ASRAT WOLDEYES HEALTH SCIENCE CAMPUS

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF PUBLIC HEALTH

DETERMINANTS OF FRUITS AND VEGETABLES CONSUMPTION OF DEBRE BERHAN TOWN RESIDENTS, NORTH SHOA, AMHARA REGION, ETHIOPIA

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DEBRE BERHAN, ETHIOPIA

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DEBRE BERHAN, ETHIOPIA

THESIS APROVAL

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APPROVED BY THE EXAMINING BOARD

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Abstract

Background: - Fruit and vegetable consumption is an important source of nutrients for healthy growth and development, as well as a protective factor against chronic non-communicable diseases. Despite consistent evidence on the importance of fruit and vegetables (F&V), their consumption in low-and-middle income countries like Ethiopia remains very low.

Objectives: - This study aimed to assess the current level of fruits and vegetables (F&V) consumption and identify factors towards (F&V) consumption of Debre Berhan Town residents, North Shoa, Amhara Region, Ethiopia in 2023.

Method: - A community-based cross-sectional study design was employed among 615 households from Feb 01 to Jun 15, 2023. The study participants were selected using a multistage sampling technique. The data was collected through face-to-face interviews using a structured and pre-tested tool. Data were cleaned and entered into Epi-Data version 4.6 and transferred to SPSS version 25 for analysis. Bivariate and multivariate logistic regression was used to identify factors associated with fruit and vegetable consumption. The Hosmer-Lemeshow goodness-of-fit was applied to test for model fitness and significant variable was obtained at adjusted odds ratio with 95% CI and p-value <0.05.

Result: - The prevalence of adequate fruits, vegetables ,and both fruit and vegetables(F&V) consumption were 22.4%,8.3% and 7.7%, respectively .The odds of adequate Fruit and vegetable consumption were higher among high income family level (AOR 1.42[95%CI 1.12-1.80]) ,affordability (AOR 3.29 (2.42-4.46),availability(AOR 4.06[95% CI 3.23-5.09]),age between 26-44 (AOR 1.42[95% CI 1.13 -1.77] and those who had place to do home gardening(AOR 3.273 [95% CI 1.091-5.818]).

Conclusion: - Fruit and Vegetable consumption among Debre Berhan town is remains low and inadequate. Income, affordability, education, Age, place to do home gardening and availability were factors associated with adequate fruit and vegetable consumption.

Keywords: -fruit, vegetables, consumption, determinants

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Acronyms

AWHSC   Asrat woldeyes health science campus

ATONU   Agriculture to nutrition

AOR   Adjusted odds ratio

CVD   Cardiovascular Disease

COR   crude odds ratio

DALYS   Daily adjusted life years

EDHS   Ethiopian Demographic Health Survey

FAO   Food and Agriculture Organization

FVs   Fruits and Vegetables

NCD   Non Communicable Diseases

PA   Physical Activity

PI   principal investigator

UK   United Kingdom

USA   United States of America

WHO   World Health Organization

1. Introduction

1.1 Background

Globally, 2.8% of deaths (mainly ischemic heart disease, stroke and gastrointestinal cancer death) can be attributed to low Fruit & Vegetables consumption (1). Fruits and vegetables are essential components of a healthy diet, providing vital nutrients and fiber. Fruit is defined as Edible parts of plants that contain the seeds and pulpy surrounding tissue; have a sweet or tart taste; generally consumed as breakfast beverages, breakfast and lunch side-dishes, snacks or desserts(2) .Vegetables is defined as Edible plant parts including stems and stalks, roots, tubers, bulbs, leaves, flowers and fruits; usually includes seaweed and sweet corn; may or may not include pulses or mushrooms; generally consumed raw or cooked with a main dish, in a mixed dish, as an appetizer or in a salad (1).

Based on the WHO and the Food and Agriculture Organization (FAO) recommendations, there should be minimum ingestion of 400 g of F&Vs daily, which is equivalent to five servings. Pursuant to the recommendations, several countries have endeavored to meet the minimum daily requirement of F&Vs, even though the consumption rates of F&Vs among school children, adolescents, and adults remain incredibly low. Some of the reasons that affect people's choices in consuming F&Vs include accessibility, availability, shelf life, cost, socio-economic factors, and socio-cultural factors (3, 4).

Globally, there seem to be sub-regional variations in the prevalence of inadequate F&Vs consumption. For example, Hall et al. in 2009 found in a survey of 52 countries that the prevalence of inadequate FV consumption ranged from 36.6% in Ghana to 99.2% in Pakistan for men, and from 38.0% in Ghana to 99.3% in Pakistan for women. Using the Global Ageing and Adult Health (SAGE) Wave 1 involving five countries (i.e., China, Ghana, India, Mexico, Russia, and South Africa), Wu et al. identified a similar pattern for inadequate consumption of F&Vs in the studied countries. It has, therefore, become expedient for researchers, health organizations, and governments to continuously advocate the consumption of F&Vs among various populations, particularly adolescents (5, 6).

Studies in Kenya indicated that nearly 49% of the respondents eat fruit for not more than 3 days a weeks, only one-third (33.2%) eat fruit 7 days a week. About 65% of them reported that they eat vegetables throughout the week. The prevalence of lower consumption of both fruit and vegetables (added together) was 57% (63% in women and 53% in men) and the prevalence of low consumption of either of them was 39.4 %(7). A study in Korle-u teaching hospital in Ghana revealed that almost 48% and 70.9% of the participants consumed fruits and vegetables respectively, at least three days in a week. The pattern of unhealthy diet consumption in Africa and Asia is worsening gradually while the developed nations are showing improvement. The heterogeneity is seen not only across the different parts of the globe but also within the same countries based on income status, residence area of people and other factors. Respondents had fruits and vegetables averaging 3 and 4 days respectively in a typical week. Only 11.6 %and 12.7 % of the male and female respondents consuming 5 or more servings according to Uganda 2014 step report on NCD (8).

Despite the consistent evidence of the importance of F&Vs, its consumption is low in many low and middle-income countries. In a recent study that evaluated F&Vs consumption in 10 sub Saharan Africa countries reported very low consumption of F&Vs in Kenya (64g), Tanzania (55 g), Uganda (34 g), Malawi (30 g), and Mozambique (25 g). Consequently, the WHO and Food Agriculture Organization (FAO) estimated that 27% of all deaths that occur in the East African region is attributed to low F&Vs consumption (9-11).

In 2014, the global supply of F&Vs was reported to fall short to provide the nutritional recommendations of 400g or >5 serving/person/day by 22%. The shortfall in the supply of F&Vs was even more pronounced (58%) in lower-income countries. Reported the household F&Vs production in Ethiopia, household level F&Vs production was the lowest in Adiss Ababa (<1%), followed by Dira Dawa (<10%), Afar (<10%) and, Tigray (10-15%). The highest proportion of household in Oromia (50%), Amhara (70%), and SNNP (>85%) produced vegetables. However, household fruit productions in these regions ranged between 20-50% (9-11).

1.2. Statement of the Problem

Approximately 16.0 million (1.0%) disability-adjusted life years (DALYs, a measure of potential life lost due to premature mortality and the years of productive life lost due to disability) and 1.7 million (2.8%) of death worldwide are attributed to low fruits and vegetable consumptions (12).

A recent WHO/FAO expert's consultation report on diet, nutrition, and prevention of chronic diseases sets of population nutritional goals and recommended intake of a minimum of 400g of fruits and vegetables per day for the prevention of chronic diseases. However, in Ethiopia, dietary diversity among vulnerable groups like women of reproductive age (WRA) is very low. Despite continued nutrition education interventions, consumption of fruits and vegetables remains extremely low 4% (13).

The WHO estimated that low F&Vs consumption contribute to approximately 2.7 million deaths per year from chronic diseases, 11% of cardiovascular disease (CVDs) and 31% of ischemic heart diseases worldwide . Low consumption of F&Vs has also been ranked the sixth major risk factor for mortality in the world. The incidences of these chronic diseases are increasing in developing countries due to their life style and dietary changes (14).

Moreover, a study was done by the WHO to determine which developed countries had national average F&Vs consumptions which were within recommended values and out of the 21 studied countries, only Israel, Spain and Italy had acceptable national average intakes of at least 400g/day. It has been noted that even in developed countries, the intake of fruit and vegetables is lower and this could be due to low knowledge and attitude regarding F&Vs intake. In Ethiopia, the total domestic consumption of fresh fruits was estimated at 760,000 metric tons. However, low F&Vs is consumed in Ethiopia compared to other regions of the world. For instances, Ethiopia's per capita consumption of fresh fruits is approximately 7 kg/person/year which is far below the WHO and FAO recommended minimum level of dietary intake (146kg/person/ year). The prevalence of F&Vs consumption in Ethiopia was very low 1.5% (15). Despite continued nutrition education interventions, consumption of fruits and vegetables remains extremely low 4%. This suggests that there are barriers to fruits and vegetable consumption that are not identified yet.

1.3. Significance of the Study

The present study could help understand current levels of F&Vs consumption and inform the design of more effective interventions that improve F&Vs consumption among the households. Effective, evidence-based interventions are needed to improve diets and reduce NCDs and micronutrient deficiency related morbidity and mortality. Therefore it is crucial to understand the food choice motives and perceived factors associated with F&Vs of urban and rural consumers, in order to ensure the success of awareness raising and other activities to foster fruit and vegetable consumption. Pragmatic interventions (e.g., adequate health education and promotion programs; arable fruits and vegetable farming initiatives) to promote sufficient F&Vs consumption among the households in Debre Berhan town seem necessary in order to improve intake. Policies should address identified factors that influence inadequate F&Vs intake among this target group in order to reduce nutrition-related health conditions such as obesity. To promote healthier dietary habits and increase fruit and vegetable intake in the Debre berhan community, it is important to address these underlying determinants through targeted interventions that focus on improving access, affordability, and education about the health benefits of these foods. Further studies examining accessibility, social, regional, seasonal, and environmental influences associated with inadequate F&Vs in Debre Berhan town using longitudinal designs are encouraged.

2. Literature Review

2.1. Classifications of fruits and vegetables

Botanically, fruits and vegetables are classified depending on which part of the plant they come from. A fruit develops from the flower of a plant, while the other parts of the plant are categorized as vegetables. Fruits contain seeds, while vegetables can consist of roots, stems and leaves (10). They are also rich in fiber, phytochemicals, essential micronutrients, which act as antioxidants like vitamin A, C and E. The inclusion of fruits and vegetables (F&Vs) in individual and household diets has been advocated by various researchers considering the numerous positive impacts F&Vs present on human health and wellbeing (16).

In a study published in 2009 about the classification of fruits and vegetables they were categorized as the botanic families rose, rue (citrus), amaryllis, goosefoot, and legume; color groupings blue/black, dark green/green, orange/peach, and red/purple; and plant parts fruit-berry, seeds or pods, and leaves. Groupings based on Total Antioxidant Capacity (TAC) levels did not match well with the identified clusters. Clusters can be mentioned as combined or classified by color and part of the plant. Using the classification method such as color and part of plant clusters were best described like the groupings of dark green leafy vegetables; cabbage family vegetables; lettuces; alliums family bulbs; legumes; deep orange/yellow fruits, roots, and tubers; citrus family fruits; tomatoes and other red vegetables and fruits; and red/ purple/blueberries are predictive for food components provided by fruits and vegetables (17).

2.2. Factors affects fruit and vegetables consumption

This study suggests that early life experience and family socioeconomic status can influence later life fruit and vegetable consumption, Children's consumption of vegetables is also influenced by maternal and familial socioeconomic factors. Maternal education and nutrition knowledge are consistent predictors of maternal vegetable intake as well as her preschool-aged child's intake In lower socioeconomic status families, availability and accessibility of vegetables in the home are consistently associated with cost, both in terms of monetary expense and preparation time and with maternal self-efficacy to offer fruit and vegetables to her preschool-aged child . Financial support to low-income women and children, via WIC (Women, Infant and Children), appears to improve infant vegetable intake and variety, underscoring the effectiveness of simultaneously providing education and financial support to families to provide vegetables to their young children (18).

The pattern of unhealthy diet consumption in Africa and Asia is worsening gradually while the developed nations are showing improvement. The heterogeneity is seen not only across the different parts of the globe but also within the same countries based on income status, residence area of people and other factors. Respondents had fruits and vegetables averaging 3 and 4 days respectively in a typical week. Only 11.6 %and 12.7 %of the male and female respondents consuming 5 or more servings according to Uganda 2014 step report on NCD. In a study in 18 countries, including South Africa and Zimbabwe in Africa, the mean daily consumption of FAV was 2.14 servings in low-income countries, 3.17 servings in lower-middle-income countries and 4.31 servings in upper-middle-income countries(8). In Mozambique, 17.8% of the participants met the recommended daily fruit consumption rate ($\geq$ 2 servings) and 18.7% the recommended daily vegetable consumption rate ($\geq$ 3 servings) (19). Various factors have been found associated with low FAV consumption, including socio demographic and health factors. Socio demographic factors associated with low F&Vs consumption include, older age male sex, lower education , lower wealth and residing in urban areas . Health factors associated with low F&Vs consumption include, high physical activity, physical inactivity, not having over weight, smoking, alcohol intake, and binge drinking (20).

A study conducted in Ghana on fruit and vegetable consumption, fruit and vegetable preference list and the difference in male and female dietary behavior resulted in Majority of respondents admitted that they did not consume fruits 1 – 3 times a day however consumed vegetables 1 – 3 times a day. Frequently consumed fruits were banana, orange, and watermelon. Most respondents consume fruits because they had a craving or want to eat fruit. Frequently consumed vegetables were tomatoes and onions. Most respondents used vegetables in stews. Male students want or prefer for orange, banana, and pineapple whereas female students indicated statistically significant likeness for blackberries and grapes while Female students want of prefer for okra, green pepper, and lettuce than their male counterparts. The study suggests to help make a change in eating habit and increase the consumption rate of fruits and vegetables among Ghanaian students, social marketing strategies should be directed at making highly preferred and frequently consumed fruits and vegetables readily available and easily accessible to students (21). So many researchers attribute that women are more likely than men to meet the recommended intake of F&Vs. However this might not be their preference it could be because of their gender roles in the society In most culturally driven middle and low-income families women to eat the leftover of the other family which means low amount of meat or fish is left for them so they are forced to eat the F&Vs as in most population-based studies, wealth and education has a significant effect on Fruit and vegetable consumption in this study among other factors like wealth quartiles, household income and expenditure and socioeconomic status (9). Study done in Ethiopia Factors Associated with Fruit and Vegetable intakes place of residence, marital status, employment status and income were associated with fruit and vegetable intake. Based on the findings, Fruit and Vegetable intake is significantly associated with gender, marital status, and employment status. Women were 1.66 times, married 1.68 times and unemployed 2.45 more likely to consume fruit and vegetables than their counter parts. There is no statistical significant different among age groups and among educational status (22).

2.3. **Determinants of fruits and vegetable consumption in the developed Country**

A study conducted in the United States of America has found out the different Barriers and Facilitators to F&Vs consumption in diverse multi-ethnic population. Even though all the ethnic groups know the positive health benefits of F&Vs they don't consume a sufficient amount, this was because the different barriers such the high cost of fruit and vegetable, lack of cooking skills, lack of time to cook because of long working hours, and spoilage rate barrier while the facilitators were knowing the health benefit have encouraged them to eat more fruit and vegetables daily. The younger age group participants also mentioned that they are trying to develop a healthier diet than their parents by consuming more fruits and vegetable (23) .

A diet low in fruit was found to be the most important dietary contributor to mortality and lost years of healthy life, and a diet low in vegetables the fourth contributor. Despite its importance to health, FV consumption worldwide is still far below the recommended levels, in a study conducted in Brazil, fruit and vegetable consumption where just 24.1% of populations present an adequate intake the barriers that lead to low F&Vs consumptions is the negative characteristics (unhealthy) of the food environment to increase access and consumption of healthy foods like F&V is to develop and consolidate a public policy aimed at creating a healthy environment (24).

 A study conducted in the UK suggest that most of the sample population are aware of the 5-aday F&Vs massage but they cannot change this into action correctly this is because of the decreased knowledge of F&Vs consumption and its benefits. To increase the consumption of F&Vs consumption in the UK it is important to increase the knowledge of the detailed 5-a-day F&Vs consumption message erase confusion of portion size and the need for variety this confusion in same UK individuals goes as deep as to believing the 5-a-day message relates to five portions of fruit and five portions of vegetable (15).

A study done in Uruguay confirmed an income level is an underlying factor for food choice and barrier to adopting healthy eating. Low economic participants admitted that their food choice is based on the cost and satiety factor such as stew, which is prepared using rice, lentils, potatoes, carrot, onion, red peppers, pumpkin, and tomato sauce. Fruit, raw vegetable, and meat were mentioned by very few of the participants and those who mentioned meat as a part of their dish meant minced meat of chicken or beef either a high proportion of bones, but in middle-income participants mentioned a wide variety of dishes than those with low income, being meat based,

salads, pies and pasta are the most frequently mentioned they also stated that they consume fruit, vegetable, and dairy products (25).

A study conducted on immigrants Russia, Somalia and Kurdish who are currently living in Finland, compared there consumption frequency of recommended healthy food like fruits, barriers, vegetables, fish and rye bread the immigrants that originated from Russia and Somalia origin ate rye bread than the Kurdish participants, vegetables were more frequently consumed by Russian (60%), kurds (44%)and Somalis (1%), consumption of fruits and barriers are consumed more frequently by kurds (63%), Russian (60%) and somalian (1%),however 85% of somilan participants consume fresh vegetables and 78% consume fruits and berries on 1-2 days a week, and fish are consumed more in Russians and somalias than Kurds.. The other used determinants were sex, age, and educational status. Women, older age groups and people with higher education level have a good association with healthy food consumption (26).

A study suggests that to improve eating behavior in disadvantage family removing structural barriers like delivering free F&Vs weekly is not enough other strategies like the social, cultural and intra familial influence of food choice targeting this household is needed and six interrelated descriptive themes were developed representing factors influencing F&Vs consumption in household with kids such as Early life exposure of F&Vs consumption can facilitate future consumption, individualized drivers personal motivation was required to make use of free products like the value of health personal interest and enjoyment of food , the house hold's evolving socio-cultural food environment, household resource constants, social network and connection, and external organizations and the environment (27). According to a study done in Brazil, family income, lower paternal educational and consumption of high sugar content beverages were significantly associated with low F&Vs consumption. Other barriers such as poor nutritional knowledge and practice, cost, dislike of F&Vs issues were found to be highly predictive of low fruit and vegetable intakes (28).

2.4. Determinants of fruit and vegetable consumption in developing country

A study was done on urban and rural dwellers in Kenya in most of the households traditionally food is prepared by the women but knows this culture is slowly changing because of the gender role. In rural dwellers the knowledge of medical benefits associated with endogenous vegetables was positively and significantly associated with increased consumption of African indigenous vegetables but Most urban dwellers work long hours which provides them a small amount of time for preparation n of food Because of this there are employed household cooks and this doesn't influence the consumption of leafy AIVs in urban dwellers (28).

A study conducted in Ghana shows that F&Vs consumption is low among young people because of factors like regional, residence, religious, educational and cultural. So the study suggested there is a big need for intervention by policymakers to educate the population about the health benefits of eating F&Vs because it could help greatly with the growing prevalence of non-communicable diseases. Overall fruit and vegetable consumption was low in young people but the females are likely to consume more fruit and vegetables than their male counterparts findings point to the need for interventions to educate young people in Ghana about the health benefits of eating fruit and vegetables (28)**.**

In Ethiopia, the total domestic consumption of fresh fruits was estimated at 760,000 metric tons. However, low F&Vs is consumed in Ethiopia compared to other regions of the world. For instances, Ethiopia's per capita consumption of fresh fruits is approximately 7 kg/person/year which is far below the WHO and FAO recommended minimum level of dietary intake (146kg/person/ year). The prevalence of F&Vs consumption in Ethiopia was very low 1.5% (15).

2.5. Fruits and vegetable consumption

The WHO and FAO recommends a minimum of 400g of fruit and vegetables per day for the prevention of chronic diseases as well as for the prevention and alleviation of several micronutrient deficiencies. Despite the growth recorded in the global F&Vs production and trade, the food consumption per capita in Africa is still below the recommended 400 gram of FV per day (146 kg/person/year). The substantial shortages in utilization are confirmed by the levels of FV consumption in Sub Saharan African countries. A study done in ten different countries including Ethiopia, Kenya, Ghana, Rwanda and Uganda show that consumption ranges from 27 to 114 kg per person per year, which is far below the recommended amount. Except for Kenya, the majority of the households consume less than the minimum amount of F&Vs recommended by the WHO and FAO (27).

A diet low in fruit was found to be the most important dietary contributor to mortality and lost years of healthy life, and a diet low in vegetables the fourth contributor. Despite its importance to health, F&Vs consumption worldwide is still far below the recommended levels, in a study conducted in Brazil, fruit and vegetable consumption where just 24.1% of populations present an adequate intake the barriers that lead to low F&Vs consumptions is the negative characteristics (unhealthy) of the food environment to increase access and consumption of healthy foods like F&V is to develop and consolidate a public policy aimed at creating a healthy environment.

Studies in Kenya indicated that nearly 49% of the respondents eat fruit for not more than 3 days a week, only one-third (33.2%) eat fruit 7 days a week. About 65% of them reported that they eat vegetables throughout the week. The prevalence of lower consumption of both fruit and vegetables (added together) was 57% (63% in women and 53% in men) and the prevalence of low consumption of either of them was 39.4 %. A study in Korle-u teaching hospital in Ghana revealed that almost 48% and 70.9% of the participants consumed fruits and vegetables respectively, at least three days in a week (29).

Study done in Kenya in determinants of fruits and vegetables consumption among adults only 15.3% of participants consumed fruits daily, and 50.9% had vegetables daily. The mean number of days consuming fruits per week was 2.52 and the mean number of days consuming vegetables per week was 4.96. On average, participants had 0.78 servings of fruits a day, 1.31 servings of vegetables a day, and 2.09 servings of F&Vs per day. Only 12.4% of respondents had two or more

servings of fruit a day, 7.4% had three or more servings of vegetables a day and 94.0% had less than five servings of F&Vs a day. In bivariate analyses, fruit servings per day increased with being male, education, greater wealth, urban residence, having general and central obesity, and being a Kikuyu or Luo by ethnic group and decreased with age, current tobacco use and low physical activity. Vegetables servings increased with age, education, being a Kikuyu or Luo by ethnic group and central obesity and decreased with greater wealth and low physical activity. F&Vs consumption increased with age, education, greater wealth, being a Kikuyu or Luo by ethnic group, and central obesity and decreased with low physical activity and current tobacco use (30).

Study done in determinants of fruit and vegetable consumption in urban Rwanda Ninety-eight percent of the total respondents (n=420) reported to consume their vegetables heated, versus 10% that consumes their vegetables raw. The survey also assessed the intake of individual fruits and vegetables, in line with the crop value chains supported through HortInvest. The consumption frequency of these crops. Often was defined at more than 2 times per week. Rare was defined as less than two times per week. Irish potato (91%), onions (96%) and tomato (93%) are most frequently consumed. Consumption frequency of the more nutritious fruits and vegetables is much lower, with consumption reported to be often by 15% of the respondents for orange flesh sweet potato, 46% for passion fruit, 1% for red pepper, 1% for yellow pepper, 61% green sweet pepper and 2% for broccoli. In addition, respondents were asked to name the three fruits they most often consume during rainy season and during dry season. The questions were repeated for vegetables. Responses including more than 3 items were excluded, as it was not possible to determine which items would belong to the top three, shows that yellow banana was the most consumed fruit during dry and rainy season. After yellow banana, for almost half of the respondents (47%) tamarillos were one of the three most consumed fruits during rainy season, and passion fruit for 43%. During dry season pineapple (40%), apple (43%) and avocado (42%) were popular fruits after yellow banana. The fruits papaya, maracuja, water melon and mandarin were reported under "other"(1, 31).

Study conducted in the 9 regions and two city administrations (Addis Ababa and Dire Dawa) in Ethiopia to assess Fruit and/or vegetable intake the mean intake off fruits was 0.3 (SD 0.7) servings/day in urban areas and 0.4 (SD.1) servings/day in rural areas, while the mean intake of vegetables was 0.5 (SD 0.1) servings/ day in urban areas and 0.7 (0.9) servings/day in rural areas. Few participants (1.5%) reached the recommended five servings a day. The intake of fruits and vegetables (F&Vs) varied with socio-demographic variables. The prevalence of fruit and/or vegetable consumption in Ethiopia was found to be 157 (1.5%) in which female respondents consumed fruit and/or vegetable more (1.8% vs 1.2%) than male respondents Rural dwellers consumed fruit and/or vegetable better than their urban counterpart 129 (1.6%) versus 28(0.9%) respectively). Only 7 (1%) of respondents in the age group 60-69 years consumed the recommended amount of fruit and/or vegetable. Similarly, one percent of respondents who had college and above education ate the recommended amount of fruit and/or vegetable. A little higher percentage of married respondents consumed fruits and vegetable compared to single ones (1.7% verses 1.0%). Unemployed respondents 85 (2%) were more likely to consume the recommended (3).

Summary of literature reviews

In conclusion, the determinants of fruit and vegetable consumption among the community of Ethiopia are multifaceted and complex. Cultural beliefs and practices, accessibility and availability, education and awareness, and socioeconomic factors all play a crucial role in determining consumption levels. Fruits and/or vegetables intake was generally extremely low. Consumption of fruit and/or vegetable in middle income category was a little higher as compared to other wealth category. There was difference in proportion among male and female fruit eaters and urban and rural dwellers in Ethiopia. Women, married and unemployed consumed fruit and/or vegetable better than their counter parts. Health promotion interventions to scale up fruit and vegetable consumption should pay attention to the factors identified in this reviews. To promote healthier dietary habits and increase fruit and vegetable intake in the Ethiopian community, it is important to address these underlying determinants through targeted interventions that focus on improving access, affordability, and education about the health benefits of these foods.

3. Conceptual framework

➢ The conceptual frame work for determinants of fruits and vegetables consumption

Socio-economic Factors

- Age
- Sex
- Educational level
- Marital status
- Employment
- Have children
- Income
- Cost
- budget plan
- social media

Dietary factor

- Fruit and Vegetable preference
- servings of F&Vs

Fruit and vegetable consumption

Environmental factors

- place to do home gardening
- Energy source used for light and cooking
- Farming land

Physical determinants

- The time it takes from cooking to consumption
- Cooking skills
- Accessibility
- Availability
- Living area
- Have a refrigerator
- Transportation
- Season

➢ **Figure 1:** Conceptual framework to assess the determinants of fruits and vegetable consumption of Debre Berhan town resident, North Shoa, Amhara Region, Ethiopia 2023, is derived from literature (18, 20, 21, 22, 27).

4. Objective

4.1 General Objectives

- ➢ To assess the determinants of fruits and vegetable consumption of Debre Berhan Town residents , North Shoa , Amhara Region, Ethiopia, 2023

4.2. Specific objectives

- ➢ To Describe fruit and vegetable consumption of Debre Berhan town residents , North Shewa, Amhara Region, Ethiopia, 2023.
- ➢ To identify factors affects fruit and vegetable consumption of Debre Berhan town residents, North Shoa, Amhara Region, Ethiopia, 2023.

5. Methods and Material

5.1. Study Area

The study was conduct in Debre Berhan town, the town is located 9°45′N latitude 39°31′E longitude, 130km far from Addis Abeba in the north direction. Debre Berhan is situated on plateaus in the central Ethiopia highland at average elevation of between 2800 and 2845 above sea level. The temperature of Debre Berhan town is in average between 6.6°c-24°c; and average rainfall is 964mm and the climate is totally highland. The city divided into five sub city(Atse Minilike, Atse zeryaqob, chacha, Etege tayetu and Tebase sub city) ,37 kebele from this 24 in urban and 13 in rural kebles,39 health post,8 health center and one governmental and two private hospital and has a population size of over 202,226 . Debre Berhan Town with a total of 47,029 households. Findings from Debre Berhan Town urban agriculture and environmental protection and land management and use office indicated that urban farmers were participated in different types of urban agriculture such as fruit and vegetable production, Vegetable production in Debre Berhan town was performed by individual farmers and micro and small enterpriser's using irrigation systems (as Bereesa river and two other dams) and during summer season. However, most urban agriculture farming practices performed in Debre Berhan town was through irrigation systems (32).

5.2. Study Design and period

A community-based cross-sectional study was conducted from September – Jun 20,2023

5.3 .Source population

The source of population was all Households in Debre Berhan town

5.4. Study population

All selected Households of selected Kebles of Debre Berhan town who are family members of the household and age of greater than and equal to 18 years.

5.5. Study unit

The study units were households of selected household head

5.6. Eligibility Criteria

5.6.1. Inclusion criteria

All selected people with age ≥18 years and who lived in Debre berhan town for 6 month and above was included.

5.6.2. Exclusion criteria

Those having acutely ill and who cannot communicate during data collection.

5.7. Sample size determination
Sample Size

The sample size was determined by single proportion formula

$n = \dfrac{Z\,\alpha/2^2\ P\ (1\text{-}P)\quad 1.96^2 * 0.5(1 - 0.5)}{d^2\quad (0.05)^2}$ $= 384.16 \approx 384$

Where;

n - The minimum sample size required for very large source population (≥10,000)

Z - The critical value for a given confidence interval (95%)

P -The Expected proportion of the event to be studied (0.5)

D - Margin of error (5%)

n = 384

Non- respondent = $384 \times 10\% = 422.2 \approx 422$

A design effect of 1.5 was used and 10% non- response rate added to the sample size .Therefore a total of 633 households was take as final sample size needed involved in this study.

5.8. Sampling technique and procedure

Multistage random sampling techniques was used to select the study participants .First of all ,three sub-cities were selected using simple random sampling with " lottery methods" from 5 sub-city then select Kebele from three sub cities using simple random sampling and proportional allocation to obtain the desired sample size. Participants were selected using systematic random sampling techniques every 4 th interval.
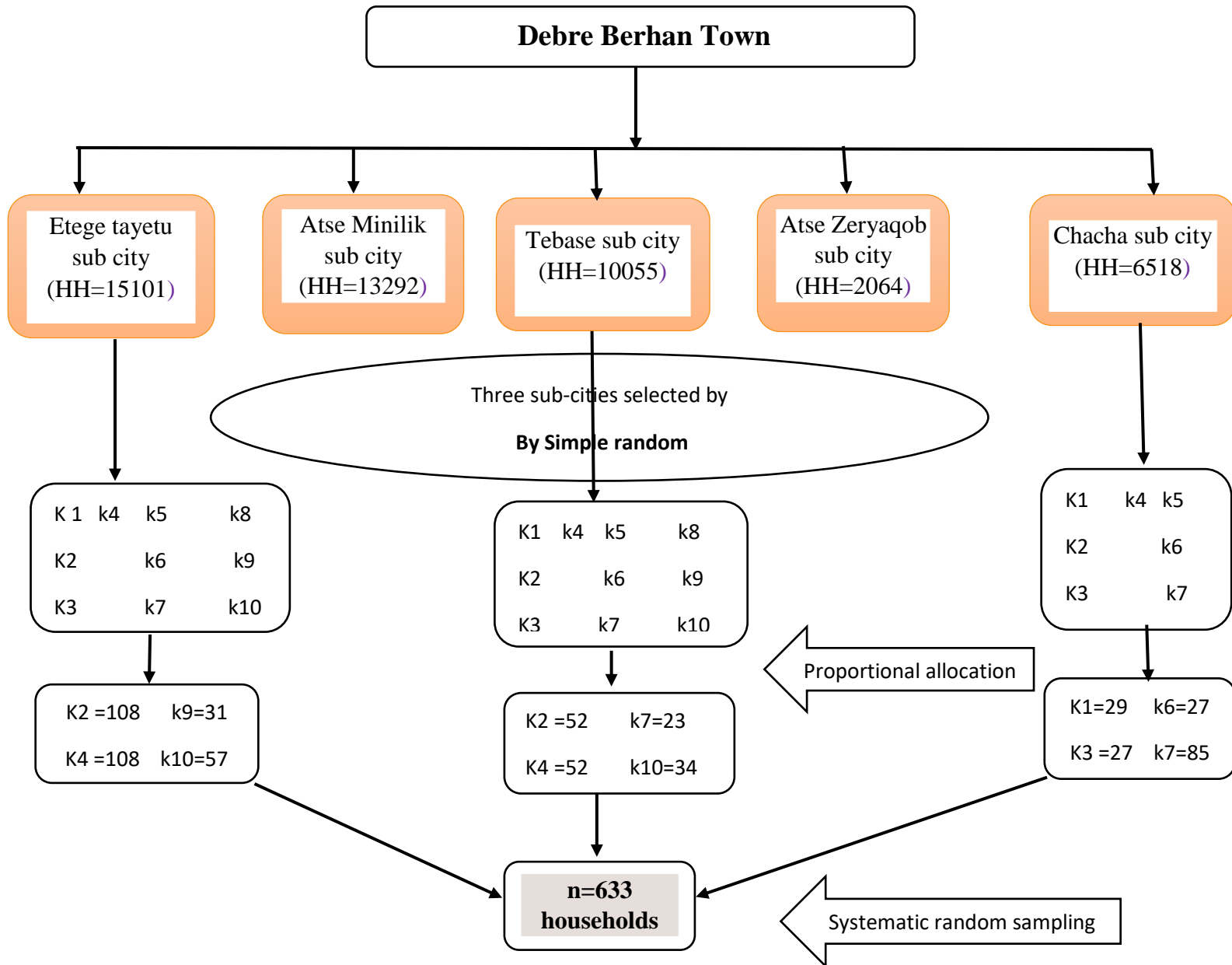
Figure 2 : Sampling procedures to assess the determinants of fruits and vegetable consumption of Debre Berhan Town residents, North Shewa, Amhara Region, Ethiopia, 2023.

5.9. Variables

5.9.1. **Dependent variables**
- ❖ Fruits and vegetables consumption

5.9.2. **Independent variables**
- ➢ **Socio-economic factors** (Age, Sex, Educational level, employment status , have children, marital status, income, cost, budget plan)
- ➢ **Environmental factors** (place to do home gardening, the energy source used for light and cooking and farming land)
- ➢ **Dietary factor** (Fruit and Vegetable preference, servings of fruits and vegetable patterns)
- ➢ **Physical determinants (**the time it takes from cooking to consumption, cooking skills, accessibility, availability ,living area ,transportation, refrigerators)

5.10. Operational definition

- **Fruit and vegetables:** is defined as the edible plant foods excluding cereals grains, nuts, seeds, tea leaves, coffee beans, cacao beans, herbs and spices

- **Serving:** is shown as a common household measure that is appropriate to the food (such as cup, tablespoon, piece, slice, or jar), followed by the metric amount in grams (g).

- **WHO Recommendation of fruit and vegetables:** Daily intake of fruit and vegetables is a total of five servings (or 400grams) per day, of which preferably 3 servings of vegetables and 2 serving of fruit.

   Adequate (consumed fruits) – for those eat ≥ 2 servings per day

   In adequate (no fruit consumption)-for those eat ≤ 1 servings per day

   Adequate (consumed vegetables) - ≥ 3 servings per day

   In adequate (no vegetables consumption) - for those ≤ 2 servings per day

   Adequate FVs- ≥ 5 servings per day

   Inadequate FVS- ≤ 4 servings per day

- **One serving**: is 1/2 cup of a fruit or vegetable, equivalent to 80g.

- **Vegetable portions or servings:** are household measures with a standard serve a volume of 250 ml of raw leafy vegetables or half of this volume (125ml) of cooked or chopped vegetables accounts for approximately 80g.this volume described as being equivalent to a cup or bowlful

- **Fruits portions or servings:** are household measures a standard serve the edible part of one whole medium sized fruits, as well as juices, some adjustment must be made to fit the approximate scale.

- **Healthy food:** Healthy food is food that gives you all the nutrients you need to stay healthy, feel well and have plenty of energy.

- **Unhealthy food:** Unhealthy food, commonly known as junk food, generally contains few nutrients and large proportions of unhealthy ingredients, such as sugar, salt, and saturated fats

- **Head of house hold:** is a person with either sex, who is considered to be the head by other member of that house hold, for polygamous wife living in separate house hold, the household is considered to be head only.

5.11. Data collection methods and tools

Data collection tools (i.e. questionnaires) was prepared in English and translate into Amharic to asses socio-economic, factors affects Fruits and Vegetables consumption and fruit and vegetables consumption. Two days Training was given to data collectors and pre-testing was do before the actual field work. Data was collect by train health professionals and under the direct supervision of the principal investigator. Fruit and vegetable preference was capture by asking the like and dislike of F&Vs from a list of available F&Vs. Measurement of fruit and vegetables intakes in the house holds by using vegetables servings in the household with a standard serve a volume of 250 ml of raw leafy vegetables or half of this volume (125ml) of cooked or chopped vegetables accounts for approximately 80g and fruits servings in the household measures as a standard serve the edible part of one whole medium sized fruits, as well as juices, some adjustment must be made to fit the approximate scale. One serving is 1/2 cup of a fruit or vegetable, equivalent to 80g.

5.12. Data processing and Analysis plan

Data was cleaned, code and enter using epi-data version 4.6 and the necessary parts of the data was export to IBM SPSS version 25. Descriptive statistical analysis (Frequency, percentiles, mean, median and standard deviations) and cross tabulation was conducted. Bi-variable and Multivariable analysis was be done to check the presence of associated factor of fruit and vegetable consumption with P-value ≤ 0.05 was be used as statistical significance and the degree of association between dependent and independent variables was be described using crude odds ratio (COR) and adjusted odds ratio (AOR) with 95% confidence interval (CI). Analysis of data was be done using Binary logistic regressions in order to evaluate the effects of independent variables on the dependent. All variable with P-value ≤ 0.25 in bivariate regression was be entered in to a Multivariate regression. The finding of the study was present in terms of frequency and percentage using tables, pie chart and bar graph. Multicollinearity was be checked among selected independent variable using variance inflation factor. Additionally, the necessary assumption of logistic regression was be checked using Hosmer-Lemeshow goodness-of-fit-test statistics.

5.13. Data quality assurance plan

The following quality controls measures was taken. Preliminary visits to the study areas were conducted in March 2023 in select area which help in to refine and adapt the questionnaires. The questionnaires were pre-test on 5% of the study participants. During the survey, daily supervision checking the consistency and the completeness of the questionnaires was implement by the PI before conduct and proper feedback will give to data collectors on the daily basis.

5.14. Ethical consideration

The thesis was be approved by Institutional Review Board (IRB) and obtained Ethical clearance from the Ethical Committee of Asrat woldeyes Health science campus, school of public health ,department of public health, Debre Berhan University before conducting the study. Autonomy was be insured by explaining the aims and objectives of the study to the health workers beforehand, and informing them that if they do not want to take part in the study. Confidentiality was be ensured since the participants are anonymous. A formal letter was also submit to Debre Berhan city office to ask for permission and support during the study period.

5.15. Result writing and dissemination plan

The final result of this study was submited to Debre Berhan University, Asrat Woldeyes Health Science Campus, School of Public Health, and present to the university community. The finding of the study was disseminated to all responsible bodies in the study area including sub city administrative bodies of Debre Berhan town , Debre Berhan City Health Bureau and Debre Berhan University. Further efforts was made to publish the findings on national and international peer reviewed journals.

6. Results

6.1. Socio - economic characteristics of the respondents

A total of 615 households were interviewed in the study, with response rate of 97.1 %. The mean $\pm$ standard deviation, age of the respondents was 38.38 ($\pm$12.95) years. Majority of households heads were female (88.8%) ,married (73.0%),attend secondary school (35.9%) and orthodox (71.4%).The study indicated , about 28(4.6%) men and women were illiterate and pregnant (4.2%) . The majority of the households head were unemployed (49.6%) in their occupation and low income 393(71.2%).Regarding to family size 2 to 3 children and 4 are accounts (48.5%) and 338(55.0%) respectively .More than 94.3% of the participants had improved source of water (tap water), 98.2% had access to electricity and about (81.6%) used electricity for cooking purposes. (Table 1).

Table 1: *Socio-economic characteristics of respondents in Debre Berhan Town, North Shoa, Ethiopia, 2023. (n=615)*

Variables	Category	Frequency (%)
Age	18-25	90(14.6)
	26-44	364(59.2)
	45-59	89(14.5)
	≥60	72(11.7)
Sex	Male	69(11.2)
	Female	546(88.8)
Marital status	Single	122(19.8)
	Married	449(73.0)
	Widowed	21(3.4)
	Divorced	23(3.7)
Religion	Orthodox	439(71.4)
	Muslim	58(9.4)
	Protestant	95(15.4)
	Others	23(3.7)
Education	Illiterate	28(4.6)
	Primary school	185(30.1)
	Secondary school	221(35.9)
	Diploma	51(8.3)
	Degree	108(17.6)
	Other	22(3.6)
Occupation	Unemployed	305(49.6)
	Housewife	115(18.7)
	Retired	18(2.9)
	Elderly without pension	8(1.3)
	Student	34(5.5)
	Farmer	7(1.1)
	Laborer	28(4.6)
	Governmental work	92(15.0)
	Other	8(1.3)
Monthly family Income	Low income	393(71.2)
	Medium income	130(23.6)
	High income	29(5.2)
Have children	1-2	77(18.3)
	3-4	204(48.5)
	≥5	139(33.2)
Family size	1	37(6.0)
	2	77(12.5)
	3	10(1.6)
	4	338(55.0)
	5	117(19.0)
	≥5	36(5.9)
Pregnant women	Yes	35(4.2)
Water sources	Private Tap	580(94.3)
	Public tap	35(5.7)

6.2. Prevalence of Fruit and Vegetable Consumption

The prevalence of adequate fruit consumption and adequate vegetables consumption among the households were 22.4% and 8.3%, respectively. Furthermore, 7.7% of the population reported consume ≥ 5 servings (adequate) fruit and vegetables per day.
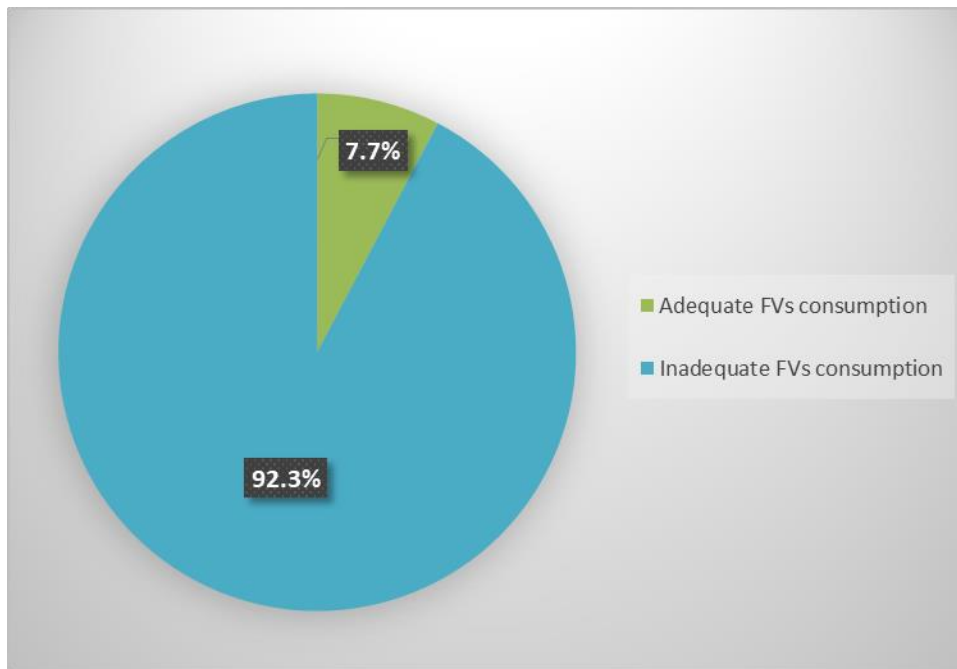
Figure 3: prevalence of fruit and vegetables consumption among households in Debre Brhan town, North Shewa, Ethiopia, 2023 (n=615)

> ➤ **Fruit and vegetable consumption**

90% of the total respondents (n=615) reported to consume their vegetables heated, versus 9.1% that consumes their vegetables raw.

6.3. Fruits and vegetables preference

The most preferred fruits were papaya, banana, avocado, lemon, and orange. The least liked fruits were pears and mandarin and that is because most of the respondents do not know them. Almost all of the vegetables except lettuce are well known, but they were not consumed because of affordability issues. The most consumed vegetables are onion followed by potatoes (Table3).

Table 2: Most preferred fruit and vegetables among the households in Debre Berhan town, North shoa, Ethiopia, 2023(n=615)

Fruit and vegetables	Frequency (%)
papaya	496(80.7)
Banana	486(79.0)
Avocado	441(71.7)
lemon	288(46.8)
orange	114(18.5)
onion	604(98.2)
potatoes	552(89.8)
cabbage	538(87.5)
carrots	514(83.6)
tomatoes	500(81.3)

6.4. Recommended daily intake of fruit and vegetables

3.3% of the respondents reported to be aware of the daily recommended intake of fruit and vegetables .out of this group , most respondents indicated that two servings is the recommended daily a total intake of fruit and vegetables. Other answers were one servings a day. Only 2(0.2%) of respondents was aware of the official WHO recommendations of 5 servings per day.

6.5. Sourcing of fruits and vegetables

Respondents source most of their fruit and vegetables from the local market.

Table 3: Sourcing of fruit and vegetable of the households in Debre berhan town , North shoa ,Ethiopia ,2023.

Source	Fruit		Vegetables	
	Frequency	**Percent**	**Frequency**	**Percent**
local market	548	89.1	481	78.2
supermarket	2	.3	0	0
convenience store	46	7.5	21	3.4
street vendor	16	2.6	11	1.8
self-grow	3	.5	102	16.6

6.6. Prioritization of fruit and vegetables

Cereals are the primary choice among communities, followed by fat and oils. Fruits and Vegetables were found the lowest choice to purchase.
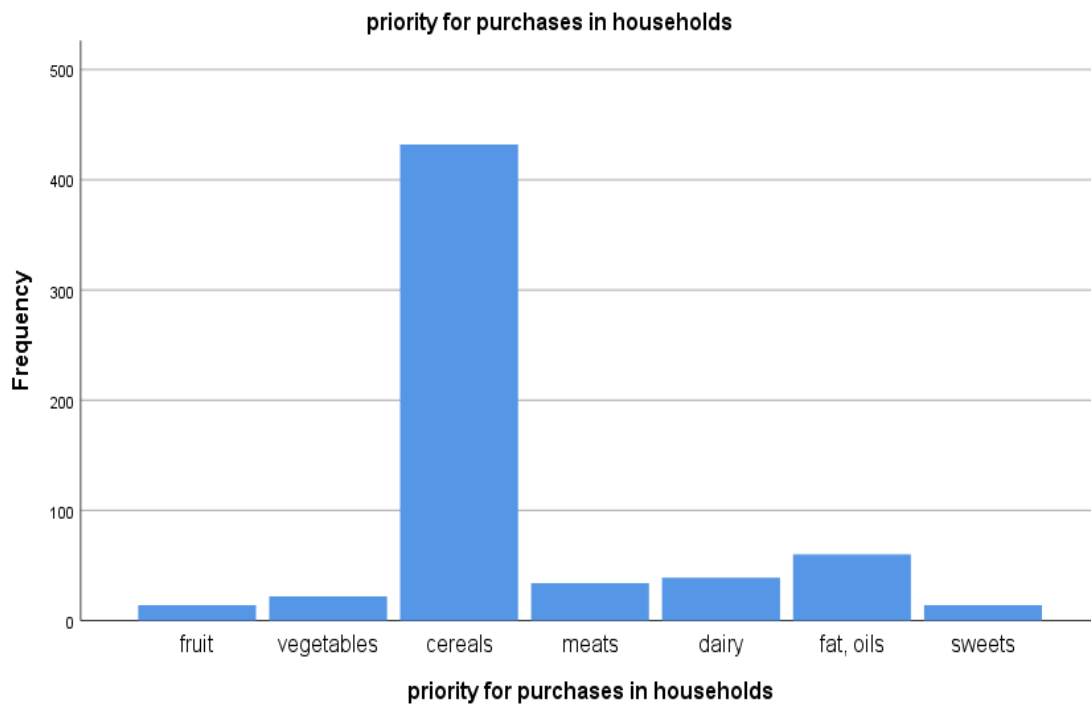
Figure 4: Percentage of the respondent prioritizing food groups for household's food purchases in Debre berhan town,North shoa,Ethiopia,2023

6.7. Source of information

Most of the respondents (58.5%) reported to not be influenced by advertisement for their food purchases, whereas (3.9%) of the respondents sometimes, and (37.6%) of the respondents confirmed to be influenced by advertisement. Most respondent heard advertisement for food on the radio and television. Newspapers/magazines, internet and billboards do not seem to be commonly used for food advertisement.
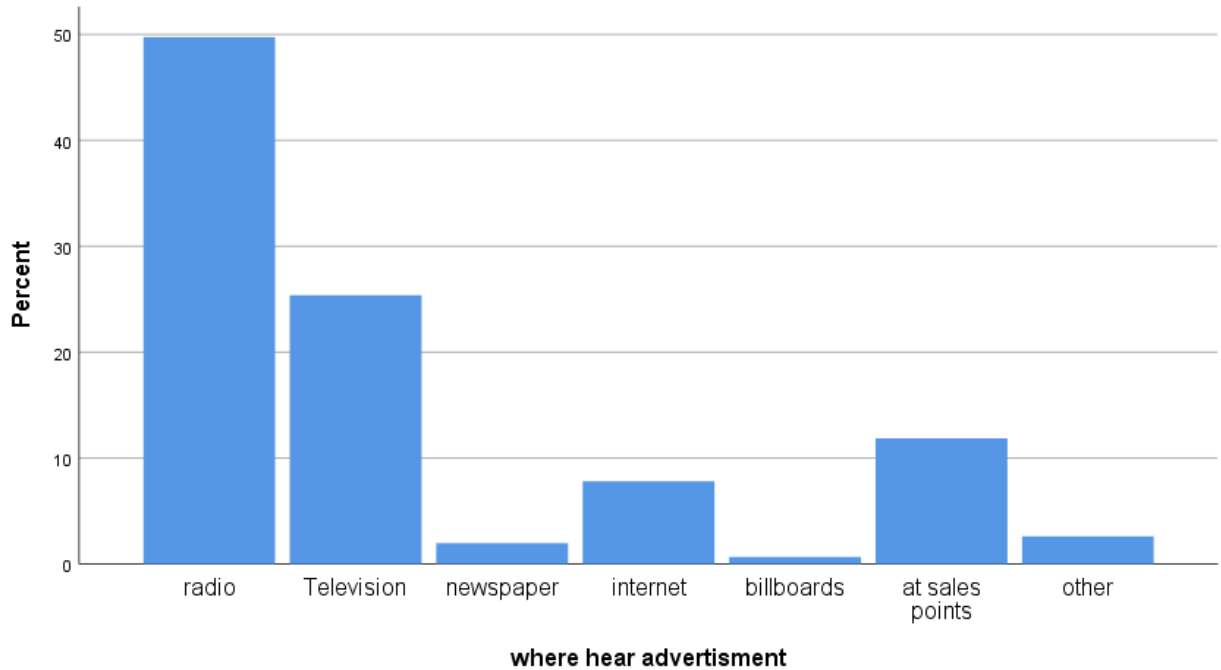
Figure 5: Percentage of respondents reporting to hear or see food advertisement through media channels

6.8. Factors associated with fruit and vegetables consumption

The result of bivariate analysis showed that there was significant association with fruit and vegetables consumption between Income, Education, current pregnancy, transportation, mobile phone in the households, whose house do you live in ,affordability, persons live in the households, age, education, place to do home gardening, affordability, availability and preparation take long times .but after controlling for possible confounders the result of multivariate analysis reveal that income affordability, availability, place to do home gardening, education ,and age were significantly associated with adequate fruit and vegetables consumption. In this study, the high income [greater than 10960 birr] were about 1.42 times (AOR 1.42[95%CI 1.12-1.80]) more likely to adequate consumption of fruit and vegetables than low income, respondents who had afford were 3.29 times more likely to consume (AOR 3.29 (2.42-4.46) than who had no afford, participants who had availability were 4.06 times more likely to consume (AOR 4.06[95% CI 3.23-5.09]) than who have not available. In this study, those who have place to do home gardening were 3.273 times more likely to consume (AOR 3.273 [95% CI 1.091-5.818]) than who had no home garden. Education status with Degree were 2.787 times more likely to consume (AOR 2.787[95% CI (1.089-6.955) than illiterate one and primary school. Respondents whose age between 26-44 were 1.42 times more likely to consume (AOR 1.42[95% CI 1.13 -1.77] than older and other age group.

Table 4: Bivariate and multivariate analysis of factors associated with fruit and vegetables consumption among Debre Berhan town, North shoa , Amhara region ,Ethiopia ,2023,(n=615).

Variable	Fruit and vegetable consumption		AOR(95%CI)
	Adequate n (%)	Inadequate n (%)	
Income			
Low income	101	354	1
Medium income	22	108	**1.15(1.12-1.80)***
High income	23	7	**1.42(1.12-1.80)***
Education			
Illiterate	25	23	1
Primary school	44	144	0.36(0.22-0.61)
Secondary school	45	179	**1.38(1.07-1.77)***
Diploma	3	27	**1.394(1.09-4.89)***
Degree	17	88	**2.787(1.089-6.955)***
Other	6	14	0.64(0.51-0.82)
Age			
18-25	5	63	1
26-44	76	288	**1.42(1.13-1.77)***
45-59	15	105	.151(.006-3.762)
≥60	25	38	.138(.027-.706)
Affordability			
Yes	125	124	**3.29(2.42-4.46)***
NO	15	348	1
Availability			
Yes	1	68	**4.06(3.23-5.09)***
NO	139	407	1
Place to do home garden			
Yes	26	60	**3.273(1.091-5.818)***
NO	114	415	1

NB*=p-value <0.05

7. Discussion

The study investigated the determinants of FVs consumption among households in Debre berhan town. This study findings showed that fruit and vegetables consumption is low and inadequate. The WHO recommended daily intake of fruits and vegetables is a total of five servings (or 400grams) per day, of which preferably 3 servings of vegetables and 2 servings of fruit (27).

Result of this study revealed that the prevalence of adequate fruit and vegetables consumption was 7.7%, the result is lower than Uganda 2014 report and higher than study conducted at national level in Ethiopia (8, 15).

In this study the most reported daily intake of fruit was 22.4% and vegetables 8.3%, Daily fruit consumption was significantly higher for study area compared to study done in Kenya daily fruit consumption was 15.3% and lower daily vegetables consumption in this study compare to Mozambique about 18.7% (19, 30).

Ninety percent of the total respondents (n=615) reported to consume their vegetables heated, versus 9.1% that consumes their vegetables raw , this is lower than study done in urban Rwanda ninety –eight percent of the respondents (n=420) reported to consume vegetables heated (2,31).

Respondents source most of their fruit and vegetables from the local Market. Almost very low of the respondents (16.6%) consume self-grow vegetables. sourcing from own production was lower for Debre berhan towns. This result finding is in accordance with the result conduct in Ghanaian marketing strategies should be directed at making highly preferred and frequent consumed fruit and vegetables (21).

The findings shows that only 3.3% of the respondents reported to aware the daily intake for fruits and vegetables .among those most respondents under estimated the daily recommended intake, most respondents said one servings a days, this is very lower than official WHO recommendations of a total of 5 servings of fruits and vegetables per day (30).

In this study ,one of the determinant factors for fruit and vegetable consumption was high income (≥ 10960) were about 1.42 times more likely to adequate fruit consumption (AOR 1.42[95% CI 1.12-1.180]) than low income (<4850 birr) .This finding is similar reports study conducted in Uruguay and brazil family income level were significantly associated with low fruit and vegetable consumption. In a study conducted in Ghana household's income and expenditure was significant effect on fruit consumption. Affordability, availability, age and Education were associated with

adequate fruit and vegetable consumption. In a study conducted in Brazil cost was highly predictive of low fruit and vegetable consumption intake (23, 28).

In this study, ownership of home gardening were 3.273 times more likely to consume adequate fruit and vegetables (AOR 3.273 [95% CI 1.091-5.818]) than who had no home garden. Respondents who had availability were 4.06 times more likely to consume vegetables (AOR 4.06 [95%CI (3.23-5.09]) than no available. This is similar to study done in Ghana frequently consumed fruit and vegetables were associated with availability and easily accessibility (21).

8. Limitation of the study

This study has some limitations. FVs consumption was measured by self-reporting based on retrospective accounts, hence might be prone to recall bias, random errors, and other social desirability concerns (e.g., under or over reporting). Other social and context specific permissiveness may have influenced noted findings in the current study. The timing of the coincide within or outside the main harvest season in Debre berhan town, hence the availability and accessibility as well as cost of fruits and vegetables, may impact consumption. Therefore, the estimation of FVs consumption may be subjective and could affect the adequacy of servings at a particular point in time. The use of cross-sectional data did not allow assessment of changes of FVs consumption over time and further restricted the control of other factors (e.g., season, culture) that might influence intake.

9. Conclusion and recommendation

9.1. Conclusion

The study examined of the determinants of fruit and vegetables consumption among households in Debre Berhan town. The finding revealed that the prevalence of FVs consumption among Debre Berhan town was low and inadequate. Income, Affordability, Education, age, place to do home gardening and availability were major determinants hindering the consumption of adequate fruit and vegetables.

9.2. Recommendation

Based on the major findings the following recommendations are forwarded

➢ **Debre Berhan city Health Department**

- The home gardening could be more effective if production is informed by food preference.
- To disseminate awareness raising message through social media

➢ **For health care workers**

- Pragmatic interventions (e.g., adequate health education and promotion programs; arable fruits and vegetable farming initiatives) to promote sufficient FVs consumption among the households in Debre berhan town seem necessary in order to improve intake.

➢ **For researchers**

- Further studies examining social, regional, seasonal, and geographical influences associated with inadequate FVs in Debre berhan town using longitudinal designs are encouraged.

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ANNEXES

Annex I: subject information sheet

Debre Berhan University

Asrat Woldeys Health sciences Campus

School of public health

Questionnaire for a study on Determinant of fruits and vegetable consumption Among Community of Debre Berhan town, North shewa, Amhara Regional States, Ethiopia, 2023.

My name is ………………….I belong to the research team studying the determinant of fruits and vegetable consumption Among Community of Debre Berhan town, North Shewa, Amhara Regional States, Ethiopia, 2023.The study is being conducted by a graduate student of Master of public health in nutrition from Debre Berhan University Asrat Woldeyes Health Science Campus School of public health. The objectives of this study is to assess the Determinant of fruits and vegetable consumption Among Community of Debre Berhan town, North Shewa, Amhara Regional States, Ethiopia, 2023. Thus, this interview is prepare for the purpose of generating appropriate information on determinant of fruits and vegetable consumption in this location. The information that I will obtain using this interview will be used only for research purpose; you are not expect to give any information that is harmful and personal issue. We need to assure you that confidentiality is our main quality. Therefore, we are kindly requesting your cooperation to participate in this interview. Participating in this interview you have no any direct benefit at this moment but the information you provide has a great benefit in solving problem factors affects to fruits and vegetable consumption. There is no risk or harm for participating in the study. The interview will take about 20 minutes.

If you need any further information or explanation regarding this study, you can have this address to contact the principal investigator

Name- Addisu Derbe

Telephone – 0937624445

E-mail- addisuderbe2021@gmail.com

Annex II: Informed consent

Based on the understanding of the information I gave you, are you willing to participate in this study?   A. Yes   B. No

1. If yes, continue the interview. 2. If no, skip to the next participant by writing reasons for his/her refusal.

   ………………………………………………………………………….

   Informed consent certified by:

   Respondents signatures ………………………. Date…………………......

   Interviewer: Name…………………………. signature………………..

   Questionnaire number……………………...

   Date of interview………………….Time started………………...Time completed………

   The result of the interview:

   1. Completed

   2. Respondent not available

   3. Refused

   4. Partially completed

   Checked by supervisor: Name _____signature_____

Thank you for your cooperation!!!

Annex III: Questionnaire English Version

No	Questions	Possible answers		CODE
		PART I. Socio-economic Factors		
No	**Questions**	**Possible answers**		**CODE**
	Region			
	Kebele			
	Household number			
1	Head of the household	Head of household	1	
		spouse/husband	2	⊔
		daughter/son	3	
		other	4	
2	What is your age (in years)?	.... years		
3	Religion of the respondent	Orthodox	1	
		Muslim	2	
		Protestant	3	⊔
		Others	4	
4	Sex of respondent	Male	1	
		Female	2	⊔
5	Have you ever went to school?	Yes	1	
		No	2	⊔
6	Level of Education	Illiterate	1	
		Primary school	2	
		Secondary school	3	
		Diploma	4	
		Technical/vocational certificate	5	
		College student	6	⊔
		University student	7	
		Degree	8	
		Other (specify)	9	
7		Yes	1	

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	Does head of the households partner have an employment	unemployed	2	
		Housewife	3	
		pupill/student/trainee	4	
		retired	5	⌞⌟
		Elderly without pension	6	
		unfit	7	
		other	8	
		If Other , Specify ……………………………………………..		
8	Number of person employed in the household	………………………………………………………..		⌞⌟
9	Number of person living in the household	………………………………………………………		⌞⌟
10	What is the average monthly incomes of the family?	In money…………..	1	
		In-kind	2	
		other	3	⌞⌟
		If Other (specify)………………………………………………		
11	Marital status	Single	1	
		Married	2	
		Widowed	3	⌞⌟
		Divorced	4	
		separated	5	
12	If you are married do you live with your husband or are you living separately?	I live with my husband	1	
		We live separately	2	⌞⌟
13	Do you have children?	Yes	1	
		No	2	⌞⌟
14	Living area	urban	1	
		Rural	2	⌞⌟

		Part II. Factor affects fruit and vegetable consumption		
15	Do you have a light source in your house?	Yes	1	
		No	2	⌴
16	What fire source do you use for cooking?	Charcoals	1	
		Wood	2	
		Kerosene	3	
		Electric	4	
		Biogas	5	⌴
		Animal fuel	6	
		Coffee waste	7	
		Dried grass	8	
		other	9	
		If Others , specify………………………………………………		
17	Do you have a clock in the house	Yes	1	
		No	2	⌴
18	which social media have follows (more than one answer is possible)?	facebook	1	
		Youtube	2	
		Twitter	3	
		messenger	4	
		Instagram	5	
		Tik Tok	6	
		Telegram	7	
		Whatsapp	8	
		Viber	9	
		imo	10	
		Television	11	
		Radio	12	
19	Do u have a refrigerator?	Yes	1	
		No	2	⌴
20		Car age	1	

	What do you use for transportation?	Baggage	2	
		Taxi	3	
		Car	4	
		Motorcycle	5	⊔
		Bicycle	6	
		Other	7	
		If other, specify…………………………………………….		
21	Do you have a place to do home gardening?	Yes	1	
		No	2	⊔
22	If you do you have a home garden?	Yes	1	
		No	2	⊔
23	How do you use your home garden produce?	To sale	1	
		Many of it to the sale and some of it we consume	2	
		For our self	3	
		Other	4	
		If other, specify ……………………………………..		⊔
		No	5	
		Other	6	
		If Other, specify…………………………………………….		
24	Does anyone from the household have a mobile phone?	Yes	1	
		No	2	⊔
25	Whose house do you live in?	Rental	1	
		My own	2	
		Relatives	3	⊔
		Other	4	
		If other ,specify …………………………………………...		
26	Does anyone in the household have a farming land?	Yes	1	
		No	2	⊔

| 27 | Do you have a budget plan in the household? | Yes | 1 | |
| | | No | 2 | � |

Part III: Fruit and vegetable consumption				
28	For the next two questions 1 serving is (approximately 80 grams)			
29	How many servings of fruits do you eat on a typical day?	0	1	
		1	2	
		2	3	
		3	4	⌴
		4	5	
		5	6	
		>5	7	
30	How many servings of vegetables do you eat on a typical day?	0	1	
		1	2	
		2	3	
		3	4	
		4	5	
		5	6	
		>5	7	
31	Add the servings of fruit and vegetables and double check with the respondents: Is it correct that you consumed (answer Q+ answer Q) servings of fruit and vegetables yeseterday?	…………….. servings		
32	If your answer to the above question is that you eat inadequate fruit and	Yes	1	
		No	2	

	vegetables (≤ 4 servings per day)			
33	If your answer is Yes could you tell me the reason to inadequate fruit and vegetable consumption?	Affordability	1	
		Availability	2	
		I don't know the preparation method	3	
		The preparation takes a long time	4	
		I don't like the taste	5	
		My husband doesn't like vegetable	6	
		My children don't like vegetable	7	
		Market is far	8	
		I don't think eating vegetable has any benefit	9	
34	Are you aware of the daily recommended number of servings of fruits and vegetables? If yes, how many?	Yes …………….		⊔
		No		
35	Do you eat your vegetables mostly heated or raw?	Heated	1	⊔
		Raw	2	
36	Where do you source most of your fruits?	Local market	1	⊔
		Supermarket	2	
		Convenience store	3	
		Street vendor	4	
		Self-grown	5	
37	Where do you source most of your vegetables?	Local market	1	⊔
		Supermarket	2	
		Convenience store	3	
		Street vendor	4	
		Self-grown	5	
38	What type of food has the highest priority for your household hold purchases?	Fruits	1	⊔
		Vegetables	2	
		Cereals/staples	3	

		Nut crops	4	
		Meat/Poultry	5	
		Dairy	6	
		Fish	7	
		Fat, oils	8	
		Sweets	9	
39	Does advertisement influence your food purchases?	Yes	1	
		No	2	└┘
		Sometimes	3	
40	Where do you see or hear advertisement for foods? Multiple answers possible?	Radio	1	
		Television	2	
		Newspaper/magazines	3	
		Internet	4	└┘
		Billboards	5	
		At sales point	6	
		Other, please specify	7	
41	Do you make a meal?	Yes	1	
		No	2	└┘
42	If you do how many times a week do you make it?	………………………		
43	Why do you prepare it?	Because of its availability	1	
		Affordability	2	
		I like it	3	
		My family enjoys it	4	
		Because I think its health	5	└┘
		All of the above	6	
		Other specify	7	

Part IV: Fruits and vegetable preference

1) I like it

2) I don't like it

3) Don't know it

4) I prefer it but it is hard to get

Fruits	1	2	3	4	Vegetables	1	2	3	4
Banana					Carrots				
Orange					Potatoes				
Watermelon					Cabbage				
Mango					Kale				
Grapes					Spinach				
Strawberries					Beetroot				
Apple					Tomatoes				
Pear					Green chills				
Mandarin					Green peas				
Lemon					Lettuces				
Papaya					Onion				
Avocado					Garlic				
Grapefruit					Ginger				
Others specify					Others specify				

የአማርኛ ቃለመጠይቅ

የርዕሰ ጉዳይ መረጃ ወረቀት

ደብረ ብርሃን ዩኒቨርሲቲ

አስራት ወልደየስ ጤና ሳይንስ ካምፓስ

የፍቃድ ቅፅ

በደብረ ብርሃን ከተማ፣ በሰሜን ሸዋ፣ በአማራ ክልል፣ ኢትዮጵያ፣ 2023 የአተክልትና ፍራፍሬ አጠቃቀምን በሚወስኑ ማህበረሰብ መካከል የተደረገ ጥናት መጠይቅ።

ስሜ ………………………… በደብረ ብርሃን ከተማ፣ ሰሜን ሸዋ፣ በአማራ ክልል፣ ኢትዮጵያ ማህበረሰብ 2023 የአትክልትና ፍራፍሬ ፍጆታን የሚወስኑ የምርምር ቡድን አባል ነኝ። ጥናቱ እየተካሄደ ያለው እ.ኤ.አ. ከደብረ ብርሃን ዩኒቨርሲቲ አስራት ወልደየስ ጤና ሳይንስ ካምፓስ የህብረተሰብ ጤና ትምህርት ቤት የህብረተሰብ ጤና በአመጋገብ ማስተርስ ተመራቂ። የዚህ ጥናት ዓላማዎች በደብረ ብርሃን ከተማ፣ ሰሜን ሸዋ፣ በአማራ ክልል፣ ኢትዮጵያ, 2023 ማህበረሰብ መካከል የአትክልትና ፍራፍሬ ፍጆታ መወሰኛን ለመገምገም ነው።በመሆኑም ይህ ቃለ መጠይቅ የተዘጋጀው የፍራፍሬ መወሰኛን በተመለከተ ተገቢውን መረጃ ለማመንጨት ነው። እና በዚህ ቦታ የአትክልት ፍጆታ. ይህንን ቃለ መጠይቅ ተጠቅሜ የማገኘው መረጃ ለምርምር ዓላማ ብቻ ይውላል። ጎጂ እና የግል ጉዳይ ምንም አይነት መረጃ እንዲሰጡ አይጠበቁም። ሚስጥራዊነት ዋናው ጥራታችን መሆኑ ልናረጋግጥልዎ ይገባል። ስለዚህ በዚህ ቃለ መጠይቅ ላይ እንድትሳተፉ ትብብራችሁን በአክብሮት እንጠይቃለን። በዚህ ቃለ መጠይቅ ውስጥ መሳተፍ በአሁኑ ጊዜ ምንም አይነት ቀጥተኛ ጥቅም የለዎትም, ነገ ግን የሚያቀርቡት መረጃ በፍራፍሬ እና በአትክልት ፍጆታ ላይ አሉታዊ ተፅእኖዎችን በመፍታት ረገድ ትልቅ ጥቅም አለው. በጥናቱ ውስጥ ለመሳተፍ ምንም አይነት አደጋ ወይም ጉዳት የለም. ቃለ መጠይቁ 20 ደቂቃ ያህል ይወስዳል።

ይህንን ጥናት በተመለከተ ተጨማሪ መረጃ ወይም ማብራሪያ ከፈለጉ ዋናውን መርማሪ ለማግኘት ይህንን አድራሻ ማግኘት ይችላሉ።

ስም- አዲሱ ደርቤ   ስልክ - 0937624445   ኢሜል- addissuderbe2021@gmail.com

በመረጃ የተደገፈ ስምምነት

በሰጠሁህ መረጃ መረዳት ላይ በመመስረት፣ በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነህ? A. አዎ   ለ. አይደለሁም

1. አዎ ከሆነ፣ ቃለ መጠይቁን ይቀጥሉ። 2. አይደለሁም ከሆነ፣ ፈቃደኛ ያልሆኑበትን ምክንያት በመጻፍ ወደ ቀጣዩ ተሳታፊ ይዝለሉ።……………………………………………………………

በመረጃ የተደገፈ ፈቃድ በ:

ምላሽ ሰጪዎች ፊርማዎች …………………………ቀን ……………………

ጠያቂ: ስም ………………………………ፊርማ …………………………

መጠይቅ ቁጥር …………………………………

የቃለ መጠይቁ ቀን ………………የተጀመረበት ሰዓት ....የተጠናቀቀበት ሰዓት ....

የቃለ መጠይቁ ውጤት:-

1. ተጠናቅቋል   2. መላሹ አልተገኘም

3. እምቢ አለ   4. በከፊል የተጠናቀቀ

በተቆጣጣሪ የተረጋገጠ: ስም.. ፊርማ...

ለትብብርዎ እናመሰግናለን!!

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	ቁጥሩን ይክበቡ	ዝለል

ክፍል I. ሶሻዮ - የስነ ሕዝብ አወቃቀር ባህሪያት

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	ቁጥሩን ይክበቡ	ዝለል
	ክልል			
	ቀበሌ			
	የቤት ቁጥር			
1	የቤተሰብ ኃላፊ ማን ነው?	አባወራ	1	
		እማ ወራ	2	
		ሴት ልጅ / ወንድ ልጅ	3	
		ሌላ_____		
2	ዕድሜዎ ስንት ነው (በዓመት)?	_____ ዓመት		
3	ሃይማኖቶ ምንድን ነው?	ኦርቶዶክስ	1	
		ሙስሊም	2	
		ፕሮቴስታንት	3	
		ሌላ ይግለጹ ____		
4	ምላሽ ሰጪ ጾታ ?	ወንድ	1	
		ሴት	2	
5	ትምህርት ተምረሽ ታውቂያለሽ/ህ?	አዎ	1	
		አላውቅም	2	
6	የትምህርት ደረጃ	ያልተማረ	1	
		የመጀመሪያ ደረጃ ትምህርት ቤት	2	
		ሁለተኛ ደረጃ ትምህርት ቤት	3	
		የሁለተኛ ደረጃ ዲፕሎማ	4	
		የቴክኒክ/የሙያ የምስክር ወረቀት	5	
		የኮሌጅ ተማሪ	6	
		የዩኒቨርሲቲ ተማሪ	7	
		ዲግሪ	8	
		ዲፕሎማ	9	
		የተለየ ከሆነ ጥቀሽ/ጥቀስ_____		
7	የሥራ አይነትሽ/ህ ምንድን ነው?	ስራ አጥ	1	
		የቤት እመቤት	2	
		ጡረታ ውጥቷል	3	
		አረጋውያን ያለ ጡረታ	4	
		ተማሪ	5	
		ገበሬ	6	
		ነጋዴ	7	
		የጉልበት ሰራተኛ	8	
		የመንግስት ሰራተኛ	9	
		የተለየ ከሆነ ጥቀሽ/ጥቀስ_____		
8	በቤተሰብ ውስጥ የተቀጠሩ ሰዎች ብዛት	_____		
9	በቤተሰብ ውስጥ የሚኖሩ ሰዎች ቁጥር	_____		
10	የቤተሰቡ አማካይ ወርሃዊ ገቢ ስንት ነው?	በገንዘብ _____ ብር	1	
		በአይነት	2	
		የተለየ ከሆነ ጥቀሽ/ጥቀስ _____		
11	የትዳር ሁኔታሽ/ህ ምንድን ነው ?	ያላገባ	1	
		ያገባ	2	

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		በሞት የተለየ	3	
		የተፋታ	4	
12	የትዳር አጋር አብሮ ይኖራል ወይስ ሌላ ቦታ ነው የሚኖረው?	አብረን እየኖርን ነው	1	የ 11 ኛው መልስ አላገቡም ከሆነ ዝለል
		ሌላ ቦታ ነው የሚኖረው	2	
13	ልጆች አሉሽ ወይ/ አሉህ ወይ?	አሉኝ	1	
		የሉኝም	2	
14	ከላይ ላሉት ጥያቄዎች መልስ ከሰጡህ ስንት አሉሽ/ህ?	_____		የሉኝም ከሆነ ዝለይ
15	በአሁኑ ጊዜ እርጉዝ ነሽ?	አዎ	1	
		አይደለሁም	2	
16	የመኖሪያ አካባቢ	ከተማ	1	
		ገጠር	2	
ክፍል II. በአትክልትና ፍራፍሬ ፍጆታ ላይ ተጽዕኖ የሚያሳድሩ				
17	በቤትዎ ውስጥ መብራት አለ ወይ?	አለ	1	
		የለም	2	
18	ምግብ ለማብሰል የምትጠቀሚበት የሀይል ምንጭ ምንድን ነው?	በከሰል	1	
		በእንጨት	2	
		በነጭ ጋዝ	3	
		በኤሌክትሪክ	4	
		በባዮ ጋዝ	5	
		በኩበት	6	
		የቡና ገለባ	7	
		ሣር/ፍርሽካ	8	
		የተለየ ከሆነ ጥቀሽ/ጥቀስ _____		
19	በቤት ውስጥ ስዓት አለሽ/ህ?	አለ	1	
		የለም	2	
20	የትኞቹን ማህበራዊ ሚዲያዎች ትከተያለሽ/ህ (ከአንድ በላይ መልስ መምረጥ ይቻላል)?	ፌስቡክ	1	
		ዩቲዩብ	2	
		ትዊተር	3	
		ሚሴንጀር	4	
		ኢንስታግራም	5	
		ቲክ ቶክ	6	
		ቴሌግራም	7	
		ዋትሳፕ	8	
		ቫይበር	9	
		ኢሞ	10	
		ቴሌቪዥን	11	
		ሬዲዮ	12	
21	በቤት ውስጥ ፍሪጅ/ማቀዝቀዣ አለ ወይ?	አለ	1	
		የለም	2	
22	ለመጓጓዝ ምን ይጠቀማሉ?	ጋሪ	1	
		ባጃጅ	2	
		ታክሲ	3	
		በመኪና	4	

		ሞተርሳይክል	5	
		ብስክሌት	6	
		የተለየ ከሆነ ጥቀሽ/ጥቀስ _____		
23	የጓሮ አትክልት መትከያ ቦታ አለሽ/ህ ወይ?	አለኝ	1	
		የለኝም	2	
24	የጓሮ አትክልት መትከያ ቦታ ካለሽ አትክልት ትተክያለሽ ወይ?	እተክላለሁ	1	የ ቁጥር 23 የለኝም ከሆነ ዝለል
		አልተክልም	2	
25	የቤትዎን የአትክልት ምርት ለምን ይጠቀማሉ?	ለሽያጭ ብቻ	1	የ ቁጥር 23 የለኝም ከሆነ ዝለል
		አብዛኛውን ለሽያጭ	2	
		ለቤት ውስጥ ፍጆታ ብቻ	3	
		ሌላ ይግለጹ		
26	የውሃ ምንጯ ምንድን ነው?	የቧንቧ ውሃ	1	
		የህዝብ የቧንቧ ውሃ	2	
		የተጣራ የጉድጓድ ውሃ	3	
		ያልተጣራ የጉድጓድ ውሃ	4	
		የከርስ ምድር ውሃ	5	
		የዝናብ ውሃ	6	
		የጉድጓድ ውሃ በቱቦ የተዘጋጀ	7	
		የተጣራ የምንጭ ውሃ	8	
		ያልተጣራ የምንጭ ውሃ	9	
		ሌላ ይግለጹ		
27	ውሃ ቀድቶ ለመምጣት ምን ያህል ጊዜ ይወስዳል?	በቤት ውስጥ የቧንቧ ውሃ አለኝ	1	
		ግማሽ ሰዓት	2	
		አንድ ሰዓት	3	
		ከአንድ ሰአት በላይ	4	
		ሌላ ይግለጹ		
28	ሞባይል ስልክ ያለው ከቤተሰቡ አባል ውስጥ አንድ ሰው አለ	አለ	1	
		የለም	2	
29	የምትኖሩበት ቤት የማን ነው?	የኪራይ	1	
		የራሴ ነው	2	
		የዘመድ	3	
		ሌላ የግለጹ		
30	በቤተሰቡ ውስጥ የእርሻ መሬት ያለው አለ?	አለ	1	
		የለም	2	
31	በቤተሰብ ውስጥ የውጪ እቅድ አለዎት?	አለ	1	
		የለም	2	
ክፍል III: የፍራፍሬ እና የአትክልት ፍጆታ				
32	በቀን ውስጥ ስንት ጊዜ ፍራፍሬዎችን ትበያለሽ/ትበላለህ?	አንድ ጊዜ	1	
		ሁለት ግዜ	2	
		ሦስት ጊዜ	3	
		በሳምንት አራት ጊዜ	4	
		በሳምንት ከአራት ጊዜ በላይ	5	
		ሳምንቱን ሙሉ	6	
		ፍራፍሬ አልመገብም	7	

33	ከመልሱ በመነሳት በሳምንት ውስጥ ያን ያህል ጊዜ ፍራፍሬ ለምን ይመገባሉ? _____		
34	**የ32** ኛው ጥያቄ መልስ ፍራፍሬ አልመገብም ከሆነ ምክንያቱ ምንድን ነው?	ዋጋው ውድ ነው	1	
		በቀላሉ አይገኝም	2	
		ገበያው ሩቅ ነው	3	
		ጣዕሙን አልወደውም	4	
		ባለቤቴ አይወዱም	5	
		ልጆቹ አይወዱትም	6	
		የፍራፍሬ መመገብ ጥቅሙ አይገባኝም	7	
		የቅንጦት ምግብ ይመስለኛል	8	
		ሌላ ይግለጹ		
35	በቀን ውስጥ ስንት ጊዜ **አትክልት** ትመገቢያለሽ/ህ?	አንድ ጊዜ	1	
		ሁለት ግዜ	2	
		ሦስት ጊዜ	3	
		በሳምንት አራት ጊዜ	4	
		በሳምንት ከአራት ጊዜ በላይ	5	
		ሳምንቱን ሙሉ	6	
		አትክልት አልመገብም	7	
36	ከመልሱ በመነሳት በሳምንት ውስጥ ያን ያህል ጊዜ አትክልት ለምን ይመገባሉ? _____		
37	የ35 ኛው ጥያቄ አትክልት አልመገብም ከሆነ ምክንያቱ ምንድን ነው ?	ዋጋው ውድ ነው	1	
		በቀላሉ አይገኝም	2	
		እንዴት እንደሚሰራ አላውቅም	3	
		ሲሰራ ጊዜ ይፈጃል	4	
		ጣዕሙን አልወደውም	5	
		ባለቤቴ አይወድም	6	
		ልጆቹ አይወዱም	7	
		ገበያው ሩቅ ነው	8	
		አትክልት መመገብ ጥቅሙ አይገባኝም	9	
		አትክልት የቅንጦት ምግብ ይመስለኛል	10	
		ሌላ ይግለጹ		
38	**1 አገልግሎት (ሳህን) (በግምት 80 ግራም) ማለት ነው**			
39	ከላይ ያለውን ግምት በመመልከት በቀን ስንት (ሳህን) ፍራፍሬ ይበላሉ?	0	1	
		1	2	
		2	3	
		3	4	
		4	5	
		5	6	
		>5	7	

40	በየቀኑ የሚመከሩትን የፍራፍሬ እና የአትክልት ምግቦች ብዛት ያውቃሉ? አቃለሁ ከሆነ ስንት ግራም ነው?	አቃለሁ _____ ግራም	1	
		አላቅም	2	
41	እርስዎ እንደሚሉት የፍራፍሬ እና የአትክልት ጥቅሞች ምንድን ናቸው? _____			
42	አትክልቶችን በብዛት ተሞቆ ወይም በጥሬ ትበላላችሁ?	ተሞቆ	1	
		በጥሬ	2	
43	አብዛኛውን ጊዜ **ፍራፍሬ** ከየት ታገኛለሽ/ህ?	ከአካባቢ ገበያ	1	
		ሱፐርማርኬት	2	
		ምቹ መደብር	3	
		የመንገድ አቅራቢ	4	
		እራሴ አሳድጌ	5	
44	አብዛኛውን ጊዜ **አትክልት** ከየት ነው የምታገኘው/ኛው?	ከአካባቢ ገበያ	1	
		ሱፐርማርኬት	2	
		ምቹ መደብር	3	
		የመንገድ አቅራቢ	4	
		እራሴ አሳድጌ	5	
45	ለቤተሰብዎ ግዢዎች ከፍተኛ ቅድሚያ የሚሰጠው ምን ዓይነት ምግብ ነው?	ፍራፍሬዎች	1	
		አትክልቶች	2	
		የእህል ምግቦች	3	
		የለውዝ ሰብሎች	4	
		ስጋ / የዶሮ ውጤቶች	5	
		የወተት ምርቶች	6	
		ዓሳ	7	
		ስብ, ዘይቶች	8	
		ጣፋጮች	9	
46	ማስታወቂያ በምግብ ግዢዎ ላይ ተጽዕኖ ያሳድራል?	ያሳድራል	1	
		አያሳድርም	2	
		አንዳንዴ	3	
47	የምግብ ማስታወቂያ የት ነው የሚያዩት ወይም የሚሰሙት? በርካታ መልሶች ሊኖሩ ይችላሉ።	ሬዲዮ	1	
		ቴሌቪዥን	2	
		ጋዜጣ/መጽሔቶች	3	
		ኢንተርኔት	4	
		ቢልቦርዶች	5	
		በሽያጭ ቦታ	6	
		ሌላ፣ እባክዎን ይግለጹ...			
48	ምግብ ትሰሪያለሽ/ህ?	እሰራለሁ	1	
		አልሰራም	2	
49	በሳምንት ስንት ቀን ነው የምትሰሩው/የምትሰራው?	_____ ቀን		

50	ለምን ታዘጋጂያለሽ/ህ?	በቀላሉ ስለሚገኝ	1	
		ርካሽ ስለሆነ	2	
		ስለ ምወደው	3	
		ቤተሰቤ ስለሚወደው	4	
		ምክንያቱም ጤናማ ነው ብዬ ስለማስብ	5	
		ከላይ የተጠቀሱት በሙሉ	6	
		ሌላ ይግለጹ...		

ክፍል IV: የምመርጠው አትክልትና ፍራፍሬ

1) እወደዋለሁ

2) አልወደውም

3) አላውቀውም

4) ምርጫዬ ነው ለማግኘት ከባድ ነው

ፍራፍሬ	1	2	3	4	አትክልት	1	2	3	4
ሙዝ					ካሮት				
ብርቱካን					ድንች				
ሀብሀብ					ጥቅል ጎመን				
ማንጎ					ጥቁር ጎመን				
ወይን ፍሬ					ቆስጣ				
እንጆሪ					ቀይስር				
ፓፕ					ቲማቲም				
ፒር					አረንጓዴ ቃሪያ				
መንደሪን					አረንጓዴ አተር				
ሎሚ					ሰላጣ				
ፓፓያ					ቀይ ሽንኩርት				
አቮካዶ					ነጭ ሽንኩርት				
ግሪፕ(ቆምባጤ)					ዝንጅብል				
ሌላ ካለ ጥቀስ					ሌላ ካለ ጥቀስ				

Declaration Sheet Format

I, the undersigned, declare that this research Entitled "Determinants of fruits and vegetable consumption of Community in Debre Berhan town , North shewa , Amhara region, Ethiopia, 2023" A Thesis submitted to School of public health ,Asrat Woldeyes Health Science Campus, Debre Berhan University; in partial fulfillment of the requirement for the Master's Degree in public health Nutrition . This is original work and has never been presented in this or any other university and that all the source materials used for this research have been fully acknowledged.

Addisu Derbe   July 17/2023 G.C

Principal Investigator Name   signature   Date

After I make essential revisions and correction, I assured that thesis is technically and methodological legible for ethical reviews and submitted with my approval as an advisors.

Asmamaw Abera   July 17/2023 G.C

Principal Advisor Name   signature   Date

                                                                                July 17/2023G.C

Name of co - advisor   signature   Date