THE PREVALENCE AND PUBLIC KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS CARDIOVASCULAR DISEASES RISK FACTORS IN JIMMA TOWN, SOUTH WEST ETHIOPIA

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DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

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ABSTRACT

Background

CVD risk factor KAP (knowledge, attitude&practice) gaps are significant obstacles to successful CVD prevention and care. Despite the rise in prevalence of CVDs risk factors in Ethiopia, there is a lack of Studies to comprehensively assess the magnitude and KAP towards them which is true of Jimma Town.

Objective: - To assess the magnitude of CVD risk factors and public KAP towards them in Jimma town

Method: - A Community based cross-sectional study was conducted in Jimma Town, between 1st and 28th November 2021 to include a person of age 18 years or above who fulfilled inclusion criteria. A multi-stage sampling technique was utilized to get the total sample size of 332. The data were collected using an interviewer-administered structured questionnaire. Data entry was done by Epidata version 3.2 software & analysis was conducted with SPSS, version 26.

Results: - About 56.4% of the participants had good knowledge of CVDs risk factors. They had a poor attitude towards CVDs risk factors. About 70.2% didn't do moderate-intensity exercise, and 85.2% didn't do vigorous-intensity exercise. Only 2.4% and 8.7% of the participants had consumed vegetables and fruits daily respectively. About 17.8% of them drank alcohol,19.9% chewed khat and 11.4 % were either active or second-hand smokers. Only 22.3% of them had normal blood pressure (BP). About 55% of females &39.9 % of males had central obesity. The average measured CVDs risk was 1.44±1.19. About 6.1 % of them had family history of CVDs.

Conclusion & Recommendations: - The KAP of this population towards CVDs risk factors were low amid the rise of CVDs risk factors at an alarming rate. We recommend the local health bureau, the ministry of health, and other stakeholders should find a way to increase the KAP of this population, through media campaigns, promotions &others.

Keywords: - KAP, CVDs risk factors, Jimma Town, Ethiopia

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ACRONYEMS

ASCVDs- Atherosclerotic Cardiovascular Diseases

BMI - Body Mass Index

BP –Blood pressure

CAD- coronary artery disease

CHD- coronary heart disease

CVDs- cardiovascular diseases

DBP-Diastolic Blood Pressure

DM -Diabetes Mellitus

FBG-Fasting Blood Sugar

HDFQ- Heart Disease Fact Questionners

HgbA1C-HemoglobulinA1C

HTN -Hypertension

JNC- Joint National Committee

KAP- Knowledge, Attitude &Practice

NCD– Non-Communicable Disease

RBS-Random Blood Sugar

SBP-Systolic Blood Pressure

SPSS-Statistical Package for Social Sciences

SSA-Sub -Sharan Africa

STEPS- Step Wise Approach to Surveillance

WC-Waist Circumference

WHO-World Health Organization

CHAPTER ONE

1. Introduction

1.1 Background

Cardiovascular disease is a term that refers to a category of diseases that affect the heart or the blood vessels that run through it. Atherosclerotic Cardiovascular Diseases (ASCVDs) are disorders such as coronary artery disease, stroke, peripheral arterial disease (PAD), and other atherosclerotic vascular diseases that are primarily driven by modifiable CVD risk factors (1,2).

ASCVDs are common in the general community, especially among adults, with most of this owing to poor execution of prevention strategies and uncontrolled ASCVDs risk factors in several adults (3).

There are non-modifiable risk factors, such as advanced age, family background, or male gender. Smoking, hypertension (HTN), diabetes, dyslipidemia, obesity, physical inactivity, unhealthy diets, and high alcohol consumption are all modifiable risk factors (1).

Even though there were no wide-scale studies have done to show a strong association between chewing khat and cardiovascular diseases (CVDs), Chewing khat is currently considered as one of the modifiable CVDs risk factors (4).

CVD risk factor awareness refers to a person's understanding of disorders, nutritional patterns ,and behavioral activities that, whether left unchecked or changed, will lead to CVDs (2). The general public's lack of awareness about CVDs and their risk factors is a major impediment to successful CVD prevention and care (5).

Evidence reports substantial gaps in awareness of cardiovascular risk factors across the general population in developing nations despite the increasing burden of CVD in these countries, there is minimal evidence available to increase the understanding of this region, which is crucial for the implementation of the preventive program (6).

Because of population-wide preventive strategies, efficient primary and secondary preventive healthcare, and improved treatment for acute events, deaths from CVDs have decreased steadily in high-income countries over the last three decades (7). In low and middle-income countries, however, rates of CVD deaths have risen over the same time period (8,9). In coupled with the increased prevalence of CVD risk factors in these settings, the increase in CVD deaths reflects a lack of population-based prevention and healthcare strategies (3).

The general public's lack of awareness about CVDs and their risk factors is a major impediment to successful CVD prevention and care (9).

CVD was stated to be among the most common morbidity's triggers (between 4–24%), the most common reasons for hospitalization (between 3–31%), the most common reasons for admission

to a hospital intensive care unit (between 8.9–9.8%), and among the major causes of mortality (range 8.9–9.8%) in a meta-analysis of studies performed in Ethiopia between 1960 and 2011(10).

According to studies undertaken in various parts of Ethiopia, the prevalence rates of CVD risk factors are on the rise, with modifiable CVD risk factors being more prominent in Ethiopian adult populations (11–15).

A study done on adult patients admitted with the diagnosis of heart failure to Jimma medical center, internal Medicine wards during 2015 has shown that ischemic heart disease and hypertensive heart disease are widely prevalent in this population. The study shows that morbidity due to ASCVDs is rising (16).

No studies were done previously to assess community KAP toward CVDs risk factors, and it has shown that the prevalence of modifiable CVDs risk factors is following an alarming trend according to limited studies in this population and nearby studies(4,11–14), and national studies (6,15).

Individual understanding of CVD risk factors, as well as knowing the prevalence of modifiable CVDs risk factors, is essential in combating the disease burden in the community (17).

The AHA /ACC 2019, Practice guideline for primary prevention of ASCVD. The most effective way to avoid ASCVD is to live a healthy lifestyle. Clinicians should evaluate the social determinants of health i.e. CVDs risk factors every 4-6 years (18). But, in our country, there is no such prepared guideline.

KAP towards the cardiovascular risk factors and prevalence in Africa has not been well studied, which is also the case in Ethiopia and the area of the current study(5). Therefore, this study intends to assess the magnitude of CVDs risk factors and KAP towards CVDs risk factors in Jimma Town, southwest Ethiopia.

1.2 Statement of the problem

The unhealthy habits of the population must be changed in order to avoid and regulate CVDs. Person initiatives, health awareness, and health promotion by health providers would all help to improve these practices. However, modifying population actions is complicated and can not be done purely by those efforts. A positive policy climate is important for changing and preserving healthier behaviors which in turn depends on the knowledge of the magnitude of CVDs risk factors and the level of people's KAP towards this predisposing condition. Handling cardiovascular risk factors using a total-risk approach is more cost-effective than using a single-risk factor approach (2).

So, community KAP towards CVDs risk factors can be a precondition for success in the prevention and control of this disease (9). Individual awareness of CVD risk factors, as well as

knowing the prevalence of modifiable CVD risk factors, is essential in combating these diseases (17).

Addressing CVD risk factors and KAP will inform individuals on health attitudes to adapt and be proactive in reducing their lifetime risk of CVDs by lowering their exposure to modifiable risk factors for CVD, and rising awareness of modifiable cardiovascular risk factors could help to reduce the disease's detrimental consequences and a financial burden (5,6).

Different studies have assessed the adult population's KAP towards CVDs risk factors and magnitude of these risk factors in Africa, however studies from Ethiopia are scant and concentrate on specific populations such as patients with already established CVDs in eastern Ethiopia in hospital setting (3), Urban and rural population in Addis -Abeba and Butajira; which they only described the rising prevalence of modifiable CVDs risk factors in this community during 2008 (6), and the study done in Jimma Town during 2010 didn't describe the biochemical CVDs risk factors with no emphasis on the population KAP towards CVDs risk factors, but it has shown that modifiable CVDs risk factors were rising (11).

However, it is not known whether these growth in the burden of CVDs risk factors in Jimma Town, as well as the general rising of CVDs risk factors, between the urban and rural population in Addis Abeba and Butajira is related to the population's KAP towards CVDs risk factor level. In addition, it is not known whether the KAP towards CVDS risk factors among patients in East Ethiopia truly reflect KAP among the general community.

To the best of the researcher knowledge, there was no study that systematically assessed the public KAP towards CVDs risk factors, and the magnitude of these risk factors among adult population of Jimma Town, and those limited studies at the national level and local level didn't bring sufficient information which will help in targeting the growing CVDs burden in this community and at the national level.

1.3 Significance of the study

This study will add knowledge on understanding the study population's KAP towards CVDs risk factors and magnitude of CVDs risk factors among the study community. Additionally, it provides baseline information on CVDs risk factors and the study population's KAP towards CVDs risk factors for physician caring in this population.

The identified gaps in the area of KAP towards CVDs risk factors and magnitude of CVDs risk factors may be input for health policymakers to give emphasis and develop programs, and develop a consolidated national guideline for the intervention of modifiable CVDs risk factors for those at-risk individuals or at the community level that play a key role in controlling the growing burden of CVDs at grass-root level. It may help to direct health care intervention which further recommends health care professionals to consider the potential value of KAP towards CVDs risk factors.

CHAPTER TWO

2. Literature review

Cardiovascular disease (CVD) is also a leading cause of death worldwide, with a large disease burden in many populations. According to the global burden of disease studies, there were 422.7 million cases of CVD globally in 2015, resulting in 17.92 million deaths(19). Among those morbidities and mortalities due to CVDs, the greatest burden was due to ASCVD (1,20).

Hypertension, Dyslipidemia, cigarette use, heavy alcohol use, low fruit and vegetable intake, and being overweight, obese, or physically inactive are all risk factors for chronic diseases, one of which is ASCVDs, which are increasing in many African countries(21,22). CVDs now kills almost as many people in developing countries as it does in developed countries (23).

Chronic diseases and their risk factors are part of an epidemiologic transformation marked by shifts in demographic dynamics and the leading causes of death. Based on the pace of fertility shifts, the distribution of risk factors, and the health system's capacity to react, the transformation happens at varying rates in different locations (24).

A significant proportion of the disease burden in Ethiopian populations is attributed to CVD as well as other chronic diseases, according to population-based evidence on the cause of death from some isolated studies in largely rural Ethiopian populations (25).

Furthermore, studies suggest that the prevalence of CVD is growing in developing countries, posing a public health threat(19,26). In Ethiopia, CVDs is a big public health problem. However, the prevalence of CVDs ranges widely between rural and urban communities. More subnational research is required to better understand the issue (6,25). In developing countries, there is a scarcity of literature on CVDs risk factors in the community (27,28).

The majority of adults in Sub-sharanAfrica (SSA) cannot identify even one CVD risk factor, but there is a geographic shortage of data on CVDs recognition and risk factor awareness across SSA populations (5,29).

According to the new world health organization (WHO) study, high BP is the leading CVDs risk factor worldwide, accounting for 13% of all deaths, followed by tobacco use (9%), excessive blood glucose (6%), low physical activity (6%), and overweight and obesity 5% (5).

A cross-sectional study which was done among adults age 18 and above in Jordan in 2012 on Public Knowledge and awareness of the CVDs and its risk factors, has shown that based on their bespoke scoring system, 29.4% had very low knowledge, 55.14% had low knowledge, 14.01% had moderate knowledge, and the rest had good knowledge on CVDs risk factors. During the study period 33.4 % smoke cigarettes, 26.2% gave attention to their diet, 58.6% exercise zero to two times per week for 30 minutes, 27.1% exercised three to four times per week for 30 minutes, and 14.3% reported exercising five times or above for 30 minutes per week. The commonly

reported modifiable CVDs risk identified by the study participant were smoking 75.7%, obesity 71.2%, high fat diet 62%, lack of exercise 22%, HTN 6.2%, and hyperlipidemia 4.6% (30).

A cross-sectional study done in the Lebanone in 2018 on public awareness and prevalence of CVDs risk factors comparing the urban and rural population has found that; the sample population's average BMI was 28.20 ± 4.50. Forty-two percent of them said they smoked cigarettes. Just 2.1% said they drank three drinks a day or more. The rate of alcohol use varied slightly between the two populations surveyed, with more rural residents being non-alcoholic (87.5% vs. 72.9%, p = 0.0001). Just 17.3% and 8.7% said they didn't eat any fruits or vegetables at all. However, only 8.1% and 3.5% of the participants ate cardioprotective servings a day of (4 fruits and 5 vegetables), respectively. Fifty-four percent and 70.0% reported doing moderate activities and walking for at least 10 minutes four days a week, respectively. Urban residents sat for an average of seven hours a day (62.8% versus 50.9%, p = 0.002) (17).

Hypertension and diabetes mellitus (DM) were found to be prevalent in 29.8% &22.8% of the population, respectively. About 61.7% of the patients had HTN, 29.8% had pre HTN, and only 8.5% had normal BP. Undiagnosed HTN was found to be prevalent in 19.3% of them (17).

The participants in the study were mainly aware of smoking as a CVD risk factor and, at the very least, DM. The average level of awareness was 5.67 ±1.41 based on the heart disease fact questionnaire (HDFQ) assessment tool (17).

A study done in 2013 on awareness and prevalence of risk factors of coronary disease (CHD) among teachers and bankers in Sokoto, Nigeria, has shown that just 4 out of 7 and 1 out of 7 CHD risk factors were reported by 50% of bankers and teachers, respectively. HTN was known by 59.0% of bankers and 50.5% of teachers, and overweight/obesity was known by 55.2% of bankers and 47.6% of teachers as a risk factor for CHD. While up to half of bankers understood that lack of physical exercise, cigarette smoking, and consuming foods high in fat were risk factors for CHD, this was not the case among teachers. Just a few of the participants in both categories were aware of DM as a CHD risk factor (31).

A community-based study done in rural Tanzanaia had found that most of them had just an elementary education (80.4%), and were mostly farmers (92.5%). In terms of behavioral and physiological features, 5.9% and 19.7% of the individuals, respectively, were current smokers and alcoholics. Table salt was utilized by most participants (85.2%). Fewer than two-thirds said they ate vegetables 5–7 days per week, while only 7.9% said they ate fruits 5–7 days per week. Over a quarter of the patients were hypertensive (29.3%), 28.5% were overweight (28.5%), and 16.3% were obese (32).

Most individuals indicated stress (85.4%), obesity (67.7%), cholesterol (64.3%), and physical inactivity (63.3%) when asked closed-ended questions. Family history of stroke (18.4%) and alcohol consumption (25.5% were the risk variables that were least found. Around 207 (6.9%) of the participants were unable to identify any risk factor, even though half of the individuals

(51.4%) could identify five or more risk factors. At least one in every four participants had a good understanding of risk variables, while 35.7% had either low or no information at all. Only 16.3% of the participants had a good understanding of risk factors, while 42.8% had a moderate understanding. The other 40.9% either had limited or no understanding of CVD risk factors (32).

The mean score for the attitude section was 54.368, with 19.00 and 65.00 as the lowest and highest scores, respectively. Following that, they had a favorable attitude regarding CVDs risk factors, as they scored above 50% on practically all the items tested. Most of the participants said they "strongly agree" or "agree" with exercise (96%), prefer walking to any other mode of transportation (90%), consume fruits and vegetables (91%), and avoid fizzy drinks (91%). However, only 52% agreed with a statement about avoiding fast food and wasting time (33).

A population-based survey in Uganda in 2014 on Knowledge and Perception of Stroke among the adult population has revealed that participants (27%; 74.5% urban) said they were aware of stroke risk factors. About 48.9% of them knew at least one risk factor, 49.3% knew two to four risk factors, and 1.8% knew five or more risk factors. HTN (63.7% urban; 33.3% rural; $P< 0.001$) was the most important risk factor reported by 244 (56%) participants, followed by stress (51.4%; 53.2% urban; 46.0% rural). Among other modifiable risk factors identified by the study community DM accounted for 14.9%, obesity 5.5%, poor diet 29.6%, HTN 56%, Ciggarite smoking 0.7%, alcohol consumption 3.4%, high cholesterol 12.2%, lack of exercise 25.7% (34).

A community-based cross-sectional analysis of randomly selected adults (> 18 years) which was conducted in 2016 in Buea, Cameroon has shown that women were heavier than men (25.6 vs. 24.4 kg/m2; $p < 0.0001$). Smoking (active/passive) and alcohol consumption were reported by 11 and 21% of the population, respectively. Both traits were shown to be more common to men (both $p< 0.0001$). Just 16.7 percent of them reported consuming healthy food (diets high in fruits and vegetables, low in saturated fats, and low salt content) on the daily basis, while half of the participants reported performing 30 minutes of physical exercise three or more times per week. (Mostly men; 57.9% vs. 47.9%, $p = 0.001$).) (27).

Participants in a study in Buea, Cameroon, were aware that smoking (82%), an unhealthy diet (70.6%), a lack of exercise (67.0%), obesity (69.7%), stress (73.15), high BP (73.3%), and DM (60.8%) were all potential risk factors for CVD, but a family history of CVD was unknown to up to 52.4% as a risk factor. Women were more aware that high BP was a CVD risk factor (75.7% vs. 69.5%; $p = 0.048$). The average CVD risk factor awareness score was 5.7 out of a possible 9 points ($p > 0.05$) (27).

From December 2002 to November 2005, a community-based, cross-sectional study done in southwestern Nigeria has found that nearly half of the respondents were able to identify modifiable risk factors for CVDs. Stress (42.7%), tobacco use (36.2%), HTN (16.2%), DM (5.4%), high salt intake (2.8%), low intake of fruits and vegetables (1.7%), obesity (1.6%), lack of exercise (1.2%), and dietary fat (1.1%) were the modifiable CVD risk factors identified by

respondents. Fifty-six percent of them couldn't know of a single risk factor. About 50.6% self-reported they were hypertensive (35).

Classic CVD risk factors such as smoking (36), HTN (37), obesity(38–40), elevated cholesterol, fatty diets, alcohol consumption (41–43), and reduced physical activity (44) have been increasing in SSA. This increase is due to accelerated urbanization and has resulted in an epidemiological and nutritional shift in which energy-dense diets have replaced conventional diets and sedentary lifestyles have surpassed poverty (45).

A cross-sectional epidemiological study in north Ethiopia during 2016 was found that, only 3.3% of men and 0.5% of women were smokers. Only 2.6% of males and 0.2% of females were chewing khat. Only 4.3% of men and none of the women had three or more standard drinks per day. Very few (0.3 %) individuals ate more than 5 servings of fruit and vegetables per day, and the majority (68.7 %) had less than one serving per day. The majority of males and females 66.0 % and 48.7 % had moderate or high levels of total physical activity (≥ 600 metabolic equivalent minutes (MET-minutes) per week), respectively (15).

According to the same study, 32.8% of women and 28.2% of men are obese or overweight, and the prevalence of elevated waist circumference (WC) and the waist-hip ratio was 31.1% and 50.9% for men and 59.8% and 48.8% for women, respectively. The age-standardized prevalence of HTN was 22.4% for males and 15.3% for females (15).

A cross-sectional study on Patients' knowledge of CVDs risk factors and associated lifestyle behavior in eastern Ethiopia in 2018 has shown that the average HDFQ percentile score was 70.5% (±15.3). Overall, 54% had optimal risk factor knowledge (score >=70%), while the remaining 46% had suboptimal risk factor awareness. Most patients had a good knowledge of the evidence that being overweight (91.3%), smoking (97.6%), and having elevated BP (81.9%) are risk factors for CVDs. Around the same time, patients were unaware that family history of heart disease (86.8%) and DM (64.1%), respectively, are risk factors. Nearly a fifth of them (19.2%), were unaware that controlling BP lowers the risk of CHD (18.1%) were unaware that consuming fried foods affects blood cholesterol levels, and (40.1%) believed that only exercising in a gym or a fitness class lowers the risk of CVDs (3).

In 2008, a cross-sectional, community-based survey design was discovered that over 30% of adults in Addis-Ababa had overweight or obesity. In Addis-Ababa, approximately 2% of males and 9% of females were overweight. Males had a prevalence of inadequate or poor physical activity (less than 600 MET minutes per week or less than 150 minutes per week in the previous week) ranging from 3% in rural Butajira to 15% in Addis-Ababa, while females had a prevalence of 19% in rural Butajira to 31% in Addis-Ababa. Overall, an average of 9% males and 25% of females, or 11% of rural and 20% of urban communities, did not get enough physical exercise. Fewer than 5% of adults in Addis-Ababa and less than 2% of adults in Butajira announced daily fruit or vegetable intake. On a daily basis, no one said they ate five or above five servings of vegetables or fruit (6).

Hypertension; systolic blood pressure (SBP)>= 140 mmHg or diastolic blood pressure (DBP) >= 90 mmHg or antihypertensive treatment prevalence rose across the rural-urban gradient, from around 8% in Rural Butajira to over 30% in Addis-Ababa. In Addis-Ababa, 11% of men smoked on a regular basis, while in Butajira, 7% smoked daily. In both populations, less than 1% of females reported smoking. Thus, in Addis-Ababa, 69% of males and 57% of females reported drinking in the previous 12 months, while in Butajira, 23% of men and 19% of females reported drinking in the previous 12 months (6).

A cross-sectional study undertaken on the prevalence of CVDs risk factors among adult peoples ages from 25 to 65 in Jimma Town in 2010 has revealed 70.9% of survey subjects had at least one of the seven CVD risk factors, with HTN accounting for 23.8%, and 13.7% reported a history of BP measurement prior to the study. Undiagnosed HTN was found in 10.1% of the research participants. Males were more likely than females to be overweight or obese, at 11.4% About 45.8% of males and 54.2% of females had inadequate consumption of fruits and vegetables. Khat was daily chewed by 65.7% of males and 34.3% of females (11).

A community-based correctional survey conducted in 2009 at Gilgel Gibe field research center among people aged 15 to 64 years old found that smoking was prevalent at 9.6%, khat chewing was prevalent at 44%, poor physical activity was prevalent at 19.1%, and alcohol intake was prevalent at 3.8%. Fasting blood glucose (FBG) levels were observed to be elevated in 3.7% of them. Around 1.5% were overweight or obese, 33.4% had a greater waist-to-hip ratio, 7.60% had HTN, and 3.2% had a high WC(12).

Obesity, overweight, and its combined index were found to be prevalent in 19.5%, 24.4%, and 43.9% of the population, respectively. Around 58.6% of people were at risk of getting central obesity, according to Ethiopian WC references. Raised BP (P = 0.034), DBP (P = 0.090), and FBG (P = 0.013) were all linked to central adiposity in binary analysis. On multivariate analysis, central obesity was linked with rised triglycerides (P 0.001), elevated diastolic BP (P = 0.047), and a high dietary diversity score (AOR = 1.52; 95 percent CI:1.12-2.25), although dietary diversity was not significant (P = 0.379) (46).

In a community-based cross-sectional survey conducted in Jimma Town in 2013, it was discovered that 7.2% of adults over the age of 20 were current smokers, 52.1% were current alcohol users, and 21.9% chewed khat daily at the time of the study; alcohol intake prevalence was comparable between men and women, while the rest were more prevalent in males. This study showed that 10.4% of the study participants were overweight (BMI 25 to 29.9), 5.1% were obese, 10.3% had stage one HTN (Systolic BP 140-159 mm Hg and diastolic BP 90-99 mm of Hg), and 3.2% had stage 2 HTN (Systolic BP 160 mm Hg and diastolic BP 100 mm of Hg) (14).

A cross-sectional study conducted in Jimma Town in 2000, was discovered that 30.6% of the population chewed khat, of which 60.1% of them were males. Among chewers, 57.8% of chewed khat daily (4).

Acommunity based study in Jimma town during 2019 has shown persons over the age of 40, the total prevalence of dysglycemia was 18.6%. Type 2 diabets affects 5.7% of the population, while impaired fasting glucose affects 12.9% of the population. Being overweight [AOR = 3.8, 95% CI (1.84, 7.95)], being obese [AOR = 7.78, 95% CI (2.90, 20.91)], and having a family history of diabetes [AOR = 2.45, 95% CI (1.08, 5.52) were all linked with dysglycemia (47).

Healthy Life in Urban Settings (HELIUS) is cohort research involving people aged 70 and younger who are Dutch, South-Asian Surinamese, African Surinamese, Ghanaian, Turkish, and Moroccan. The prevalence of family history of CVDS was 31% (48).

Evidence gaps on CVDs risk factors are a roadblock to successful CVDs prevention. As a result, evidence on people's KAP towards CVD risk factors is critical for both primary and secondary CVD prevention. However, there is a scarcity of studies aimed at closing the evidence gap and reducing the rising pressure of CVD risk factors in developing countries (49).

Until now, most research in Ethiopia has concentrated on explaining the high prevalence of CVD, although few others have looked at patients' towards CVDs risk factors in a hospital setting, and the prevalence of CVD risk factors (3,6,15,50,51). And again few studies were done to assess the prevalence of modifiable CVDs risk factors in Jimma Town with no biochemical risk factor for CVDs mentioned in this study (11).

Currently, there is no community-based study done in Ethiopia to assess public KAP towards of CVDs risk factors in the general population from a searched online database of [PubMed, Medline, Science Direct & Google Scholar], to retrieve relevant primary studies conducted in Ethiopia, using pre-defined search (Title/Abstract) and indexing terms (MeSH/Emtree)". Therefore, the purpose of this study is to assess the public KAP towards CVDs risk factors and the magnitude of CVD risk factors in Jimma Town.

CHAPTER THREE

3. Objective

3.1 General Objective

- This study aimes to assess magnitude of cardiovascular diseases risk factors and public knowledge, attitude, and practice towards them in Jimma town between 1st and 28th November 2021.

3.2 Specific Objectives

- To assess the magnitude of modifiable cardiovascular disease risk factors among adult population of Jimma Town
- To identify the magnitude of non-modifiable cardiovascular diseases risk factors among adult people of Jimma Town
- To determine public knowledge, attitude, and practice towards CVDs risk factors among adult people of Jimma Town

CHPATER FOUR

4. Methods and materials

4.1 Study area and period

The research was carried out at Jimma Town, Ethiopia's largest town in the southwest. It lies 335 kilometers southwest of Addis Ababa, in the Oromia Region. According to the Central Statistical Agency, it had a population of 159,009 in 2005, with 80,897 men and 78,112 females with 2015 population projections of 177,900. Administratively, the town is split into 17 kebeles. The kebeles have assigned numbers to all the dwellings in order to facilitate administrative tasks.

4.2 Study Design

A community-based cross-sectional study was conducted to include all residents of Jimma Town of age ≥ 18 years, between 1st and 28th November 2021.

4.3 Population

4.31 Source population

All adult people of Jimma Town of age ≥18 years

4.32 Study population

Individuals of age ≥18 years who fullfilled the inclusion criteria

4.4 Eligibility Criteria

4.41 Inclusion Criteria

Volunteer individuals of age ≥ 18 years who were residents of Jimma Town &available during the data collection period were within the study.

4.42 Exclusion Criteria

An individual with established ASCVDs diagnosis by a physician were excluded.

4.5 Sample size determination and sampling technique

The sample size was decided by employing a single population proportion formula. The subsequent assumptions were made, marginal error (d) that was tolerated in either side of the true proportion to be 5%, and using 95% confidence level, a = 0.05 and 5% was added to catch-up on non-responses and since the prevalence of CVDs risk factors in Jimma Town from the previous study in this area was 70.9% which give P-value of 0.71 for the current study(11), the p-value of the current study was taken as 0.71

The total sample size for WHO stepwise approach to surveillance (STEPS) 1,2&3 (52), was calculated as nf

$$sample\ size(n) = Z_{1-}a/_2{}^2 P(1-P)/d^2$$

Sample size (n) = was minimum sample size required for the study

z=is standard Gaussian distribution (d=1.96) with the confident interval of 95 % and a = 0.05

P = 0.71 (proportion of individuals who had at least one CVDs risk factors from a study done in Jimma Town)

d = tolerable margin of error (d = 0.05)

nf = is the final sample size

$$n = \frac{(1.96)^2 0.71(1-0.71)}{(0.05)^2} = 316$$

$$Assuming\ 5\%\ non\ response\ rate, nf = 332$$

4.6 Sampling procedures

Participants were chosen using a multistage stage sampling approach. Initially, simple random selection was employed to choose 6 kebeles from a list of 17 kebeles, based on the WHO rule of thumb of 30% inclusion for prevalence studies(53). The needed number of households was distributed proportionally across the kebeles. Households were picked from each kebele using systematic selection techniques with a predetermined sample interval; every 31st household in the kebele was chosen, with an estimated 1700 households per kebele and approximately 56 participants per kebele. After that, a systematic sampling approach was used to choose homes from each of the selected kebeles, and a bottle spinning technique was used to select the first house from the middle of the selected kebeles. Then, inside the sample interval, a random number was chosen, and the number of homes in the direction of the bottle's head was tallied until the selected number reached; finally, the next household was chosen by adding the sampling interval to the randomly chosen number. Finally, using simple random selection, one eligible adult was chosen from each home.

4.7 Study Variables

4.7.1. *Dependent Variables*

- KAP towards CVDs risk factors
- Random blood sugar (RBS), BP, Smoking, physical inactivity, Dyslipidemia, alcohol consumption, diet, and BMI, abdominal circumference, and Khat chewing Habit.

4.7.2. *Independent Variables*

- Socio-demographic variables including age, sex, marital status, education, income, health care provider counseling, and last date a hath care provider seen.

4.8 Operational Definitions

- Knowledge of CVDs risk factors; was the understanding of a condition or facts that was tested based on eight questions from the HDFQ retrieving details about smoking, obesity, alcohol intake, unhealthy diet, physical inactivity, HTN, diabetes, and dyslipidemia(54) and one question about khat chewing. If a person has a sufficient

score on HDFQ, he or she will be considered of having good knowledge of CVD risk factors.

- Established ASCVDs; was a person told by a Clinician to have CVD including CAD (angina and myocardial infarction), stroke, PAD, and heart failure
- Adult; was a person ≥18 years of age.
- Active Smoker; a person who smoked at least one cigarette within the past one month of the study period.
- Ex-smoker; a person who quit smoking for at least one month before the study
- Current Khat chewer; a person who chewed khat within the past one month of the study period.
- Attitude towards CVD risk factors; was the individual's perception of CVDs risk factors as a health problem which was assessed by using a Likert scale of five degrees of agreement from "strongly agree" to "strongly disagree" on nine of the questions used for assessment of knowledge.
- Practice towards CVD risk factors; was an individual's behavior in daily practice which can either lower or increase CVD risks. It was assessed by questions related to an individual's habit of smoking, diet, exercise, and habit of having blood sugar measurement, the habit of having blood lipid measurement, the habit of chewing khat, the habit of salt consumption, and the habit of having BP measurement.
- A serving of fruit or vegetable was about 100grams of fruits or vegetable (55).
- Non -modifiable risk factors refer to age, sex, and family history (18).
- Modifiable risk factors refer to poor diet, physical inactivity, HTN, DM, overweight/obesity, central obesity (18).
- Behavioural risk factors refer to smoking, harmful use of alcohol (18), and khat chewing (4).
- Moderate-intensity exercise refer to total physical activity MET-minute per week≥600minute/week (18).
- Vigorus intensity exercise refers to total physical activity MET-minute/week ≥1500minute/week (18).
- Blood pressure was classified as normal, prehypertension, and hypertension which was described as SBP/DBP of ≤120mmHg/80mmHg, 120-130mmHg/80-90mmHg, ≥140mmHg/90 mmHg respectively (18).
- The results of WC and BMI of the participants were classified according to the new Ethiopian standard for anthropometric classification which was described in the result section (56).
- Age of the participants was calssfied for comparession purpose as ≥45 years (older) & <45 years (young) since, CVDs risk factors starts to increase at age of 45 years (17).
- One "standard" drink (or one alcoholic drink equivalent) contains roughly 14 grams of pure alcohol, which is found in: 12 ounces of regular beer, which is usually about

5% alcohol; 5 ounces of wine, which is typically about 12% alcohol and 1.5 ounces of distilled spirits (or local alcohol), which is about 40% alcohol. (https://www.niaaa.nih.gov/alcohols-effects-health/overview-alcohol)

4.9 Data collection Tools and Procedures

The data were collected using an interviewer-administered structured questionnaire which was translated into Afan -Oromo & Amharic via a back-to-back translation approach by the interviewer.

Individuals Demographics, Health Care Access, Socio-economic status, Patient awareness of contributing risk factors, Risk Factors Assessment, Tobacco Use, Alcohol Consumption, Diet, Physical Activity, HTN, Diabetes, Dyslipidemia, and in addition Khat chewing habit was being recorded.

The nine questions from HDFQ were used to determine the patient's knowledge level of CVDs risk, as well as one additional question about khat chewing patterns on a three-point scale, with "one" denoting a “yes” answer and "two" denoting a “no” answer & “three” denoting “I don’t know” response. Then it was scored by adding each participant's “yes” response for all the objects. A higher score indicated a greater understanding of CV risk factors. Good/optimal knowledge (score>=70%), fair knowledge (score between 50 and 69%), and poor level of knowledge (score 50%) were a score out of 100% (54).

The height and weight of participants were assessed using standardized methods in order to determine obesity and overweight, as suggested by the National Health and Nutrition Examination Surveys Procedures for anthropometry and physical activity monitoring (57).

Based on JNC (Joint National Committee) 8 recommendations for BP measurement, systolic and diastolic BP were measured for two readings with a digital BP machine, each separated by 5 min of rest in between (58).

Random blood sugar measurement was taken with a digital glucose meter following the procedure explained to the participant.

Finally, the questionnaire was prepared based on the WHO STEPS approach to non-communicable disease (NCDS) risk factor surveillance (52).

4.10 Data Quality Control

To control the quality of data, the following measures were taken; effective training was provided for data collectors and supervisors on the data collection process and the collected data were checked for completeness and consistency on the same day of collection.

Waist circumference, weight, height, and BP were taken using the standard methods with calibrated equipment. Two measurements of BP were recorded and the lower value was taken. The instruments were tested on 5% of the respondents in Jimma Town to prevent data contamination. Supervisors performed the spot cheeking and review of all the completed questionnaires to ensure completeness and consistency of the information collected and those

questionnaires which were incorrectly filled or incomplete were given back to the data collectors for completeness.

At the end capillary blood sample was taken for measurement of RBS for all individuals.

4.11 Data Entry, Analysis, and Processing

The generated data using questionnaires and biochemical analysis was cheeked, edited, coded, and entered a personal computer using Epi data version 3.1, and data analysis was conducted with "Statistical Package for Social Sciences" software (SPSS, version 26). Descriptive statistics were used to describe participant socio-demographics, distribution of risk factors, knowledge, attitude, and mean for continuous variables and comparison between two continuous variables was done with an independent samples T-test with a level of significance at a P-value of <0.05 and 95% CI.

Significant correlations between nominal or continuous variables and continuous outcomes were tested using a model of linear regression, whereas significant associations between nominal or continuous variables and nominal outcomes were tested using model of binary logistic regression. Variables with a P-value of ≤ 0.25 on univariate logestic regression were chosen as candidates for multivariable studies. The goodness-of-fit test developed by Hosmer and Lemeshow was used to assess model fitness. Multicollinearity was also verified by seeing if the standard error was < 2, VIF<5, tolerance was >0.1 matrix, and all tests were two-sided. For both linear and logistic regression the alpha was set at < 0.05 significance level for all reported p-values and variables with only significant p value was put in tables& an AOR (Adjusted Odds Ratio) were put for binary logistic regression.

4.12 Ethical Considerations

A formal letter of ethical permission was gained from the institutional review board of Jimma University, and the permission letter was delivered to the administrator of the Keble chief.

All the study participants were informed about the purpose of the study, about the right to participate or to terminate at any time if they want and respondents were ensured about the confidentiality of information obtained. The verbal consent of respondents was obtained by asking whether they participate or not.

After that, the data collectors started the data collection by considering the norms, values, beliefs, cultures, and confidentiality of the participants. The beneficence of the participants was maintained throughout the study. COVID-19 prevention protocol was followed.

4.13 Dissemination plan

The results of this research are submitted to Jimma University's College of Health Sciences and the Jimma Town Health Bureau. The findings will be disseminated to various stakeholders who can help improve the country's health. Finally, efforts will be made to present the findings at various seminars and workshops, as well as to publish them in peer-reviewed publications.

CHAPTER FIVE

5. Result

5.1 Socio-demographic charachterstics of the study participants

A total of 332 participants were included in the study with a response rate of 100%. One hundred eighty-seven (56.3 %) of them were women. The study population's mean age was 40.74 years with an SD of (±15.19). Fifty-two percent of the study population got overall council from health care professionals. About 26.5% had health care coverage & 16.5% of them were either illiterate or read &write only. Most of them (62.2%) had low income (<2250 birr/month). Regarding occupation, 26.5% were government employe and 25.9 % were housewives. When we look at the age category about 38% of them were ≥45 years while the rest were between 18 and 44 years. Table 5.1 summarized socio-demographic characteristics of the study population during, November 2021.

Table 5. 1:Socio-demographic characteristics of the study participants of the magnitude of CVDs risk factors and public KAP towards them in Jimma Town, November 2021(N=332)

Variables	Variable category	Frequency	Percent
Counseled by Health Care Professional	Yes No	172 160	52% 48%
Last date a health care provider seen	Within the past year	187	56.3%
	Within the past 2 years	20	6%
	Within the past 5 years	26	7.8%
	>5 years	13	3.9%
	Never	86	25.9%
Monthly income	Low (<2250 birr)	223	67.2%
	Medium (2500- 8900 birr)	98	29.5%
	High (>8900 birr)	11	3.3%
Occupation	Farmer	4	1.2%
	Merchant	41	12.3%
	Housewife	86	25.9%

	Healthcare professionals	3	0.9%
	Other Gov.employe	88	26.5%
	Un employed	30	9%
	Others[1]	80	24.1%
Do you have health care coverage	Yes	88	26.5%
	No	244	73.5%
Education	Illitrate	25	7.5
	Read & write	30	9
	Elementary	116	34.9
	High school	82	24.7
	College/University	79	23.8
Marital status	Single	55	16.6%
	Married	228	68.7%
	Divorced	18	5.4%
	Widowed/Widower	31	9.3%
Ethincity	Oromo	162	48.8%
	Amhara	58	17.5%
	Dawro	33	9.9%
	Gurage	30	9%
	Others[2]	49	14.8%
Religion	Orthodox	134	40.4%
	Muslim	138	41.6%
	Protestant	56	16.9%
	Others[3]	4	1.2%

[1]self employed and student [2]Silte, Tigree, and Wolyeta [3]Catholic&Wakefata

5.2 Knowoledge of CVDs risk factors

The internal reliability and validity of those ten questions used to assess the knowledge of CVDs risk factors were cheeked and the questions were found to have high internal reliability at Cronbach's Alpha of 0.919 and had internal validity with p = 0.000 at 95% CI.

When asked closed-ended questions concerning risk factors, the most known risk factors by the participants were smoking and alcohol consumption (76.8%). The other mentioned risk factors were too much dietary salt intake (74.1%), physical inactivity (73.5%), improper diet (70.2%), obesity &overweight (62.7%), Chewing khat (56%), HTN (56%). DM (54.2%) and dyslipidemia (52.1%) were the least indicated risk factors. About 46 (13.9%) of the participants were unable to identify any of the ten risk factors. Figure 5.1 summarized the proportion of participants knowledgeable of risk factors.

The participants' knowledge scores for CVDs risk factors were summarized in figure 5.2. Only 56.4% of the participants had a good knowledge score.

The level of knowledge had a strong relationship with a variety of characteristics (Table 5.2). Those who were more educated, had no habit of often adding salt to a meal, had moderate or higher income, were government employe, and sat fewer hours a day had a higher knowledge score.

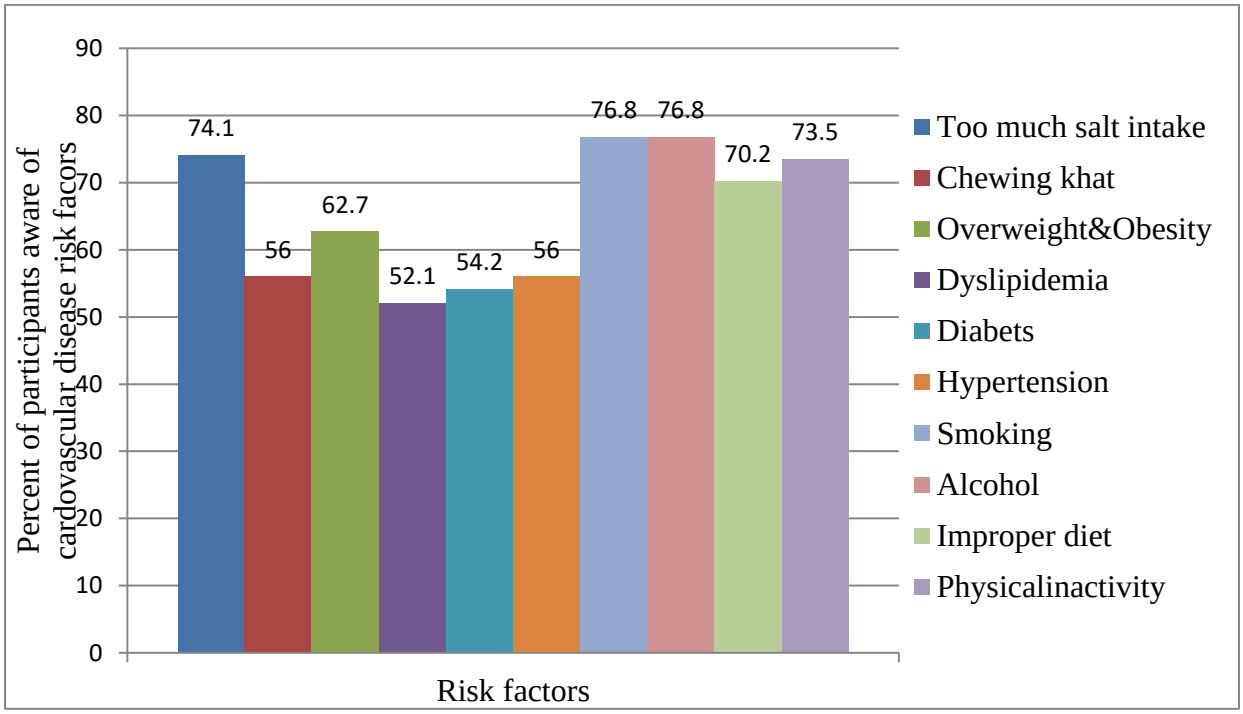

Figure 5. 1: Proportion of participants in Jimma Town who were knowledgeable of CVDs risk factors, November 2021(N=332).

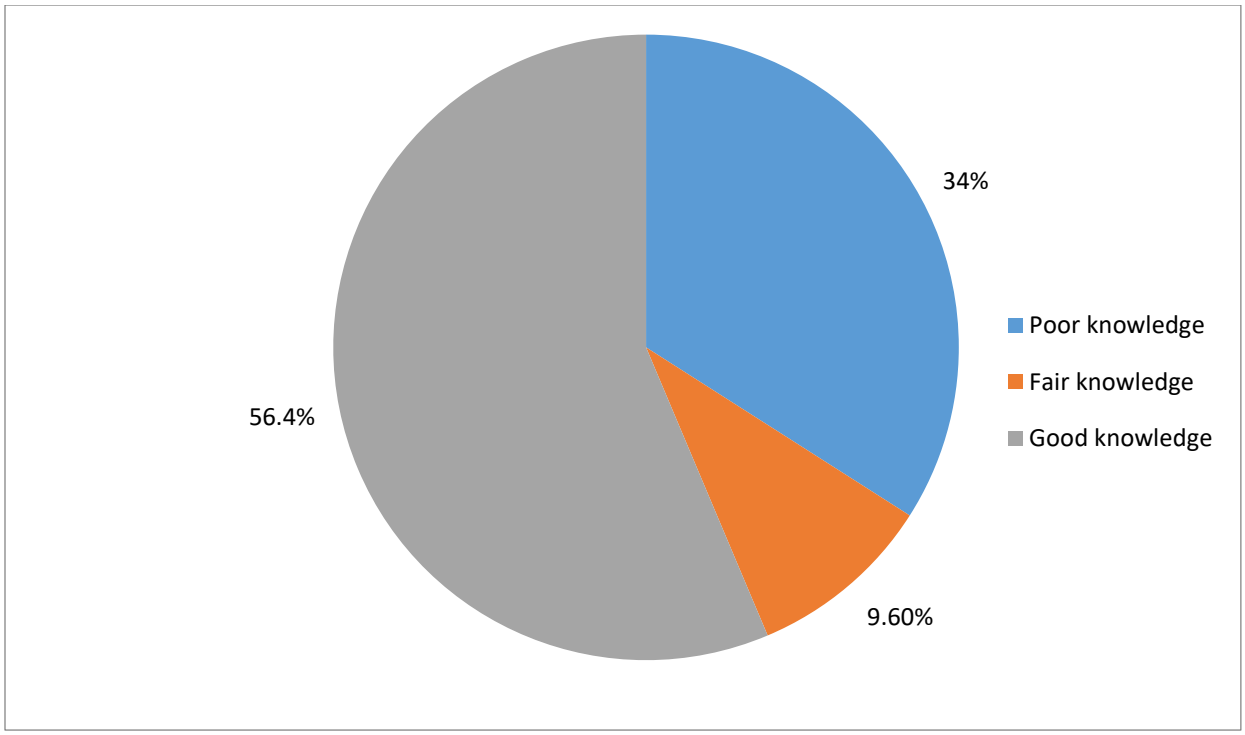

Figure 5. 2 : CVDs risk factors Knowlege score of the study participants in Jimma Town, November 2021(N=332)

Table 5. 2:Correlations of different variables on linear regression model at 95% confidence level among the study participants of Jimma town, November 2021(N=332)

Dependent variable (type)	Independent variable	ß[4]	P-value	Confidence Interval
Knowledge score(continuous)	Habit of adding salt to food (yes)	1	1	1
	Habit of adding salt to food (no)	.807	.000	(0.190, 0.262)
	Sitting hour ≥ 7hours/day	1	1	1
	Sitting hour/day <7hours/day	.816	.000	(0.032, 0.047)
	Education (un educated[2])	1	1	1
	Education (educated)	.198	.000	(0.279, 0.933)
	Occupation (other[3])	1	1	1
	Occoupation (gov. employe)	0.532	.000	(0.019, 0.035)

	Income (moderate & high)	1	1	1
	Income (low)	-0.118	.032	(-0.173, -0.008)
Average measured CVDs risk factors (continuous)	Age (continuous)	.237	.000	(0.002, 0.005)
	Gender (female)	1	1	1
	Gender (male)	-.170	.001	(-0.120, -0.029)
	SBP (continuous)	.300	.014	(0.004, 0.031)
	Smoking (no)		1	1
	Smoking (yes))	.298	.013	(0.254, 1.967)
	Alchol consumption (no)	1	1	1
	Alcohol consumption (yes)	.294	.013	(0.206, 1.618)
	Khat chewing (no)	1	1	1
	Khat chewing (yes)	.333	.007	(0.240, 1.399)
Attitude score (continuous)	Knowledge score (continuous)	.611	.000	(10.329, 13.559)
	Income/month(low)	1	1	1
	Income per month (moderate&high)	.171	.000	(1.129, 3.271)
	Age (continuous)	.083	.049	(0.00, 0.076)
SBP (continuous)	Age(continuous)	-.232	0.000	(-0.047, -0.018)
	Added salt to food (Yes)	1	1	1
	Added salt to food (No)	-.160	0.002	(-0.048, -0.011)
	Marital status (Married)	1	1	1
	Marital status (Single, Divorced, Widowed)	-.147	0.006	(-0.044, 0.007)
DBP(Continous)	WC (continuous)	.182	0.001	(14.077, 55.690)
	Age(continuous)	-.162	0.004	(-6.774, -1.331)

	Added salt to food (yes)	1	1	1
	Added salt to food (no)	-.124	0.021	(-7.524, -0.606)
	Gender (male)	1	1	1
	Gender (female)	-.163	0.000	(-0.037, -0.013)
	Income per month (moderate & high)	1	1	1
	Income per month (low)	-.139	0.001	(-0.036, -0.010)
	Days of vegetable consumption/week (continuous)	.144	0.000	(0.003, 0.010)
	Time spent sitting/reclining(continuous)	.081	0.037	(0.000, 0.005)
	Vigorous exercise (no)	1	1	1
	Vigorous exercise (yes)	.131	0.001	(-0.046, -0.011)
WC (continuous)	BMI (continuous)	.661	0.000	(0.009, 0.11)
	Marital status (married)	1	1	1
	Marital status (single, divoreced & widowed)	-.156	0.000	(-0.039, -0.012)
	RBS (continuous)	.086	0.032	(0.000, 0.000)
	Time spent sitting/reclining (continuous)	-.081	0.042	(-0.004, 0.000)
Days of fruit consumption/week(continuous)	Age (continuous)	.134	0.022	(0.051, 0.647)
	Income/month (moderate & high)	1	1	1
	Income/month (low)	-.208	0.001	(-.855, -0.216)
Days of vegetable consumption/week(continuous)	Income/month (moderate& high)	1	1	1
	Income/ month (low)	-.175	0.008	(-1.094, -0.167)

1=refernce group of dummy coded categorical variables [2]illitrate, read and write [3]merchant, farmer, student, self employed [4]standardized cofficent

5.3 Attitude towards CVDs risk factors among participants who had good knowledge score

The internal reliability and validity of the ten items used to assess attitude towards CVDs risk factors were checked and the questions were found to have high internal reliability at Cronbach's Alpha of 0.938 and internal validity at p=0.000 with 95% CI.

The mean score for the attitude section among participants who had a good knowledge score of CVDs risk factors was 39.14±6.27, with 19.00 and 50.00 as the lowest and highest scores, respectively. Table 5.3 described the proportion of participants with their attitude towards each of the ten questions concerning CVDs risk factors among participants who had good knowledge scores.

Most of the participants answered they "strongly agree" or "agree" with increased alcohol consumption (86.6%), smoking (88.2%), a diet rich in fruits and vegetables (84%), routine physical activity (85.6%), as a predisposing or protective factor for developing CVDs respectively. However, only 68.4 % agreed with a statement about looking at the salt level in food has health importance. On linear regression model, the average attitude scores among the participants were positively correlated with higher knowledge score, increased age, and moderate&higher income per month at a 95% confidence interval (table 5.2).

Table 5.3: Attitude towards CVDs risk factors among study participants of Jimma Town who has good knowledge score, November 2021(N=187)

Likert scale questions

Items		frequency	Percent of study participants
Looking the salt level on food has importance	Agree	136	72.7%
	Disagree	11	5.9%
	Neutral	40	21.4%
Avoiding khat chewing can decrease the chance of developing CVDs	Agree	128	68.4%
	Disagree	19	10.2%
	Neutral	40	21.4%
Lowering body weight protect you from developing CVDs	Agree	135	72.2%
	Disagree	13	7.0%
	Neutral	39	20.9%
Avoiding diet high in Cholesterol decrease risk of	Agree	136	72.7%

CVDS	Disagree	10	5.3%
	Neutral	41	21.9%
Lowering high blood sugar with diet decrease your CVDs risk	Agree	140	74.9%
	Disagree	14	7.5%
	Neutral	33	17.6%
Lowering BP with drug can decrease your CVDs risk	Agree	148	79.1%
	Disagree	12	6.4%
	Neutral	27	14.4%
Routine physical activity can protect you from developing CVDs	Agree	160	85.6%
	Disagree	15	8.0%
	Neutral	12	6.4%
Diet rich in fruits and vegetables are protective of CVD	Agree	157	84.0%
	Disagree	13	7.0%
	Neutral	17	9.1%
Smokers are highly likely to develop CVDs than non-smokers	Agree	165	88.2%
	Disagree	10	5.3%
	Neutral	12	6.4%
Increased alcohol consumption predisposes to CVD	Agree	162	86.6%
	Disagree	11	5.9%
	Neutral	14	7.5%

Agree= sum of strongly agree and agree. Disagree= sum of strongly disagree and disagree.

5.4 Practice towards CVDs risk factors

Regarding the physical activity level of the participants, most of them (70.2%) didn't have the practice of doing moderate-intensity exercise while 27.4% & 2.4 % did moderate-intensity exercise with time engaged in exercise per week of ≥150 minutes/week & <150 minute/week respectively. Similarly, most of them (85.2%) had no habit of performing the vigorous-intensity exercise as a part of scheduled physical activity per week. Only 6.8 % of them sat per day for seven hours and above.

Regarding dietary patterns, only 2.4 % of the participants had consumed fruits daily while only 8.7 % of them had consumed vegetables daily. Most of them often add salt to each meal daily. Around 21.8% of them had consumed 1 to 2 servings of sweet food in a week. The practice of the participants towards modifiable CVDs risk factors was found in table 5.4.

On multivariate binary logistic regression model the habit of doing moderate exercise was correlated with being male gender, younger age group (<45 years), recently visiting of health care provider (within the past 2 years), and being educated (elementary & above) while the habit of doing moderate-intensity exercise was associated with male gender and younger age group (table 5.5)

On multivariate linear regression the days of fruit consumed per week were strongly correlated with increasing age and moderate and higher income while vegetables consumed was correlated only with increased income (See table 5.2).

Table 5. 4 : The practice towards CVDs risk factors among the study participants of Jimma Town, November 2021(N=332)

Variables	Category	Ferquency	Percent
Sitting hours/day	0-3 hours	172	51.8%
	3-7 hours	137	41.3%
	≥7 hours	23	6.9%
Moderate exercise in minutes/week	≤149 minutes/Week	8	2.4%
	≥150 minute/Week	91	27.4%
	None	233	70.2%
Vigorous exercise in minutes/week	<75 minute/Week	2	0.6
	75-150 minutes/Week	8	2.4%
	≥150 minutes/Week	39	11.7%
	None	283	85.2%
Kahat chewing habit	Usually	66	19.9%
	Occasionally	56	16.9%
	None	210	63.3%
Alcohol drinking/day	0 drink	274	82.5%
	1 drink	42	12.7%
	2 drinks	11	3.3%

	≥ 3 drinks	5	1.5%
Days of fruit consumption/week	< 2 days	264	79.5%
	2-3 days	39	11.7%
	4-6 days	17	5.1%
	Daily	8	2.4%
	None	4	1.2%
Days of vegetable consumption/week	< 2 days	151	45.48%
	2-3 days	91	27.4%
	4-6 days	61	18.4%
	Daily	29	8.7%
Usually add salt before each meal	Yes	282	85%
	No	50	15%
Serving of sweet foods/week	None	257	77.4%
	1-2 serves	72	21.8%
	≥2 serves	3	0.9%
Serving of fried foods/week	Less than once	280	84.3%
	1-2 times	38	11.5%
	3-6 times	13	4.21%
Smoking status	Current smoker	12	3.6%
	Second-hand smoker	26	7.8%
	Ex-smoker	14	4.2%
	Never smoked	280	84.3%

Table 5. 5: Correlations of variables in multivariate binary logistic regression model among the study participants in Jimma Town, November 2021

Dependent variable (type of variable)	Independent variable	Frequency	P-value at 95% CI for EXP(ß)	AOR(CI)
Do you do moderate intensity exercise(nominal)	Gender (Female)	43	1	1
	Gender (Male)	56	0.001	2.551(1.500, 4.339)
	Age (≥45 years)	21	1	1
	Age (<45 years)	78	0.008	2.315(1.248, 4.295)
	Health care provider seen (>2 years)	39	1	1
	Health care provider seen (≤2 years)	60	0.020	2.151(1.126, 4.108)
	Education (un educated)	8	1	1
	[2]Education(educated)	91	0.005	2.338(1.307, 4.365)
Do you do vigorus intensity exercise(nominal)	Age (≥45 years)	7	1	1
	Age (<45 years)	40	0.005	3.643(1.467, 9.052)
	Gender (Female)	11	1	1
	Gender (Male)	36	0.000	6.630(3.032,14.498)
Rised RBS (nominal)	Age (<45 years)	6	1	1
	Age (≥45 years)	12	0.012	4.092 (1.360,12.317)

Alchol consumption(nominal)	Age(<45Years)	28		
	Age (≥45 years)	31	0.004	2.656 (1.378,5.121)
	Gender (Female)	24	1	1
	Gender (Male)	35	0.027	2.008 (1.081,3.732)
	Income/month(low)	25	1	1
	[3]Income per month(high)	30	0.010	2.534 (1.250,5.135)
Smoking(nominal)	Gender (Female)	2	1	1
	Gender (Male)	24	0.000	16.985 (3.899,73.99)
Khat chewing	Age (≥45 years)	24	1	1
	Age (<45 years)	98	0.000	3.571 (1.859, 6.861)
	Gender (Female)	30	1	1
	Gender (Male)	92	0.000	10.072(5.738, 17.679)
	[2]Education(educated)	25	1	1
	Eduction(educated)	97	0.004	2.465 (1.338,4.541)

1= Reference group after dummy coded [2]Illitrate or read and write only [3]Those who earned medium and high income/month.

5.5 Magnitude of behavioural CVDs risk factors of the participants

The proportion of participants who had consumed alcohol was 17.8 % while 4 .8 % of them had 2 and above drinks per day. The proportion of participants who usually chewed khat within 1 month of the study period was 19.9%. About11.4% of them were either active smoker or second-hand smokers. The magnitude of behavioral CVDs risk factors was summarized in table 5.4 above.

At multivariate binary logistic regression model, the practice of consuming alcohol was correlated with older age (≥45 years), male gender, and higher-income while smoking practice was correlated with the male gender. The practice of chewing khat was strongly correlated with male gender and younger age (<45 years). See table 5.5 above

5.6 Magnitude of measured CVDs risk factors of the study participants

The average SBP and DBP were 128.95±20.443 and 87.90±12.062, respectively (Table 5.3). Normal BP (SBP 120 and/or DBP 80mmHg), preHTN (SBP 120–139 and/or DBP 80–89 mmHg), and HTN (SBP ≥140 mmHg and/or DBP ≥90 mmHg) were the three groups of BP measurements (Figure 3). Only 22.3% of them had normal BP while 33.1% & 44.6% had preHTN and HTN respectively (fig 5.3).

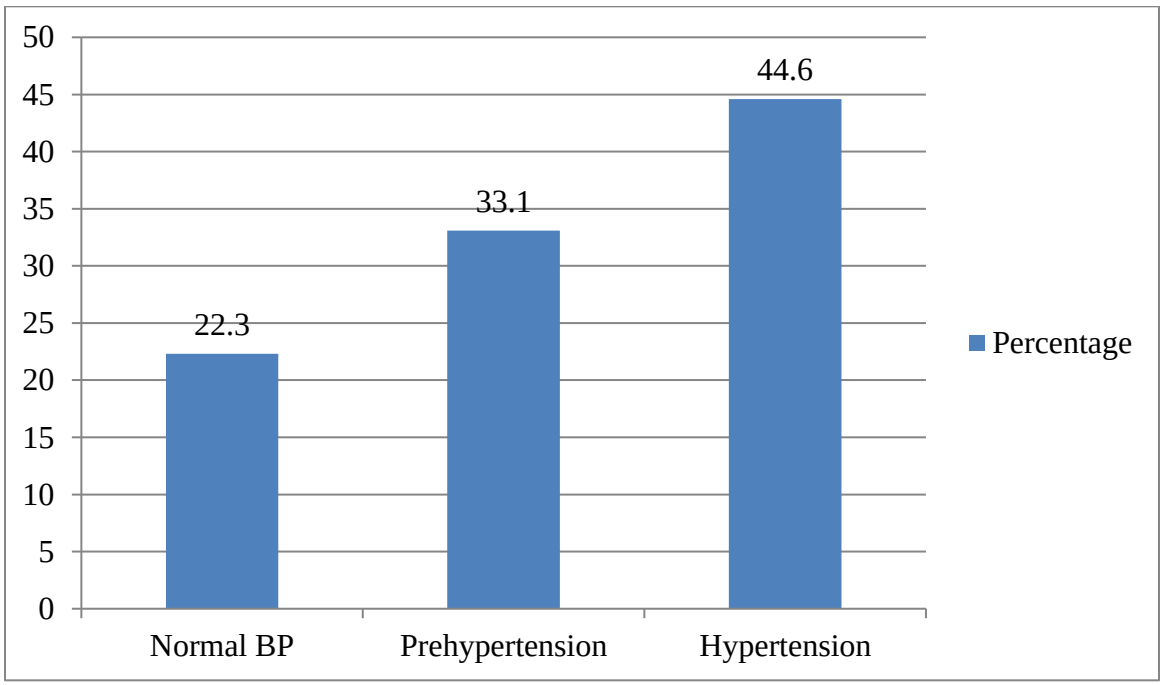

Figure 5. 3: BP category of the study population in Jimma Town, November 2021(N=332)

The mean of WC of the female study participants was 81.9516 cm (±12.74332) while the mean for male participants was 79.9448 cm (±9.66148) (table 5. 6). Out of 187 females, most of them (55%) had central obesity (WC ≥ 78cm) while out of 145 males only 39.9% of them had central

obesity (WC ≥ 87.3cm). See table 5.7. There is no statistically significant difference between the WC of male and female participants on independent samples T-test (MD = -2.00679, p= 0.104, 95% CI [-4.51226, 0.49869]).

Table 5. 6:The mean of measured and biochemical parameters of the study participants in Jimma Town, November 2021.

Parameters	Mean±SD(N=332)	Minumum	Maximum
SBP (mmHg)	128.95±20.443	78	213
DBP (mmHg)	87.90±12.062	52	130
RBS (mg/dl) (n=325)	124.76±48.113	67	443
WC of females in cm (n=331)	81.9516±12.74332	56.00	112.00
WC of malesin in cm (n=331)	79.9448±9.66148	64.00	125.00
BMI of males (n=328)	21.5212±3.41017	14.86	38.42
BMI females (n=324)	23.3256±4.31875	14.87	34.48
Knowledge score in %(n=332)	65.24±35.971	0.00	100.00
Attitude score (n=332)	35.9729±7.02666	11.00	50.00
Average of modifiable CVDs risks (n=332)	1.4455±1.18696	0	7

The average BMI score of the male participants was 21.5212 (±3.41017) kg/m² (see table 5.3). About 51.2% of them had obesity, and 6.7% of them were overweight. So, according to the new Ethiopian anthropometric standard, 57.9 % of the total male participants were at risk of developing obesity. The mean BMI score for the female study population was 23.3256 (±4.31875) Kg/m². Similarly, according to the new Ethiopian anthropometric standard out of 187 female participants 29% were obese and 13.6% were overweight. Overall, 42.6% of the female subjects were at risk of developing obesity according to BMI classification. On independent samples T-test females had higher BMI than males (MD = -1.80820, p= 0.000, 95% CI [-2.63103, -0.98538).

The mean average RBS was 124.76 (±48.113) mg/dl while the prevalence of RBS ≥ 200mg/dl was 5.5%. Table 5.7 summarized the magnitude of measured CVDs risk factors. The average of measured CVDs risk factors was 1.45± (1.187).

Table 5. 7: The magnitude of measured CVDs risk factors among the study participants in Jimma Town, November 2021

Item	measurement	frequency	Proportion
WC of females[1] (n=331)	<78 cm	149	45.0%
	>=78 cm	182	55.0%
Waist[1] circumference of male(n=331)	<87.3 cm	199	60.1%
	>87.3 cm	132	39.9%
BMI of females[1](n=324)	Obese	94	29.0%
	Overweight	44	13.6%
	Normal	34	10.5%
	Mild to Moderate Chronic Energy deficiency	38	11.7%
	Severe Chronic Energy Deficiency	114	35.2%
BMI of males[1](n=328)	Obese	168	51.2%
	Overweight	22	6.7%
	Normal	86	26.2%
	Mild to Moderate Chronic Energy deficiency	48	14.6%
	Severe Chronic Energy Deficiency	4	1.2%
RBS (n=325)	< 200mg/dl	307	94.5%
	≥200g/dl	18	5.5%

[1]Newely defined Ethiopian anthropometric standard: *Sinaga M, Worku M, Yemane T, Tegene E, Wakayo T, Girma T, Lindstrom D, Belachew T. Optimal cut-off for obesity and markers of metabolic syndrome for Ethiopian adults. Nutrition journal. 2018 Dec;17(1):1-2.*

On multivariate linear regression model increased SBP was correlated with increased age, BMI, the habit of often adding salt to a meal, and being married. Increased DBP was correlated with increased WC, increased age, and the habit of often adding salt to a meal. Increased BMI of the participants was correlated with increased WC, male gender, higher income, lower days of

vegetable consumed/week, increased time of sitting/day, and lack of doing vigorous intensity exercise while the increased WC was correlated with being married, higher time spent sitting/reclining per day, increased income, and increased RBS level (table5.5). The increased average of measured CVDs risk factors was positively correlated with increased age, being female gender, increased BMI, smoking cigaritte, alcohol consumption, and khat chewing habit (Table 5.5).

5.7 Magnitude of non-modifiable CVDs risk factors

About 6.1 % of the participants had a family history of CVDs while 22% of the male participants were aged fifty-five and above and 9.6% of the female study population were age 65 or above; the ages at which traditional CVDs risk factors start to rise. See table 5.8 below.

Table 5. 8 The magnitude of non-modifiable risk factors of the study participants in Jimma Town, November 2021

Non-modifiable CVDs risk factors		Frequency	Percentage
Family history of CVDs (n=328)	Yes	20	6.1%
	No	308	93.9%
Male (n=332)	< 55 years	259	78.0%
	≥ 55 years	73	22.0%
Female (n=332)	< 65 years	300	90.4%
	≥65 years	32	9.6%

6. Disscussion

6.1 Knowoledge of CVDs risk factors

To the best of the researcher's knowledge, this was the first study in Ethiopia to conduct a community-based assessment of public KAP toward CVDs risk factors.

In this study, it was found that low level of knowledge of CVDs risk factors among the study participants. Only about 56.4% of them had a good knowledge score of CVDs risk factors. Regarding knowledge of the specific risk factors of CVDs assessed on closed-ended questions the most known risk factors by the participants were smoking and alcohol consumption, while the least known risk factors by the participants were chewing khat, HTN, diabetes, and dyslipidemia. About 13.9% of them didn't identify even one CVDs risk factor. The finding of this study was comparable to the results of most studies in SSA in which the majority of adult populations had poor knowledge of CVDs risk factors (5,29). In addition, similar to to the result of this study other community-based cross-sectional studies were also reported a low level of knowledge of risk factors of CVDs in the community (27,30–32).

In contrary to the finding of this study high knowledge level has been reported among a study that targets special populations like cardiac patients in outpatient clinics in East Ethiopia (3).

When compared to a study done in Lebanese, the population in this study had low knowledge score on HDFQ score assessed out of 100% (17); the difference of this result can be explained by the low educational status, low income, and low health-seeking behavior among the population of the current study.

When asked about each CVDs risk factor, 76.7 % knew smoking and alcohol consumption, 62.7 % knew overweight and obesity, 56.2 % knew HTN, and 54.2 % knew diabetes as risk factor. This was lower than a study done in an outpatient cardiac clinic in eastern Ethiopia in which 96.7% knew smoking, 91.3 % knew overweight and obesity, 81.9 % knew elevated BP (3).

Compared to the current study subjects, a higher proportion of participants in Buea, Cameroon was knowledgeable that smoking, unhealthy diet, lack of exercise, obesity, high BP, and DM were risk factors of CVDs. This may be due to participants in Buea, Cameroon had higher income, higher education and the majority of them were students (27).

Regarding the knowledge of smoking, overweight, and obesity as a risk factor of CVDs the proportion of participants in this study who were knowledgable was compared to a study done in Jordan(30), and the knowledge of HTN as a risk factor of CVDs was similar to study done in Uganda (34).

A community-based study in southwestern Nigeria revealed a lower proportion of the study population were knowledgeable of each CVDs risk factor when compared to this study(35). This discrepancy may be due to the methodological difference between the two studies in which the

study done in Nigeria used open-ended questions which required the participants to list the possible CVDs risk factors.

A good knowledge score of CVDs risk factors in this study was correlated with higher income, higher educational status, and being a government employee. And those who had good knowledge sat less /24 hours and consumed less salt than those who had poor knowledge. As a result, primary preventive interventions, particularly health education, should be provided to enhance population knowledge of the hazards associated with diabetes, dyslipidemia/abnormal cholesterol, improper diet, exercise, and other CVDs risk factors.

6.2 Attitude towards CVDs risk factors

The attitude towards CVDs risk factors of this population were lower than the study done in Malaysia. Even when the attitude among the participants who had good knowledge score of CVDs risk factors were compared to the study done in Malaysia the majority of the participants said they "strongly agree" or "agree" with exercise (96%), consuming fruits and vegetables (91%), and read nutritional facts about each food (90%) were protective of CVDs (33). But in this study 85.6% agree or strongly agree with the fact that doing regular exercise lowers the risk of CVDs, 84% agree or strongly agree with the fact of a diet rich in fruits and vegetables were protective of CVDs, 72% agree or strongly agree with the fact that looking at the salt level on food has health importance. Regarding attitude towards lowering or avoiding smoking decrease CVDs chance, both groups had a similar proportion of respondents. The discrepancy of this result can be explained by the study conducted in Malaysia was done among patients attending outpatient follow-up clinics in which those study participants may have more education and more knowledge of CVDs risk factors.

Since those having higher knowledge scores and higher-income had good attitude scores on multivariate linear regression, awareness creation on risk factors of CVDs has importance to boost the attitude of the participants of this study.

6.3 Practice towards ASCVDs risk factors

The majority of the participants in this study did not engage with moderate and high-intensity physical exercise which was significantly lower than the finding of a study conducted in rural Butajira and Addis Ababa (6) &North Ethiopia (15). This can be explained by the growing trend of a sedentary lifestyle in urban populations and the low level of knowledge&attitude of this study participants.

Only a minority of those participants in this study had eaten fruit and vegetables daily which was similar to the findings of a study done in rural Butajira&Addis-Ababa (6) and North Ethiopia (15). In contrast to this, the majority of participants in rural Tanzania(32), as well as, Lebanese had consumed fruit and vegetables daily (17). The discrepancy may be related to the difference in socio-economic status.

Table salt utilization habit of this population was very high similar to the finding of the study done in rural Tanzania (32).

The practice of doing moderate and high-intensity physical exercise was higher among the participants of this study who had higher income, higher education, being younger age (<45 years), and male while fruit consumption was higher among participants who had a higher income. Thes findings suggest that awareness creation on physical exercise & dietary diversification to tackle rising CVDs risk factors in this population is very important especially targeting female population and elder age.

6.4 Magnitude of behavioural CVDs risk factors

The proportion of participants who consumed alcohol and smoked a cigarette(both active and second-hand smokers) was higher than a study done in Jimma town during 2013 & Gilgel Gibe field research center (12,14). Despite this the proportion of participants who chewed khat was lower than the finding of those two studies which can be explained by a higher proportion of the study subjects in current one was females & there may be increased awareness of the participants about the adverse health outcome of khat chewing from the effect of prior studies done in Jimma town, the area of the current study.

In contrast to the findings of this study similar research which were done in Cameroon(27), Lebanese (17), and Jordan (30) has found that a higher proportion of their participants had consumed alcohol & smoked cigarettes which may be justified by the difference of socio-economic levels.

Those who were elder (≥ 45years) (AOR=2.656[1.378, 5.121], P=0.004), male (AOR= 2.008[1.081, 3.732] p= 0.027), and had higher income/month (AOR =2.534[1.250, 5.135)] p=0.010) at 95% CI had higher alcohol consumption when compared to the corresponding groups respectively. This has shown that the elderly, males, and higher-income groups should get special focus on alcohol-related CVDs risk factor counseling.

6.5 Magnitude of measured CVDs risk factors of the study participants

Using the new Ethiopian standard of anthropometric classification(56) about 55% of females and 39.9% of males were centrally obese, about 29 % females and 51.2 % of male participants met the criteria of obesity according to BMI which was comparable to a study done in North Ethiopia despite that study design was implemented the Western standards of anthropometry(15). In contrary to this finding the study done in West Ethiopia has shown slightly lower WC and BMI values than the current study (46). The increased overweight&obesity in this study can be explained by the higher urbanization &higher sedentary life of the participants compared to the study done in West Ethiopia.

Again, the prevalence of overweight&obesity in this study was much higher than those studies done 10 years prior in this area (11,14). These trends of increased overweight&obesity can be explained by several factors; among these, the first is this study used new Ethiopian

anthropometric cutoff values which used lower reading than the one which was used by the previous studies (the Western anthropometric standard), second was due to the increased magnitude of CVDs risk factors in this community due to the increased trends of sedentary life, urbanization, low level of knowledge and poor attitude of CVDs risk factors

On multivariate linear regression, those participants who had higher income, male gender, lower days of vegetable consumption /week, and those who didn't engage in vigorous-intensity exercise had higher BMI which were statistically significant at a 95% confidence level (Table 5.2).

In this study, almost a quarter of the study population had normal BP (both systolic and diastolic), while one-third were prehypertensive& the remaining were hypertensive. When compared to the result of different studies done in a similar area, the proportion of the population who were prehypertensive and hypertensive was increasing (11,14), which may be explained by the changing dynamics of socio-demographic characteristics of the population associated with the increased practice of Western styles of life. But, the proportion of rised BP(prehypertensive & hypertensive) was lower than the study done in Lebanese (17).

In multivariate linear regression, there was a positive correlation between increased age, BMI, the habit of usually adding salt to food, and being married to SBP while DBP was associated with WC, age, and the habit of adding salt to the diet. This shows us health education targeting dietary pattern and exercise are important in this population.

About 5.5% of the participants in this study were at risk of developing diabetes (asymptomatic RBS≥200mg/dl) which was comparable to the prevalence of type II diabetes from the previous study done in this area(47). In multivariate logistic regression, age ≥45 years were independently correlated with RBS≥200mg/dl with [AOR=4.092,95% CI (1.360,12.317)].

The average of measured CVDs risk factors (1.4455±1.18696) was higher than a similar study previously done in this area which revealed that only 70.9% of the participants had at least one jrisk factor(11) but lower than a study done in Lebanese (17). The increased average of measured CVDs risk factors was positively correlated with increased age, female gender, increased BMI, smoking cigarettes, alcohol consumption, and khat chewing habit, which were statistically significant with (p- values <0.05 at 95% CI).

6.6 Magnitude of non-modifiable CVDs risk factors

A significant proportion of these study participants especially women were in the age category which predispose them to the traditional risks of ASCVDs. The proportion of participants who has a family history of CVDs was 6.1%. Even though there was no previous community-level study that assessed the magnitude of family history of CVDs, the family history of CVDs in a multi-ethnic hypertensive population cohort was 31% (48).

Even though we can not change the magnitude of non-modifiable CVDs risk factors, still health education and awareness creation for early screening of at-risk individuals are recommended.

7 Conclusion

Despite the increasing magnitude of modifiable CVDs risk factors at an alarming rate in this population, the public knowledge of CVDs risk factors was low and the population's attitude towards them was poor even among subgroups of participants who had good knowledge scores. In addition, the practice of CVDs risk reduction lifestyles in this community was very low. The low knowledge and poor attitude level of this community were due to low education & lack of health information, and low economic status. At the same time, the increasing prevalence of modifiable CVDs risk factors was associated with low education, low knowledge level & lack of health education, inadequate level of physical exercise, inadequate consumption of cardioprotective fruits&vegetables, consumption of fried foods, the habit of often adding salt to meals and the shift of the trends towards sedentary ways of life.

7.1 Strength

To the best of the researcher's knowledge, this study was the first of its kind in Ethiopia to asses the public KAP towards CVDs risk factors at the community level. In addition, through following standardized approaches like the WHO STEPS approach and other standardized data collection procedures it tried to generate high-quality data, results, and conclusions, as well as, objectives were met especially in filling the gap of why CVDs risk factors were increasing in this community.

7.2 Limitation

Blood pressure measurement after 6 hours of interviewing the participants was not repeated because it was difficult to re-encounter the participants within the same day of the data collection.

7.3 Recommendations

For Jimma Town health office and other stakeholders

The Jimma Town Health bureau should consider the rising magnitude of modifiable CVDs risk factors despite the low level of knowledge, attitude & practice towards modifiable CVDs risk factors in this population and reinforce the existing chronic NCDS preventive strategy by combining high-risk and general-population methods.

Through the employment of health extension professionals, the Town Health Office should increase its efforts to raise knowledge &attitude towards CVDs risk factors to reduce the burden of CVDs.

The Town Health Office, in partnership with the Sports Commission and other responsible parties, should encourage residents to become more physically active.

For Minstry of Health

The ministry of health of Ethiopia should have a national consolidated guideline that would help the local community leaders, health extension workers, physicians, and other concerned bodies that would help on counseling and apply early preventive strategy at the individual and community level

For the media

To lower the risk of CVDs burden, many outlets such as radio, informal meetings, and other social media should be used to raise awareness about the elevated risk of modifiable CVDs risk factors.

For the community

The public should be aware of the problem of low level of knowledge & poor attitude towards CVDs risk factors and the increasing magnitude of these risk factors, which was linked to physical inactivity, smoking, diabetes, abnormal weight/obesity, chewing khat, increased salt and alchol consumption, and monotonous diet and consumption of fried and sweet foods.

For the researchers

For the researcher, there is a need to do this study at a national level in order to encourage the national health policy and extend the recommendation of this study to nationwide

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Name…… Tel…….. kebele…....H. N……...

Annex-I

CARDIOVASCULAR DISEASE RISK ASSESSMENT QUESTIONNAIRE

Questionnaire for assessing KAP towards CVD risk factors and magnitude of cardiovascular disease risk factors among adult people of Jimma Town, South West Ethiopia, 2021. Jimma University: School of Medicine, Department of Internal Medicine Questionnaire developed to assess magnitude of cardiovascular disease risk factors and KAP towards them in Jimma Town

Verbal consent

Greeting….

My name is _____ I am working as data collector in a study conducted by Jimma University post graduate student on magnitude of CVDs risk factors and KAP towards them in Jimma Town. I would like to ask you a few questions about your personal characteristics; yours eating habit, your physical exercise, risk related behaviors and your willingness for whist circumference measurements, weight, height and blood pressure measurement and blood for laboratory measurement for HgbA1C and Lipid profile. This will help us to improve the prevention and control of modifiable cardiovascular disease risk factors by the information you provide us. Your response is very important and highly appreciable. I expect the interview may take about 15-30minutes.

You do not need to provide your name. Please be assured that all the information gathered will be kept strictly confidential. You can prefer not to respond to all or some of the questions and you can stop the interview at any time. Are you willing to participate in our study? Thank you for your cooperation!!!

Verbal consent obtained..... Yes ☐

No ☐

Date of data collection _____ / _____ / _____

(Ethiopian calendar: Day, Month, Year)

Name of Kebele _____ HH No. _____Questionnaire code _____

Name of data collector_____ Sign_____

Demographic Characteristics			
101	Age in years	……..Years	
102	Sex	1. Male	2. Female
Healthcare Access			
103	When was the last date a health care provider seen	1. Within the past year 2. within the pat 2 years	3. within the past 5 years 4. ≥5 years 5. Never
104	Are you counseled by your health care professional at each health care visit?	1.Yes	2.No
105	Do you have any kind of health care coverage?	1.Yes	2.No
Socio-economic status:			
106	What is your educational level?	1. Illiterate 2. Read andWrite only 3. Elementary	4. High School level 5. University level/Collage level
107	What is your marital status?	1. Single 2. Married	3. Divorced 4. Widowed
108	What is your occupational status?	1. Farmer 2. Merchant 3. Housewife 4. Health care professional	5. Other Gov.Employe 6. Un employed 7. Other
109	What is your average income per month?	1. Low (<2,250)	2. Medium (2,250 - 8,900 ETB) 3. High(>8,900ETB)
Individual knowledge of CVDs risk factors:			

110	Do you think that smoking may increase the risk of cardiovascular diseases?	1. Yes 2. No	3. I don't know
111	*Do you think that alcohol consumption can increase the risk of cardiovascular diseases?*	1. Yes 2. No	3. I don't know
112	Do you think that an improper diet can increase the risk of cardiovascular diseases?	1. Yes 2. No	3. I don't know
113	*Do you think that physical inactivity can increase the risk of developing cadiovascular disease?*	1. Yes 2. No	3. I don't know
114	Do you think that hypertension can increase the risk of developing cardiovascular diseases?	1. Yes 2. No	3. I don't know
115	*Do you think that diabetes can increase the risk of developing cardiovascular diseases?*	1. Yes 2. No	3. I don't know
116	Do you think that dyslipidemia /abnormal cholesterol level can increase the risk of developing cardiovascular diseases?	1. Yes 2. No	3. I don't know
117	*Do you think that Obesity/overweight can increase the risk of*	1. Yes 2. No	3. I don't know

	developing cardiovascular disease?		
118	Do you think that Chewing Khat can increase the risk of cardiovascular disease?	1. Yes 2. No	3. I don't know
119	*Do you think that too much salt or salty sauce in your diet could cause a health problem?*	1. Yes 2. No	3. I don't know
Individual's Attitude towards CVDs risk factors:			
120	Smokers are highly likely to develop CVDs than non-smokers	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
121	Increased alcohol consumption can predispose to CVDs	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
122	Diet rich in fruits and vegetables are protective of CVDs	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
123	Routine physical activity can protect from cardivascular diseases	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
124	Lowering high blood pressure with drug and exercise can decrease your CVDs risk	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
125	Lowering high blood sugar with diet, exercise and drug can decrease your risk of	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree

	CVDs		
126	Avoiding consumption of a diet high in Cholesterol can decrease your risk of CVDS	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
127	Lowering body weight with exercise can protect you from developing CVDs	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
128	Avoiding khat chewing can decrease the risk of getting CVDs	1. Strongly agree 2. agree 3. neutral	4. Disagree 5. Strongly disagree
129	**Looking at the salt or sodium content on food has importaance**	1. Strongly agree 2. Agree 3. Neutral	4. Disagree 5. Strongly disagree
Individual's practice towards CVDs risk factors:			
130	**Tobacco Use:**		
130.1	Describe your current smoking status?	1. Current smoker 2. Second hand smoker 3. Ex- smoker	4. Never smoked
130.2	If you are a current smoker, how many ciggarite per day?	1. < 5 2. 5-10 3. 10-20	4. ≥20 cigarettes/day
131	**Alcohol Consumption:**		
131.1	Have you consumed any alcohol within the past 1month?	1. Yes	2. No
131.2	If yes, what is your average daily alcohol consumption?	1. 0 drink 2. 1 drink	2 drinks 3. ≥3 drinks
132	**Khat chewing Habit**		
132.1	Are you currently chewing Khat?	1. Yes	2. No
132.2	If yes, how frequent did you chew khat in the	1. Usually,	2. Occasionally

	last one week?		
133	**Dietary Habit:**		
133.1	How often do you usually eat fried foods (chicken &fish/shellfish, potatoes, rice, cassava and, snacks such as potato chips, butter)?	1. Less than once a week 2. 1-2 times a week	3. 3 to 6 times a week 4. Every day
133.2	How many servings of sweet foods like cakes, biscuits, candies, or chocolate do? you consume in a week?	1. None 2. 1-2 serves	3. More than 2 serves
133.3	In a typical week, on how many days do you eat fruit	……...Days	
133.4	How many serving of fruits do you eat on one of those days	1. 1-2 serves 2. 3-4 serves	3. ≥5 serves
133.5	In a typical week, on how many days do you eat vegetables	……. Days	
133.6	How many serving of vegetables do you eat on one of those days	1. 1-2 serves 2. 3-4 serves	3. ≥5 serves
133.7	Do you often add salt to your food before or while eating it?	1. Yes	2. No
134	**Physical Activity:**		
134.1	Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football or farming at field] for at least 10 minutes continuously? 1. Yes 2. No		
134.2	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities? ……...Days		
134.3	How much time do you spend doing vigorous-intensity sports, fitness, or recreational activities on a typical day? ……. Hours		
134.			

4	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, and volleyball] for at least 10 minutes continuously? 1. Yes 2. No		
134.5	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities? ……. Days		
134.6	How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day? ……Hours		
134.7	How much time do you usually spend sitting or reclining on a typical day?	……. Hours	
135	**Hypertension:**		
135.1	Have you ever had your blood pressure measured by a doctor or other health worker?	1. Yes	2.No
135.2	Do you have hypertension diagnosed by a doctor?	1. Yes	2. No
135.3	Do you take any medications to treat hypertension?	1. Yes	2. No
135.4	Do your self-measure your blood pressure at home?	1.Yes	2.No
135.5	Measurement of BP and Heart rate:	……. mmHg (the lower of 2 readings) ……. bpm (the lower of the two)	
136	**Diabetes**		
136.1	Have you ever had your FBG or HbA1c done before?	1. Yes	2. No
136.2	Do you have rised blood glucose diagnosed by a doctor?	1. Yes	2. No
136.	Do you take insulin or	1. Yes	2. No

3	anti-hyperglycemic medications to treat your diabetes?		
136.4	How often do your self-monitor your blood glucose?	1. 4 times a day 2. once per day	3. None
136.5	HgbA1C level (if age ≥40 years)	……..%	
137	**Dyslipidemia:**		
137.1	Have you had your lipid profile/cholesterol level measured before?	1. Yes	2. No
137.2	Do you have dyslipidemia/ Cholesterol abnormality diagnosed by a doctor?	1. Yes	2. No
137.3	Are you currently taking any medication to treat dyslipidemia/Cholesterol abnormality?	1. Yes	2. No
137.4	Lipid panel measurement (If age ≥40 years):	1. Total cholesterol …… 2. Triglyceride…….	3. HDL …… 4. LDL …….
138	Do you have family hx of CVDs	1. Yes	2. No
	Anthropometry		
138	Weight	……. Kg	
139	Ht	……...Meter	
140	Waist Cicumference	…….cm	

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: Alemayehu Abebe (MD)

Signature: _____

Name of the institution: Jimma University

Date of submission: _____

This thesis has been submitted with my approval as university advisor

Name of the first advisor: Dr. Elsah Tegene (MD, Associate professor of Medicine &Interventional Cardiologist)

Signature of the first advisor: _____

Name of the second advisor: Dr. Muhidin Shemsedin (MD, Asst. professor of Internal Medicine)

Signature of the second advisor: _____