Abstract

Introduction: Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases (CVD) and cancer. CVD are increasing throughout the world and cause 16.7 million deaths each year. In Zimbabwe, hypertension is the top leading cause of outpatient chronic conditions and its proportion to the overall burden is 48.9%. In Mt Darwin hypertension (51.4%) remains the chronic condition with the highest burden. Eating a healthy diet such as high fruits and vegetables, low fat and low salt have been shown to substantially reduce CVD and increase quality of life. This study sought to determine factors influencing dietary patterns in Mt Darwin district.

Methods: The study was an Analytic Cross Sectional study and the sample size was 350. Data was collected by an Interviewer Administered Questionnaire targeting people in Mt Darwin that are over the age of 18 years. Multistage sampling was done. Epi info version 3.5.1 was used to create frequencies and proportions were calculated as well as Odds ratios to determine associations. Multivariate Logistic regression analysis was done to identify independent risk factors and to control for confounding variables.

Results: Three hundred and fifty (350) participants were included in the study. Being male or female [POR=3.97; 95% CI (2.28-6.89)], preferring fatty foods [POR= 2.1; 95% CI (1.11-3.99)], adding salt to served food [POR=0.42; 95% CI (0.26 -0.67)], boiling food as a method of preparation [POR=1.65; 95% CI (1.05-1.59)], and perceiving that a big body means one is healthy [POR=0.56; 95% CI (0.36-0.96)] were significantly associated with dietary patterns. Being male or female [AOR=0.23; 95% CI (0.13-0.40)], boiling food as a method of preparation [AOR=1.69; 95% CI (1.03-2.76)] and preferring fatty foods [AOR=2.56; 95% CI (1.29-5.06)], remained significant on logistic regression analysis.

Conclusion and Recommendations: Unhealthy dietary patterns have been found to be prevalent in Mt Darwin, especially among women. Taste and food preference, and image and body size were factors influencing dietary patterns in this study. Health education messages of diet should encompass all social and cultural context issues around food, including correction of myths.

Key Words: Cardiovascular disease, dietary patterns, obesity, physical activity
Acknowledgement

I would like to express my sincere gratitude to the Provincial Medical Director of Mashonaland Central Province Dr C Tshuma and his staff for all the support rendered in this project. I would also want to express my gratitude to my field supervisor Mr P Chinakidzwa for the guidance and support throughout this project. I also want to acknowledge the Department of Community Medicine for all the support rendered to me. My sincere gratitude also goes to the District Medical Officer for Mt Darwin Dr Mapiye and all other health staff for their unwavering support. My sincere gratitude goes to my research assistants; Mrs F Rice, Mr J Chimaenda and Mr M Mutesva for their unwavering support during data collection. Many thanks also to all the clinic nurses and nutrition department for assisting me during the study and guidance in their areas of jurisdiction. I would also want to thank all the study participants for taking their time and agreeing to take part in this study. My uttermost gratitude goes to Dr J Chirenda and Mrs J Maradzika for the guidance throughout the whole process of preparing this project.

I would also like to thank the Ministry of Health and Child Welfare, Zimbabwe for funding the project. Finally I would like to appreciate all my immediate family members for their unwavering support through this project.

Rumbidzai Chimukangara

University of Zimbabwe, August 2013
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Abbreviations

W.H.O- World Health Organization

CVD- Cardiovascular Disease

F&V- Fruits and Vegetables

RHD- Rheumatic Heart Disease

CCF- Congestive Cardiac Failure

HDL- High-Density Lipoproteins

LDL- Low-Density Lipoproteins

BMI- Body Mass Index

DASH- Dietary Approach to Stop Hypertension

TB- Tuberculosis

HIV- Human Immune Deficiency Virus

AIDS- Acquired Immune Deficiency Syndrome

EMR- East Mediterranean Region

CHD- Congenital Heart Disease

VHD- Vulpular Heart Disease

CMP- Cardio-myopathy
IHD- Ischaemic Heart Disease

SA- South Africa

WHR- Waist to Hip Ratio

Na/K- Sodium to Potassium Ratio

SBP- Systolic Blood Pressure

DBP- Diastolic Blood Pressure

POR- Prevalence Odds Ratio

MRCZ- Medical Research Council of Zimbabwe

JREC- Joint Research and Ethics Committee

PMD- Provincial Medical Department

DMO- District Medical Officer

DHE – District Health Executive
Chapter 1

1. BACKGROUND

1.1. Introduction

Diet is one of the factors that cause cardiovascular disease (CVD) and is also a causal factor in approximately a third of all cancers. McGinnis and Foege (2006) rank poor diet in combination with lack of exercise as a cause for morbidity and mortality, tobacco being the first. National public policies that advocate an improved diet have been established in developed countries due to evidence linking poor diet and disease. Studies on cancer and disease prevention increasingly suggest that many of the dietary components found in plants have a role in the prevention of cancer and coronary heart disease this is according to Craig and Potter, hence increasing consumption of vegetables and fruit is a major dietary strategy for disease prevention. The public policy has recommended dietary intake guidelines that should be followed, below is table 1 showing the guidelines.

Table 1: Sources of dietary current intakes and goals or recommendations

<table>
<thead>
<tr>
<th>Food/nutrient</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and vegetables</td>
<td>*400 g/ day</td>
</tr>
<tr>
<td>Fiber</td>
<td>18 g /day</td>
</tr>
<tr>
<td>Total fat</td>
<td>33% of total energy</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>10% of total energy</td>
</tr>
<tr>
<td>Salt</td>
<td>6 g/ day</td>
</tr>
</tbody>
</table>

*Equivalent to five portions a day, with an average portion size of 80 g
The processes of urbanization associated with migration, globally lead to the availability and abundance of high fat and refined foods and the adoption of sedentary lifestyles. This may be leading to increased risks of morbidity and mortality from CVDs and other non-communicable diseases (NCDs). Urbanization and globalization increase access to non-traditional foods due to affordability of food and increased availability, thereby influencing dietary patterns throughout developing countries. Dietary intake and the prevalence of obesity have been changing at an alarming rate over the past 15 years\(^2\).

1.2. CVD
Cardiovascular disease (CVD) is not a single disease, but a complex of diseases of varied causes. According to Sally Fallon\(^3\) some of the recognized causes of cardiovascular disease are blockages or damages to heart vessels due to a congenital defect and effects associated with infectious diseases.

CVD are a group of disorders of the heart and blood vessels and include; coronary cardiac failure (CCF); cerebro-vascular disease (stroke); peripheral arterial disease; rheumatic heart disease (RHD); hypertension; congenital heart disease; deep vein thrombosis and pulmonary embolism\(^3\). However for data collection in Zimbabwe, CVD are captured in three main groups, these are hypertension, RHD and CCF. RHD is not a dietary disease and so will be excluded in this study.

1.3. Risk Factors of CVD
There are a number of risk factors that cause CVD; these can be grouped into factors related to lifestyle and personal factors. Life style factors include tobacco use, alcohol abuse, diet and physical inactivity, while personal factors include obesity and hereditary factors. Tobacco use causes atherosclerosis, high blood pressure and oxygen flow reduction. Abusing alcohol
increases the fatty deposits in the blood leading to atherosclerosis. Alcohol abuse also raises blood pressure, thereby increasing the risks of coronary heart disease ⁴.

Diet, physical inactivity, and obesity are three major causes of CVD. A diet high in saturated fats, Tran’s fats, and cholesterol may promote the onset of atherosclerosis ⁴. In addition, a diet high in salt raises the blood pressure significantly. Physical inactivity leads to high blood pressure, high levels of fatty acids which promote hardening of the arteries, low levels of HDL cholesterol, and diabetes. Obesity also triggers the onset of high blood pressure and diabetes ⁴. Diabetes is another cause of cardiovascular disease including coronary artery disease with angina, heart attack, atherosclerosis, and stroke.

1.4. Global burden of CVD

Globally the mortality from CVD is approximately 16.7 million each year and CVD are the leading cause of mortality globally. About 80% of all cardiovascular-related deaths occur in low to middle income countries⁵. Almost 30% of smokers die from heart disease each year ⁶. Worldwide, nearly one third (8.6 million) of all deaths in women are attributable to heart disease ⁶. Between 2005 and 2030, mortality from CVD is expected to double in the Sub-Saharan region ⁷. The risk of CVD is higher in women than men; this can be supported by statistics in South Africa as at 2005 where the prevalence of CVD was at 16% in women over the age of 65 years, while the prevalence for men was 11%.
Figure 1 Percentage breakdown of deaths due to CVD in United States, 2006

Source: NCHS. *Not a true underlying cause

Figure 2 Trends of vascular disease in South Africa

1.5. CVD in Zimbabwe

Between 1990 to 1997 data collected in the absence of national health surveys showed an increase in hypertension from 1000 to 4000 per 100 000, and cerebro-vascular accidents from 5 to 15 per 100 000. Zimbabwe STEP wise survey found hypertension to be as high as 27%, while in 2006 hypertension accounted for 25% of all out-patient visits of chronic conditions. Strokes were also found to be responsible for a significant portion of disabilities and attendances at medical rehabilitation units.

According to the latest WHO data published in April 2011 CHD deaths in Zimbabwe reached (5,194); 3.06% of total deaths. The age adjusted death rate was 90.05 per 100,000 of population, ranking Zimbabwe number 124 in the world. Hypertension deaths reached (907); 0.53% of total deaths. The age adjusted death rate was 15.87 per 100,000 of population, ranking Zimbabwe number 138 in the world. Stroke deaths reached (6,213); 3.66% of total deaths. The age adjusted death rate was 107.75 per 100,000 of population, ranking Zimbabwe number 85 in the world.

1.6. Prevention of CVD

The steps that can be taken to prevent increasing the risks of developing a heart condition include avoiding smoking or tobacco use, getting some regular daily exercise, eating a healthy diet (foods low in fat, cholesterol and salt, rich in fruits, vegetables, whole grains and low-fat dairy products), moderate alcohol consumption, maintaining a healthy weight and regular health screening (blood pressure levels, cholesterol levels and diabetes screening).

Cardiovascular disease (CVD) and its predisposing risk factors are determined by lifestyle and behaviour. Dietary lifestyle choices such as healthy diet, regular exercise, a lean weight,
moderate alcohol consumption, and smoking cessation have been shown to reduce CVD and increase longevity. Recent research has shown that men and women who adhere to the mentioned lifestyle can substantially reduce their risk of coronary heart disease (CHD). Moira McAllister et.al reported that the preventive benefits of maintaining a healthy lifestyle are far better than those reported for using medication and procedures. The table below shows the lifestyle modifications expected and the recommended goals for each lifestyle.

**Table 2: Diet-Related Lifestyle that can lower BP**

<table>
<thead>
<tr>
<th>Lifestyle Modification</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>For overweight to obese persons weight loss is required</td>
</tr>
<tr>
<td></td>
<td>For normal weight persons, maintaining desirable weight is required</td>
</tr>
<tr>
<td>Reduced salt intake</td>
<td>Lowering salt intake as much as possible to 65 mmol/d sodium</td>
</tr>
<tr>
<td>DASH-type dietary patterns</td>
<td>Consumption of fruits and vegetables (8–10 servings/d), low-fat dairy products (2–3 servings/d), and reduced saturated fat and cholesterol</td>
</tr>
<tr>
<td>Increased potassium intake</td>
<td>Increasing potassium intake to 120 mmol/d (4.7 g/d)</td>
</tr>
<tr>
<td>Moderation of alcohol intake</td>
<td>Moderate consumption of alcohol [2 alcoholic drinks/d (men) ; 1 alcoholic drink/d (women)]</td>
</tr>
</tbody>
</table>

Adapted from *Journal of American Heart Association, 2006*
Hypertension is the most common cardiovascular condition in the world and the problem of defining a strategy for control has been faced by most countries. Hypertension is fully treatable; however social conditions in Africa make the implementation of blood pressure control programmes difficult. Lack of a clear strategy based on evidence has prevented further efforts to control hypertension.\(^8\)

1.7. Statement of the Problem

Studies focusing on dietary patterns over the years have demonstrated the powerful protective associations of healthy dietary patterns, and the higher risk associations of consumption of Western or meat and refined grains foods. There is also substantial evidence on the link between dietary patterns and obesity.

Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Overweight and obesity are now dramatically on the rise in low- and middle-income countries. With urbanization some rural populations of African countries are also being affected by obesity. In urban West Africa rates of obesity have more than doubled in the last 15 years. Global Health Observatory estimated female obesity prevalence to be at 13.8\% in 2008.
In Mount Darwin District there is no substantial data on obesity or dietary patterns among adults hence the need to determine the dietary patterns present and the factors influencing these dietary patterns.
Chapter 2

2.1. LITERATURE REVIEW

2.1.1. Introduction

According to the World Health Organization (W.H.O.) a healthy diet is one that provides the adequate vitamins, calories, fluids, minerals and fatty acids required by the body for day to day function. These requirements should be supported without any exposure to excess calories that may enhance weight gain.

W.H.O made dietary recommendations that can help individuals and communities improve their dietary patterns; these include 1) eating the same amount of calories each day, 2) increasing consumption of plant foods, 3) limiting intake of fats, 4) limiting the intake of granulated sugar, and 5) limiting salt / sodium consumption and making sure that salt is iodized.

There might be a relationship between healthy eating and the reduced risk of chronic diseases including some cancers according to World Cancer Research Fund. Types of foods that constitute a healthy diet are fruits and vegetables, low sugary foods, low red meat and/or processed meat, limited alcoholic beverages and low salt. The American Institute for Cancer Research has done a study that shows that certain diseases such as high blood pressure, diabetes, cardiovascular diseases, and cancer maybe be as a result of unhealthy diets.

2.1.2. Urbanization and Changes in Diet
Globalization has largely influenced food availability and choices in developing countries, due to media marketing and the availability of less traditional foods; by and large influencing tastes and preferences. Several studies in developing countries have shown noticeable changes in world production of animal source foods available for human consumption, such as eggs, meats, poultry, dairy and fish. There has been noticeable tripling of the amounts of animal source products available for consumption in the developing world. Similarly, consumption of vegetable oils increased several times faster in low- than in high-income adults; however changes in vegetable intakes at any income level remain low.

In Africa, the high consumption of added salt through seasonings and common staples for many households such as cereals, breads, margarine, salted fish and processed meats poses a high risk of hypertension. Compounding the problem is the growing use of processed foods as well as ready-made food purchased from food vendors and changing dietary fibers.

Fast foods are largely consumed globally, due to individuals’ needs for food that is low in price and tasty. Fast foods, by definition, are designed for ready availability, use, or consumption, with little consideration given to quality or significance of the food. Fast foods are prepared by deep-frying in Trans fats, leading to high cholesterol rates and heart attacks in the world. These foods are usually eaten with starchy vegetables and sugary drinks, which have high glycogen. They also contain a large amount of chemical additives and often lack accurate nutrition labelling.
Eating healthy can prevent a number of morbidities and mortalities due to chronic conditions.

Table 3 below show the potential number of deaths that can be prevented if previously discussed dietary recommendations or guidelines are followed.

**Table 3: potential reduction in deaths by achievement of dietary recommendations**

<table>
<thead>
<tr>
<th></th>
<th>Fruit and vegetables</th>
<th>Fiber</th>
<th>Fats (via raised Cholesterol)</th>
<th>Fat (via raised BMI)</th>
<th>Salt</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coronary heart disease</strong></td>
<td>7053</td>
<td>3661</td>
<td>4605</td>
<td>1544</td>
<td>3937</td>
<td>20,800</td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td>3383</td>
<td></td>
<td>-538</td>
<td>623</td>
<td>2408</td>
<td>5,876</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10,436</td>
<td>3661</td>
<td>4,067</td>
<td>2,167</td>
<td>6,345</td>
<td>26,76</td>
</tr>
</tbody>
</table>

British Heart Foundation Health Promotion Research Group, 2010

**2.1.3. Factors Influencing Dietary Patterns**

Availability, cost and time, are some of the many external factors that influences a person’s diet, while internal factors may include tastes and preferences as discussed by Ziebland et al, 1998.

Focus groups, surveys and interview studies by Reicks et al., 1994; Marshall et al., 1995; Treiman et al., 1996 have repeatedly shown that high cost of fruits and vegetables can be a barrier to eating healthy diets for people on low incomes. It was reported that socially deprived
areas usually lack affordable and good-quality fruits and vegetables resulting in a vicious circle of poor demand and supply.

Caraher et al., 1998 discussed other external factors influencing diet that include availability in the workplace, where Anderson et al., 1998; found out that many canteens offer poor value for food compared with fast foods, making most people resort to unhealthy diets. The perception that some types of food are time-consuming to prepare is also a barrier to healthy diets. There are social influences to dietary choices, families being one of the strong external influences. Charles and Kerr, 1988; concluded that women are much more likely than men to prepare main meals and shop for food, however they might have little control over what is eaten, since they respect the tastes of their husbands and children.

Cultural influences have often had an impact on dietary choices and food preparation, evidence having shown that traditions, beliefs and values are among the main factors influencing preference, mode of food preparation, and nutritional status. Cultural habits, however, change with migration and urbanization processes. Social context includes both the people who have an impact on an individual’s eating behaviour and the setting in which an individual consumes their dietary choice. Settings for food consumption include the home, school, work, and restaurants, which affect food choices by the availability of food options. Dietary habits from earlier on in life can be difficult to change later in life especially taste and food preferences.
In a study that sought to determine the socio-cultural factors influencing food consumption patterns in the Black African Population in an Urban Township in South Africa\textsuperscript{20} five themes on how they perceived food were noted.

1. Meaning of Food in Relation to Health: - this was what people believed were health outcomes due to consumption of food. Participants had a general understanding that excess or lack of certain nutrients predisposed them to certain diseases\textsuperscript{11}.

2. Relationship of Food to Body Size and Image: - Women felt that eating excess food could make them overweight, while eating very small amounts would make them very thin hence not so attractive in both situations. Body size was related to socio-economic status in the study. Men felt that individuals of a high social class were supposed to have big bodies to show that they have enough food \textsuperscript{11}.

3. Social Meaning of Food: - It was felt that food is used to show love, acceptance and humanity and associated with happiness. It was mentioned that people became angry or sad in the absence of food \textsuperscript{11}. In other studies in was shown that within a culture, food brings people together, and has symbolic meanings in different religious occasions along with moral significance. Some cultures put their focus more on the quality of the food rather than the availability and quantity \textsuperscript{13}. More over each society determines what food is, what is permissible to eat, and how and when particular things are consumed. There are good and bad foods, appropriate and inappropriate foods, basic and foods for celebrations. Food preparation and consumption are almost always bound to the beliefs, practices, and laws of nations and cultures\textsuperscript{14}.
4. Values Attached to Food: - Consumption of food was associated with ceremonies, for example the study found out that when Africans are celebrating; fatty meats and sweet foods are usually consumed. Sometimes food is used for personal satisfaction, for example if an individual is stressed they might use food as a stress reliever, and in some instants food may be used to initiate social interaction\textsuperscript{11}. Across almost all societies, the process of eating together or giving and receiving food reinforces social relations among communities. Elder rural adults view food sharing as an integral part of life in the community, being able to share reinforces their identity as active community members, and impacts on their personal value or worth\textsuperscript{15}.

5. Changing Values about Food: - globalization and migration to urban settings had affected how some individuals perceived traditional foods. In cities competition on buying expensive food to show one’s social status lead individuals to consume high energy and cholesterol foods\textsuperscript{11}. Africans retain a strong sense of culture through food; unfortunately many traditional healthy eating practices have changed to unhealthy dietary patterns due to migration, immigration, changes in social status, and the availability and convenience of more harmful foods\textsuperscript{1}.

Taste and preference can also influence food intake. It should be noted, that the preference for sweet taste often includes foods such as pastries, chocolate and ice cream which are also fatty foods. Experimental research has, however, shown that sugar masks the taste of fat; hence individuals do no notice the damage\textsuperscript{16}. In recent cohort studies it was shown that high liking for sweet, salt or fat sensations was associated with unhealthy dietary profiles and risk of obesity. It is important to considering taste preference as a strong determinant of dietary patterns, since relationships of taste sensations with dietary intakes and nutritional status was evidently shown
The issues discussed above could help guide the development and implementation of strategies for promoting cardiovascular health, including nutrition interventions in Mt Darwin.

2.1.4. CVD burden

CVDs cause around 17 million deaths, representing over a third of mortality globally. Nearly 80% of these deaths occur in low- and middle-income countries where the trend is increasing. In some countries of the East Mediterranean Region (EMR), 40% of all deaths are caused by CVD. Reddy and Yusuf, 1998; 2001 indicated that by the year 2010 CVDs will be the leading cause of death, resulting from lifestyle changes brought about by industrialization and urbanization. Care of CVD patients is often costly and has often lead to use of scare family and community resources in poor countries; where there are greater prevalence of risk factors, higher incidence of disease and higher mortality.

Overall, 26.4% of the adult population in 2000 had hypertension, 26.6% of men and 26.1% of women, and 29.2% were projected to have this condition by 2025. The number of adults with hypertension in 2025 was predicted to increase by about 60% to a total of 1.56 billion. The prevalence of hypertension has been widely reported in various regions of the world.

Despite the existence of proven preventive strategies for more than 50 years, prevalence rates of CVD in sub-Saharan Africa are on the rise; contributing to this might be the lack of improvement in dietary habits in most countries. Elimination of the preventable risk factors can prevent 80% of heart diseases.

Heart disease including congenital heart disease (CHD), valvular heart disease (VHD), and hypertension pose a public-health challenge because of their high frequency. CVD has been identified as the leading risk factor for mortality, and is the third leading cause of disability-
adjusted life-years. Over the last few years, the incidence of an acute coronary event during pregnancy has increased, due to older child-bearing age, and more hypertension, smoking, and obesity among women. It is estimated that about 35 million people have an acute coronary or cerebro-vascular event every year and about half of these events occur in individuals with pre-existing vascular disease.

The causes and results of an epidemic of CVD and its major component, heart disease, in developed countries have been well documented; however, data gaps remain in low-income and middle income countries to describe the effect of CVD. The burden is evident in South Africa where coronary artery disease, hypertensive heart disease, and stroke already account for more than a third of deaths in people older than 65 years.

2.1.5. Factors Associated with CVD

The INTERHEART study shows hypertension as a high risk factor of heart disease among black Africans. Hypertension is treatable and to some extent preventable. According to the American Heart Association and the American College of Cardiology, risk factors for CVD include smoking, hypertension, elevated serum total (and LDL) cholesterol, low serum HDL cholesterol, diabetes and advancing age. Other found predisposing risk factors, include obesity, abdominal obesity, and physical inactivity and presence of disease in family.

All the previously mentioned risk factors are modifiable using various interventions and treatments. However advancing age, family history, gender and ethnicity are non-modified. Preventive efforts should target each specific risk factor; for if left untreated for many years, there is a potential to develop cardiovascular disease.
An assessment of the increase in trends of NCDs in south Africa showed that they were due to; the prevalence of overweight 17\% to 20\% and obesity from 4\% to 5\%, decreased physical activity, physical education and increased sedentary time, under nutrition and malnutrition remain a significant factor and predispose to overweight and obesity in adulthood. These risk factors have been estimated to find out the number of people affected; the estimates are as follows: Smoking tobacco 7.7 million, High BMI 9.1 million, Hypertension 6.3 million, Diabetes II 0.9 million, High blood cholesterol 7.9 million, Low fruit and vegetable intake 13.4 million and Physical inactivity 13.6 million\textsuperscript{22}.

In a study done in Zimbabwe, in Marondera the researcher evaluated the relationship between systolic blood pressure (SBP) and age, body mass index (BMI), waist circumference, sodium to potassium ratio and tobacco use in an urban population. They reported the prevalence of hypertension to be 30\% and 21\% for women and men respectively and the average BMI was 26.3 kg/m\textsuperscript{2} for women and 21.4 kg/m\textsuperscript{2} for men. In the study hypertension was highly associated with age, sodium to potassium ratio in spot urines in men was significantly associated with an increased SBP, and in both men and women the levels of hypertension and SBP were positively associated with BMI\textsuperscript{23}.

In another cross sectional study done in Poland\textsuperscript{24} to determine CVD risk, the prevalence of chronic diseases among participants was 38.4\% for hypertension, 5.9\% for diabetes and 11.0\% for CVD. CVD was associated with ever-smoking, body mass index (BMI), as well as with measures of abdominal adiposity; however BMI showed the stronger association with CVD than the other measures. Both hypertension and diabetes were associated with CVD in adjusted models.
2.2. Justification

Although there has been an increase in adult obesity in Zimbabwe over the years suggesting changes in dietary patterns, no studies have been done in Mount Darwin district on dietary patterns among adults. This study will help us determine the dietary patterns and understand the factors that influence these patterns in Mt Darwin District. Results will be used to make recommendations for an improved dietary lifestyle in the district.

2.3. Objectives

2.3.1. Broad Objective

- To determine the factors influencing dietary patterns in Mt Darwin District in 2013

2.3.2. Specific Objectives

- To describe the demographic factors associated with dietary patterns
- To determine the dietary patterns in Mt Darwin District
- To determine the factors influencing these dietary patterns
- To make appropriate recommendations

2.3.3. Research Questions

a) What are the dietary patterns in Mt Darwin district?

b) What are the factors influencing dietary patterns in Mt Darwin district?
2.3.4. **Hypothesis**

**H0**: In a study to determine factors influencing dietary patterns in the general population of Mt Darwin; food preference, method of food preparation, social meaning of food, are not associated with dietary patterns.

**H1**: At least one of the factors; food preference, method of food preparation, social meaning of food, is associated with dietary patterns in Mt Darwin district.
Chapter 3

3. METHODS

3.1. Study Design

An analytical cross-sectional study was carried out where any individual above the age of 18 years was drawn in the study and their dietary patterns. This study design enabled the researcher to establish individuals’ dietary patterns. Dietary patterns were grouped into unhealthy diet (consumption of red and processed meats, alcoholic beverages, and sugary foods, white bread) and healthy diets (consumption of fruits and vegetables, legumes, whole wheat bread). The mean age from the demographic frequency was used to determine the cut-off point for age in bi-variate analysis.

3.2. Study Setting

The study was carried out in Mt Darwin District. Mt Darwin District is one of the 8 districts in Mashonaland Central Province. The district population profile in the health information department shows that Mt Darwin District has a projected total population of 221,786 people in 2013. Means of survival for people in the district include farming, self-employment and to a less extend formal employment. In Mt Darwin Township there are food outlets that sell foods from the range of fried chicken and French fries to deserts like ice-cream.

3.3. Study population

The study population were all individuals above the age of 18 and residing in Mt Darwin district during the period of the study. The study was carried out at the respondents’ households.

3.4. Sampling Frame
Seven (7) wards were randomly selected from the 40 wards of Mt Darwin District. In these 7 wards a household listing was then carried out. Fifty (50) participants were then randomly drawn from each wards’ household listing.

3.5. **Study Unit**

An individual above the age of 18 years residing in Mt Darwin district

3.6. **Sampling Technique**

Multistage sampling was used to come up with a sample that was representative to the study population. 7 wards were randomly selected from a list of all 40 wards in the district. The wards were selected by writing numbers from 1 to 40, putting them in a hat and after mixing them, picking 7 from a total of 40. The numbers that were picked corresponded to the ward number to be included in the sample.

For each ward, a household listing was done to come up with a sampling frame. Random sampling was used to come up with the sample for each ward. The numbers in the sampling frame were written on small pieces of paper, put in a hat and after shaking and mixing; they were picked out without replacement until a sample size of 50 was reached for each ward. Picking without replacement is when a number is picked and for some reason if the participant is not eligible for the study the paper is put aside and the picking continues. The households that had been given numbers that were similar to the numbers picked constituted the sample. 50 households for 7 wards gave a total sample size of 350 for the district.

3.7. **Sample Size**
The sample size was calculated using Dobson’s formula (sample size for a single proportion). Sample was calculated at 95% confidence level, with minimum error to be detected (d) being 5%. Data from the STEPWISE survey 2010 revealed the prevalence (p) of hypertension in Zimbabwe to be 27%.

Sample size for a single proportion:

\[ n = \left( \frac{Z_{\alpha/2}}{d} \right)^2 p (1-p) \]

\[ \frac{d^2}{Z_{\alpha/2}} \]

Where:

\[ Z_{\alpha/2} \text{ (95% confidence interval)} = 1.96, \quad p \text{ (prevalence)} = 0.27, \quad d \text{ (minimum error)} = 0.05 \]

Therefore:

\[ n = (1.96)^2 (0.27) (0.83) \]

\[ (0.05)^2 \]

\[ n = 0.8609 \]

\[ 0.0025 \]

\[ n = 344.36 \]

Therefore the minimum required sample size for the study was 345. The sample size that was used in this study is 350.
3.8. Inclusion criteria

Any individual above the age of 18 years who resided in Mt Darwin during the period of data collection and who had consented to participate were included in the study.

3.9. Exclusion criteria

The study excluded any individual who was below the age of 18 years, visitors to the district and those who did not give consent to be included in the study.

3.10. Study and Outcome Factors

3.10.1. Study factors/ independent variables

These are variables used to describe or measure the factors that are assumed to cause or at least influence the problem under study.

i. Socio Demographic factors:

- Background information about the participants, these variables can be notorious confounder

  - Age- number of years since birth
  - Sex- the biological and physiological characteristics that define men and women.
  - Occupation- where one generates their income
  - Level of education- level in which one completed his/her studies
  - Marital status- the condition of being married or unmarried
  - Religion -a set of beliefs concerning the cause, nature, and purpose of the universe, especially when considered as the creation of a superhuman agency.
ii. **Factors influencing dietary patterns**:

Factors that are likely to influence dietary intake

- **Taste & preference** - the sense by which the qualities and flavour of food are distinguished by the taste buds and a preference or liking for food
- **Social meaning** - relating to interest or concerns; pleasure; benefits; happiness; and duties expected of one living in a society in relation to food.
- **Image and body size** - an intellectual or idealized image of what one's body is or should be and the physical dimensions, proportions, magnitude, or extent of the body.
- **Changing values** - changing relative worth, merit, or importance of food
- **Meaning in relation to health** - health consequences resulting from dietary intake

iii. **Types of diet**

- **Fatty foods** - Examples: red meat, cheese, chicken or pork skin, bacon, sausages, milk
- **F&V** - edible plant parts, excluding roots, tubers
- **Refined foods** - examples: rice, white bread, white sugar, potatoes
- **Unrefined foods** - examples: brown/whole wheat bread, brown sugar, unrefined mealie-meal,
• Sweet foods- examples; cakes, muffins, cookies, biscuits, sweets,
• Salty foods- snacks (roasted peanuts, dried chips etc)

3.10.2. Outcome factor/ dependent variable

This is the variable that is used to describe or measure the problem under study.

Dietary patterns:
- refers to eating patterns that people engage in, as well as behaviors related to consuming foods, eating out, or portion size. It also includes behavior such as drinking alcoholic beverages and smoking cigarettes. These behaviors can have some consequences on a person’s health, for example they may influence the occurrence of coronary heart disease.
3.11. Data Collection

An interviewer-administered questionnaire was used to collect data from the participants (See Annex 2). The questionnaire was created based on the constructs of the conceptual framework. Dietary patterns were determined by asking the food consumed in the last five days of interviewing and these were grouped into healthy and unhealthy diet. Questions on food preference were asked by using specific types of foods that individuals might eat, and then later recoded into food classes such as fatty foods, fast foods during data analysis. Examples of categorizes re-coded are given in section 3.9 of the document.
The questionnaire administration was done in Shona. The ward councillor and village heads aided us to identify the households that were included in the sample. Three research assistants that were well trained on the data collection tool took part in the data collection process. The data collection exercise was done in a period of two weeks from 10 June to 21 June 2013.

3.12. Pre-testing.

The data collection tool was pretested in Chomagora, ward 40 of the district and where necessary adjustments were done.

3.13. Data analysis

Epi Info version 3.5.1 was used to enter, clean and analyse the data. Frequencies and proportions were generated. Prevalence odds ratios (POR) were used to determine strength of associations between the independent variables and the outcome of interest. The outcome of interest was dietary patterns. 95% confidence intervals for PORs and the p-value were used to determine the significance of associations between independent variables and the outcome of interest. Multivariate Logistic regression analysis was performed to identify independent risk factors for factors influencing dietary patterns and to control for confounding variables. The logistic regression model initially included all variables with a p-value of 0.25 or less.

3.14. Permission to proceed with study

Permission to proceed with the study was sought from the Provincial Medical Director of Mashonaland Central Province, the District Medical Officer and District Administrator of Mt Darwin District in form of a letter. (See Annex 3) When approved to proceed, each ward that was included in the study was visited and the Councillors were informed about the study to take place. This was done two weeks before data collection, when the pre-test was done. During the
study, participants were asked to give an informed consent before taking part in the study. This was done in form of a written consent form.

3.15. Ethical considerations

Ethical approval for the protocol was sought from the Joint Research Ethics Committee and the Medical Research Council of Zimbabwe and was granted (See Annex 4 & 5). The study protocol was explained in full to all study participants in Shona (their local language). Written informed consent was obtained from all study participants using a consent form (See Annex 1). No force, coercion or persuasion by any means was used to recruit study participants. Study participants were allowed to terminate their participation at any time they felt like doing so. The consent forms and filled questionnaires were stored separately under lock and key by the Principal Investigator. Confidentiality was assured and maintained throughout the study.
Chapter 4

4. RESULTS

UNIVARIATE ANALYSIS

4.1. Demographic data

The mean age of participants was 35.6 ± 13.3 years. Males had a higher level of education than females, and level of education was higher in the younger age groups in both sexes. The majority of participants were married, farmers and Christians; they had also reached secondary level of education. More males were formally employed than females. Table 4 below shows the summary of demographic factors.

Table 4: Demographic factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (N=350)</th>
<th>Proportion %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>26</td>
<td>7.4</td>
</tr>
<tr>
<td>20-29</td>
<td>115</td>
<td>32.9</td>
</tr>
<tr>
<td>30-39</td>
<td>88</td>
<td>25.1</td>
</tr>
<tr>
<td>40-49</td>
<td>60</td>
<td>17.1</td>
</tr>
<tr>
<td>50-59</td>
<td>43</td>
<td>12.3</td>
</tr>
<tr>
<td>60-69</td>
<td>13</td>
<td>3.7</td>
</tr>
<tr>
<td>70+yrs</td>
<td>5</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>126</td>
<td>36.0</td>
</tr>
<tr>
<td>Females</td>
<td>224</td>
<td>64.0</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>None</td>
<td>34</td>
<td>9.7</td>
</tr>
<tr>
<td>Primary</td>
<td>107</td>
<td>30.6</td>
</tr>
<tr>
<td>Secondary</td>
<td>199</td>
<td>56.9</td>
</tr>
<tr>
<td>Tertiary</td>
<td>10</td>
<td>2.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Occupation</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Formally employed</td>
<td>45</td>
<td>12.9</td>
</tr>
<tr>
<td>Self employed</td>
<td>71</td>
<td>20.3</td>
</tr>
<tr>
<td>Farmer</td>
<td>167</td>
<td>47.7</td>
</tr>
<tr>
<td>Scholar</td>
<td>5</td>
<td>1.4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>62</td>
<td>17.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Marital status</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>43</td>
<td>12.3</td>
</tr>
<tr>
<td>Married</td>
<td>270</td>
<td>77.1</td>
</tr>
<tr>
<td>Divorced / Widowed</td>
<td>37</td>
<td>10.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Religion</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Christianity</td>
<td>281</td>
<td>80.3</td>
</tr>
<tr>
<td>African Tradition</td>
<td>54</td>
<td>15.4</td>
</tr>
<tr>
<td>None</td>
<td>15</td>
<td>4.3</td>
</tr>
</tbody>
</table>
The 20-29 age group preferred eating fatty foods, salty foods, and sweet foods; the 40-49 preferred eating F&V and refined foods; and the <20 years age group preferred eating unrefined foods more than the other groups. 34.4% of the respondents consumed unhealthy diet.

4.2. Factors influencing choice of food

Table 5: Factors that influenced choice of food in Mt Darwin

<table>
<thead>
<tr>
<th>Factor</th>
<th>Frequency</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability</td>
<td>261</td>
<td>74.6</td>
</tr>
<tr>
<td>Taste of food</td>
<td>69</td>
<td>19.4</td>
</tr>
<tr>
<td>Affordability</td>
<td>14</td>
<td>4.0</td>
</tr>
<tr>
<td>Easiness to prepare</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Others</td>
<td>14</td>
<td>4.0</td>
</tr>
</tbody>
</table>

4.3. Food preference

The majority of participants preferred eating fatty foods. Mentioned refined foods included rice, potatoes, white sugar, white bread, and refined mealie-meal while unrefined foods included brown sugar, brown bread, and unrefined mealie-meal. The proportion of food preferences are shown in fig.3 below.
4.4. Food preparation

Main preferred means of food preparation was deep frying and boiling. However a number of participants also reported that they liked their vegetables hard cooked. Fig. 4 shows the proportion frequency distribution.

Figure 3: Food preference

![Food preferences in Mt Darwin 2013](image)

Figure 4: Methods of food preparation

![Preference of food preparation in Mt Darwin 2013](image)
4.5. Food consumption

Fig. 5 below shows the frequently mentioned foods that were eaten within the last five days of interviewing in Mt Darwin. The bar graph excludes foods that were less than 10% in frequency of mentioning.

Figure 5: Food frequently eaten in Mt Darwin

| Foods eaten within the last 5 days in Mt Darwin District, 2013 |
|-----------------|-----------------|
| porridge        | 11.7            |
| eggs            | 11.7            |
| muboora         | 14.9            |
| matemba         | 21.1            |
| okra            | 23.1            |
| chicken         | 23.7            |
| beans           | 24.6            |
| sweet potatoes  | 26.3            |
| fish            | 26.6            |
| cowpeas         | 26.6            |
| chimodho        | 26.9            |
| rice            | 33.7            |
| bread           | 34.9            |
| beef            | 35.4            |
| tea             |                 |
| vegetables      |                 |
| sadza           |                 |

4.6. Social Meaning of Food

As a social aspect, participants reported that food was used to show love (31.1%), to show acceptance (26.6%), to show happiness (24.9%), to show humanity (16.3%) and other (7.4%). Other reported social meanings of food were to keep people healthy (3.4%), nothing (1.7%), customary (0.9%), alleviates hunger (0.6%), for people to survive (0.6%), to improve health (0.3%).
Participants reported that at social gatherings like weddings, parties; foods that were usually eaten are foods high in fat (68.9%), foods low in fibre (59.4%), sweet foods (46.0%) and vegetables (9.4%); where salads were frequently mentioned.

Individuals of low social status were perceived to be eating vegetables (79.7%), foods high in fibre (47.4%), legumes (33.4%), and foods low in fat (27.7%) while individuals of high social status were perceived to be eating foods high in fat (69.7%), foods low in fibre (59.7%), fast foods (26.9%), fruits (24.0%) and sweet foods (23.4%)

4.7. Image and body size

Participants reported that having a big body meant that an individual was healthy (32.9%), have enough food to eat (30.9%), and was of high social class (20.6%) and others (25.1%). Other reported meaning of big body size are unhealthiness (16.6%), sedentary lifestyle (1.7%), it’s their body (1.4%), takes ARVs (1.1%), eats more than enough (0.9%), peace of mind (0.9%), takes fattening tablets (0.6%), too much body fat (0.6%), obesity (0.6%), hereditary (0.6%), nothing (0.3%).

4.8. Changing Values (Industrialization)

Participants frequently reported eating fast foods or vendor sold foods when they visited town. Below is Fig.8 showing the proportion of respondents and the foods they reported eating when visiting town.
Figure 6: Food eaten when visiting town

Food people in Mt Darwin normally eat if they visit town

- Fast foods: 43.1%
- Vendor sold meals: 35.4%
- Supermarket sold meals: 12.9%
- Soft drinks: 5.1%
- Fresh fruits and vegetables: 3.4%
BIVARIATE ANALYSIS

4.9. Factors influencing dietary patterns

Table 6: Demographic Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td>(n=230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35+yrs</td>
<td>52</td>
<td>(35.4)</td>
<td>95</td>
<td>(64.6)</td>
</tr>
<tr>
<td>&lt;35</td>
<td>68</td>
<td>(37.6)</td>
<td>113</td>
<td>(62.4)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>110</td>
<td>(46.3)</td>
<td>116</td>
<td>(53.7)</td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td>(17.9)</td>
<td>92</td>
<td>(82.1)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>79</td>
<td>(35.0)</td>
<td>147</td>
<td>(65.0)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>19</td>
<td>(32.2)</td>
<td>40</td>
<td>(67.8)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>111</td>
<td>(37.5)</td>
<td>185</td>
<td>(62.5)</td>
</tr>
<tr>
<td>None</td>
<td>9</td>
<td>(28.1)</td>
<td>22</td>
<td>(71.9)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>112</td>
<td>(35.6)</td>
<td>203</td>
<td>(64.4)</td>
</tr>
<tr>
<td>None</td>
<td>8</td>
<td>(61.5)</td>
<td>5</td>
<td>(38.5)</td>
</tr>
</tbody>
</table>

* Statistically significant

Females were at higher risk of unhealthy dietary patterns as compared to male in this study.
Table 7: Food preference

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td>(n=230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatty foods</td>
<td>Yes</td>
<td>106 (37.1)</td>
<td>180 (63.9)</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>14 (21.9)</td>
<td>50 (78.1)</td>
<td>(1.11 – 3.99)</td>
</tr>
<tr>
<td>Salty foods</td>
<td>Yes</td>
<td>20 (40.0)</td>
<td>30 (60.0)</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>100 (33.3)</td>
<td>200 (66.7)</td>
<td>(0.72 - 2.47)</td>
</tr>
<tr>
<td>Sweet foods</td>
<td>Yes</td>
<td>20 (32.8)</td>
<td>41 (67.2)</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>100 (34.6)</td>
<td>189 (65.4)</td>
<td>(0.51 – 1.66)</td>
</tr>
<tr>
<td>Refined foods</td>
<td>Yes</td>
<td>24 (41.4)</td>
<td>34 (58.6)</td>
<td>1.44</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>96 (32.9)</td>
<td>196 (67.1)</td>
<td>(0.81 - 2.57)</td>
</tr>
<tr>
<td>Unrefined foods</td>
<td>Yes</td>
<td>13 (31.7)</td>
<td>28 (68.3)</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>107 (34.6)</td>
<td>202 (65.4)</td>
<td>(0.45 – 1.76)</td>
</tr>
<tr>
<td>F &amp; V</td>
<td>Yes</td>
<td>26 (35.6)</td>
<td>47 (64.4)</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>94 (33.9)</td>
<td>183 (66.1)</td>
<td>(0.63 – 1.85)</td>
</tr>
</tbody>
</table>

* Statistically significant

Those who preferred eating fatty foods were at high risk of unhealthy dietary patterns as compared to those who did not prefer fatty foods.
Table 8: Food intake behavior

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td>(n=230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adds salt to served food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>72 (28.6)</td>
<td>180 (71.4)</td>
<td>0.42</td>
<td>0.0005*</td>
</tr>
<tr>
<td>No</td>
<td>48 (49.0)</td>
<td>50 (51.0)</td>
<td>(0.26 – 0.67)</td>
<td></td>
</tr>
<tr>
<td>Eats chicken/pork skin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>99 (33.3)</td>
<td>198 (66.7)</td>
<td>0.76</td>
<td>0.46</td>
</tr>
<tr>
<td>No</td>
<td>21 (39.6)</td>
<td>32 (60.4)</td>
<td>(0.43 – 1.39)</td>
<td></td>
</tr>
<tr>
<td>Vegetable servings /day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;3</td>
<td>95 (33.5)</td>
<td>189 (66.5)</td>
<td>0.82</td>
<td>0.59</td>
</tr>
<tr>
<td>3-5</td>
<td>25 (37.9)</td>
<td>41 (62.1)</td>
<td>(0.47 – 1.44)</td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant

Those who added salt to served food were less likely to have unhealthy dietary patterns those that did not add salt to served food in this study.
Table 9: Food preparation methods

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td></td>
<td>(n=230)</td>
<td></td>
</tr>
<tr>
<td>Boiled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>55</td>
<td>(41.4)</td>
<td>78</td>
<td>(58.6)</td>
</tr>
<tr>
<td>No</td>
<td>65</td>
<td>(30.0)</td>
<td>54</td>
<td>(70.0)</td>
</tr>
<tr>
<td>Deep fried</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>(31.4)</td>
<td>127</td>
<td>(68.6)</td>
</tr>
<tr>
<td>No</td>
<td>62</td>
<td>(37.6)</td>
<td>103</td>
<td>(62.4)</td>
</tr>
<tr>
<td>Raw F &amp; V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>(66.7)</td>
<td>1</td>
<td>(33.3)</td>
</tr>
<tr>
<td>No</td>
<td>118</td>
<td>(34.0)</td>
<td>229</td>
<td>(66.0)</td>
</tr>
<tr>
<td>Hard cooked vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>(34.7)</td>
<td>47</td>
<td>(65.3)</td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>(34.2)</td>
<td>183</td>
<td>(65.8)</td>
</tr>
</tbody>
</table>

* Statistically significant

In this study those who boiled food as a means of food preparation were at higher risk of unhealthy dietary patterns as compared to those who did not boil food as means of food preparation.
### Table 10: Meaning of a big body

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td>(n=230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Availability of food</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>35</td>
<td>(34.0)</td>
<td>68</td>
<td>(66.0)</td>
</tr>
<tr>
<td>No</td>
<td>85</td>
<td>(37.8)</td>
<td>140</td>
<td>(62.2)</td>
</tr>
<tr>
<td><strong>High social class</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>(37.3)</td>
<td>42</td>
<td>(62.7)</td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>(36.4)</td>
<td>166</td>
<td>(63.6)</td>
</tr>
<tr>
<td><strong>Healthiness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>(28.6)</td>
<td>75</td>
<td>(71.4)</td>
</tr>
<tr>
<td>No</td>
<td>90</td>
<td>(40.4)</td>
<td>133</td>
<td>(59.6)</td>
</tr>
</tbody>
</table>

* Statistically significant

Those who thought having a big body meant one is healthy were less likely to have unhealthy dietary patterns in this study.
Table 11: Foods eaten when visiting town

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unhealthy diet</th>
<th>Healthy diet</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(n=120)</td>
<td></td>
<td>(n=230)</td>
<td></td>
</tr>
<tr>
<td>Fast foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59 (40.4)</td>
<td>87 (59.6)</td>
<td>1.35</td>
<td>0.24</td>
</tr>
<tr>
<td>No</td>
<td>61 (33.5)</td>
<td>121 (66.5)</td>
<td>(0.86 – 2.11)</td>
<td></td>
</tr>
<tr>
<td>F &amp; V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (41.7)</td>
<td>7 (58.3)</td>
<td>1.25</td>
<td>0.46</td>
</tr>
<tr>
<td>No</td>
<td>115 (36.4)</td>
<td>201 (63.6)</td>
<td>(0.39 – 4.02)</td>
<td></td>
</tr>
<tr>
<td>Healthy cooked meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (35.7)</td>
<td>27 (64.3)</td>
<td>0.96</td>
<td>0.96</td>
</tr>
<tr>
<td>No</td>
<td>105 (36.7)</td>
<td>181 (63.3)</td>
<td>(0.49 – 1.88)</td>
<td></td>
</tr>
<tr>
<td>Soft drinks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4 (21.1)</td>
<td>15 (78.9)</td>
<td>0.44</td>
<td>0.11</td>
</tr>
<tr>
<td>No</td>
<td>116 (34.6)</td>
<td>193 (62.5)</td>
<td>(0.14 – 1.37)</td>
<td></td>
</tr>
<tr>
<td>Vendor sold meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>37 (34.6)</td>
<td>70 (65.4)</td>
<td>0.88</td>
<td>0.69</td>
</tr>
<tr>
<td>No</td>
<td>83 (37.6)</td>
<td>138 (62.4)</td>
<td>(0.54 – 1.42)</td>
<td></td>
</tr>
</tbody>
</table>

Types of food eaten when visiting town were no significantly associated with dietary patterns.
4.10 Logistic regression analysis

Step wise multivariate analysis was carried out to estimate the measures of association while at the same time controlling for a number of confounding variables. All the variables that were significant at 0.25 level (P-value< 0.25) in the Bi-variate analysis were included in the logistic regression model.

The model was started off with a single variable. Other variables were added one by one. Variables that were not significant were eliminated until all the variables that were significant at 0.05 levels (95% CI) were added to the model. The adjusted odds ratios (AOR) and 95% confidence intervals (95% CI) from the final model are presented in the Table 11 below:

Table 12: Logistic regression analysis output

<table>
<thead>
<tr>
<th>Term</th>
<th>Odds Ratio</th>
<th>95%</th>
<th>C.I.</th>
<th>Coefficient</th>
<th>S. E.</th>
<th>Z-Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2Sex (Male/Female)</td>
<td>0.2257</td>
<td>0.1283</td>
<td>0.3972</td>
<td>-1.4885</td>
<td>0.2884</td>
<td>-5.1617</td>
<td>0.0000</td>
</tr>
<tr>
<td>Q44fattyfoods (Yes/No)</td>
<td>2.5570</td>
<td>1.2922</td>
<td>5.0597</td>
<td>0.9388</td>
<td>0.3482</td>
<td>2.6963</td>
<td>0.0070</td>
</tr>
<tr>
<td>Q48boiled (Yes/No)</td>
<td>1.6894</td>
<td>1.0334</td>
<td>2.7617</td>
<td>0.5244</td>
<td>0.2508</td>
<td>2.0911</td>
<td>0.0365</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-1.5068</td>
<td>0.3639</td>
<td>-4.1406</td>
<td>0.0000</td>
</tr>
</tbody>
</table>
The results show that being male or female [AOR=0.23; 95% CI (0.13-0.40)], boiling food as a method of preparation [AOR=1.69; 95% CI (1.03-2.76)] and preferring fatty foods [AOR=2.56; 95% CI (1.29-5.06)], are independent factors associated with unhealthy diet in Mt Darwin district.
Chapter 5

5.1. DISCUSSION

This study sought to determine the factors influencing dietary patterns in Mt Darwin District. The study established the prevalence of unhealthy diet to be fairly high (34.4%). This is expected in a population with high obesity and physically inactive rates; this can be supported by a study by Kushner F et.al 26 that showed generally high levels of unhealthy eating among a population of overweight to obese women.

Findings from this study indicated that dietary patterns were significantly associated with some demographic factors, food preference and body image and size. Finding show being male or female as an influencing factor in dietary choices, where women were at higher risk of unhealthy behaviours is similar to a study by Margret J Whichelow 1996 27 that showed that consumption of high-starch foods, most vegetables and meats and high fat foods was prevalent among women and the young.

Food preference was the dominating factor that was statistically associated with dietary lifestyle. Preferring fatty foods was evidently associated with unhealthy diet in this study, Guldstrand MC et.al. 2007 28 concluded that high-fat diets could give rise to unhealthy diets if consumed with carbohydrates. Adding salt to served food was associated with healthy dietary pattern in the findings of this study. This is in contrast with findings from the INTERSALT study 29 that showed an association between high sodium intake and hypertension confirming the unhealthy dietary pattern.
Eating boiled food was also associated with unhealthy dietary pattern in this study. Studies\textsuperscript{12, 15} have consistently shown boiling as a method of food preparation to be a healthy dietary practice. This contrast in findings is likely caused by other food preferences the individuals mentioned. The perception that a big body meant one is healthy was associated with healthy dietary practice. Thandi Puoane et.al 2006 \textsuperscript{20} reported that participant mentioned that having a big body was due to excess consumption of food. Thinking that a big body is healthy can influence individuals to eat more so as to gain weight and become socially accepted as a healthy individual.

Most respondents reported eating chicken or pork skin, high salt and less than 3 servings of fruits and vegetables per day. It was noted that de-skinning before meat preparation was not a tradition in this population. In a study in the US \textsuperscript{30} eating processed meats and liver increased the risk of NCDs while fish and chicken without skin decreased the risk. Most participants highlighted that chicken and pork skin added flavour to the meat, so they could not eat the meat without the skin. Those who drank alcohol and smoked reported to add more salt to food since their taste buds had become weak in tasting any seasoning. Vegetable consumption was very low; this might be mainly because of the lack of variety of vegetables and fruits, where the types of vegetables available in the population were often labelled food for the poor.

The most type of food eaten when people in this population visited town were fast foods and vendor sold foods. These foods however are either fatty foods, sweet foods, high salt foods and or low fibre foods that puts individuals at more risk of CVD. It is hypothesized that as communities become urbanized; people tend to abandon traditional foods adopting foods that are associated with status, such as meat, and fast foods.
The respondents perceived consumption of foods such as samp (corn), beans, greens, and root plants as associated with poverty. Other studies\textsuperscript{31} have shown that once people move to the city their expenses increase hence there is reduced money for food and so usually resort to cheap unhealthy food.

From the mentioned foods eaten in the past 5 days, no type of fruit is included in the highly mentioned foods. It is regrettable because Mt Darwin has a diverse of wild fruits that include; magaka, masau, nhunguru, mauyu, nyii, tsongoro, tsubvu, tsvanzva, and exotic but locally produced fruits like pawpaw, guava, banana, sugarcane, avocado, watermelon, tomatoes. On the market you can also find fruits like apple, pear, and orange. One study done in Zimbabwe showed that wild fruits which are often the only source of fruit for households are usually consumed by children. Findings from our study are unlike a study done in Harare and Chidamoyo showing most participants eating mangoes in season and bananas all year round\textsuperscript{32}.

Food was seen in the social context as a tool to show love, acceptance, happiness, and humanity. This can affect dietary habits in some facts 1. A visitor is usually given the so called “foods for the rich” if available, and 2. As the visitor if you refuse food it is considered as disrespect to your host. People become more exposed to high energy fatty foods because they want to be socially accepted in their communities. We found out from the study that having a big body meant that one is healthy, one has enough food to eat, and or one is of high social class. This might influence more and more individuals to become obese and so be at risk of CVD. Such cultural myths have to be address in CVD risk reduction health promotion programs.
5.2. Strengths and limitations

This study is among the first to evaluate the dietary patterns and factors influencing these patterns in Mt Darwin District. Results from this study are a starting point for further in-causal effect studies into the relationship between diet and CVD risk factors in Mt Darwin and also pave the way for developing future research and health promotion/health education programs targeting this population.

The study has its own limitations. People who spent more time in their homes would have been more likely to have participated in the study as they would have been more likely to be home when the interviewers came to recruit participants. This may limit our generalizability to the population as a whole.

Another limitation is that this study relied on self-reported measures of dietary intake which could bias the validity. However, these measures are commonly used in epidemiologic studies with reasonable accuracy.

Finally, given the cross-sectional nature of our study, the temporal or causal relationships of anthropometric measurements and questionnaire responses to our outcome of interest, dietary patterns, cannot be assessed.

5.3. Conclusion

In conclusion, Mt Darwin District appears to have very high levels of unhealthy dietary patterns, women being at more risk of unhealthy eating. Factors influencing dietary patterns include being male or female, taste and food preference and image and body size. These factors are diverse,
including social, psychological and cultural factors. Social gatherings pose a risk especially to individuals who like partying since unhealthy foods were mentioned to be eaten at such places.

There are still a lot of myths and misconceptions on issues of diet in relation to the body and health outcomes in Mt Darwin community. These if not addressed can lead to increase levels of unhealthy diet.

5.4. **Recommendations**

It is important to taking all factors influencing dietary patterns into consideration in developing strategies for modifying dietary patterns. The following recommendations should be addressed.

5.4.1. **Recommendations for improvement in healthy dietary patterns**

- Patients should be provided with written information to supplement the verbal information they receive during counselling. The District Health Promotion Officer and Nutritionist should be actively involved in designing, sourcing and distributing pamphlets, posters, leaflets and other written information to patients. Alternatively, the advice to modify eating may be written in the patients’ out-patients card during the initial counselling.
- Health education on dietary intake should include social aspects discussed in the study, correcting all misconceptions about diet.
- The District Health Promotion Officer, Nutritionist and Community Nurse should liaise with Ministry of Agriculture in order to implement nutritional gardens and orchards to increase availability of vegetables and fruits.
- Health education should target women since their dietary choices have been found to be unhealthy, and they are the ones who usually buy and cook food.
• The communities’ compliance with the recommended dietary patterns should be monitored and evaluated routinely by the DHE through small surveys, once a quarter.

5.4.2. Recommendation for Future Research

• A prospective study should be carried out in order to determine the temporary relationships between dietary patterns and the various factors that may affect it.
• Future research on dietary patterns should include measuring amounts of calories and other nutrients consumed per day in various foods.
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ANNEX 1- CONSENT FORM

INFORMED CONSENT FORM (adapted from the MRCZ Consent Form)

FACTORS INFLUENCING DIETARY PATTERNS IN MT DARWIN, A RURAL DISTRICT IN ZIMBABWE, 2013

Principal Investigator: Ms. Rumbidzai Chimukangara (MPH- HP Trainee)

Phone number: 0773468834
Email: rchimu@gmail.com

What you should know about this research:

- We give you this consent so that you may read about the purpose, risks, and benefits of this research study
- The main goal of this research is to gain knowledge that may help you and the community
- We cannot promise that this research will benefit you directly
- You have the right to refuse to take part, or agree to take part now and change your mind later
- Whatever you decide, it will not affect your regular care
- Please review this consent form carefully. Ask any questions before you make a decision
- Your participation is voluntary

Introduction:

My name is Ms. Rumbidzai Chimukangara. I am a Public Health student with the University of Zimbabwe attached to the MoHCW Mashonaland Central Provincial Directorate. I am conducting a study on the Factors Influencing Dietary Patterns in Mt Darwin District
Before you decide to volunteer for this study, you must understand its purpose, how it may help you, the risks to you and what is expected of you.

**Purpose and significance of the study**
The purpose of the study is to identify the factors that influence individuals to indulge in risky dietary patterns despite the knowledge of diet being a risk factor of Cardiovascular Disease. There has been a rapid increase in caloric intake in diet in Mt Darwin District over the past five years due to a shift from the traditional diet to western diets which contain high saturated fats.

A review into causes of increased caloric intake revealed that after the intense shortage of food during the 2008 episode in Zimbabwe people now eat more than enough, for example very oily food to compensate for the time they could not get the cooking oil. In this way they put themselves at risk of chronic diseases including cardiovascular disease. The growing use of processed foods as well as ready-made food purchased from food vendors and changing dietary fibres are compounding the problem.

The findings from the study will assist in coming up with recommendations to enable the development of health promotion interventions to improve healthy dietary intake in Mt Darwin District.

**Procedures and Duration**
If you decide to participate in this study, you will undergo an interview which may take 10-30 minutes. If you have questions about the study, you may ask at any time.

**Risks and Discomforts**
There are no physical risks and discomforts associated with this study.

**Benefits and / or Compensation:**
There are no direct individual benefits such as cash payments that will come from participating in this study. However, in the long term, you will indirectly benefit, since the findings from the study will be used to improve dietary policies and programs.

**Alternative Procedure or Treatments:**
There are no interventions or treatments that will be done in this study.

**Confidentiality**
If you indicate your willingness to participate in this study, information collected about you and your responses will be treated with confidentiality. The questionnaire to be used during the interview will be identified by a code (number) instead of your name. This consent form will be separated from the coded questionnaires and stored in a secure place.

We plan to disclose any information found in this study to the Academic panel of the University of Zimbabwe and the Ministry of Health and Child Welfare. Results may be shared at different fora but only for the purpose of improving service provision to patients. No personal information will be disclosed to anyone hence the absence of any names on these questionnaires. Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. The MRCZ or University panel may need to review your records for compliance audits hence they will be given access to the questionnaires.

**Additional Costs**
You will not incur any expenses from participating in this study.

**In the event of injury**
In the rare event of injury resulting from your participation in this study, treatment can be obtained at the nearest health centre. You should understand that the costs of such treatment will be our responsibility. Financial compensation is not available.
**Voluntary Participation**

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect the quality of care you receive if you visit any hospital or any other health facility.

**Additional Elements**

Should you decide to withdraw from this study and its procedures at any stage, you are free to do so. There will be no penalty for withdrawal. I may terminate your participation in this study without your consent if your participation puts you at risk. Should this happen, I will inform you.

**Offer to Answer Questions**

If you have any questions on any aspects that are not clear to you about this study, please feel free to ask me before you sign this form. You are free to take as much time as you can to think about it.

**Authorization**

By signing this form, it means that you have read and understood the information provided above, had all your questions answered, and decided to participate voluntarily without being coerced and can choose to stop your participation at any time without loss of any benefits entitled to you. You authorize me and my field and academic supervisors to access the information that you will have provided. The information you provide will only be used for the purpose of this study.

The date you sign this document to enroll in this study, that is, today’s date, Must fall between dates indicated on the approval stamp affixed to each page. These dates indicate that this form is valid when you enroll in the study but do not reflect how long you may participate in the study. Each page of this Informed Consent Form is stamped to indicate the form’s validity as approved by the MRCZ.
Name of Research Participant (please print)          Date

____________________________________________________
Signature of participant / legally authorized representative  Time

____________________________________________________
Signature of staff obtaining consent

For any further information pertaining to this study, please feel free to contact me at:
University of Zimbabwe,
College of Health Sciences
Department of community medicine
PO Box A178, Avondale, Harare, Zimbabwe

YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP
If you have any questions concerning this study or consent form beyond those answered by the investigator, including questions about the research, your rights as a research subject or research-related injuries: or if you feel that you have been treated unfairly and would like to talk to someone other than a member of the research team, please feel free to contact
The Medical Research Council of Zimbabwe on telephone 04- 791792 or 791193
ANNEX 2- GWARO RECHITENDERANO

TSAMBA YEMVUMO (yakavandzwa kubva patsamba yeMRCZ)

ONGORORO YEKUDYA KUNOITA VANHU, MUDUNHU REMT DARWIN,
ZIMBABWE 2013.

Muongorori: Muzvari Rumbidzai Chimukangara (Mudzidzi weMPH-HP)

Nhamba dzenhare: 0773468834

Email: rchimu@gmail.com

Zvamunfanira kuziva maererano neongororo ino:

- Tirikukupai gwaro remvumo rino kuti muzviverenge pamusoro pezvinangwa, zvakaipa uye zvakanakira ongororo ino.
- Chinangwa chikuru cheongoror ino ndechekutsvaga ruzivo runozobatsira pakubatsirwa kwenyu nenharaunda yenyu paremangwana renyu
- Hatikuvimbisei kuti mune chinobatika chamuchawana pakupinda muongororo
- Mune mvumo yekuramba kupinda mungororo kana kutanga mabvuma mozofunga kuramba ongororo yava pakati.
- Zvamunenge mafunga kuita hazvikanganise kubatsirwa kwenyu ramangwana.
- Tapota nyatsoverngai gwaro rino rechibvumirano zvakakwana. Bvunzai mibvunzo yose yamungava nayo musati masarura kupinda kana kusapinda muongororo.
- Kupinda kwenyu muongororo kuda kwenyu.
Mavambo:


Chinangwa cheongororo

Chinangwa cheongororo iyi ndechekutsvaga izvo zvingakonzerese vanhu kuti vadye chekudya chinovaisa panjonzi yezvirwere zmoyo. Mudunhu reMt Darwin kadyiro kanoita vanhu kashanduka kubva munezvekudya zvaidya madzitetenguru edu kutevedzera madyiro anoita vanwe wedu venyika dzakabudirira. Kudya uku kwakawanda mafuta anoisa munhu panjonzi yezvirwere zvakasiyanasiyana.


Zvichaduda muongororo iyi zvichabatsira mugadzira mitemo ingabatsira vanhu munharaunda yeMt Darwin kuti vadye zvekudya zvakakanIRA mudiri yavo.

Zvichaitwa neguva ichatorwa

Kana makasarudza kuva muongororo iyi, munobvunzo mibvunzo kwenguva ingaita maminiti anobva pagumi kusvika makumi matatu. Kana muine mubvunzo pamusoro peongororo iyi, makasununguka kubvunza pachero nguva.
Zvingakuisei panjonzi kana kurwadziwa

Hapana zvichaitwa paongororo iyi zvingakuisei panjonzi kana pakurwadziwa.

Zvakanakira kuva muongororo

Hapana chamuchawana nekuva muongororo iyi zvingafanane nekupihwa mari. Zvisinei muchazoona zvichabatsira muongororo nekufamba kwenguva, sezvo zvichingona kubatsira vanhu munharaunda kuti vadye madyiro anopa hutano.

Kubatsirwa kana kurapwa

Paongororo iyi, hapana kurapwa kana kubatsirwa kwechekudya kuchaitwa kune avo vanenege vapinda muongororo.

Kuchengetedzwa kwezvmuchataura

Kana makatora chikamu muongororo iyi, zvose zvmuchataura zvichange zvakachengetedzwa kubva kuvanhu vasinei neongororo iyi. Bepa richashandiswa kubvnunza mibvunzo nekunyora mhinduro, harisi kuzonyorwa zita renyu. Fomu rino richange rakaparadzana nebepa remhinduro kuitira kuti zvisazivikanwe kuti ndiani apa mhinduro idzi. Mafomu aya achachengetedzwa pasingabatwe nemunhu wese wese

Zvichabuda kwamuri zvinogona kuzviswa vadzidzi vedu paUniversity yeZimbabwe kana bazi rezveutano muhurumende. Tinogona kukurukura zvabuda muongororo pamaungano akasiyanasiyana nechinangwa chekunakisa zvekudya zvinopa hutano. veMRCZ kana University vanogona kuda kuona mapepa ewongororo ino semutemo weongororo dzinoitwa munyika munyika ino. Zvine chekuita nemazita kana hupenyu hwenyu hazvizoziwiswa mumwe munhu. Tichavimba kuchengetedza zvine chekuita nehupenyu hwenyu muchivade.

Mumwe muripo

Hapana mari dzichabhadharwa kuti muve muongororo ino.
Toti makuvara

Kurikuti makuvara nekuda kweongororo ino munozorapwa pachipatara chiri padyo nemi. Mukurapwa kwenyu hamuna chamunobhadhara. Hapana mubhadharo wemari uchabuda muongororo ino.

Kusunguka kupinda muongororo

Hamumanikidzwe kuva muongororo ino, isarudzo yenyu sedungamunhu.Kana makasada kuva muongororo iyi hazvikanganise mabatirwo amungaitwe makaenda kukiriniki kana chipatara kuno rapwa.

Zvimwewo zvinechekuita neongororo

Kana makafunga kubuda muongororo ino pachero nguva, makasununguka kudaro. Hapana zvakaipa zvamunoitwa kana mafunga kubuda.

Mibvunzo

Kana muine mibvunzo nezveongororo ino pachero chipi chamunoda kubvunza, ivai makasununguka musati masaina fomu rino. Makasununguka kutora nguva yamunoda kufunga musati masaina fomu.

Mvumo

Zita remupinduri (nyora zvinooneka)                        Zuva

Chiratidzo chebvumirano chemupinduri                        Nguva
(*kana cheanotenderwa pamutemo)

Chiratidzro chearikutambira chibvumirano

Kana muine zvakawanda zvamunoda kuziva maererano neongororo iyi ivai makasungunguka kunyora tsamba ku:

University of Zimbabwe,
College of Health Sciences
Department of community medicine
PO Box A178, Avondale, Harare, Zimbabwe

Zvamungada kuzi
Kana muine mibvunzo nezveongorora kana fomu yakapfuura zvamapindurwa nemuongorori, kusanganisira konzero dzenyu, kurwadziswa muongororo kana kusabatwa zvakanaka, ivai makasununguka kutaura nevamwe vasiri muongororo iyi ku:
Medical Research Council of Zimbabwe
Nhamba dzenhare 04- 791792 or 791193
**ANNEX 3- ENGLISH VERSION OF QUESTIONNAIRE**

<table>
<thead>
<tr>
<th>Questionnaire number</th>
<th>Ward..................................................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date ........../....../........</td>
<td></td>
</tr>
</tbody>
</table>

Good Morning/ Afternoon. My name is Rumbidzai Chimukangara. I am a Public Health Officer attached to the Provincial Medical Directorate in Mashonaland Central Province. As part of my studies I am carrying out a study on **Factors Influencing Dietary Patterns in Mt Darwin District.**

I would greatly appreciate it if you spare some time to go through the questionnaire with me. I have a number of questions concerning dietary behaviour. Your cooperation will be greatly appreciated as it will help towards reducing unhealthy dietary patterns in the District.

**Section A: DEMOGRAPHIC DATA**

1. Age ............Years

2. Sex [ ] Female [ ] Male

3. Level of education [ ] None  
   [ ] Primary  
   [ ] Secondary  
   [ ] Tertiary
4. Occupation

- Formally employed
- Self employed
- Farmer
- Scholar
- Unemployed

5. Marital status

- Married
- Divorced/ widowed
- Single

6. Religion

- Christianity
- African Tradition
- None
Section B: DIETARY RISK FACTORS

7. Give a list of all the foods you ate in the last 5 days.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

8. What motivates you to eat these types of foods?
   It is what is available
   It is the least expensive
   It is easy to prepare
   It tastes good
   Other (Specify) ______________________________________________________________

9. What is food used for as a social aspect in your community?
   To show love to show acceptance
   To show humanity to show happiness
   Other (specify) ______________________________________________________________
10. What kinds of food do you prefer to eat when you are with your friends or relatives?

<table>
<thead>
<tr>
<th>Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red meat</td>
<td></td>
</tr>
<tr>
<td>French fries</td>
<td></td>
</tr>
<tr>
<td>Fried chicken</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td></td>
</tr>
<tr>
<td>Whole milk products</td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
</tr>
</tbody>
</table>

11. How do you usually like your food prepared?

<table>
<thead>
<tr>
<th>Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiled</td>
<td></td>
</tr>
<tr>
<td>Deep Fried</td>
<td></td>
</tr>
<tr>
<td>Raw (fresh fruits and vegetables)</td>
<td></td>
</tr>
<tr>
<td>Hard cooked vegetables</td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>

12. What do you expect a person of high social status to regularly eat?

<table>
<thead>
<tr>
<th>Options</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pizza, burgers, hot dogs</td>
<td></td>
</tr>
<tr>
<td>Red meat, pork, chicken</td>
<td></td>
</tr>
<tr>
<td>Fruits, vegetables</td>
<td></td>
</tr>
<tr>
<td>Cheese, yogurt</td>
<td></td>
</tr>
<tr>
<td>Cookies, cakes, muffins,</td>
<td></td>
</tr>
<tr>
<td>(Refined) sugar, mealy meal</td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
</tr>
</tbody>
</table>
13. What foods do you think people of low social status usually eat?

- Vegetables
- Legumes
- Kapenta
- Unrefined foods
- Other (specify) ________________________________

14. What do you expect to eat at a party, wedding etc.?

- Deep fried chicken
- Ice cream
- Red meat
- Rice, potatoes
- Other (specify) ____________________________________________________

15. What does having a big body mean in your society?

- One has enough food to eat
- One is of high social status
- One is healthy
- Other (specify) __________________

16. What foods do you usually eat if you visit town?

- Pizza, burgers, chicken inn
- Fresh vegetable salad dishes
- Vendor sold cooked meals
- Other (specify) __________________
17. How many servings of vegetables do you take per day?

- <3 servings
- 3-5 servings
- >5 servings

18. Do you add any salt to food served?

- Always
- Regularly
- Sometimes
- Never

19. Do you eat chicken or pork skin?

- Always
- Regularly
- Sometimes
- Never

We have come to the end of our interview. Thank you for taking your time to participate in this study.
**ANNEX 4- SHONA VERSION QUESTIONNAIRE**

<table>
<thead>
<tr>
<th>Questionnaire number</th>
<th>Wadhi ........................................</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deti ........../......../..........</td>
<td></td>
</tr>
</tbody>
</table>


---

**Chikamu chekutanga: ZVAKANANGANA NEMARARAMIRO ENYU**

1. Makore ................

2. Munhu rudzii ?         Mukadzi [ ] Murume [ ]

3. Makasvika papi padanho rekudzidza

[ ] Handina kuenda kuchikoro
[ ] Puraimari
[ ] Sekondari
[ ] Kupfuura Sekondari
4. Mune mabasa amunobata anokuraramisai here?

- [ ] Basa rine mubhadharo
- [ ] Kuzvishandira
- [ ] Murimi
- [ ] Mwana wechikoro
- [ ] Hapana

5. Makawana/wanikwa here?

- [ ] Ndakaroorwa/ kuroora
- [ ] Ndakabuda muwanano/ kufirwa
- [ ] Handisati ndaroorwa/ kuroora

6. Chitendero

- [ ] Chikiritsu
- [ ] Chivanhu
- [ ] Hapana
Chikamu chechipiri : ZVEKUDYA ZVINOKANGANISA UTANO

7. Pamazuva mashanhu apfuura, ndiudzeiwo zvekudya zvose zvamakadya.

| _____________________________________________________________________________ |
| _____________________________________________________________________________ |
| _____________________________________________________________________________ |
| _____________________________________________________________________________ |

8. Chii chakaita kuti mudye zvekudya izvi?

| Ndzivo zvaivapo panguva iyoyo | ☐ |
| Ndzivo zvakachipa kutenga    | ☐ |
| Ndzivo zvisinganetsi kubika  | ☐ |
| Ndzivo zvinondinakira        | ☐ |

Zvimwewo (tsanangura) __________________________________________________________

9. Munharaunda menyu, chekudya chinoshandiswa kurevei?

| Kuratidza rudo                           | ☐ | Kuratidza kugamuchira munhu | ☐ |
| Kuratidza kuti uri munhu pavanhu        | ☐ | Kuratidza mufaro             | ☐ |

Zvimwewo (tsanangura) __________________________________________________________
10. Ndechipi chekudya chamunofarira kudya kana muine hama kana shamwari dzenyu?

   nyama yemombe, mbudzi, hwai □ machipusi □
   nyama yehuku yakakangwa □ miriwo (maveji) □
   michero □ mukaka, cheese, yogurt □

   zvimwewo (tsanangura)______________________________

11. Munowanzo farira kudya chekudya chakabikwa zvakaita sei?

   chakafashaidzwa □ miriwo (maveji) yakafashaidzwa kwenguva refu □
   michero nemiriwo isina kubikwa □ chakakangwa nemafuta kakawanda □

   Zvimwewo (tsanangura) ________________________________

12. Munotarisira kuti vanhu vane mari vadye zvekudya zvipi?

   Pizza, burgers, hot dogs □ nyama yemombe, nguruve,huku □
   Michero, miriwo (maveji) □ Cheese, yorgurt □
   makeke, mabhanzi anotapira □ sugar, hupfu (zvakatsetseka) □

   zvimwewo (tsanangura)__________________________________________
13. Munofunga kuti ndezvipi zvekudya zvinowanzo dyiwa nevanhu vanoshaya?

Miriwo (maveji)  [ ] nzungu, bhinzi, nyemba  [ ]
Matemba  [ ] hupfu husina kutsetseka  [ ]
Zvimwewo (tsanangura) ________________________________

14. Unotarisira kudya zvekudya zvakaita sei kana maenda kumuchato kana bhavhudhe?

Huku yakakangwa mumafuta akawanda  [ ] zvinotapira  [ ]
Nyama yemombe, mbudzi, hwai  [ ] mupunga, mbatatisi  [ ]
Zvimwewo (tsanangura) ________________________________

15. Kusimba kunorevei mudunhu renyu?

Munhu ari kuwana kudya kwakakwana  [ ] munhu ane mari yake  [ ]
Munhu ane hutano hwakanaka  [ ]
zvimwewo (tsanangura) ________________________________

16. Munowanzo farira kudyei kana maenda kuguta?

Pizza, burgers, chicken inn  [ ] miriwo (maveji)  [ ]
Zvakabikwa zvinotengeswa pamusika  [ ]
Zvimwewo (tsanangura) ________________________________
17. Munodya zvikamu zvemiriwo (maveji) zvingani pazuva?

- zvikamu zvisingadarike zvitatu
- zvikamu zviri pakati pezvitatu nezvishanhu
- zvikamu zvinopfuura zvishanhu

18. Muno wedzera here sauti muzvekudya mavakudya?

- Nguva dzose
- Dzimwe nguva

19. Munombodya ganda rehuku kana nguruve here?

- Nguva dzose
- Dzimwe nguva

Tasvika kumagumo ehurukuro yedu. Maita basa nenguva yenyu.
ANNEX 5: PMD’S APPROVAL LETTER

DEPARTMENT OF COMMUNITY MEDICINE

P. O. Box A 178
Avondale
Harare, Zimbabwe

Telephone: + 263 4 795835/707707
Fax: + 263 4 795835
Telex: 26580 UNIVZ ZW
Telegrams: UNIVERSITY

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF ZIMBABWE

11th April 2013

PMD
Mashonaland Central Province

RE: REQUEST FOR PERMISSION TO CARRY OUT A STUDY ON FACTORS ASSOCIATED WITH DIETARY BEHAVIOUR IN MOUNT DARWIN DISTRICT

Miss Rumbidzai Chimukangara is a student studying for a Master Degree in Public Health (Health Promotion) and is carrying out an investigation on factors associated with dietary behaviour in Mount Darwin District

Kindly assist her with all relevant information to facilitate her study.

Yours Sincerely

[Signature]
Prof S. Rusakaniko
CHAIRMAN
DEPARTMENT OF COMMUNITY MEDICINE
ANNEX 6: INSTITUTIONAL REVIEW BOARD APPROVAL

Joint Parirenyatwa Hospital
And College of Health Sciences
Research Ethics Committee

APPROVAL LETTER

Date: 1st July 2013

Name of Researcher: Rumbidzai Chimukangara
Address: University of Zimbabwe, Department of Community Medicine

Re: Factors Influencing Dietary Patterns And Cardiovascular Risk In Mt Darwin, A Rural District In Zimbabwe 2013.

Thank you for your application for ethical review of the above mentioned research to the Joint Research Ethics Committee. Please be advised that the Joint Research Ethics Committee has reviewed and approved your application to conduct the above named study.

- APPROVAL NUMBER: JREC/73/13
- APPROVAL DATE: 1st July 2013
- EXPIRATION DATE: 30th June 2014
- TYPE OF MEETING: Expedited Review

This approval is based on the review and approval of the following documents that were submitted to the Joint Ethics Committee:

a) Completed application form
b) Full Study Protocol
c) Informed Consent in English and/or appropriate local language
d) Data collection tool version:

After this date the study may only continue upon renewal. For purposes of renewal please submit a completed renewal form (obtainable from the JREC office) and the following documents before the expiry date:

a. A Progress report
b. A Summary of adverse events.
c. A DSMB report

- MODIFICATIONS:
Prior approval is required before implementing any changes in the protocol including changes in the informed consent.
TERMINATION OF STUDY:

On termination of the study you are required to submit a completed request for termination form and a summary of the research findings/ results.

Yours Faithfully,

[Signature]

Dr CE Ndhlovu
For JREC Chairman
ANNEX 7: MEDICAL RESEARCH COUNCIL APPROVAL

Medical Research Council of Zimbabwe
Josiah Tongogara / Mazoe Street
P. O. Box CY 573
Causeway
Harare

APPROVAL LETTER

Ref: MRCZ/B/545 06 August, 2013

Rumbidzai Chimukangara
University of Zimbabwe
Department of Community Medicine
Harare

RE: Factors Influencing Dietary Patterns and Cardiovascular Risk in Mt. Darwin, A Rural District in Zimbabwe, 2013

Thank you for the above titled proposal that you submitted to the Medical Research Council of Zimbabwe (MRCZ) for review. Please be advised that the Medical Research Council of Zimbabwe has reviewed and approved your application to conduct the above titled study. This is based on the following documents that were submitted to the MRCZ for review:

a) Study Proposal
b) English and Shona Informed Consent Forms

• APPROVAL NUMBER: MRCZ/B/545

This number should be used on all correspondence, consent forms and documents as appropriate.

• TYPE OF MEETING: Expedited Review
• APPROVAL DATE: 06 August, 2013
• EXPIRATION DATE: 05 August, 2014

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted one month before the expiration date for continuing review.

• SERIOUS ADVERSE EVENT REPORTING: All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices.

• MODIFICATIONS: Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).

• TERMINATION OF STUDY: On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices.

• QUESTIONS: Please contact the MRCZ on Telephone No. (04) 791792, 791193 or by e-mail on mrcz@mrcz.org.zw

• Other

Please be reminded to send in copies of your research results for our records as well as for Health Research Database.

You’re also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.

Yours Faithfully

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH

[Stamp: MEDICAL RESEARCH COUNCIL OF ZIMBABWE 2013 -08- 08 APPROVED P.O. BOX CY 573 CAUSEWAY, HARARE]