure duration among study population in Mulbagal.

Males	Females	Total
Minutes/day (Mean + S.D.)	**Minutes/day (Mean + S.D.)**	**Minutes/day (Mean + S.D.)**
232.5 + 135.1	217.4 + 125.3	225.1 + 130.6
Median (Q1 & Q3)	**Median (Q1 & Q3)**	**Median (Q1 & Q3)**
180 (300-120)	180 (300-120)	180 (300-120)

Males tend to relax more than females when they are not busy with their major occupation. But the difference when compared between the genders is not significant (t value: -1.82 and p value: 0.07). The combined average of duration of relaxation is around four hours for both the genders.

Table 17. Distribution of study population in Mulbagal according to pre existing non communicable disease conditions.

Non communicable diseases	Males (N=499)	Females (N=480)	Total (N= 979)
	No. (%)	**No. (%)**	**No. (%)**
Hypertension			
25-44 yrs	17 (3.4)	10 (2.1)	27 (2.8)
45-64 yrs	30 (6)	36 (7.5)	66 (6.7)
Diabetes Mellitus			
25-44 yrs	2 (0.4)	3 (0.6)	5 (0.5)
45-64 yrs	8 (1.6)	17 (3.5)	25 (2.6)
C.H.D.			
25-44 yrs	0 (0)	0 (0)	0 (0)
45-64 yrs	5 (1)	4 (0.8)	9 (0.9)
Stroke			
25-44 yrs	0 (0)	0 (0)	0 (0)
45-64 yrs	3 (0.6)	0 (0)	3 (2.2)

CHD- Coronary heart disease.

Around 9% of the study population was already diagnosed with the hypertension. Between genders there is no significant difference in the

occurrence of hypertension (χ^2 value: 0.0077 and p value: 0.93). But between the two age groups the difference was significant (χ^2 value: 19.42 and p value: <0.001). Around 3% of the study population had been diagnosed with diabetes mellitus. More number of diabetics were among the females and it was statistically significant (χ^2 value : 3.85 and p value : 0.05). Also the known diabetics were found more among the middle age group of 45-64 years (χ^2 value: 14.39 and p value: <0.001). Around 1% of the study population had one or more events related to coronary heart disease. Number of people who had it were almost equally distributed among both the genders and all of them were in the middle age group of 45-64 yrs. Three men in the age group of 45-64 yrs had stroke in the past.

Table 18. Treatment adherence among known cases of diabetes and hypertension.

Condition*	Males		Females		Total	
	Known cases	Adherence No. (%)	Known cases	Adherence No. (%)	Known cases	Adherence No. (%)
Hypertension	47	25 (53.12)	46	18 (39.1)	93	43 (46.2)
25-44 yr	17	6 (35.3)	10	2 (20)	27	8 (29.6)
45-64 yr	30	19 (63.3)	36	16 (44.4)	66	35 (53)
Diabetes Mellitus	10	9 (90)	20	14 (70)	30	23 (76.7)
25-44 yr	2	2 (100)	3	1 (33.3)	5	3 (60)
45-64 yr	8	7 (87.5)	17	13 (76.5)	25	20 (80)

** Adherence to any forms of treatment since past one month among those with known hypertension and diabetes mellitus.*

Those who had diabetes showed a higher adherence when compared to those with hypertension. Among diabetics the difference in adherence among two age groups was not significant (Fisher exact p value: 0.65) and the difference between the two genders was also not significant(Fisher exact p value: 0.45). Among the hypertensives the adherence was more among individuals belonging to middle age group of

45-64 yrs. The difference was significant (χ^2 value:4.22 and the p value : 0.04). Between genders men showed a higher adherence compared to women but it was not significant (χ^2 value: 1.84 and p value : 0.17).

Table 19. Distribution of blood pressure among study population in Mulbagal at the time of survey.

Grade	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Normal	178 (35.7)	266 (55.4)	444 (45.4)
Pre hypertension	204 (40.9)	134 (27.9)	338 (34.5)
Hypertension, Stage 1	82 (16.4)	58 (12.1)	140 (14.3)
Hypertension, Stage 2	35 (7)	22 (4.6)	57 (5.8)
Total	**499 (100)**	**480 (100)**	**979 (100)**

In 45.4% of the study population the blood pressure was in the normal range. Around 20% of them had BP readings suggestive of hypertension. The BP reading of 34.5% of them was in the pre hypertension category. But when only males are considered the number of people in the pre hypertension range outweighed people in the normal range. The difference between the genders in the pre hypertensive range was significant (χ^2 value: 18.19 and p value: <0.001). More number of males compared to females were present in the hypertension stage 1 and the difference is significant (χ^2 value: 3.77 and the p value: 0.05). Similarly number of males in the hypertension stage 2 category were also more, but the difference is not significant (χ^2 value: 2.63 and p value:0.1).

Table 20. Distribution of body mass index (BMI) among the study population in Mulbagal.

Nutritional Status	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Underweight	52 (10.4)	72 (15)	124 (12.6)*
Normal	267 (53.5)	271 (56.5)	538 (55)
Overweight	121 (24.3)	104 (21.7)	225 (23)
Obese	59 (11.8)	33 (6.9)	92 (9.4)*
Total	**499 (100)**	**480 (100)**	**979 (100)**

* $p < 0.05$

Around 55% of the study population were in the range of normal BMI. 12.6% of individuals were in the underweight range. Women were more in the underweight category compared to men. The difference between the genders was significant (χ^2 value: 4.63 and p value: 0.03). 23% of the individuals were in the overweight category. Around 9% of the study population was obese. Here too males were more and there is a significant association too (χ^2 value: 7.03 and the p value: 0.008).

Table 21. Distribution of study population according to fasting blood glucose values in Mulbagal.

Glucose levels	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Normal (< 110 mg/dl)	123 (82)	85 (77.3)	208 (80)
Impaired fasting glucose (110-124 mg/dl)	16 (10.7)	11 (10)	27 (10.4)
Suggestive of diabetes (> 125 mg/dl)	11 (7.3)	14 (12.7)	25 (9.6)
Total	**150 (100)**	**110 (100)**	**260 (100)**

Blood samples were taken for the estimation of fasting blood glucose in a sub sample of 260 individuals. 80% of the them had a normal fasting blood glucose value. 9.6 % had diabetes and 10.4% had an impaired fasting blood glucose level. More men had impaired fasting

glucose compared to women but the difference was not significant (χ^2 value: 0.03 and p value : 0.862) Among those who had values suggestive of diabetes more women (12.7%) had value >125 mg/dl. But the difference when compare to men were not significant (χ^2 value: 2.12 and p value: 0.145).

Table 22. Distribution of study population in Mulbagal according to cholesterol values.

Serum cholesterol levels*	Males	Females	Total
	No. (%)	No. (%)	No. (%)
Normal (<200 mg/dl)	121 (80.7)	92 (83.6)	213 (81.9)
Borderline high (200-239 mg/dl)	23 (15.3)	15 (13.7)	38 (14.62)
High (>240 mg/dl)	6 (4)	3 (2.7)	9 (3.5)
Total	**150 (100)**	**110 (100)**	**260 (100)**

** According to the American heart association guidelines.*

Among a sub sample of 260 individuals in whom the fasting serum cholesterol estimation was done around 82% of them had normal value. Around 15% of individuals had a borderline high cholesterol and 3.5% had a high cholesterol level. More males had borderline high cholesterol compared to females. But the difference is not significant (χ^2 value: 0.146 and p value: 0.702). Even among those who had got a high level of cholesterol males formed the majority, but again there was no significant difference (Fisher exact p value: 0.847).

Table 23. Distribution according to number of risk factors in study population.

No. of risk factors	Males		Females		Total	
	No. (%)	Cumulative total	No. (%)	Cumulative total	No. (%)	Cumulative total
0	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	2 (0.2)	2 (0.2)
1	83 (16.6)	84 (16.8)	98 (20.4)	99 (20.6)	181 (18.5)	183 (18.7)
2	143 (28.7)	227 (45.5)	164 (34.2)	263 (54.8)	307 (31.4)	490 (50.1)
3	149 (29.9)	376 (75.4)	146 (30.4)	409 (85.2)	295 (30.1)	785 (80.2)
4	81 (16.2)	457 (91.6)	55 (11.5)	464 (96.7)	136 (13.9)	921 (94.1)
5	40 (8)	497 (99.6)	16 (3.3)	480 (100)	56 (5.7)	977 (99.8)
6	2 (0.4)	499 (100)	0 (0)	480 (100)	2 (0.2)	979 (100)
Total	**499 (100)**		**480 (100)**		**979 (100)**	

Eight risk factors for cardiovascular diseases were studied namely: tobacco usage, alcohol consumption, consumption of less fruits and vegetables, physical inactivity, hypertension(newly diagnosed and on treatment), diabetes mellitus(impaired, high and on treatment), hypercholesterolemia(borderline and high) and obesity(overweight and obese). The number of risk factors a person has was found out. As the entire population had not undergone biochemical measurements, the table no. 23 considers diabetes as a risk in only those who were diagnosed and on treatment at present. Also the hypercholesterolemia risk factor has been omitted. So a total of seven risk factors analysis has been given.

It was noticed that around 82% of the study population had more than one risk factor at the time of study. About half of the individuals had more than two risk factors. Around 25% of males and 15% of females had more than three risk factors at the time of the study.

The average number of risk factors for males is 2.6 + 1.1 and for females is 2.7 + 1.2 and overall it is 2.4 + 1.1.

Table 24. Distribution according to number of risk factors in the sub group of the study population.

No. of risk factors	Males		Females		Total	
	No. (%)	Cumulative total	No. (%)	Cumulative total	No. (%)	Cumulative total
0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
1	32 (21.3)	32 (21.3)	29 (26.4)	29 (26.4)	61 (23.5)	61 (23.5)
2	51 (34)	83 (55.3)	42 (38.2)	71 (64.5)	93 (35.8)	154 (59.2)
3	42 (28)	125 (83.3)	27 (24.6)	98 (89.1)	69 (26.5)	223 (85.8)
4	18 (12)	143 (95.3)	7 (6.4)	105 (95.5)	25 (9.6)	248 (95.4)
5	4 (2.7)	147 (98)	5 (4.6)	110 (100)	9 (3.5)	257 (98.8)
6	3 (2)	150 (100)	0 (0)	110 (100)	3 (1.2)	260 (100)
Total	**150 (100)**		**110 (100)**		**260 (100)**	

As the biochemical measurements were carried out in only a sub population of 260, the table number 24 considers all the eight risk factors in that sub population only. It was noticed that all of the studied population had at least one risk factor. Around 77% of the study population had more than one risk factor at the time of study. About 40% of the individuals had more than two risk factors. Around 17% of males and 11% of females had more than three risk factors.

The average risk factors for males is 2.5 + 1.2 and for females is 2.2 + 1.1 and overall it is 2.4 + 1.1 in the subgroup.

Table 25. Association between modifiable risk factors and occurrence of hypertension.

Risk factors	Hypertension (p values)
Tobacco	**0.005***
Alcohol	**0.02***
Consumption of less fruits and vegetables	0.801
Physical inactivity	0.236
Hypertension[1]	NA
Diabetes mellitus[2]	**<0.001***
Hypercholesterolemia	0.29
Obesity	0.084

1- *Includes both known and newly detected cases.*

2- *Includes only known cases*

3- *Association found using Chi square test.*

* $p < 0.05$.

The association between the CVD , hypertension and CVD risk factors namely tobacco consumption, alcohol consumption, decreased fruit and vegetable consumption, physical inactivity, diabetes mellitus, cholesterol and obesity were found.

Hypertension was significantly associated with usage of tobacco, alcohol consumption and diabetes mellitus in the study population at Mulbagal.

Table 26. Prevalence of cardiovascular disease risk factors in the study population in Mulbagal.

Cardiovascular disease risk factors	Males (N=499)	Females (N=480)	Total
	No. (%)	N (%)	N (%)
Tobacco[1]	244 (48.9)	206 (42.9)	450 (46)
Alcohol[2]	83 (16.6)	2 (0.4)	85 (8.7)
Consumption of less fruits and vegetables	496 (99.4)	471 (98.1)	967 (98.8)
Physical inactivity	208 (41.7)	243 (50.6)	451 (46.1)
Hypertension[3]	129 (25.9)	85 (17.7)	214 (21.9)
DM	10 (2)	20 (4.2)	30 (3.1)
Obesity[4]	180 (36.1)	137 (28.5)	317 (32.4)
	N=150	**N=110**	
FBS suggestive of diabetes mellitus	11 (7.3)	14 (12.7)	25 (9.6)
Impaired fasting glucose	16 (10.7)	11 (10)	27 (10.4)
Cholesterol levels – High	6 (4)	3 (2.7)	9 (3.5)
Cholesterol levels- Borderline high	23 (15.3)	15 (13.6)	38 (14.6)

1- Both smoke and smokeless form of usage is considered.
2- All those consuming alcohol more than the moderate users is considered.
3- Includes both known and newly detected cases
4- People who are either overweight or obese are considered.

Table 26 shows the prevalence of all the CVD risk factors studied in Mulbagal taluq and Kolar district . The commonest risk factor identified was low consumption of fruits and vegetables in 98.8% of the study population. Physical inactivity and tobacco consumption prevalence constituted to around 46% each. 9.6% of the study population had diabetes mellitus and 21.9% had hypertension.

Table 27. Prevalence of cardiovascular disease risk factors in the study population in Mulbagal (according to the age group).

Cardiovascular disease risk factors	25-44 yrs (N=497)	45-64 yrs (N=482)	Total
	No. (%)	No. (%)	No. (%)
Tobacco	150 (30.6)	300 (62.2)	452 (46.2)
Alcohol	26 (5.2)	59 (12.2)	85 (8.7)
Consumption of less fruits and vegetables	492 (99)	475 (98.6)	967 (98.8)
Physical inactivity	223 (44.9)	228 (47.3)	451 (46.1)
Hypertension	53 (10.7)	161 (33.4)	214 (21.9)
Diabetes mellitus	5 (1)	25 (5.2)	30 (3.1)
Obesity	145 (29.2)	172 (35.7)	317 (32.4)
	N=154	**N=106**	
FBS suggestive of diabetes mellitus	8 (5.2)	17 (16)	25 (9.6)
Impaired fasting glucose	19 (12.3)	8 (7.6)	27 (10.4)
Cholesterol levels – High	3 (1.9)	6 (5.7)	9 (3.5)
Cholesterol levels- Borderline high	22 (14.3)	16 (15.1)	38 (14.6)

Table 27 shows the prevalence of CVD risk factors according to the age. Tobacco and alcohol consumption in men is more than double among the study population in 45-64 yrs age group compared to 25-44 yrs group. There is no difference in physical inactivity and consumption of vegetables and fruits in the 2 age groups. The prevalence of diabetes mellitus and hypercholesterolemia as assessed from the fasting serum levels increased in the 45-64 years age group. The prevalence of obesity and hypertension also was high in the 45-64 yr age group.

Table 28. Logistic regression of risk factors associated with hypertension.

Risk factor	Absent	Present	Odds ratio (95% CI)	p value	Logistic regression	
					Odds ratio (95% CI)	p value
Tobacco	97	117	**1.55** (1.14-2.1)	**0.005**	1.55 (1.12-2.14)	**0.01**
Alcohol	187	27	**1.76** (1.08-2.9)	**0.02**	1.38 (0.83-2.29)	**0.22**
Low consumption of veg & fruits	3	211	0.84 (0.23-3.12)	0.79	0.84 (0.22-3.14)	0.79
Physically inactivity	123	91	0.83 (0.61-1.13)	0.24	0.77 (0.56-1.05)	0.10
Obesity	134	80	1.33 (0.97-1.82)	0.08	1.30 (0.94-1.79)	0.11

Multiple logistic regression analysis of the risk factors associated with hypertension was done. People who consumed tobacco had 1.55 times higher risk of having hypertension.

People who consumed alcohol more than the moderate drinkers had 1.76 times higher risk of having hypertension. Also the odds of obesity associated with hypertension was 1.33.

Table 29. Logistic regression of risk factors associated with hypercholesterolemia (N=260).

Risk factor	Absent	Present	Odds ratio (95% CI)	p value	Logistic regression	
					Odds ratio (95% CI)	p value
Tobacco	66	14	0.79 (0.40-1.56)	0.5	0.66 (0.31-1.41)	0.29
Alcohol	76	4	1.13 (0.33-3.9)	0.84	1.53 (0.40-5.83)	0.53
Veg & Fruits	4	76	0.32 (0.07-1.47)	0.13	0.29 (0.06-1.35)	0.11
Physically inactive	55	25	1.22 (0.68-2.16)	0.51	1.18 (0.66-2.12)	0.58
Obesity	62	18	0.73 (0.40-1.36)	0.33	0.69 (0.36-1.30)	0.25

The odds of alcohol consumption associated with having hypercholesterolemia was 1.53. Also the odds of physical inactivity associated with having hypercholesterolemia was 1.18. However it was not statistically significant.

DISCUSSION

The present study on cardiovascular disease risk factor burden in rural Kolar using WHO-STEPS tool found that tobacco usage, alcohol consumption, sedentary behaviour, overweight, inadequate consumption of fruits and vegetables, obesity, diabetes mellitus, impaired fasting blood glucose and obesity are common. The most common among these was inadequate consumption of fruits and vegetables, followed by tobacco usage and physical inactivity. Using the similar WHO STEPS tool many other researchers have performed the surveillance for the cardiovascular disease risk factors in India. Bharadwaj et al[76] in rural population , Nath et al[77] in urban population and Nawi et al[78] in both urban and rural areas. There are many other studies undertaken in the country, done to find out the prevalence of risk factors for CVDs , like Thankappan et al[38], Hazarika et al[37], Chow et al[36] etc but the WHO STEPS tool has not been used completely for these studies. All these previous studies are invaluable in comparing the findings of the present study and thus to find out the differences and similarities in prevalence of CVD risk factors in various parts of the country.

Tobacco use in India is high and there are considerable differences in the form and amount of tobacco consumption among gender and place. In this study there is a high prevalence of usage of tobacco either in smoke or smokeless form. About 45% of the study population were using tobacco in one or the other form. But there is not much difference in the percentage of usage between two genders. This lack of difference can be attributed to the fact that there were much more number of females using smokeless tobacco. Among men smoking beedies and cigarettes was more common. Ninety nine percent of females using tobacco was of the smokeless type. Even though 28.9% of our study population were using tobacco in the smoke form only 4 females belonging to the age group of

45-64 years were smoking tobacco. It should be noted that women may not have reported about the tobacco consumption habits accurately because of embarrassment. Across age groups, the proportion of study population from middle age group of 45-64 yrs were more than double (62%) that of the younger age group (31%) of reporting of using tobacco . But as it is a well known fact that quitting of smoking is rare, most of the smokers in the younger age group will continue their harmful habit over the course of years even after getting old and at the same time the teenagers who would have just started smoking, they too join in the group and thus there will be much more higher prevalence of smokers over the coming years. Tobacco consumption is a chronic habit. People generally start the habit in the younger days and hence the proportion of middle age group using tobacco is higher than younger age group.

Studies on NCD conducted by ICMR (2005) at six different centres, found bidi and gutkha among men and snuff among women as most common form of tobacco consumption[81]. Anand K et al (2008) in Faridabad found that 22.2% and 1.4% of men and women studied respectively were using tobacco. [82] However study conducted in rural area of Faridabad by Krishnan A et al (2008) showed high prevalence of current smokers, 41.0% in men and 13.0 % among women while the prevalence of smokeless tobacco was 7.1 % and 1.2% among men and women respectively.[83] This shows that the smoking in females in the present study is much less compared to studies in North India. Among men, the common form of smoking was bidi which is in accordance with the NCD study conducted by ICMR.

These findings hold significance because many epidemiological studies from various parts of India have shown a significant correlation of smoking or tobacco use with hypertension prevalence.[84] A case control

study from Bangalore also showed that smoking was an independent risk factor for hypertension (odds ratio 2.25 , p = 0.014).[85]

In our study prevalence of current alcohol consumers in men was 23% and in women was 2%. The proportion of study population consuming alcohol varies widely in different parts of the country . In a study conducted by Thankappan et al which is a community based intervention program for the control of hypertension 13.4 %. of the study population had consumed alcohol in the past 30 days38 , in Hazarika et al[37] 36.4% , in Bharadwaj et al[76] 37.7% was found out. Low reporting in our study could be because of the fear of low social acceptability.

There was a significant difference in the drinking habits between the two age groups. The middle age group of 45-64 years had more number of people (12.2%) compared to the younger age group (5.2%).

Our study revealed that women and men were consuming less amount of fruit and vegetables than recommended. This can be attributed to their low purchasing power and lack of knowledge about the amount of fruits and vegetables to be consumed. Only 1.2% of the study population were consuming adequate fruit and vegetables. Either across genders or across the age groups there was no much difference in the consumption pattern. In a family , every member shares the food from the same pot.[86] This might be the reason for the similarity across age and gender groups.

Our study showed that equal number of physically inactive people were present compared to active people. Physical inactivity was mainly during the leisure time. In a similar study conducted by Nath et al 40.3% in which they have presented the findings of ongoing surveillance study that is being conducted in the urban field practice area Maulana Azad Medical College, New Delhi where they have used just the step 1 part of the WHO STEPS tool for risk factor surveillance and by Hazarika et al where native rural population of Assam were examined for blood

pressure and anthropometry , thus trying to find out the risk factors for hypertension, found that 25.5% of people were physically inactive. In our study 53% were physically inactive.[37]

If the physical activity was compared across age groups, the middle age group had more number of people who were sedentary. This is expected, as the physiological changes happen over the course of years, many elderly won't be able to work in the same vigor as the young and might have to quit working owing to their health problems. This is even supported by the study conducted by Bharadwaj et al.[76]

Fasting blood glucose was examined in a sub sample of 260 individuals. Around 10% of them were having levels suggestive of diabetes mellitus. 7% of males and 13% of females were included in this category. In a study conducted by Gupta et al to determine the association of obesity, measured by body-mass index (BMI), waist-size or waist-hip ratio (WHR), with multiple risk factors for cardiovascular disease in an urban Indian population an epidemiological study was performed. Thus fasting blood glucose was also measured. They found that 13% of males and 11.27 of females were diabetics.[87]

In this study only about 2% of males and 4% of females knew they had diabetes mellitus. This can be attributed to low health seeking behavior by the study population and absence of screening programme for NCD. In this study more women were already diagnosed to have diabetes mellitus (4.2%) compared to men (2%).

If we compare the values across the age groups, 16% of people of middle age group compared to 5% of younger age group had glucose levels suggestive of diabetes mellitus. But when impaired fasting glucose levels are compared , 12.3% of younger age group were in this category compared to just 7.6% of middle age group.

The prevalence of diabetes in India is escalating rapidly both in the urban and rural areas.[88] It has also been observed that diabetes in India occurs a decade earlier than in the developed world. As we can see that even in the younger age group many appear to be potential candidates for diabetes in the near future. As diabetes is an asymptomatic disorder, early identification of individuals at risk and appropriate lifestyle interventions will greatly help to prevent or delay the onset of diabetes and thereby reduce the burden of complications due to diabetes in India.

Around 22% of the current study population had hypertension (either by blood pressure examination during study, or previously diagnosed and on treatment). People belonging to either stage1 or stage 2 hypertension were considered in this category. This was lower compared to previous studies by Thankappan et al[38] where they have presented baseline prevalence data for hypertension, anthropometric measurements and demographic details with the help of a questionnaire has been obtained and Hazarika et al.[37]

Out of this 40% were males and only 27% were females. This is in accordance to the previous studies conducted by Nawi et al[78] in which WHO STEPS tool was used to find out the prevalence of risk factors for cardiovascular disease in rural Indonesia. They found that males comprised the majority of hypertensives. This difference between the males and females is present in the other categories of blood pressure too (Stage 1 and stage 2 of hypertension.) When it was compared across the age groups there was significantly more number of people in the middle age group (34%) compared to the younger (11%). This finding can be explained physiologically, as the age advances, owing to the hardening of the blood vessels[89], blood pressure tends to rise in the majority of people. But we cannot just overlook the lesser percentage in the younger age group. Studies indicate that the cardiovascular disease related death occur

in the young age group in the developing countries.[90] So today those who are in the pre hypertensive group in the younger age group most certainly will progress to overt hypertensive stage. All these factors might increases the cardiovascular disease in a developing country like ours.

But known hypertensives were only 10% in this study population, which can be because of low health seeking behavior and absence of screening programmes. Even among known hypertensives, the proportion of people in middle age group were more (6.7%) compared to the younger (2.8%).

Around 47% of those who had been diagnosed with hypertension were taking regular treatment in the past one month. 53% of people in the middle age group were taking regular treatment and only 30% of the people in the younger age group were taking treatment. This might be because of lack of motivation and carelessness towards the importance of treatment among the younger generation towards the chronic non communicable diseases. Around 53% of males and 39% of females were taking treatment regularly. This difference can be because of the poor social status of the females in the society.

Indian urban population studies in mid 1950s used older WHO guidelines for diagnosis (BP > 160 and/or 95 mm Hg) and reported hypertension prevalence of 1.2 to 4.0%. Subsequent studies report steadily increasing prevalence from 5% in 1960s to 12-15% in 1990s and so on. Also studies using revised criteria (BP > 140 and/or 90 mmHg) have shown high prevalence of hypertension among urban adults. Hypertension prevalence is lower in rural Indian population although there has been a steady increase over time here as well.[91] Studies from developed countries have reported that smoking, alcohol consumption, obesity and low socio-economic status as suggested by low level of education are associated with greater prevalence of hypertension. These

factors are equally important in developing countries as in the developed.[92] So the findings of this study holds a great significance, considering the present scenario of our country where harmful lifestyles are increasing, even in rural sectors, some of them which are risk factors for CVD.

In this study population there were few subjects who were obese compared to the overweight range. But they are the potential candidates to enter the obesity category. In studies conducted by Hazarika et al[37], Chow et al[36] in which a cross sectional survey was performed to know the prevalence of cardiovascular disease risk factors using a questionnaire, anthropometry and biochemical measurements, the prevalence of people with overweight was in accordance with this study (23%). But the prevalence of obesity in these studies was about 1% and 5% respectively. In the present study it is about 10%. Also the proportion of people who were under weight was about 13%, majority of which was composed by females. The social status and the decision making capacity of females in rural areas of our country is still not equivalent to males. This might be the reason for the more number of underweight females in this study.

If we compare the proportion of people having BMI more than normal, middle age group has the higher prevalence.

About 5% of the people in this study were detected to have hypercholesterolemia. This is much lesser compared to about 12% which was obtained in a similar study conducted by Chow et al.[36]

In the present study 5 males and 4 females had any significant cardiovascular event in their lives. All of them belonged to the age group of 45-64 years.

In our study 3 males had an episode of stroke in their lives. All these cases belonged to the middle age group of 45-64 years.

An association was tested between tobacco usage, alcohol consumption, inadequate intake of fruits and vegetables , sedentary lifestyle ,obesity and hypertension. p value for the association between tobacco ,alcohol and hypertension was statistically significant (<0.05). The association between smoking and CVD is a well known fact. [93,94] The odds of getting hypertension in smokers was higher compared to non smokers. Also there is a threefold increase in the odds of having a non fatal AMI in current smokers compared to non smokers. There is an increased odds of getting hypertension in those who are who drinkers compared to others.[95]

Similarly the association between the same risk factors mentioned above and hypercholesterolemia was tested. None of these risk factors was found to be associated.

STUDY LIMITATIONS

Self reporting: This however can be unreliable if the subject is under the impression that social approval is important and acceptance of smoking and alcohol consumption might damage his/her social status, which is usually the case in many rural parts of our country. So that person might give socially desirable responses rather than the truth.

Recall bias : Data collection from subjects depends mainly on their recall ability. In case of a dietary recall, one's ability to recall food intake is associated with a number of factors including age of the participant, gender, intelligence, mood, attention and consistency of the eating pattern.

STRENGTH:

This study was conducted according to the WHO STEPS guidelines for chronic non communicable disease survey. This will help in uniformity of data collection and thus help in the comparison of data collected in different regions of the world. There was equal representation of both genders and also across younger and middle age groups. Government of India in past few years has taken some positive steps in this regards establishing surveillance system to provide risk factor data from different parts of the country, using WHO STEPS methodology. Data obtained from simple and sustainable surveillance systems would help to guide future policy. The Surveillance Programme (IDSP), launched by the Government of India in 2004, incorporates key elements of chronic disease risk factor surveillance and has the potential to yield such nationally representative data. Along with data generation, various intervention models (school based projects) are also being studied which would help in strengthening the design and delivery system of a national programme for chronic disease prevention and control.

RECOMMENDATIONS FOR FUTURE RESEARCH

More information can be gathered about the risk factors for CVD throughout the country is these surveillance activities are carried out in large number. The scope for success of a surveillance programme relies on its sustainability, flexibility, appropriateness of data collected and timely dissemination to its users for action. In India, several reports on CVD risk factors have been brought out in different regions and populations. Many of these are repeated surveys in the same population at random time intervals. There are surveys conducted by various agencies, but the information remains un-utilized for action related to CVD risk factors. These surveys have been able to demonstrate changes in the risk factor profile. Collectively, these have been useful in raising an alarm amongst health planners and policy makers, and for making a case for initiating interventions. Efforts to harmonize these local surveys so as to make them useful for surveillance systems would improve efficiency.

SUMMARY AND CONCLUSION

This study found that CVD risk factors are common in rural Kolar region. Diabetes and hypertension are common in the rural people and comparable with urban people. Comparing with previous studies reveal that the risk factor of physical inactivity, hypercholesterolemia and obesity/overweight are increasing in the rural areas of the country. Poor intake of vegetables and fruits are a perennial problem. Usage of tobacco and alcohol has not declined as per the trends. Hence this study highlights the need to further understand the influence of the social and economic transition happening in the rural society on the CVD risk factors and cardiovascular diseases. It becomes imperative to initiate and strengthen measures to reduce CVD risk factors in the rural society so as to reduce the rising burden of CVD morbidity and deaths. The recent efforts made by the Government of India initiating Integrated Disease Surveillance Project (IDSP) and National Programme for Prevention of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) is in the right direction. Similar studies using WHO STEPS approach reveal the time trends in CVD risk factors and the assessment of the program.

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ANNEXURES

ANNEXURE-1.

List of villages surveyed in Mulbagal taluq, Kolar district.

1) Honnikere
2) Vommasandra
3) Mudiyanur
4) K.G.Lakshmisagara
5) Devarayasamudra
6) Avani
7) Kuruba chadumanahalli
8) Bandahalli
9) Anehalli
10) Mannenahalli
11) Challapally
12) Doddathihalli
13) Kadenahalli
14) Perumakanahalli
15) Nangali
16) N.Chowdenahalli
17) Ramachandrapura
18) Dommasandra
19) Sanyasipalli
20) Achampalli

ANNEXURE -2

ಒಪ್ಪಿಗೆ ಪತ್ರ (consent form)

ನಾವು ಶ್ರೀ ದೇವರಾಜ್ ಅರಸ್ ವೈದ್ಯಕೀಯ ಕಾಲೇಜಿನಿಂದ ಬಂದಿದ್ದೇವೆ. ನಮ್ಮ ಕಾಲೇಜು ವತಿಯಿಂದ ಆಹಾರ, ದೈನಂದಿನ ಚಟುವಟಿಕೆಗಳು, ಬಿ.ಪಿ., ಮಧುಮೇಹ, ಇತ್ಯಾದಿಗಳ ಬಗ್ಗೆ, 25ರಿಂದ 65ರ ಮಧ್ಯೆ ವಯಸ್ಸು ಇರುವವ ಕೆಲವರಲ್ಲಿ ತಿಳಿದುಕೊಳ್ಳಲಾಗುತ್ತದೆ. ಆ ಕೆಲವರಲ್ಲಿ ನಿಮ್ಮ ಹೆಸರು ಆಯ್ಕೆಯಾಗಿರುವುದರಿಂದ ನಿಮ್ಮನ್ನು ನಾವು ಪರೀಕ್ಷೆ ಮಾಡಲು ಇಚ್ಛಿಸುತ್ತೇವೆ.

ನೀವು ಕೊಡುವ ಮಾಹಿತಿಯು ಗೌಪ್ಯವಾಗಿ ಇಡಲಾಗುತ್ತದೆ. ಅದನ್ನು ಕೇವಲ ಸಂಶೋಧನೆಗೆ ಉಪಯೋಗಿಸಬಹುದು. ನಿಮ್ಮ ಹೆಸರು, ವಿಳಾಸ ಮತ್ತು ಇತರೆ ಸ್ವಂತ ವಿಚಾರಗಳನ್ನು ಉಪಯೋಗಿಸದೆ ಕೇವಲ ಒಂದು ಸಂಖ್ಯೆ ಇಡಲಾಗುವುದು.

ನೀವು ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನಿಮ್ಮ ಸ್ವೈಚ್ಛೆಯಿಂದ ಪಾಲ್ಗೊಳ್ಳಬಹುದು , ನೀವು ಈಗ ಒಪ್ಪಿಕೊಂಡು, ನಂತರ ಬೇಕಿದ್ದಲ್ಲಿ ನಿರಾಕರಿಸಬಹುದು. ನಾವು ನಿಮಗೆ ಕೇಳುವ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ, ಯಾವುದನ್ನಾದರೂ ನೀವು ಉತ್ತರಿಸಲು ನಿರಾಕರಿಸಬಹುದು. ನಿಮಗೆ ಏನಾದರೂ ಪ್ರಶ್ನೆಗಳಿದ್ದರೆ ನನ್ನನ್ನು ಕೇಳಬಹುದು.

ನಿಮ್ಮ ರಕ್ತದ ಸಕ್ಕರೆ ಹಾಗು ಕೊಬ್ಬಿನ ಅಂಶವನ್ನು ಪರೀಕ್ಷೆ ಮಾಡಿಸುತ್ತೇವೆ ಹಾಗು ಅದರ ಫಲಿತಾಂಶವನ್ನು ನಿಮಗೆ ತಿಳಿಸುತ್ತೇವೆ.

ಈ ಪತ್ರವನ್ನು ಸಹಿ ಮಾಡಿದರೆ, ನಾವು ನಿಮ್ಮಿಂದ ಏನನ್ನು ಬಯಸುತ್ತಿದ್ದೇವೆ ಎಂಬುದು ನಿಮಗೆ ಅರ್ಥವಾಗಿ, ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನೀವು ಪಾಲ್ಗೊಂಡಂತೆ ಆಗುತ್ತದೆ.

ಒಪ್ಪಿಗೆ ಪತ್ರ

ನಾನು ಈ ಮೂಲಕ, ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ಒಪ್ಪಿದ್ದೇನೆ

ತಾರೀಕು- ಹೆಸರು-

ಸ್ಥಳ- ಗುರುತು ಸಂಖ್ಯೆ-

ಸಹಿ-

ANNEXURE-3

WHO STEPS QUESTIONNAIRE.

ಸರ್ವೇ ಮಾಹಿತಿ:

	ಸ್ಥಳ, ಪ್ರಶ್ನೆ ಕೇಳುವವರ ಹೆಸರು ಹಾಗು ದಿನಾಂಕ	ಪ್ರತಿಕ್ರಿಯೆ	ಕೋಡ್
1	ಹಳ್ಳಿಯ ಕೋಡ್		ಐ 1
2	ಹಳ್ಳಿಯ ಹೆಸರು		ಐ 2
3	ಪ್ರಶ್ನೆ ಕೇಳುವವರ ಹೆಸರು		ಐ 3
4	ದಿನಾಂಕ	ದಿ ದಿ ತಿ ತಿ ವವವವ	ಐ 4

	ಭಾಷೆ , ಹೆಸರು ಹಾಗು ಫೋನ್ ನಂಬರ್	ಪ್ರತಿಕ್ರಿಯೆ	ಕೋಡ್
6	ಪ್ರಶ್ನೆ ಕೇಳುವ ಭಾಷೆ ಕನ್ನಡ 1 ಆಂಗ್ಲ ಭಾಷೆ 2 ತೆಲುಗು 3 ಹಿಂದಿ 4 ಇತರೆ 5		ಐ 6
9	ಪೂರ್ತಿ ಹೆಸರು		ಐ 9
10	ಫೋನ್ ನಂಬರ್		ಐ 10

Step 1 Demographic Information

Core: Demographic information

CORE: Demographic Information			
ಪ್ರಶ್ನೆ		ಪ್ರತಿಕ್ರಿಯೆ	ಕೋಡ್
11	ಲಿಂಗ	ಗಂಡಸು 1 ಹೆಂಗಸು 2	ಸಿ 1
12	ನಿಮ್ಮ ಹುಟ್ಟಿದ ದಿನಾಂಕ ಯಾವುದು?	ದಿ ದಿ ತಿ ತಿ ವವವವ (ಗೊತ್ತಿದ್ದಲ್ಲಿ ⟶ ಸಿ 4)	ಸಿ 2
13	ನಿಮಗೆ ಎಷ್ಟು ವಯಸ್ಸು?	ವರ್ಷಗಳು	ಸಿ 3
14	ನೀವು ಒಟ್ಟು ಎಷ್ಟು ವರ್ಷಗಳನ್ನು ಶಾಲೆಯಲ್ಲಿ ಕಳೆದಿದ್ದೀರಾ (ಅಂಗನವಾಡಿ, u.k.g., l.k.g. ಇತರೆ ಹೊರತುಪಡಿಸಿ)?	ವರ್ಷಗಳು	ಸಿ 4

Expanded: Demographic Information

15 **ನೀವು ಎಲ್ಲಿಯ ತನಕ ಓದಿದ್ದೀರಾ?** — ಸಿ 5

ಶಾಲೆಗೆ ಹೋಗಿಲ್ಲ	1	10 ನೇ ತರಗತಿ ಮುಗಿದಿದೆ	5
5 ನೇ ತರಗತಿಗಿಂತ ಕಡಿಮೆ	2	ಗ್ರಾಜುಏಟ್/ಕಾಲೇಜ್ ಮುಗಿದಿದೆ	6
5 ನೇ ತರಗತಿ ಮುಗಿದಿದೆ	3	ಡಬಲ್ ಗ್ರಾಜುಏಟ್	7
7 ನೇ ತರಗತಿ ಮುಗಿದಿದೆ	4	ನಿರಾಕರಿಸಿದ್ದಾರೆ	88

16 ನಿಮ್ಮ ಜಾತಿ ಮತ್ತು ಮತ ಯಾವುದು ? — ಜಾತಿ — ಸಿ 6 ಎ; ಮತ — ಸಿ 6 ಬಿ

17 ನಿಮಗೆ ಮದುವೆ ಆಗಿದೆಯಾ? — ಸಿ 7

ಮದುವೆ ಆಗಿಲ್ಲ	1	ಗಂಡ/ಹೆಂಡತಿ ತೀರಿದ್ದಾರೆ	5
ಈಗ ಮದುವೆ ಆಗಿದ್ದಾರೆ	2	ಒಟ್ಟಿಗೆ ವಾಸವಾಗಿದ್ದಾರೆ	6
ಬೇರೆ ವಾಸವಾಗಿದ್ದಾರೆ	3	ನಿರಾಕರಿಸಿದ್ದಾರೆ	88
ಡೈವೋರ್ಸ್	4		

18 ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ನಿಮ್ಮ ಮುಖ್ಯ ಕೆಲಸ ಏನಾಗಿತ್ತು? — ಸಿ 8

ಸರ್ಕಾರಿ ಕೆಲಸ	1	ಮನೆಗೆಲಸ	6
ಬೇರೆ ಕೆಲಸ	2	ರಿಟೈರ್ಡ್	7
ಸ್ವಂತ ಉದ್ಯೋಗ	3	ನಿರುದ್ಯೋಗಿ (ಕೆಲಸ ಆಗುವುದಿಲ್ಲ)	8
ಆದಾಯ ಇಲ್ಲದ	4	ನಿರುದ್ಯೋಗಿ (ಕೆಲಸ ಆಗುತ್ತದೆ)	9
ವಿದ್ಯಾರ್ಥಿ	5	ನಿರಾಕರಿಸಿದ್ದಾರೆ	88

19 ನಿಮ್ಮ ಮನೆಯಲ್ಲಿ ನಿಮ್ಮನ್ನೂ ಸೇರಿಸಿ, ಎಷ್ಟು ಜನ 18 ವರ್ಷದ ಮೇಲ್ಪಟ್ಟವರಿದ್ದಾರೆ? — ಜನರು — ಸಿ 9

20 ಕಳೆದ ವರ್ಷದಲ್ಲಿ , ನಿಮ್ಮ ಮನೆಯ ಆದಾಯ ಎಷ್ಟು ಎಂದು ಹೇಳಲು ಆಗುತ್ತದಾ ?

- ಒಂದು ವಾರಕ್ಕೆ (ಗೊತ್ತಿದ್ದಲ್ಲಿ → ಟಿ 1) — ಸಿ 10 ಎ
- ಒಂದು ತಿಂಗಳಿಗೆ (ಗೊತ್ತಿದ್ದಲ್ಲಿ → ಟಿ 1) — ಸಿ 10 ಬಿ
- ಒಂದು ವರ್ಷಕ್ಕೆ (ಗೊತ್ತಿದ್ದಲ್ಲಿ → ಟಿ 1) — ಸಿ 10 ಸಿ
- ನಿರಾಕರಿಸಿದ್ದಾರೆ 88 — ಸಿ 10 ಡಿ

21	ನಿಮಗೆ ಸರಿಯಾಗಿ ಗೊತ್ತಿಲ್ಲದಿದ್ದಲ್ಲಿ , ನಾನು ನಿಮಗೆ ಕೆಲವು ಅಂದಾಜು ಆದಾಯ ಓದಿ ಹೇಳುತ್ತೇನೆ , ಆಗ ಒಂದು ತಿಂಗಳಿನ ಆದಾಯ ಎಷ್ಟು ಅಂತ ನಿಮಗೆ ಹೇಳಲು ಆಗ್ತದಾ?	1000 ರೂ ಗಿಂತ ಕಡಿಮೆ		1	11
		1000 ದಿಂದ 3000 ರೂ		2	
		3001 ದಿಂದ 5000 ರೂ		3	
		5001-10000 ರೂ		4	
		10000 ರೂ ಗಿಂತ ಹೆಚ್ಚು		5	

Step 1 : Behavioural Measurements

Core: **ತಂಬಾಕು ಸೇವನೆ**

ಈಗ ನಾನು ನಿಮಗೆ ಕಲವು ಆರೋಗ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಚಟುವಟಿಕೆಗಳ ಬಗ್ಗೆ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುತ್ತೇನೆ. ಇದರಲ್ಲಿ ಬೀಡಿ, ಸಿಗರೇಟ್ ಸೇದುವುದು, ಕುಡಿಯುವುದು, ಹಣ್ಣು ,ತರಕಾರಿ ತಿನ್ನುವುದು ಮತ್ತು ಓಡಾಟದ ಬಗ್ಗೆ ಕೇಳುತ್ತೇನೆ. ನಾವು ತಂಬಾಕು ಸೇವನೆಯಿಂದ ಶುರು ಮಾಡೋಣ.

ಪ್ರಶ್ನೆ		**ಪ್ರತಿಕ್ರಿಯೆ**	**ಕೋಡ್**
22	ನಿಮಗೆ ಬೀಡಿ, ಸಿಗರೇಟ್ ಸೇದುವ ಅಭ್ಯಾಸ ಈಗ ಇದೆಯಾ ?	ಹೌದು 1 ಇಲ್ಲ 2 **ಇಲ್ಲವಾದಲ್ಲಿ** → ಟಿ 6	ಟಿ 1
23	ನೀವು ಈಗ ಪ್ರತಿ ದಿವಸ ಸೇದುತ್ತ ಇದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 **ಇಲ್ಲವಾದಲ್ಲಿ** → ಟಿ 6	ಟಿ 2
24	ನೀವು ಮೊದಲನೆಯ ಸಾರಿ ಬೀಡಿ, ಸಿಗರೇಟ್ ಸೇದಲು ಶುರು ಮಾಡಿದ್ದಾಗ , ನಿಮಗೆ ವಯಸ್ಸು ಎಷ್ಟು ?	ವಯಸ್ಸು (ವರ್ಷ) **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → ಟಿ 5 ಎ ಗೊತ್ತಿಲ್ಲ 77	ಟಿ 3
25	ನಿಮಗೆ ಅದು ಎಷ್ಟು ಸಮಯದ ಮುಂಚೆ ಅಂತ ಗೊತ್ತಾ ?	ವರ್ಷ ಗೊತ್ತಿದ್ದಲ್ಲಿ → ಟಿ 5 ಎ ಅಥವ ತಿಂಗಳು **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → ಟಿ 5 ಎ ಅಥವ ವಾರಗಳು **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → ಟಿ 5 ಎ	ಟಿ 4 ಎ ಟಿ 4 ಬಿ ಟಿ 4 ಸಿ
26	ಇವುಗಳನ್ನು ನೀವು ಅಂದಾಜು ಎಷ್ಟು ಸೇದುತ್ತೀರಾ ಒಂದು ದಿವಸಕ್ಕೆ?	ಸಿಗರೇಟ್ ಬೀಡಿ ಇತರೆ ಇತರೆ (**ಆದ್ದಲ್ಲಿ** → ಟಿ 9)	ಟಿ 5 ಎ ಟಿ 5 ಬಿ ಟಿ 5 ಸಿ ಟಿ 5 other

Expanded: Tobacco use			
27	ಮುಂಚೆ ಯಾವಾಗಲಾದರೂ ನೀವು ಪ್ರತಿ ದಿನ ಸಿಗರೇಟ್/ಬೀಡಿ ಸೇದುತ್ತಾ ಇದ್ರಾ?	ಹೌದು 1 ಇಲ್ಲ 2, **ಇಲ್ಲವಾದಲ್ಲಿ** → ಟಿ 9	ಟಿ 6
28	ಪ್ರತಿ ದಿನ ಸೇದೋದನ್ನ ನೀವು ಬಿಟ್ಟಾಗ, ನಿಮಗೆ ವಯಸ್ಸು ಎಷ್ಟು?	ವಯಸ್ಸು **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → **ಟಿ 9** ಗೊತ್ತಿಲ್ಲ 77.	ಟಿ 7
29	ಎಷ್ಟು ಸಮಯದ ಮುಂಚೆ ನೀವು ಪ್ರತಿ ದಿನ ಸೇದೋದನ್ನ ಬಿಟ್ಟಿದ್ದು ?	ವರ್ಷಗಳು **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → **ಟಿ 9** ಅಥವ ತಿಂಗಳು **ಗೊತ್ತಿದ್ದಲ್ಲಿ** → **ಟಿ 9** ಅಥವ ವಾರಗಳು ಗೊತ್ತಿಲ್ಲ 77	ಟಿ 8 ಎ ಟಿ 8 ಬಿ ಟಿ 8 ಸಿ
30	ನಿಮಗೆ ಈಗ ತಂಬಾಕು ತಿನ್ನುವುದು, ನಶ್ಯ ತಗೊಳ್ಳುವುದು , ಇವುಗಳ ಅಭ್ಯಾಸ ಇದೆಯಾ?	ಹೌದು 1 ಇಲ್ಲ 2 **ಇಲ್ಲವಾದಲ್ಲಿ** → ಟಿ 12	ಟಿ 9
31	ನೀವು ಇವನ್ನು ಪ್ರತಿ ದಿನ ತಗೊಳ್ಳುತ್ತಾ ಇದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 **ಇಲ್ಲವಾದಲ್ಲಿ** → ಟಿ 12	ಟಿ 10
32	ಒಂದು ದಿನಕ್ಕೆ, ಅಂದಾಜು ಎಷ್ಟು ಬಾರಿ ನೀವು ಇವನ್ನು ತಗೊಳ್ಳುತ್ತೀರಾ? (ಓದಿ ಹೇಳಿ)	ಖೈನಿ (ಹಂಸ್) ನಶ್ಯ ಪುಡಿ –ಮೂಗಿನಿಂದ ತಂಬಾಕು ತಿನ್ನುವುದು (ಗುಟ್ಕಾ) ಅಡಿಕೆ ತಿನ್ನುವುದು ಇತರೆ-ಹೊಗೆಸೊಪ್ಪು ಕಡ್ಡಿಪುಡಿ ಜರ್ದಾ ಬೀಡಾ …… **ಆದ್ದಲ್ಲಿ** → ಟಿ 13	ಟಿ 11 ಎ ಟಿ 11 ಬಿ ಟಿ 11 ಸಿ ಟಿ 11 ಡಿ ಟಿ 11 ಇ ಟಿ 11 ಎಫ್
33	ನಿಮಗೆ ಮುಂಚೆ ಯಾವಾಗಲಾದರೂ ನಶ್ಯ ಪುಡಿ, ತಂಬಾಕು ತಿನ್ನುವುದು, ಇವುಗಳ ಅಭ್ಯಾಸ ಇತ್ತಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಟಿ 12
34	ಕಳೆದ ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ದಿನ, ನಿಮ್ಮ ಮನೆಯಲ್ಲಿ ಯಾರಾದರೂ, ನೀವು ಇದ್ದಾಗ ಬೀಡಿ ಸಿಗರೇಟ್ ಸೇದಿದ್ದಾರಾ?	ದಿನಗಳು ಗೊತ್ತಿಲ್ಲ 77	ಟಿ 13

35	ಕಳೆದ ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ದಿನ ನೀವು ಕೆಲಸ ಮಾಡುವ ಕೋಣೆಯಲ್ಲಿ, ಯಾರಾದರೂ ನೀವು ಇದ್ದಾಗ , ಬೀಡಿ ಸಿಗರೇಟ್ ಸೇದಿದ್ದಾರೆ?	ದಿನಗಳು ಗೊತ್ತಿಲ್ಲ ಅಥವ ಕೋಣೆಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುವುದಿಲ್ಲ 77	ಟಿ 14

Core: ಕುಡಿಯುವ ಅಭ್ಯಾಸ

ನಾನು ಈಗ ಡ್ರಿಂಕ್ಸ್ ಮಾಡುವ ಅಭ್ಯಾಸದ ಬಗ್ಗೆ ಕೆಲವು ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುತ್ತೇನೆ.

	ಪ್ರಶ್ನೆ	ಪ್ರತಿಕ್ರಿಯೆ	ಕೋಡ್
36	ನೀವು ಯವಾಗಲಾದರೂ ಯಾವುದೇ ರೀತಿಯ ಡ್ರಿಂಕ್ಸ್ (ಬೀರು/ವಿಸ್ಕಿ ಇತ್ಯಾದಿ) ತಗೊಂಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದಲ್ಲಿ → ಡಿ 1	ಎ 1 ಎ
36 b	ನೀವು ಯಾವ ಡ್ರಿಂಕ್ಸ್ ನ ಹೆಚ್ಚಾಗಿ ಮಾಡುತ್ತೀರಾ ?		ಎ 1 ಬಿ

ವಿಸ್ಕಿ	1	ವೋಡ್ಕ	5
ಬ್ರಾಂದಿ	2	ಬೀರ್	6
ರಮ್	3	ವೈನ್	7
ಜಿನ್	4	ಇತರೆ ಸ್ಪಷ್ಟಿಸಿ	8
ಗೊತ್ತಿಲ್ಲ	77	ನಿರಾಕರಿಸಿದ್ದಾರೆ	88

37	ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ನೀವು ಡ್ರಿಂಕ್ಸ್ ಮಾಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದಲ್ಲಿ → ಡಿ 1	ಎ 1 ಸಿ
38	ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ನೀವು ಎಷ್ಟು ಬಾರಿ ಡ್ರಿಂಕ್ಸ್ ಮಾಡಿದ್ದೀರಾ? ಒಂದು ಪೆಗ್ ಆದರೂ ಸರಿ. (use showcard)	ದಿನಾಲೂ 1 ಒಂದು ವಾರದಲ್ಲಿ 5ರಿಂದ 6 ದಿನ 2 ಒಂದು ವಾರದಲ್ಲಿ 1ರಿಂದ 4 ದಿನ 3 ಒಂದು ತಿಂಗಳಲ್ಲಿ 1ರಿಂದ 3 ದಿನ 4 ಒಂದು ತಿಂಗಳಲ್ಲಿ 1ಕ್ಕಿಂತ ಕಡಿಮೆ 5	ಎ 2

39	ನೀವು ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ ಯಾವಾಗಾದರೂ ಡ್ರಿಂಕ್ಸ್ ಮಾಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದಲ್ಲಿ ⟶ ಡಿ 1	ಎ 3
40	ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ ನೀವು ಎಷ್ಟು ಬಾರಿ ಡ್ರಿಂಕ್ಸ್ ಮಾಡಿದ್ದೀರಾ? ಒಂದು ಪೆಗ್ ಅದ್ರೂ ಸರಿ	ನಂಬರ್ ಗೊತ್ತಿಲ್ಲ 77	ಎ 4
41	ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ ನೀವು ಒಂದು ಬಾರಿ ಕುಡಿದಾಗ , ಅಂದಾಜು ಎಷ್ಟು ಪೆಗ್ ತಗೊಳ್ಳುತ್ತಾ ಇದ್ರಿ?	ನಂಬರ್ ಗೊತ್ತಿಲ್ಲ 77	ಎ 5
42	ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ, ಒಂದು ಬಾರಿ ,ಎಲ್ಲಾ ರೀತಿಯ ಡ್ರಿಂಕ್ಸ್ ಲೆಕ್ಕಕ್ಕೆ ತಗೊಂಡ್ರೆ ಜಾಸ್ತಿ ಅಂದ್ರೆ ಎಷ್ಟು ಪೆಗ್ ತಗೊಂಡಿರಬಹುದು?	ಹೆಚ್ಚು ಎಷ್ಟು ಗೊತ್ತಿಲ್ಲ 77	ಎ 6
43	ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ನೀವು (ಗಂಡಸರಿಗೆ) 5 ಅಥವಾ ಜಾಸ್ತಿ ಪೆಗ್ ತಗೊಂಡಿದ್ದೀರಾ? (ಹೆಂಗಸರಿಗೆ) 4 ಅಥವಾ ಜಾಸ್ತಿ ಪೆಗ್ ತಗೊಂಡಿದ್ದೀರಾ?	ನಂಬರ್ ಗೊತ್ತಿಲ್ಲ 77	ಎ 7
Expanded: ಕುಡಿಯುವ ಅಭ್ಯಾಸ			
44	ನೀವು ಕಳೆದ 30 ದಿನಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ಊಟದ ಜೊತೆಗೆ ಡ್ರಿಂಕ್ಸ್ ಮಾಡಿದ್ದೀರಾ? ತಿಂಡಿ ಎಲ್ಲ ಲೆಕ್ಕಕ್ಕೆ ತಗೊಳ್ಳಬೇಡಿ	ಸಾಮಾನ್ಯವಾಗಿ ಯಾವಾಗಲೂ 1 ಕೆಲವೊಂದು ಸಾರಿ ಮಾತ್ರ 2 ಅಪರೂಪಕ್ಕೆ 3 ಯಾವತ್ತೂ ಇಲ್ಲ 4	ಎ 8
45	ನೀವು ಕಳೆದ 7 ದಿನಗಳಲ್ಲಿ, ಪ್ರತಿ ದಿನ ಎಷ್ಟು ಪೆಗ್ ತಗೊಂಡಿದ್ದೀರಾ?	ಸೋಮವಾರ ಮಂಗಳವಾರ ಬುಧವಾರ ಗುರುವಾರ ಶುಕ್ರವಾರ ಶನಿವಾರ ಭಾನುವಾರ	ಎ 9 ಎ ಎ 9 ಬಿ ಎ 9 ಸಿ ಎ 9 ಡಿ ಎ 9 ಇ ಎ 9 ಎಫ್ ಎ 9 ಜಿ

Core: ಆಹಾರ			
ಈಗ ನೀವು ಸಾಮಾನ್ಯವಾಗಿ ತಿನ್ನುವ ಹಣ್ಣು ಮತ್ತು ತರಕಾರಿಗಳ ಬಗ್ಗೆ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುತ್ತೇನೆ. ನನ್ನ ಹತ್ತಿರ ಇರುವ ಈ ಫೋಟೋಗಳನ್ನು , ಪ್ರತಿ ಬಾರಿ ಬಡಿಸಿಕೊಳ್ಳಬೇಕಾಗುವ ತರಕಾರಿ/ಹಣ್ಣಿನ ಅಂಶವನ್ನು ತೋರಿಸುತ್ತ ಇದೆ. ನೀವು ಉತ್ತರಿಸಬೇಕಾದರೆ, ಕಳೆದ ವರ್ಷದ ಯವುದಾದರೂ ಒಂದು ಸಾಧಾರಣ ವಾರವನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಳ್ಳಿ.			
46	ಸಾಧಾರಣವಾಗಿ ಒಂದು ವಾರದಲ್ಲಿ ನೀವು ಎಷ್ಟು ದಿನ ಹಣ್ಣು ತಿನ್ನುತ್ತೀರಾ?	ದಿನಗಳು ಇಲ್ಲವಾದ್ದಲ್ಲಿ ⟶ ಡಿ 3	ಡಿ 1
47	ನೀವು ಹಣ್ಣು ತಿನ್ನುವ ದಿನಗಳಂದು , ಕಪ್ನಲ್ಲಿ ತೋರಿಸಿದ ಅಂಶದಶ್ಟು , ನೀವು ಎಷ್ಟು ಬಾರಿ ತಗೊಳ್ಳುತ್ತೀರಾ?	ಎಷ್ಟು ಕಪ್ಪುಗಳು ಗೊತ್ತಿಲ್ಲ 77	ಡಿ 2
48	ಸಾಧಾರಣವಾಗಿ ಒಂದು ವಾರದಲ್ಲಿ ನೀವು ಎಷ್ಟು ದಿನ ತರಕಾರಿಗಳನ್ನು ತಿನ್ನುತ್ತೀರಾ ?	ದಿನಗಳು ಇಲ್ಲವಾದ್ದಲ್ಲಿ ⟶ ಡಿ 5 ಗೊತ್ತಿಲ್ಲ 77	ಡಿ 3
49	ನೀವು ತರಕಾರಿ ತಿನ್ನುವ ದಿನಗಳಂದು , ಕಪ್ನಲ್ಲಿ ತೋರಿಸಿದ ಅಂಶದಷ್ಟು, ನೀವು ಎಷ್ಟು ಬಾರಿ ತಗೊಳ್ಳುತ್ತೀರಾ ?	ಎಷ್ಟು ಕಪ್ಪುಗಳು ಗೊತ್ತಿಲ್ಲ 77	ಡಿ 4

Expanded : Diet			
50	ನೀವು ಎಣ್ಣೆ , ತುಪ್ಪವನ್ನು ಊಟ ತಯಾರು ಮಾಡಲು, ಬಳಸಲುಬೇಕಾದಾಗ , ಹೆಚ್ಚಾಗಿ ಏನನ್ನು ಉಪಯೋಗಿಸಿದ್ದೀರಾ?	ಎಣ್ಣೆ 1 ಡಾಲ್ಡಾ 2 ತುಪ್ಪ 3 ಬೇರೆ 4 ಯಾವುದು ಇಲ್ಲ 5 ಗೊತ್ತಿಲ್ಲ 77	ಡಿ 5
		ಬೇರೆ (ಸ್ಪಷ್ಟಿಸಿ)	ಡಿ 5 other
51	ಅಂದಾಜು ಒಂದು ವಾರದಲ್ಲಿ, ನೀವು ಎಷ್ಟು ಬಾರಿ ಮನೆಯಲ್ಲಿ ತಯಾರಿಸದೆ ಇರುವ ಊಟವನ್ನು ತಿನ್ನುತ್ತೀರಾ ? ಇಲ್ಲಿ ಊಟ ಅಂದ್ರೆ, ಬೆಳಗ್ಗೆಯ ತಿಂಡಿಯೂ ಸೇರುತ್ತದೆ	ಎಷ್ಟು ಬಾರಿ ಗೊತ್ತಿಲ್ಲ 77	ಡಿ 6

Core: ಚಟುವಟಿಕೆ			
ಪ್ರಶ್ನೆ		ಪ್ರತಿಕ್ರಿಯೆ	ಕೋಡ್
52	ಸಾಮಾನ್ಯವಾಗಿ ಒಂದು ವಾರದಲ್ಲಿ ನೀವು ಎಷ್ಟು ದಿವಸ ಕೆಲಸ ಮಾಡುತ್ತೀರಿ?	ದಿನಗಳು	ಪಿ 1
53	ಹಾಗಿದ್ದಲ್ಲಿ ಒಂದು ದಿವಸದಲ್ಲಿ ನೀವು ಎಷ್ಟು ಸಮಯ, ಕೆಲಸ' ಮಾಡುತ್ತೀರಿ?	ಗಂಟೆ ನಿಮಿಷ	ಪಿ 2 (ಎ-ಬಿ)

Expanded: Physical Activity			
Sedentary behaviour			
ನಾನು ಈಗ ಕೇಳುವ ಪ್ರಶ್ನೆ, ನೀವು ಕುಳಿತು ಅಥವ ಮಲಗಿ ಕಾಲ ಕಳೆಯುವ ಬಗ್ಗೆ, ಅದು ಕೆಲಸ ಮಾಡುವಾಗ , ಮನೆಯಲ್ಲಿ , ಪ್ರಯಾಣ ಮಾಡುವಾಗ, ಇಲ್ಲ ಬಿಡುವಿನ ಸಮಯದಲ್ಲಾದರೂ ಇರಬಹುದು. ಆ ಹೊತ್ತಿನಲ್ಲಿ ನೀವು ಕುಳಿತು ಏನಾದರೂ ಓದುತ್ತ ಇರಬಹುದು, ಕಂಪ್ಯೂಟರ್ ಮುಂದೆ ಕೆಲಸ, ಸ್ನೇಹಿತರ ಜೊತೆ ಚಿಕ್ಕ ಪುಟ್ಟ ಆಟ ಆಡುತ್ತ ಇರಬಹುದು, ಟಿ.ವಿ. ನೋಡುತ್ತಿರಬಹುದು, ಇಲ್ಲ ಯಾರೊಡನೆಯಾದರೂ ಮಾತಾಡುತ್ತ ಇರಬಹುದು (ಫೋನ್ ಇತ್ಯಾದಿ). ಆದರೆ ನಿದ್ದೆ ಸಮಯವನ್ನು ಇದರಲ್ಲಿ ಸೇರಿಸಬೇಡಿ.			
54	ಸಾಮಾನ್ಯವಾಗಿ ಒಂದು ದಿನದಲ್ಲಿ ಹೀಗೆ ನೀವು ಕುಳಿತುಕೊಂಡು ಇಲ್ಲ ಮಲಗಿಕೊಂಡು ಎಷ್ಟು ಸಮಯ ಕಳೆಯುತ್ತೀರಾ ?	ಗಂಟೆ ನಿಮಿಷ	ಪಿ 3 (ಎ-ಬಿ)

Core: ಬಿ.ಪಿ. ಖಾಯಿಲೆ			
55	ನಿಮ್ಮ ಬಿ.ಪಿ. ಅನ್ನು ಯಾವುದಾದರೂ ಡಾಕ್ಟರ್ ಇಲ್ಲ ನರ್ಸ್ ಪರೀಕ್ಷೆ ಮಾಡಿದ್ದಾರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ → ಎಚ್ 5 ಬಿ	ಎಚ್ 1
56	ಯಾವಾಗಾದರೂ, ಡಾಕ್ಟರ್ ಇಲ್ಲ ನರ್ಸ್, ನಿಮಗೆ ಬಿ.ಪಿ. ಇದೆ ಅಂತ ಹೇಳೀದ್ದಾರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ → ಎಚ್ 5 ಬಿ	ಎಚ್ 2 ಎ
57	ಅದನ್ನ ನಿಮಗೆ ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ಹೇಳಿದ್ದಾರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 2 ಬಿ

Expanded: History of Raised Blood Pressure			
58	ನಿಮ್ಮ ಬಿ.ಪಿ. ಖಾಯಿಲೆಗೆ ಡಾಕ್ಟರ್ ಅಥವಾ ನರ್ಸ್ ಕೊಟ್ಟಿರುವ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಚಿಕಿತ್ಸೆ/ಸಲಹೆ ಅನ್ನ ನೀವು ತಗೊಳ್ಳುತ್ತ ಇದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ → ಎಚ್ 5 ಬಿ	
	ಕಳೆದ ಎರಡು ವಾರಗಳಲ್ಲಿ ನೀವು ಮಾತ್ರೆ ತಗೊಂಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್3ಎ
	ಉಪ್ಪಿನ ಅಂಶದ ಪದಾರ್ಥಗಳನ್ನು ಕಡಿಮೆ ತಗೊಳ್ಳುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್3ಬಿ
	ತೂಕ ಕಡಿಮೆ ಮಾಡುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್3ಸಿ
	ಬೀಡಿ/ಸಿಗರೇಟ್ ನಿಲ್ಲಿಸುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್3ಡಿ
	ವ್ಯಾಯಾಮ ಶುರು/ಜಾಸ್ತಿ ಮಾಡುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್3ಇ
59	ಈ ಬಿ.ಪಿ. ಖಾಯಿಲೆಗೆ ನೀವು ಯಾವಾಗಲಾದರೂ ನಾಟಿ ವೈದ್ಯರನ್ನು ನೋಡಿದ್ದೀರಾ ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್4
60	ಬಿ.ಪಿ. ಖಾಯಿಲೆಗೆ ನೀವು ಈಗ ಯಾವುದಾದರೂ ನಾಟಿ ಓಷಧಿ/ಮಾತ್ರೆ ತಗೊಳ್ಳುತ್ತ ಇದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್5

History of C.V.D. and stroke			
61 a	ನಿಮಗೆ ಯಾವಗಲಾದರೂ ಹೃದಯ ಸಂಬಂಧ ಖಾಯಿಲೆ ಇತ್ತ ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 5 ಬಿ
61 b	ನಿಮಗೆ ಯಾವಗಲಾದರೂ ಲಕ್ವ ಆಗಿತ್ತ	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 5 ಸಿ
Core: **ಡಯಾಬಿಟಿಸ್**			
62	ನೀವು ಯಾವಾಗಲಾದರೂ sugar test/ಮೈಯಲ್ಲಿರುವ ಸಕ್ಕರೆ ಅಂಶ ಪತ್ತೆ ಮಾಡುವ ಪರೀಕ್ಷೆ ಮಾಡಿಸಿದ್ದೀರಾ ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ → ಅಳತೆ	ಎಚ್ 6

63	ಯಾವಾಗಲಾದರೂ ಡಾಕ್ಟರ್, ಇಲ್ಲ ನರ್ಸ್ ನಿಮಗೆ ಮೈಯಲ್ಲಿ ಜಾಸ್ತಿ ಸಕ್ಕರೆ/ಮಧುಮೇಹ ಇದೆ ಅಂತ ಹೇಳಿದ್ದಾರಾ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ ⟶ ಅಳತೆ	ಎಚ್ 7 ಎ
64	ಅದನ್ನು ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ಹೇಳಿದ್ದಾರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 7 ಬಿ

65	ನಿಮ್ಮ ಸಕ್ಕರೆ ಖಾಯಿಲೆಗೆ, ಡಾಕ್ಟರ್ ಅಥವಾ ನರ್ಸ್ ಕೊಟ್ಟಿರುವ ಕೆಳಗಿನ ಯಾವುದಾದರೂ ಚಿಕಿತ್ಸೆ/ ಸಲಹೆ ಅನ್ನು ನೀವು ತಗೊಳ್ಳುತ್ತಾ ಇದ್ದೀರಾ ?	ಹೌದು 1 ಇಲ್ಲ 2 ಇಲ್ಲವಾದ್ದಲ್ಲಿ ⟶ ಅಳತೆ	
	ಇಂಜೆಕ್ಶನ್ - ಇನ್ಸುಲಿನ್	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಎ
	ಕಳೆದ ಎರಡು ವಾರಗಳಲ್ಲಿ ನೀವು ಮಾತ್ರೆ ತಗೊಂಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಬಿ
	ಆಹಾರದಲ್ಲಿ ಬದಲಾವಣೆಗಳು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಸಿ
	ತೂಕ ಕಡಿಮೆ ಮಾಡುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಡಿ
	ಬೀಡಿ/ಸಿಗರೇಟ್ ನಿಲ್ಲಿಸುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಇ
	ವ್ಯಾಯಾಮ ಶುರು/ಜಾಸ್ತಿ ಮಾಡುವುದು	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 8 ಎಫ್
66	ನೀವು ಯಾವಾಗಲಾದರೂ ಈ ಸಕ್ಕರೆ ಖಾಯಿಲೆಗೆ ನಾಟಿ ವೈದ್ಯರನ್ನು ನೋಡಿದ್ದೀರಾ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 9
67	ಸಕ್ಕರೆ ಖಾಯಿಲೆಗೆ ನೀವು ಈಗ ಯಾವುದಾದರೂ ನಾಟಿ ಓಷಧಿ/ಮಾತ್ರೆ ತಗೊಳ್ಳುತ್ತಾ ಇದ್ದೀರಾ ?	ಹೌದು 1 ಇಲ್ಲ 2	ಎಚ್ 10

ಅಳತೆ.

ಬಿ.ಪಿ -	ಎದೆ ಬಡಿತ -	ಎತ್ತರ -
ತೂಕ -	B.M.I. (kg/m^2) -	
F.B.S. (mg/dl)-	Cholesterol (mg/dl)-	

ANNEXURE 4

APPOINTMENT LETTER FOR BIOCHEMICAL EXAMINATION.

ರಕ್ತ ಪರೀಕ್ಷೆಗೆ ಅಪಾಯಿಂಟ್ಮೆಂಟ್ ಪತ್ರ

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ಸಮ್ಮತಿಸಿದ್ದಕ್ಕೆ ಧನ್ಯವಾದಗಳು.

ವ್ಯಕ್ತಿಯ ಗುರುತು ಸಂಖ್ಯೆ:_____

ಸ್ಥಳ:

ದಿನಾಂಕ:

ಸಮಯ:

ದಯವಿಟ್ಟು ರಕ್ತ ಪರೀಕ್ಷೆಗೆ ಬರುವಾಗ ಈ ಪತ್ರವನ್ನು ತೆಗೆದುಕೊಂಡು ಬರಬೇಕಾಗಿ

ವಿನಂತಿ.

(ಉಪವಾಸ ಇರಲು ಸಲಹೆಗಳಿಗೆ ಈ ಹಾಳೆಯನ್ನು ಹಿಂತಿರುಗಿಸಿ)

ರಕ್ತ ಪರೀಕ್ಷೆಗೆ ಬೇಕಾದ ಮುನ್ನೆಚ್ಚರಿಕೆ

- ನಿಮ್ಮ ರಕ್ತ ಪರೀಕ್ಷೆಯಿಂದ ಸರಿಯಾದ ಫಲಿತಾಂಶ ಬರಬೇಕೆಂದರೆ ನೀವು ಖಾಲಿ ಹೊಟ್ಟೆಯಲ್ಲಿ ಇರಬೇಕಾದುದು ಅತ್ಯಮೂಲ್ಯ.
- ನೀವು ರಕ್ತ ಪರೀಕ್ಷೆಗೆ, **12**ಘಂಟೆಗಳ ಕಾಲ, ನೀರು ಬಿಟ್ಟು ಬೇರೆ ಏನನ್ನೂ ತಗೆದುಕೊಳ್ಳಬಾರದು (ಬೆಳಗ್ಗೆಯ ಕಾಫಿ, ಟೀ ಕೂಡ ಸೇವಿಸಬಾರದು).
- ಅಂದರೆ ನಿಮಗೆ ಮರುದಿನ ಬೆಳಗ್ಗೆಗೆ ಪರೀಕ್ಷೆ ಮಾಡಿಸುವುದಿದ್ದರೆ, ಹಿಂದಿನ ದಿನ ರಾತ್ರಿ **8** ಘಂಟೆಯ ನಂತರ ಖಾಲಿ ಹೊಟ್ಟೆಯಲ್ಲಿ ಇರಬೇಕು ಮಾಡಬೇಕು.
- ಮುಖ್ಯವಾದ ಸೂಚನೆ:
    - ❖ ನೀವು ನಿಮ್ಮ ಸಕ್ಕರೆ ಖಾಯಿಲೆಗೆ ಅಥವಾ ಕೊಬ್ಬಿನ ಅಂಶ ಕಡಿಮೆ ಮಾಡಲು, ಮಾತ್ರೆ ಅಥವಾ ಇಂಜೆಕ್ಶನ್ ತೆಗೆದುಕೊಳ್ಳುತ್ತ ಇದ್ದರೆ, ದಯವಿಟ್ಟು ಪರೀಕ್ಷೆ ಮಾಡಿಸುವ ದಿನದ ಬೆಳಗ್ಗೆ ಅವನ್ನು ತೆಗೆದುಕೊಳ್ಳಬೇಡಿ.
    - ❖ ಔಷಧವನ್ನುಬರುವಾಗ ತೆಗೆದುಕೊಂಡು ಬಂದರೆ, ಪರೀಕ್ಷೆ ಆದ ನಂತರ ನೀವು ಅವನ್ನು ತಗೊಳ್ಳಬಹುದು.

ANNEXURE 5

WHO STEPS : Step 2-Anthropometry result form.

ಫಲಿತಾಂಶ ಪತ್ರ

ಹೆಸರು: ದಿನಾಂಕ:

ವಯಸ್ಸು: ಸ್ತಳ :

ಗುರುತು ಸಂಖ್ಯೆ:

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಂಡಿದ್ದಕ್ಕೆ ನಿಮಗೆ ಧನ್ಯವಾದಗಳು.

ನಾವು ನಿಮಗೆ ನಿಮ್ಮ ಮೈಗಾತ್ರ, ಎದೆ ಬಡಿತ, ಬಿ.ಪಿ. ಮಾಪನದ ಫಲಿತಾಂಶಗಳನ್ನು ಈ ಪತ್ರದ ಮೂಲಕ ತಿಳಿಸುತ್ತಿದ್ದೇವೆ.

ಬಿ.ಪಿ. ಸಿಸ್ಟೊಲಿಕ್:_____mmHg (reading 3)

ಡಯಾಸ್ಟೊಲಿಕ್:_____mmHg (reading 3)

ಬಿ.ಪಿ. ವರ್ಗೀಕರಣ ___ ಸಾಧಾರಣ (ಸಿಸ್ಟೊಲಿಕ್ 140ಕ್ಕಿಂತ ಕಡಿಮೆ ಹಾಗು ಡಯಾಸ್ಟೊಲಿಕ್ 90ಗಿಂತ ಕಡಿಮೆ)

___ ಸ್ವಲ್ಪ ಜಾಸ್ತಿ (ಸಿಸ್ಟೊಲಿಕ್ 140-159 ಹಾಗು/ಅಥವ ಡಯಾಸ್ಟೊಲಿಕ್ 90-99)

___ ಜಾಸ್ತಿ (ಸಿಸ್ಟೊಲಿಕ್= 160/ಗಿಂತ ಹಚ್ಚು ಹಾಗು/ಅಥವ ಡಯಾಸ್ಟೊಲಿಕ್=100/ಗಿಂತ ಹೆಚ್ಚು)

___ ಮಾತ್ರೆ ತೆಗೆದುಕೊಳ್ಳುತ್ತ ಇದ್ದಾರೆ.

ಎದೆ ಬಡಿತ ಒಂದು ನಿಮಿಷಕ್ಕೆ:_____(reading 3)

ಎತ್ತರ: _____cm

ತೂಕ:_____kg

ANNEXURE 6

WHO STEPS: Step 3-Biochemical examination result form.

ಫಲಿತಾಂಶ ಪತ್ರ

ಹೆಸರು: ದಿನಾಂಕ:

ವಯಸ್ಸು: ಸ್ಥಳ :

ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಪಾಲ್ಗೊಂಡಿದ್ದಕ್ಕೆ ನಿಮಗೆ ಧನ್ಯವಾದಗಳು.

ನಿಮ್ಮ ರಕ್ತ ಪರೀಕ್ಷೆಯ ಫಲಿತಾಂಶಗಳು ಈ ರೀತಿ ಇವೆ:

ಸಕ್ಕರೆ ಅಂಶ (ಖಾಲಿ ಹೊಟ್ಟೆಯಲ್ಲಿ): _____ mg/dl

ಸಕ್ಕರೆ ಅಂಶ ವರ್ಗೀಕರಣ : ____ ಸಾಧಾರಣ (100-109mg/dl)

____ ಜಾಸ್ತಿ (>110mg/dl)

____ ಮಾತ್ರೆ ತೆಗೆದುಕೊಳ್ಳುತ್ತ ಇದ್ದಾರೆ

ಕೊಬ್ಬಿನ ಅಂಶ (ಖಾಲಿ ಹೊಟ್ಟೆಯಲ್ಲಿ):_____ mg/dl

ಕೊಬ್ಬಿನ ಅಂಶ ವರ್ಗೀಕರಣ:____ ಸಾಧಾರಣ (<200 mg/dl)

___ಸ್ವಲ್ಪ ಜಾಸ್ತಿ (200-239mg/dl)

____ಜಾಸ್ತಿ (>240mg/dl)

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