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Dietary preference and perceptions of the health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo Community Health Centre, Eastern Cape, South Africa

BY

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DECLARATION

I, Ronnie JAV Chocko, declare that this mini-dissertation on 'Dietary Preference and Perceptions of Health Implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa, is submitted in partial fulfilment of the requirements for Masters in public health. It is entirely my own work, and has not been taken from other works, except were specifically cited. Reasonable care was taken to ensure that the work is original as far as possible, and does not breach copyright laws to the best of my knowledge, except for where other sources have been cited and acknowledged within my work.

Signed…… (Candidate)

Date…01/08/2022……

CERTIFICATION

This mini-dissertation entitled 'Dietary Preference and Perceptions of Health Implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa' was completed under the supervision and guidance of Dr. KE Oladimeji at the University of Fort Hare, East London.

Signature  ……...

Dr. KE Oladimeji, MPH, PHD (Supervisor)

Date …01/08/2022……...

DEDICATION

This mini-dissertation is dedicated to all the billions of animals that have been slaughtered just to satisfy man's taste for flesh. Through gruesome violence, these beautiful lives are ruined, by the cruelty of humans. These are the tales that the innocent will never tell. It is normal but does this mean it is moral, doesn't it go against our conscience? Is our compassion dead? We are leaving them with no choice, with no options left, these animals have no voice. It's the same as yesterday and it's the same as tomorrow, just another regular day on a farm. Another day, another face, another slaughter, another paycheck, suffering, pain and more trauma, sounds of death echoing, empty cries, lost souls and dark karma.

It's a sad position that we're living in. Time to ban the killings from the lambs to pigs, the chickens and the fish. Teeth sinking into mammal's skin, cannibals are not phased, but it's animal slave trade that is happening. It is not in our nature to kill, and if it's faced it's pain that we feel. Is there really such a thing as humane slaughter? Those who profit, give flesh different names to conceal, so we get it packaged, and don't comprehend the damage, and we forget that the process is savage, they are caged, enslaved against their will and on the daily they are killed, over a 100 billion animals a year, that's a painful ordeal. We all used to understand right from wrong, till we were taught and told differently.

This work is also dedicated to all my people who are trying to survive, every day and night, struggling to stay alive, for my people living on the street with no shelter, clean water or no food to eat, this is for my people who are treated like they don't exist, for my people who society has left behind, acting deaf and blind to the plight of the people that need their help. They are victims of a system of economic oppression, poverty is like a weapon, another form of aggression and class warfare. Poverty is a prison that millions have got to live in, we can help them get their freedom, if all of us start giving.

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I give thanks to my family, who have been a driving force for me to complete my studies. You have been a source of strength and support through the good and bad times. I thank you for all the love and care that you have shown me throughout this journey.

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My final and unending thanks and praise to our loving God, the creator of the universe, the giver of life and bestower of countless blessings. I pray that you continue to shine upon us your sin destroying light, and guide our intellect in the right direction.

ABSTRACT

Introduction and background

Poor dietary choices are resulting in an increase of mortality and morbidity rates globally. Epidemiological studies reveal that diets high in animal-sourced foods (ASF) lead to an increased risk of developing cardio-metabolic diseases (CMD). On the other hand, plant-based foods (PBF) have been shown to reduce this risk. Making well informed dietary choices plays an important role in reducing the burden of these diseases. To this end, this study further explores the role that diet plays in maintaining good health by exploring current dietary preferences, perceptions of the health implications of these dietary choices and perceptions of the benefits of PBFs vs ASFs of people in a local South African context.

Methodology

This qualitative study was conducted at Nontyatyambo Community Health Centre, Mdantansane, Buffalo City Metropolitan district in the Eastern Cape province of South Africa. A sample of 42 participants was enrolled for the study. A question/interview guide was used to collect data through key-in-depth interviews and focus group discussions. Two audio recorders were used to record the verbal responses of participants. The recorded interviews were transcribed and translated to English. The transcribed data was systematically and thematically analyzed.

Results

It was found that all participants in this study were following an omnivorous dietary pattern. A number of participants expressed that they did not like vegetables. In this study, most participants felt that PBFs were healthier than ASFs. Even though they felt PBFs were healthier, none followed exclusively plant-based diet.

Conclusion

Transforming dietary patterns to contain more plant-based foods may be a critical factor in reversing harmful effects on public health and the environment. This calls for urgent public health intervention to improve nutritional uptake as a strategy to reduce potential CMD.

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List of acronyms

AGE – Advanced glycoxidation end-product

AHA – American Heart Association

ASF – Animal-sourced food

BBQ - Barbeque

BCM – Buffalo city metropolitan

BMI – Body mass index

CAD – Coronary artery disease

CBA – Cerebro-vascular accident

CHC – Community health centre

CMD – Cardio-metabolic disease

CVD - Cardiovascular disease

DASH – Dietary Approaches to Stop Hypertension

FGD – Focus group discussion

GHGE – Global greenhouse gas emissions

GI – Glycemic index

HAA – Heterocyclic amine

HCW – Health care worker

HF –Heart failure

HPT – Hypertension

IHD – Ischemic heart disease

KII – Key-in-depth interview

MedDiet – Mediterranean diet

MRP – Maillard reaction product

PBD – Plant-based diet

PBF – Plant-based food

PT - Patient

ROS – Reactive oxygen species

T2DM – Type 2 Diabetes Mellitus

TMAO – Trimethylamine-N-Oxide

CHAPTER 1

1.1. Introduction

Globally, poor dietary choices are causing an increase in mortality and morbidity (Hemler and Hu, 2019). Advances in science demonstrates that the development of cardio-metabolic disease (CMD) is largely due to inclusion/exclusion of particular foods (Mozaffarian, 2016). Epidemiological studies reveal that a high intake of red and processed meat leads to an increased risk of developing CMD. Furthermore, oxidative stress usually produced during the digestion of these meats is a critical factor in the aetiology and progression of CMD (Van Hecke et al, 2017). On the other hand, plant-based foods have been found to have beneficial effects on oxidative stress, insulin sensitivity, body weight, blood lipids and glycemic control (Kahleova et al, 2017). Studies comparing meat-heavy omnivorous diets to vegetarian diets showed that increased meat consumption was associated with worsened health outcomes and increased water, energy and land use (Nelson et al., 2016). Evidence supports the short- to medium-term positive health effects of plant-based diets (PBDs) compared to conventional diets on systemic inflammation, energy metabolism and weight status (Tonstad et al., 2015; Medawar et al., 2019).

A factor, influencing dietary choices, is resource-intensive food production systems due to current research and technological methods (Herforth et al, 2019). A consequence of this is an increase in the availability of non-organic foods or processed foods for consumption, which can be detrimental to the body, environment and the future food supply (Wilson et al, 2019). Well informed dietary choices can contribute towards reducing the burden of these diseases. Since individual and public health are interconnected and negatively affected by poor diet choices, transforming dietary patterns to contain wholesome plant-based diets could play a crucial role in reversing these harmful effects on health and the environment (Tonstad et al., 2015; Hemler and Hu, 2019). To this end, this study further sought to explore the role that diet played in maintaining good health by determining current dietary intake preferences and

perceptions of the implications that dietary choices have on health in a local South African context.

1.2. Background

Today's lifestyle and dietary choices worldwide result in a net surplus of caloric intake that contributes to an increase in CMD (Castro-Barquero et al., 2020). The shift in worldwide dietary patterns from plant based to refined animal-based foods also has effects on the environment apart from the impact on the health of the population (Springmann, 2018). Producing food from animals is much more damaging to the environment and requires more resources as compared to food from plants (Springmann, 2018; Vieux et al, 2018; Fresan & Sabate, 2019; Szczebylo et al, 2020). In general, the production of animal protein requires approximately 11 times the energy from fossil fuel compared to an equivalent amount of grain-based protein (Hemler and Hu, 2019, Wilson et al, 2019). The production and harvesting of red meat have been found to be extremely inefficient, as it requires high amount of energy from fossil fuels. In units of kilocalories (kcal), 57kcal of energy is expended to generate 1 kcal of protein for lamb, and 40kcal of energy is expended for 1 kcal of protein for beef, respectively (Nelson et al., 2016; Hemler and Hu, 2019).

The unsustainable demand for animal products is increasing, further compounding the problem. Developing countries such as South Africa are also experiencing an increase in the consumption of refined grains and animal products, especially meat, and a decrease in physical activity due to modern lifestyles influenced by automated technologies (Mchiza et al, 2015; Hemler and Hu, 2019). Thus, practical interventions are needed to allow for a food environment and conditions that promote healthier lifestyles and diets amongst the populations of the world. Interventions focusing on shifting diet and lifestyles towards incorporating more plant-based food and fewer animal-sourced foods could be effective in the prevention and management of CMD.

1.3. Problem Statement

Non-communicable diseases, which include CMD are the leading cause of 71% of all deaths worldwide and are predominantly associated with dietary and metabolic risks (Chen et al, 2019). According to Cappuccio and Miller (2016); Du et al (2016) & Lopes et al (2020), of all the non-communicable diseases cardiovascular disease (CVD) is responsible for approximately 17 million deaths annually, and is a leading cause of premature disability and death globally. Developing countries account for nearly 80% of the disease burden. Prevalence of CVD risk factors amongst the adult population in Africa is 30% for high blood pressure, 20% for dyslipidemia and 3,4% to 8,9% for diabetes mellitus (Lopes et al., 2020).

In 2016, 13% and 39% of the world's adult population were obese and overweight, respectively (Mattei et al, 2012; Hemler & Hu, 2019). Recent statistics from South Africa report that 31% of men and 68% of women in South Africa are obese/overweight, with women being more likely to be affected (Lopes et al., 2020). As obesity is a significant risk factor for CMD, this is a cause for concern. Cardio-metabolic diseases (CMD) such as diabetes mellitus type 2 (T2DM), ischemic heart disease (IHD) and obesity are real threats to public health and are closely associated with diet (Lynch et al, 2018; Lassen et al, 2019).

According to Kahleova et al (2017), improper dietary choices are a leading contributing factor to premature deaths and to the development of these CMD. A contributor to the increasing burden of CVD in Africa is urbanization and embracing of westernized lifestyles (Tydeman-Edwards et al., 2018; Lopes et al., 2020). Dietary patterns in urbanized areas are usually high in fat and low in fiber, compared to low-fat, high-fiber diets in rural areas, and generally the amount of physical activity also decreases in urban areas (Tydeman-Edwards et al., 2018; Lopes et al., 2020). Westernized diets are further characterized by increased consumption of energy-dense and processed foods, with high content of saturated fat, mainly from animal-sourced foods, and refined sugar - from fast-foods and soft-drinks.

1.4. Central theoretical statement

Evidence reveals that consuming meals high in healthy plant-based foods and low in animal-based foods have preventative and curative effects on CMDs.

1.5. Research Questions

1. What are the current dietary preferences of patients and health care workers at Nontyatyambo CHC, Eastern Cape, South Africa?
2. What are the perceived health implications of these dietary choices on participants at Nontyatyambo CHC, Eastern Cape, South Africa?
3. What are the perceptions on the value of shifting from animal-based dietary patterns to a plant-based diet among the participants at Nontyatyambo CHC, Eastern Cape, South Africa?

1.6. Study Objectives

1.6.1. Main objective

To explore dietary preferences and perceptions on health implications of preferred diet by patients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa.

1.6.2. Specific objectives

1. To explore current dietary preferences of patients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa.
2. To explore the perceptions of the participants at Nontyatyambo CHC towards the effects of dietary preferences and choices on health

3. To explore the perceptions on the value of shifting dietary patterns from animal-based to a plant-based diet among the participants at Nontyatyambo CHC, Eastern Cape, South Africa.

1.7. Significance of the study

Diet and lifestyle choices have implications on public health, such as development of CMD. Prevention of CMD is possible by making healthier informed choices. Plant-based diets have been shown to be effective in preventing CMD. Increasing awareness of this information could be achieved by formulating and implementing appropriate public health interventions. In South Africa, studies focused on diet as a risk factor for CMD are limited and requires further research. Consequently, this research will look into current dietary preferences and perceptions in the South African context. The data will be analyzed and compared to similar studies published within the African continent and globally. It will also highlight how shifting diets and lifestyles to adopting more plant-based choices may be effective strategy in future public health nutrition interventions.

1.8. Delimitations of the study

The dietary preferences of outpatients and healthcare workers and their perceptions of the health implications of dietary choices were covered in the study. A comparison of the impact on health, of adopting predominately plant-based diet versus an animal-based diet on people and the environment will also be evaluated.

1.9. Limitations of the study

Due to the nature of qualitative research design to be applied, there might be concerns on the generalizability of study findings based on the smaller sample size that will be purposively sampled compared to a quantitative study. Furthermore, outcomes of study may vary due to personal attributes and skills of the researcher.

1.10. Operational definitions of key terms and concepts

Animal-sourced foods – foods that are of animal origin, e.g. Meat, milk and eggs.

Cardiovascular disease- conditions that involve the blood vessels and the heart.

Cardio-metabolic disease – conditions that include cardiovascular diseases plus metabolic conditions such as diabetes and high cholesterol.

Chronic disease – are defined as conditions that last for over a year and that limit quality of life and often require regular medical attention.

Developed countries – are countries in which the population typically earn higher incomes with strong economic and industrial activity

Developing countries –are countries in which the population typically earn low incomes, with weak economic and industrial activity.

Diabetes mellitus type 2- A disease condition characterized by high levels of blood sugar and insulin resistance in the body.

Ischemic heart disease – a condition that develops when cholesterol deposits form within the arteries of the heart, resulting in insufficient blood flow to the heart.

Fast-foods- are foods that are quickly and easily prepared, with low nutritional value and served quickly as a standardized meal.

Processed foods – defined as foods that has been altered in any way from its natural state. Generally subjected to processes such as milling, chopping, heating, freezing and having added artificial ingredients.

Plant-based foods – foods derived from plants such as fruits, vegetable, nuts, legumes and seeds.

Refined grains – are grains such white rice and wheat flour that have undergone the process of milling, which removes the bran and germs from the wholegrain.

1.11. Conceptual framework

To guide the conduct of the study, the conceptual framework in figure 1.1. was created. The framework highlights the various factors that influence dietary choices. The dietary choices made, range from diets that are more ASF oriented to diets that are more PBD orientated, as all food is sourced either from animals or plants. The framework also illustrates the health implications of the dietary choices and perceptions of the impact of dietary choices on health (Figure 1.1.).

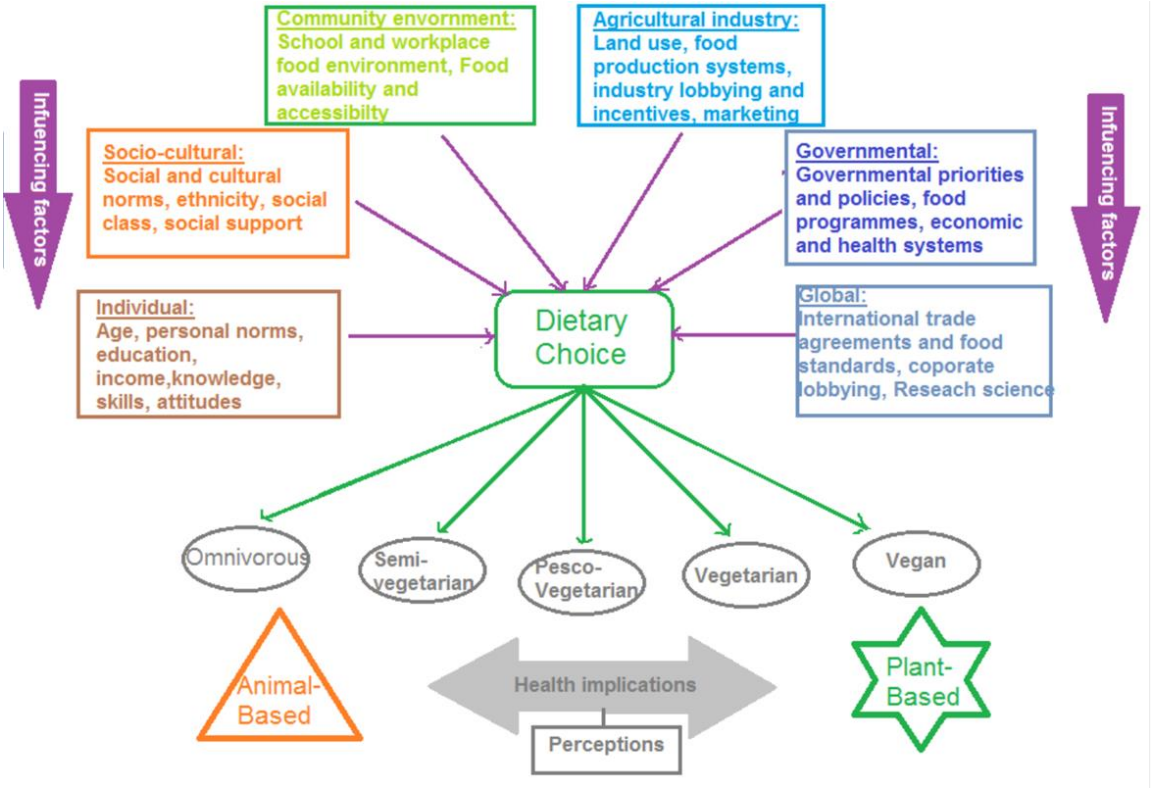


Figure 1.1: Conceptual framework

CHAPTER 2:

LITERATURE REVIEW

2.1. Definition of diet, types of diet

Dietary patterns can be defined as the amount, proportions, combinations and variety of foods and beverages as part of normal daily diet and how frequently they are consumed (Nelson et al., 2016). Intake of combinations of different foods or food choices can be classified by diets according to the food types and sources and depending on how much and how often they are eaten. Numerous dietary patterns have been recognized and promoted. Examples of dietary patterns include;

Omnivorous – Eating of animal-sourced foods, such as meat and fish, on an almost daily basis

Semi-vegetarian – Eating animal-sourced foods no more than once a week

Pesco-vegetarian – Eating fish and other seafood, but excluding meat

Vegetarian – Excludes meat and fish, but includes dairy and eggs

Vegan – Eating of plant-based foods only, excluding all animal-sourced foods

(Clarys et al, 2014)

Mediterranean diet (MedDiet)

The MedDiet is mostly a plant-based diet that is moderate in fat intake from extra-virgin olive oil, rich in carbohydrates, from wholegrains, fruits, vegetables and nuts. It includes fish, but has reduced intake of red meat, white meat, processed meat, dairy and refined sugar (Kerley, 2018 & Castro-Barquero et al., 2020).

Dietary Approaches to Stop Hypertension (DASH)

The DASH diet was formulated with the aim of preventing and treating hypertension, based on findings of studies that showed lower average blood pressure amongst vegetarians (Kerley, 2018). It was designed to be rich in plant-based foods, containing reduced animal-sourced foods, to make the diet more favourable to non-vegetarians. It promotes consumption of mainly wholegrains, fruits, vegetables, and nuts, with some white meat (e.g. Poultry and fish) and low-fat dairy, with minimal red meat, sugar and processed foods (Kerley, 2018 & Castro-Barquero et al., 2020).

2.2. Factors that influence dietary choices

Individual and community dietary choices are made dependent on various inter-related factors. Understanding and awareness of how and why certain dietary choices are made, is important in promoting healthy and sustainable eating habits.

These factors include

- Individual factors
  - -Affordability: ability to purchase certain foods depending on available financial resources
  - -Awareness: knowledge of healthy vs unhealthy eating.
  - -Attitudes: towards adopting healthy eating habits.
  - -Taste: personal preference regarding sweet, sour, bitter, savory and salty characteristics of food.
- Community environment
  - -School and workplace environment
  - -Availability and accessibility to food
- Socio-cultural
  - -Accepted norms within the society and culture

• Agricultural industry

-Land utilization

-Food production systems

-Industry marketing, lobbying and incentives

• Governmental

-Health systems within the country

-Governmental policies and priorities

• Global

-International food standards

-International trade agreements

-Corporate marketing and lobbying

-Research science

- Ethnic background

(Verstraeten et al.,2014& Chen and Antonelli, 2020)

2.3. Staple foods consumed in South Africa

Currently there is no national data on the dietary consumption of the adult population of South Africans, apart from one dietary study, performed in 1999, which involved children (Mchiza et al., 2015). This is an issue that needs attention of health policymakers in the country, in order to plan and implement strategies and interventions to promote healthy eating choices (Barnard et al., 2014 & Mchiza et al., 2015). It has been found that in some communities in South Africa there is a lack of diversity in food groups (Mchiza et al., 2015). The Food group generally consumed is high in bread, cereals, such as maize and added sugar (Mchiza et al., 2015 & Oldewage-Theron and Kruger, 2017) In South Africa, the cost per unit of energy of staple foods is much less

than an equivalent unit of energy of fruits and vegetables, making them the preferred food of choice by many people in less affluent communities (Mchiza et al., 2015 & Tydeman-Edwards et al., 2018). So it is common for households to select the staple food when buying food for their families.

Animal sourced foods frequently consumed include red meat, chicken and full cream milk, chicken being the most preferred (Mchiza et al., 2015 & Tydeman-Edwards et al., 2018). Excessive consumption of calories from processed cereals, sugars and fats and poor intake of micronutrients from fruits and vegetables are risk factors in developing CVD (Mchiza et al., 2015; Tydeman-Edwards et al., 2018). Parts of the population of South Africa still face drastic deficiencies in micronutrients (Mchiza et al., 2015 & Oldewage-Theron and Kruger, 2017). Fruits and vegetables have been identified as the food group that is most lacking in dietary intake (Mchiza et al., 2015; Oldewage-Theron and Kruger, 2017; Tydeman-Edwards et al., 2018). This is compounded by the lack of access, availability and the high prices of fruits and vegetables in less affluent urban, township and rural areas.

2.4. Health implications of dietary choices and risk of developing CMD

Introduction

According to Springmann et al (2018) imbalanced dietary choices are the cause of most of the burden of disease worldwide. The cost of managing and treating CMD, associated with improper diet, has been calculated to result in a whopping $17.3 trillion of financial loss in terms of healthcare expenditure, capital and productivity loss from the year 2011 to 2030 (Mozaffarian, 2016; Gardner and Hauser, 2017). Prevention of CMD, associated with diet, should thus be considered as a priority to alleviate the economic and health burdens they will otherwise cause. The impact of diet on notable CMD will be further explored in this section.

Ischemic heart disease (IHD)

Diets that incorporate predominately plant-foods are becoming increasingly recognized as being healthier than diets that have meat and other animal-sourced foods as central components. In the United States (US), atherosclerosis is the leading cause of mortality and is associated with high dietary intake of meat and fats and oxidative stress. The condition develops from progressive damage to the cells lining the blood vessels including those in the heart (Tuso et al., 2015). Tuso et al also suggests that shifting from a typical western diet to PBD is a simple and cost-effective intervention in preventing coronary artery disease (CAD) or IHD.

Adopting PBDs results in an increased intake of nutrient-dense plant foods, whilst minimizing intake of animal-based foods, processed foods, oils and added sugar (Tuso et al., 2015). According to a study by Du et al (2016), participants who regularly ate fresh fruits as part of daily diet, had a 34% decreased risk of suffering from major coronary events and a 40% decreased risk of cardiovascular related death, compared to those who did not or seldom ate fresh fruit. Fresh fruits are generally consumed raw, without any cooking processes, thus maximizing their potential health benefits when incorporated in a healthy diet. Fresh fruits are rich source of phytochemicals, antioxidants, dietary fiber, vitamins and minerals, which all potentiate their cardio-protective effects (Du et al., 2016).

Studies have shown that PBDs are an effective treatment for CMD, such as hypertension and diabetes. 'The Lifestyle Heart Trial' placed patient participants, diagnosed with IHD, into two groups: one that adopted a PBD program and one that followed the American Heart Association (AHA) diet (Tuso et al., 2015). 82% of the PBD group had measureable reversion of atherosclerosis, whilst 53% of AHA diet group showed continued progression of atherosclerosis. Similar studies by other researchers have also shown that groups on PBDs had a 70% and 73% decrease in all-cause mortality and cardiovascular events respectively, compared with control groups (Tuso et al., 2015).

According to Tuso et al; (2015) consumption of red meat (from cattle, sheep) is a risk factor for CVD. In the 'Nurses Health Study', which involved 84136 women- over 26 years, it was found that higher intake of red meat was strongly related to increased risk of CVD. The formation of an atherosclerosis promoting metabolite, trimethylamine-N-Oxide (TMAO), during intestinal microbial metabolism of red meat has been identified, playing a key role in the development of IHD (Kerley, 2018 & Tuso et al., 2015). The study also showed that higher fruit and vegetable consumption was associated with decreased risk of IHD. This may be due to the antioxidant effects of polyphenols and flavonoids found in fruits and vegetables (Kerley, 2018 &Tuso et al., 2015)

Compared with conventional bypass, stent placement surgeries, angiographies and drug therapy, adopting plant-based diets is a less invasive, less costly and simpler intervention that can play an important role in reversing and preventing IHD (Tuso et al., 2015; Hemler and Hu, 2019).

Oxidative stress

Processed meats (e.g. bacon, sausages, polony) and red meat have been classified as Group 1(being carcinogenic to humans) and group 2A (being probably carcinogenic to humans) respectively, by the International Agency for Research on Cancer (Van Hecke et al., 2017). Being classified as probably carcinogenic, means that regular consumption of red meat will most likely promote development and progression of cancer. Epidemiological studies have shown that oxidative stress plays a role in the etiology and progression of cancer and CMD. Oxidative stress is generated in the body when pro-oxidant factors outweigh antioxidants, leading to formation of reactive oxygen species (ROS). Food preparation, such as cooking of meats and intake of refined sugars can further increase ROS generation, while intake of some fruits, vegetable, spices and herbs seem to play a protective role (Mari-Sanchis et al., 2016; Van Hecke et al., 2017).

ROS have been shown to induce damage to cellular DNA, contributing to onset and progress of disease conditions (Van Hecke et al., 2017). As consumption of raw meat is generally unpalatable to humans, most meat products are heated through cooking processes. The heating of meats damages its nutrient profile and inactivates antioxidant

enzymes (Van Hecke et al., 2017). Other potentially harmful factors generated through the ingestion and digestion of meat include polycyclic aromatic compounds, heterocyclic amines and N-nitroso-compounds (Mozaffarian, 2016 & Van Hecke et al., 2017).

Heart failure (HF)

HF is a clinical disease condition that affects the heart's functional ability to pump oxygenated blood to bodily tissues, characterized by poor filling volume and ejection of blood due structural dysfunction of the heart (Sanches Machado d'Almeida et al., 2018). According to Kerley (2018), HF is a significant cause of mortality, morbidity and hospitalization. Studies adopting DASH and MedDiets, have shown reduction in the incidence and severity of CVD such as HF (Sanches Machado d'Almeida et al., 2018). Diets low in cholesterol and high in fibre, have also shown preventive effects on development of CVD. Ironically all dietary cholesterol is derived from animal sourced foods and all dietary fibre is found in unprocessed PBFs (Kerley, 2018).

Intake of dairy, eggs and especially meat are associated with increased incidence of HF, whilst intake of wholegrains, fruits and vegetables decrease HF incidence (Kerley, 2018). Several studies have shown the amino acids L-carnitine and choline/phosphatidylcholine found in animal-sourced foods (dairy, eggs and meat), are metabolized by intestinal microbiota to produce trimethylamine, which is oxidized to TMAO (Borgi et al., 2015; Mari-Sanchis et al., 2016 & Kerley, 2018).

Cholesterol

Having high cholesterol is a recognized risk factor for development of CVD. Eggs are a major source of dietary cholesterol, with a medium sized egg having about 225mg of cholesterol (Shin et al., 2013). According to Shin et al (2013) & Mozaffarian (2016), meta-analysis of some studies have shown that those who eat 1 egg per day have a 42% increased chance of developing type 2 diabetes. Among diabetic patients, those who ate 1 egg or more a day had a 69% increased risk of developing CVD comorbidity (Shin et al., 2013; Mozaffarian, 2016; Chen et al., 2019). The possible mechanisms through which disease risk increases with egg consumption include unfavorable

changes to blood lipid profiles, low-grade chronic inflammation and pancreas beta cell dysfunction due to elevated serum cholesterol (Shin et al., 2013).

Cerebrovascular accident (CBA)

CBAs or strokes are a serious disease condition, which is responsible for high disease burden, disability and death worldwide, along with an increase in incidence (Kim et al., 2017). CBAs may be ischemic or hemorrhagic in origin. Dietary changes have been identified as an important influential factor for managing and preventing the disease condition.

Modifying diet with higher fruit and vegetable intake is associated with decreased CBA risk, whilst higher intake of red and processed meats is associated with an increase in CBA risk (Kim et al., 2017). A study by Du et al (2016) found that increased fresh fruit consumption in particular had a significant effect on reducing the risk of developing hemorrhagic strokes. According to Kim et al (2017) meat consumption (Red, white and processed) is significantly associated with an increased CBA risk of 9% to 28%. White meat intake, in particular, has a less detrimental effect, and showed decrease in CBA risk.

Hypertension

HPT or high blood pressure affects approximately 1,4 billion people, it is one of the most prevalent disease conditions worldwide and it is responsible for about 9.4 million deaths (Cappuccio and Miller, 2016; Joshi et al., 2019). The highest prevalence of HPT is found in Africa, with 46% of adults above the age of 25 being affected (Cappuccio and Miller, 2016). In developing countries, being overweight or obese is associated with increased HPT. In sub-Saharan Africa, it is estimated that, about 250 000 deaths a year could be prevented by effectively treating HPT, which affects between 10 to 20 million people (Cappuccio and Miller, 2016). According to Borgi et al (2015) cross –sectional studies have shown that groups who are on vegetarian diets show a lower incidence of hypertension. Initial evidence of the effect of PBDs on hypertension, were derived from

studies on aboriginal societies in Australia, Kenya and Solomon Islands, whose diet comprised mainly of plant-based foods, with virtually no HPT measured (Joshi et al., 2019).

A longitudinal prospective study carried out by Borgi et al (2015), was the largest in terms of participant numbers, having 193518 participants, and was carried out over the longest period of time, about 20 years, in investigating the relationship of long-term intake of animal flesh and risk of developing hypertension. The results from the study showed that eating any animal flesh once a day, was associated with 30% increased risk of developing hypertension, compared to those who ate animal flesh less than once a month. The study further identified that the higher the frequency and quantity of animal flesh consumption, the higher the associated resultant blood pressure (BP) findings. The Epic-oxford study which followed 11004 participants, found that those on vegan diets showed the lowest incidence of HPT and had lower average BPs, than those who consumed animal-sourced foods who were found to have the highest incidence of HPT and highest BPs. Those on vegetarian and pescatarian diets had mid-range values (Joshi et al., 2019).

The mechanisms, by which animal-sourced foods increase blood pressure risk, are not clearly understood (Borgi et al, 2015). A possible mechanism relates to products of complex chemical reactions called Maillard Reaction Products (MRPs) that form especially when animal-based foods are browned when they are heated and cooked (Borgi et al., 2015; Joshi et al., 2019). Higher cooking temperatures are associated with increased concentration of MRPs such as acrylamides, advanced glycoxidation end-products (AGEs) and heterocyclic amines (HAAs). Foods such as fried chicken and fish are high in MRPs. In comparison, negligible amounts of MRPs are found in plant-based carbohydrates, vegetables and fruits. MRPs have been found to increase inflammation and oxidative stress, which are potential factors that influence development of HPT (Borgi et al., 2015; Mozaffarian, 2016; Mari-Sanchis et al., 2016; Joshi et al., 2019)

According to Joshi et al (2019), consumption of ASFs may also directly raise BP, due to the higher quantities of the amino acids methione and alanine found in them, which are associated with higher BPs. PBDs in contrast result in increased intake of the amino

acids threonine and histidine, which result in lower BPs. Furthermore, AGEs in particular have been found to act on specialized receptor sites found in vascular tissue, which are responsible for modulating blood pressure homeostasis and vascular function (Borgi et al., 2015). This results in increased generation of oxidative stress and pro-inflammatory cytokines, which induces vasoconstriction and impairs vasodilation, raising BP (Borgi et al., 2015; Joshi et al., 2019)

Obesity

Approximately 2 billion people worldwide are currently obese and overweight (Springmann et al., 2018). It has been noted that the incidence of obesity and being overweight, in South Africa and throughout the world, has increased together with a corresponding increase in CMD due to adoption sedentary lifestyles and unhealthy diets (Smethers and Rolls, 2018; Tydeman-Edwards et al., 2018; Castro-Barquero et al., 2020). Excess abdominal weight, in particular, impacts metabolic health, and has been shown to increase incidence rates of HPT and T2DM (Mozaffarian, 2016 & Castro-Barquero et al., 2020). Adopting PBDs prevents long-term weight gain as they are low in fats, are less energy dense and have high fibre content (Joshi et al., 2019 & Castro-Barquero et al., 2020). In contrast, consumption of energy dense ASFs promote long-term weight gain, especially when consumed together with processed carbohydrates (Barnard et al., 2014; Castro-Barquero et al., 2020).

Having higher body weight in relation to height or body mass index(BMI), correlate to higher BPs, whilst lower BMIs are associated with lower BP measurements (Joshi et al., 2019) According to Tonstad et al (2015) & Joshi et al (2019), vegetarians and vegans generally have a lower BMIs and BPs compared to non-vegetarians. DASH and MedDiet are low energy dense eating patterns, that can also be adopted to improve weight management (Barnard et al., 2014; Smethers and Rolls, 2018). In contrast western eating patterns tend to predispose those who follow them to increased prevalence of obesity compared to traditional diets (Tydeman-Edwards et al., 2018; Lopes et al., 2020).

Diabetes Mellitus

Type 2 Diabetes mellitus (T2DM) is a chronic CMD, characterized by high blood sugar levels and insulin resistance in affected individuals. The condition affected approximately 382 million people in 2013, not including undiagnosed cases, and it is estimated to affect 439 million people by the year 2030 (Mattei et al., 2015; Mari-Sanchis et al., 2016). T2DM accounts for increased morbidity and mortality worldwide, with associated rise in healthcare costs (Mari-Sanchis et al., 2016). T2DM is frequently found together with dyslipidemia, obesity and hypertension and results in a complex disease condition known as metabolic syndrome (Mari-Sanchis et al., 2016; Castro-Barquero et al., 2020). Metabolic syndrome increases the risk of developing major cardiovascular events by up to 5 times and other chronic diseases such as cancer and neurodegenerative diseases (Castro-Barquero et al., 2020). Adopting appropriate dietary patterns plays an important role in preventing the development of T2DM (Barnard et al., 2014; Chen et al., 2019). Carbohydrate rich PBFs can be classified by glycemic index (GI), which ranks the relative post-ingestion insulin response and blood glucose level, in relation to the particular carbohydrate source (Mattei et al., 2015). Low GI foods, such as whole grains, are characteristically high in dietary fiber. Refined and processed grains have most of their germ and bran removed through milling, accompanied by a loss of healthy vitamins, minerals and fiber. Several studies have shown that diets that incorporate whole grains such as brown rice, reduce risk of T2DM by 36% compared to refined grains such as white rice (Mattei et al., 2015).

Studies have shown that PBDs are associated with a lower risk of T2DM; in contrast ASFs are consistently associated with higher risk of T2DM (Barnard et al., 2014; Mari-Sanchis et al., 2016; Chen et al., 2019). According Mari-Sanchis et al. (2016), the SUN project study which involved 187527 participants, showed those who consumed more than 3 servings of meat per day, had two times the risk of developing T2DM compared to those who ate less than 2 servings of meat a day. A large cohort study by Chen et al (2019), demonstrated that participants on diets with more PBFs, were associated with lower risk of T2DM, prediabetes and insulin resistance, which reinforces the protective role that PBFs play. Risk of developing T2DM is lower in vegans and vegetarians

compared to non-vegetarians (Barnard et al., 2014; Lynch et al., 2018; Chen et al., 2019). Mattei et al (2015) & Chen et al (2019) also emphasize that the quality of PBF is an important factor to consider, as unhealthy plant-based foods such as processed and sweetened beverages may increase insulin resistance and risk T2DM. Mechanism of protection against development of T2DM is attributed to PBDs being high in fiber, anti-oxidants, chlorogenic acids and unsaturated fatty acids (Chen et al., 2019). According to Mattei et al (2015) & Chen et al (2019), fiber lowers glycemic load, due to slower gastric emptying, and can reduce inflammation and obesity. Chlorogenic acids found in PBFs have been shown to improve glucose tolerance, glucose levels, inflammation and increasing secretion of insulin. Increased ratio of unsaturated fatty acids consumption is also linked to reduced obesity and inflammation.

According to Mari-Sanchis et al (2016) & Chen et al (2019) non-vegetarian diets, on the other hand, are higher in animal protein, heme iron and saturated fatty acids. Animal proteins are high in aromatic and branched-chained amino acids which have been shown to be detrimental to glucose metabolism. The high heme iron content in animal proteins is associated with higher risk of developing CMDs. Heme iron acts as a pro-oxidant, which promotes formation of ROS, which have damaging effects on bodily tissues such as pancreatic cells, that produce insulin (Barnard et al., 2014; Chen et al., 2019). The high content of saturated fatty acids in ASFs are also linked to increased inflammation and obesity risk. Furthermore, the high amounts of sodium and nitrites as preservative agents in processed meats, also increase risk of developing CMDs (Mari-Sanchis et al., 2016; Chen et al., 2019) On average the amount of salt in processed meats is four (4) times higher than in unprocessed meats. Nitrites appear to play a role in pancreatic dysfunction, through the formation of nitrosamines (Mari-Sanchis et al., 2016). From the literature reviewed, it is evident that meat consumption is associated with increased diabetes risk whereas consumption of more PBF is inversely associated with diabetes risk.

2.5. Environmental considerations related to dietary choices

Food production systems currently generate around 20% to 30% of global greenhouse gas emissions (GHGEs) and are responsible for 80% of deforestation across the world (Resin and Sabaté, 2019 & Wilson et al., 2019). These systems also impact on the area of land use and the water quality and consumption in affected regions. Adopting diets that are more plant- based can contribute to increasingly sustainable use of land and water resources (Nelson et al., 2016; Lynch et al., 2018; Springmann et al., 2018; Wilson et al., 2019). According to Nelson et al (2016); Fresan & Sabate (2019) & Wilson et al (2019) the dietary patterns found to be most favorable in terms of reducing GHGEs, cropland requirements and all-cause mortality were vegan, vegetarian, pescatarian, Mediterranean and the normal omnivorous diet in descending order. Livestock production in food systems leads to a higher risk in humans contracting diseases from pathogenic organisms associated with the production and consumption of animal-sourced foods (Wilson et al., 2019). Furthermore, livestock production may also utilize certain anti-microbial agents to promote growth of animals (Wilson et al., 2019). The use of these agents may result in development of antimicrobial resistance (AMR) bacteria, and associated genes from these organisms may transfer to humans from animals though direct contact, food practices and the environment (Wilson et al., 2019).

According to Perignon et al (2017); Vieux et al (2017); Chen et al (2019); Wilson et al (2019) and Segovia-Siapco et al (2019), optimized diets meet environmental, sustainability and nutritional requirements. It was found that optimized diets were diets consisting of more PBFs, with reductions of meat, particularly beef and lamb and reductions in dairy products. Foods that are also limited in optimized diets include baked sweet foods, white bread, and sweetened soda and alcoholic beverages (Segovia-Siapco et al., 2019; Wilson et al., 2019). Improving dietary patterns are also associated with economic benefits. Adoptions of vegan and lacto-ovo vegetarian diets have been

shown to reduce healthcare costs, compared with diets meeting current global dietary guidelines (Gardner and Hauser, 2017; Fresán and Sabaté, 2019; Wilson et al., 2019).

Worldwide food waste of an estimated US$ 2.6 trillion is generated, which impacts on food security and sustainability (Fresán and Sabaté, 2019; Wilson et al., 2019). Improving on current food production systems should take this into consideration so as to prevent generation of GHGE from wasted food and promote efficient food production. According to Gardner and Hauser (2017), the food industry has a powerful influence and has been very effective in making convenient, low-cost, hyperpalatable foods which are most often unhealthy. Wilson et al (2019), also suggest that further research should ideally not be funded by organizations that would derive commercial benefits from their findings. The researchers should ideally also have no previous history of doing research funded by organizations with commercial interests.

CHAPTER 3:

Research Methodology

3.1 Design of the study

To address the research questions of this study a descriptive, phenomenological/ generic qualitative approach was used. This approach was used, as this study sought to gather data that is not easily quantifiable i.e. the personal choices, perspectives and beliefs of participants (Lincoln and Guba,1985). Qualitative research design is dynamic, it is always changing based on changing contexts and phenomenon and can be adapted to differing situations (Lincoln and Guba,1985).

The qualitative research method allows for a deeper understanding of the choices and perspectives of the study participants in their current contexts. It allows for exploration of how decisions are made and can provide insights into how future public health interventions could be planned (Barrett and Twycross, 2018). It is thus a suitable approach to discover and understand the dietary preferences and perceptions about the health implications of the study sample.

3.2. Study setting

The Buffalo City Metropolitan (BCM) district, Figure 3.1., is located in the Eastern Cape Province in South Africa, with a population of approximately 864130 people (National Department of health, 2019). It has a population density of 302 people per km2. (NDoH, 2019).

Two-third of the health facilities in the BCM Health District are in urban areas whilst the remaining one-third is in the rural areas. The health facilities include 2 district hospitals, 2 specialized hospitals, 5 Community Health Centres (CHCs) and 79 Primary Health Care (PHC) facilities.

Figure 3.1: Map showing study setting

Source: Buffalo city, municipalities.co.za

The leading causes of disease in the district were identified as injury, non-communicable diseases, HIV/AIDS and TB and other communicable diseases (NDoH, 2019).

Major staple foods consumed are starches including bread, maize and rice. Hypertension (HPT), ischaemic heart disease (IHD) and diabetes (T2DM) are prevalent, non-communicable disease conditions found in the district. Approximately half of the population of the district is under 30 years, with a high unemployment rate of 35.1% (NDoH, 2019). The population distribution shows a higher female to male ratio, with approximately 51.8% of the population female and 48.2% males (NDoH, 2019).

This study was conducted at Nontyatyambo CHC, which is one of the 5 CHCs in the district.

3.3. Study population, sampling and sample size

3.3.1 Study Population

The population was selected based on the location and accessibility of the researcher to the study group. The population selected was those who reside in and around Mdantsane Township, in BCM district. Specifically, the patients who present at the outpatient department and the healthcare workers in the various departments at the CHC were sampled for convenience factors. Other eligibility criteria are presented below;

13.3.1.1. Inclusion criteria

- Participants aged 18 years and above, willing to participate in the study, as they are old enough to give consent without parental guidance.

13.3.1.2. Exclusion criteria

- Patients younger than 18years
- Potential participants who are suffering from serious medical conditions that would affect their ability to participate were excluded.

3.3.2. Sampling and sample size

Sampling will be done in order to achieve data saturation, the point at which no significant new information and themes can be elicited, even if sample size is further increased (Moser and Korstjens, 2018). According to a study by Guest et al (2020), an analysis of themes of 60 Key informant interviews (KII), showed that 70% of all themes were identified within the first 6 interviews, and 92% were identified by the 12th interview. As this study was qualitative in nature, a convenience, purposive, non-probability sampling technique was used, based on the researcher's experience and objectives. A sample size of 42 consenting respondents, was reached in total. The sample included 36 patients and 6 healthcare workers (HCW). The 36 patients made for

6 FGDs of 6 particpants each, and the 6 HCW made for 6 KII. The sample size was adequate because qualitative research focuses more on the richness of data than on large sample size, which is recommended to be above 30 (Brink et al, 2014).

3.4. Data Collection

3.4.1. Research instruments (Data collection tool)

A question/interview guide was designed comprising of two sections, A and B. Section A consisted of 1½ pages with 9 structured questions to obtain information on the socio-clinical/demographic profile of the study respondents, whilst maintaining their anonymity. Section B consisted of 8 semi-structured open-ended questions which were used to elicit information related to the research questions from the consenting study respondents. The question/interview guide was designed based on literature reviewed and questions asked were within the scope of the study objectives. The questions were centered on daily food intakes, dietary choices/preferences with reasons, perceived health implications and prevailing history CMD such as IHD, T2DM and hypertension.

3.4.2 Data collection procedure

The question/interview guide was used to collect data through interviews that included both KII of health care workers at the CHC and focus group discussions (FGDs) by out-clinic patients. A trained research assistant was recruited, following ethical approval, who spoke the predominant language in the study setting which was IsiXhosa. The research assistant had previous experience with the research process and assisted with the recruitment of prospective participants and conducting of both the KIIs and FGDs that were in IsiXhosa to ensure adequate communication and facilitate collection of rich data.

Given the covid-19 pandemic, all participants were required to wear a mask and maintain social distancing. Hand sanitizer was available for use throughout the data

collection procedure. Patients who were at the facility and who had long waiting times were informed about the study verbally, and whether they would be interested in participating.

The study was carried out over 6 working days. On the first day, 12 willing participants were enrolled in 2 FGDs consisting of 6 participants each. A suitably sized office room was utilized to conduct both KIIs and FGDs over the 6 days. The first FGDs served as a pilot to test whether the question/ interview guide was appropriate. This FGD went well, and the interview guide was found to be adequate to collect the necessary data to answer the research questions. It was found that participants tended to answer with brief responses, so additional probes were necessary to get clearer and more comprehensive answers. The 2nd FGD was conducted thereafter taking this into consideration.

The next day two members of staff at the facility who were willing to participate in the KIIs were selected and interviewed one after the other. Then the day after that, another two FGDs were done, and the following day another two KIIs were done. This pattern was continued until the sample size of 42 participants was reached.

In total there were 6 FGDs done, consisting of 6 participants each, which ranged from 20 to 35 minutes and 6 KIIs were done, which ranged from 10 to 15 minutes. All 6 of the FGDs were conducted in IsiXhosa, whilst 4 of the 6 KIIs were conducted in English with the remaining 2 also being conducted in IsiXhosa. Prior to commencing FGDs and KII, all participants were provided with information sheets and signed informed consent was obtained. During the FGDs and KIIs, two audio recorders were used to record the verbal responses of the participants, and the researcher also actively observed and took notes of particular gestures and body language of the participants'. The research assistant carried out discussions of KII and FGD in isiXhosa, whilst the researcher audio recorded and noted observations. The researcher carried out discussions of KII in English, whilst research assistant audio recorded them. The participants were also provided with light refreshments as a gesture of appreciation for participating in the study.

Recorded interviews were listened to, a number of times and then transcribed in writing by hand in the original language on the day KII or FGD was conducted. The IsiXhosa transcripts were then translated into English with the assistance of the research assistant. All the English transcripts were typed out and saved using MS Word on the researcher's laptop hard drive which was password protected. The audio recordings were also transferred and saved to the same hard drive. All the signed informed consent forms, completed Section A questionnaires and original hand written transcripts were then stored in a lockable filling cabinet. The data will be stored securely for a period of 5 years after which it will be deleted or destroyed.

3.5. Data Analysis

Analysis of qualitative data involves a range of procedures and processes where the qualitative data, that has been collected during the research process, are studied and organized into meaningful explanations, interpretations and understandings of the situations and people being studied (Lewins, Taylor & Gibbs, 2005).

Rich, holistic and well described data obtained from KII and FGD, were carefully analyzed to allow for findings and themes to emerge (Barrett and Twycross, 2018). Data analysis included distilling data to most important core meanings, organizing the meanings by themes and explaining the conclusions drawn (Cleland, 2017).

In this study, the 6 steps of systematic and thematic analysis of qualitative data, as described by Rädiker and Kuckhartz (2020), were followed.

Step 1: Preparation, organization and exploration of data

Recorded interviews were listened to a number of times and then transcribed in writing by hand into the original language on the day KII or FGD was conducted. The IsiXhosa transcripts were then translated into English with the assistance of the research assistant. All the English transcripts were then typed out, and field notes of observations included. Individual participants in each of the focus groups were not differentiated and labeled, as the analysis focused more on their conceptions, as a group and not as individuals (Gizzi and Rädiker, 2021). The transcripts were then read a number of times

to familiarize the data and ensure accuracy. These were then saved using MS Word on the researcher's laptop hard drive which was password protected. The socio-demographic and background data of the participants was entered into a MS excel spreadsheet and saved.

Step 2: Development of categories for the analysis

The use of categories in the analysis of qualitative data is an essential tool. Categories are used for the attribution of meaning, reduction and classification and are useful for indexing and presenting data (Rädiker and Kuckhartz, 2020).

In this study, thematic categories were derived using a deductive approach. Using this approach themes were identified during the data analysis and the collected data were then categorized into the predetermined thematic codes (Lincoln and Guba, 1985). Careful exploration of the data and the interview guide was used to develop the 4 categories or themes, with the original research questions in mind.

Table 3.1. Interview guide- corresponding category guide table

The interview guide below was used to develop the 4 categories or themes, with the original research questions in mind. Questions were grouped according to the themes they most related to.

Interview guide questions	Category/Theme
1. Please tell me about all the foods you normally eat during the day	1. Dietary preferences
2. What are your favorite foods?	
3. What are your least favorite foods?	
4. What do you look at when deciding to eat certain foods?	2. Factors that influence dietary choice
5. Have you been diagnosed with and treated for any medical conditions?	3. Health implications of dietary choices
6. What do feel, are the health consequences of eating the food you normally eat as part of your diet?	
7. What kinds of food, do you feel ,will cause the most harm to ones' health?	
8. Do you feel that adopting a diet with more plant-based foods (grains, fruits and	4. Benefits of plant-based foods vs animal-sourced foods

vegetables) will result in better health condition compared to a diet with more animal-sourced foods (meat, eggs, milk)?

Step 3: Coding of interviews

Codes are used to symbolically assign meaning, in the form of a descriptive, straightforward and relatable label or phrase, to the comprehensive information that is gathered during the study (Miles et al, 2014, Saldaña, 2015).

According to Brink et al., (2014) data analysis entails the integration, combination and synthesis of the verbal, non-numeric data, so that it can be grouped into categories and themes as part of a procedure of coding. Coding is the process of assigning specific parts of the text passages from the interviews into categories or thematic codes (Rädiker and Kuckhartz, 2020).

All the interview transcripts were manually coded by going through each interview script from top to bottom one line at a time. Sections of text that were relevant to the research questions were colour highlighted, to be assigned to the corresponding, pre-developed theme it related to. An intracoder check was performed two weeks after first coding and the interviews were coded a second time, to reduce risk of coding error (Rädiker and Kuckhartz, 2020).

Step 4**:** Fine coding

Involves further developing the initial category system. All the interview segments that were colour highlighted were then compiled in another word document by theme. An overview of the segments of each theme was then gained by reading through the newly categorized data. Keeping research questions and purpose in mind, sub-themes were then developed (Rädiker and Kuckhartz, 2020). The data was then fine coded by the newly created sub-themes, whereby the coded sections were read, colour underlined and assigned into appropriate sub-themes.

Step 5**:** Analysis after coding

Once the coding steps were completed, the resulting data was well structured and organized via the systematic process of categorization. The data was then exported into a new word document as this allowed for an in-depth analysis of the content through a topic-orientated approach, i.e. the interview segments were each assigned, according to their responses corresponding to the 4 identified themes.

Step 6**:** Writing up of findings and results

The data that resulted, as described in the above steps, was then used to interpret, write up and present the main study findings, including specific quotations from the study respondents in the remaining chapters of this study. The socio-demographic data of participants will also be presented in a quantitative perspective, as this data relates to numerical figures.

3.6. Reliability and Validity: Trustworthiness

It is important that research that is qualitative in nature utilizes strategies to enhance trustworthiness of the study during research processes and design (Noble & Smith, 2015 & Cypress, 2017). Trustworthiness refers to the credibility, dependability, confirmability and transferability of the study.

3.6.1. Credibility

Credibility refers to how true or believable the study findings are (Daftary, 2017). In the study there was prolonged field engagement with study participants through FGD's and KIIs over 6 days. Triangulation of data was done as data was collected through both FGDs and KIIs which included field observations. A letter of informed consent was given to participants to ensure credibility. Some of the transcripts were confirmed with the participants for clarity and to check if the meaning was still reserved, hence credibility was maintained.

3.6.2. Dependability

Dependability is the consistency of the analytical processes used, accounting for research method and personal biases (Lueng, 2015; Cypress, 2017). Whether study findings are consistent and can be repeated (Daftary, 2017). True and accurate records of data collection procedures were kept, illustrating a clear decision trail. Interview audio recordings allowed for repeated reviewing of data, checking for emerging themes. An intracoder check was performed, two weeks after first coding and the interviews were coded a second time, to reduce risk of coding error (Raïdiker and Kuckhartz, 2020). Rich and exact descriptions of participants' accounts were used to support study findings.

3.6.3. Confirmability

Confirmability refers to how reflective the study findings are of the data collected (Daftary, 2017). Any personal biases of the researcher were accounted for and excluded so that study findings were not unduly influenced. This was done by recoginizing any personal biasis that were present and ensuring that these did not affect the carrying out and the results of the study. The results of the study were reflective of the literature review and not any bias of the researcher. Clarity of thought processes was shown during data interpretation and analysis with clear descriptions on how they were carried out. Confirmability was further ensured as data was interpreted in a consistent and transparent manner. The results and conclusion of the study correlated with data collected and interpreted.

3.6.4. Transferability

Transferability of a study refers to how easily the findings of the study can be transferred to different settings and contexts (Lueng, 2015; Noble & Smith, 2015). Rich and exact descriptions of participants' accounts were used to support study findings. Although the results of the study may not be wholly generalizable, the research design may be applied to different study settings, hence maintaining transferability.

3.7. Ethical considerations

Ethical clearance and approval were received from the Universities' ethics and research committee before conducting the study. Certificate reference number is Ref#2021=09=02=ChockoR (Appendix 1). Approval was also sought and received from the department of health for the study to be conducted at Nontytyambo CHC (Appendix 2 and 3)

Information sheets were shared with potential participants to make them aware of the study and any ethical concerns related to the study, such as possible benefits, risks and confidentiality and voluntariness to participate in the study. Verbal and written informed consent was obtained before enrolling participants into the study. Non-maleficence was ensured during the study as none of the partipants were not subject to any harm that would affect their well being. The nature and results of the study were to the potential benefit of individual and community health with virtually no risk of any physical harm.

As participation in the study was strictly voluntary in nature, it did not involve any kind of reimbursement to participants. However, participants were provided with light refreshments as a gesture of appreciation for being willing to participate in the study.

The data collected (both the voice recorder and transcripts} will be stored in a lockable filing cabinet and computer password secured computer that will only be accessible by the study researcher until after a period of five (5) years, after which it will be destroyed.

The researcher and project are not covered by insurance, as it is not applicable. There was no conflict of interest in carrying out this study.

CHAPTER 4: RESULTS

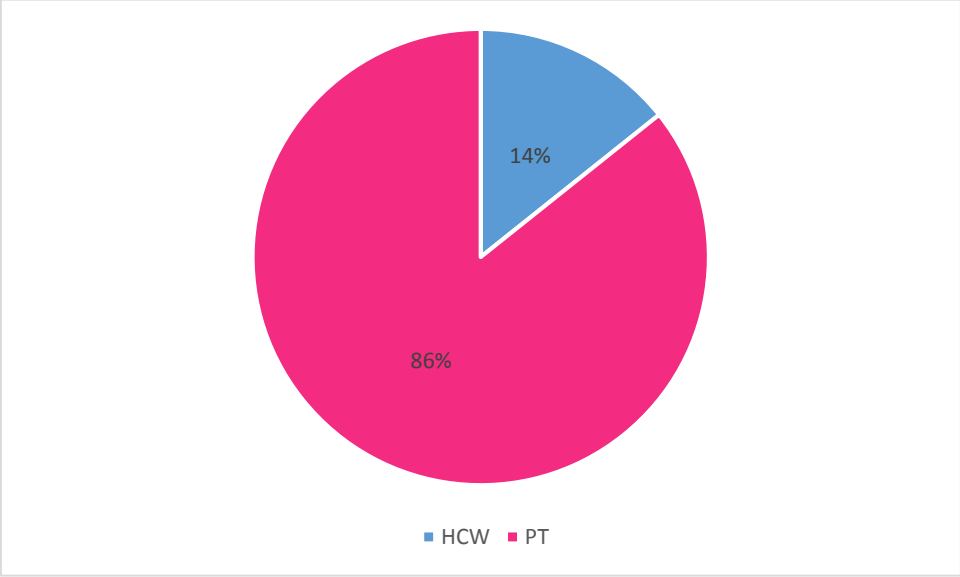
4.1. Introduction

In this chapter findings from the research study will be presented, following the research methodology described in chapter 3. This chapter will be presented in 3 sections. The first section will be an overview of the socio-demographic profiles of the research participants. The next section will be a tabulated summary of the themes and sub-themes that emerged from data analysis. The last section will be study results from the themes and sub-themes, with selected excerpts from the transcripts to substantiate study findings. The texts will be assigned a code to specify the interview or discussion it was linked to. R1 to R6 are responses from key informant interviews (KII), F1 to F6 are the responses from the focus group discussions (FGD), PT for patients and HCW for healthcare workers.

4.2. Socio-demographic characteristics

This section gives an overview and background into the study sample of those who participated in the study. There were a total of 42 participants in this study; 36 (86%) were PT whilst the remaining 6 (14%) were HCW as shown in **Figure 4.1**.

Figure 4.1. Pie chart of PT vs HCW distribution



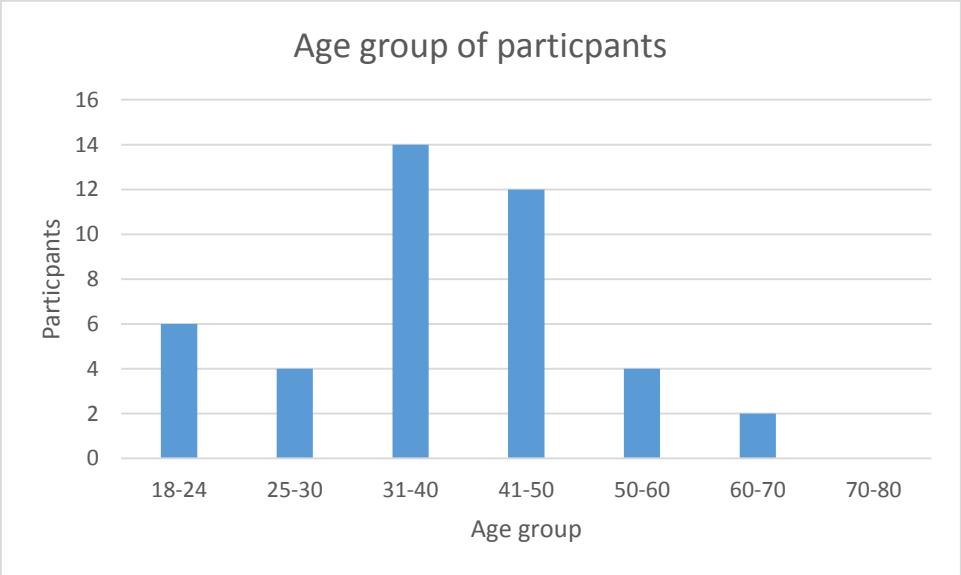
The majority of the sampled participants, 86%, were female whilst the remaining 14% were males, as shown in **Table 4.1**. This may be considered a reflection of the general higher female to male distribution at the study setting according to the BCMM district health plan (NDoH, 2019). It is also an indication that most of the patients that present at the CHC are female.

Table 4.1. Gender distribution of participants

Males	Females
6	36

The majority of participants, 33%, in the study were in the age group of 31-40. Followed by 29% which were in the age group 41-50. The remaining 14% of the participants were in the 18-24 age group, 10% were in 50-60 age group, 9% were in the 25-30 and 5% were in the 60-70 age group. None of the participants was above the age of 70. This is shown in **Figure 4.2**. Thus most of the participants could be considered to be in their middle ages.

Figure 4.2. Age group of participants



All the participants in the study were African as shown in **Table 4.3.**, which may be considered as a reflection of the majority of the population within the district.

Table 4.2. Race distribution of participants

Race	Number of participants
African	42
Asian	0
Caucasian	0
Other	0

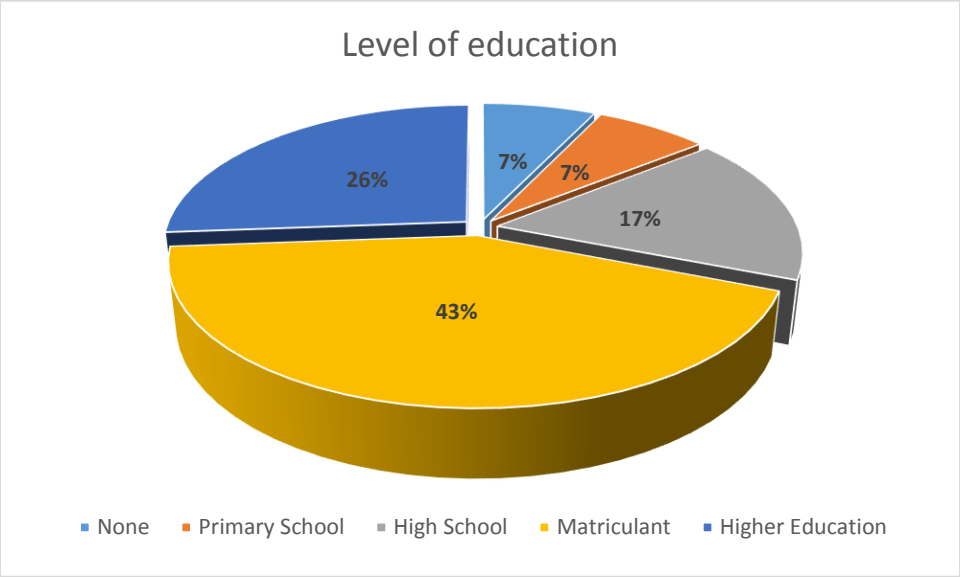
Almost all participants, approximately 95%, spoke their home language IsiXhosa, except two, one being English and the other Afrikaans, as shown in **Table 4.4**. This may also be considered as a reflection of the predominant language spoken in the district.

Table 4.3. Home language

Home language	Number of participants
Afrikaans	1
English	1
IsiXhosa	40
Other	0

Figure 4.3. below, shows nearly half of the participants (43%), completed high school and have not done any further studies. 26% of the participants have studied in higher education after school. The remaining 17% did not complete high school, 7% only went to primary school, and the other 7% have not been through any form of formal education.

Figure 4.3. Pie chart of level of education



50% of the study participants were employed, 45% were unemployed, and only 2% were retirees, as shown in **Table 4.4**. According to the BCMM district health plan the unemployment rate in the district was high, at 35.1% (NDoH,2019). In this study sample the rate was 45%, which can even be higher.

Table 4.4. Employment status

Status	Number of participants
Employed	21
Unemployed	19
Retired	2

The majority of the study participants, 71%, were never married, only 27% were married and the remaining 2% were divorced, as shown in **Table 4.5**. This is an interesting finding as although the majority of the participants were in their middle ages, most have never been married.

Table 4.5. Marital status

Status	Number of participants
Never married	29
Married	11
Divorced	1
Widowed	1

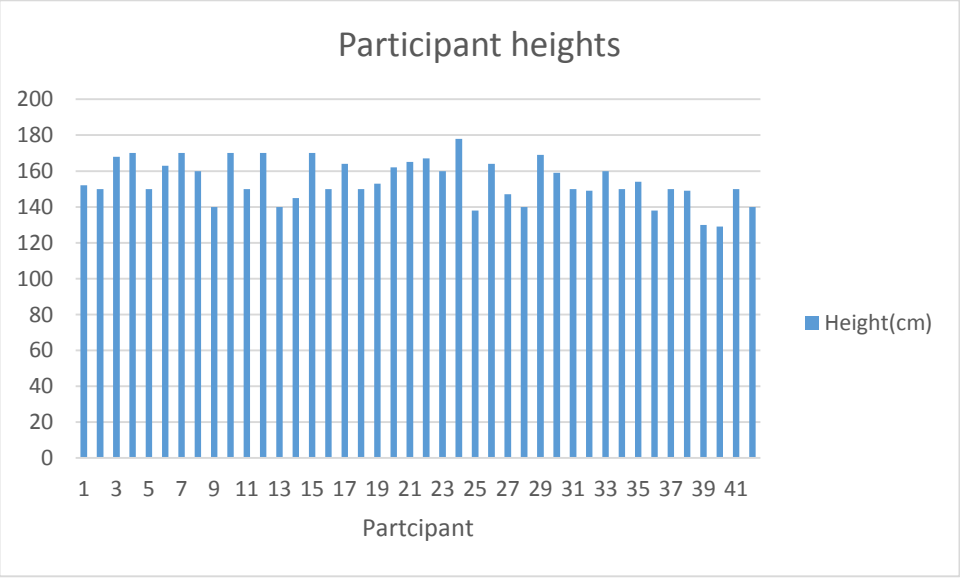
The majority of participants, 48%, were staying in households with 5 or more members, as shown in **Table 4.6**. None of the participants were living on their own and most had at least 2 or more household members.

Table 4.6. Number of household members

Number of household members	Number of participants
1	0
2	4
3	7
4	11
5 or more	20

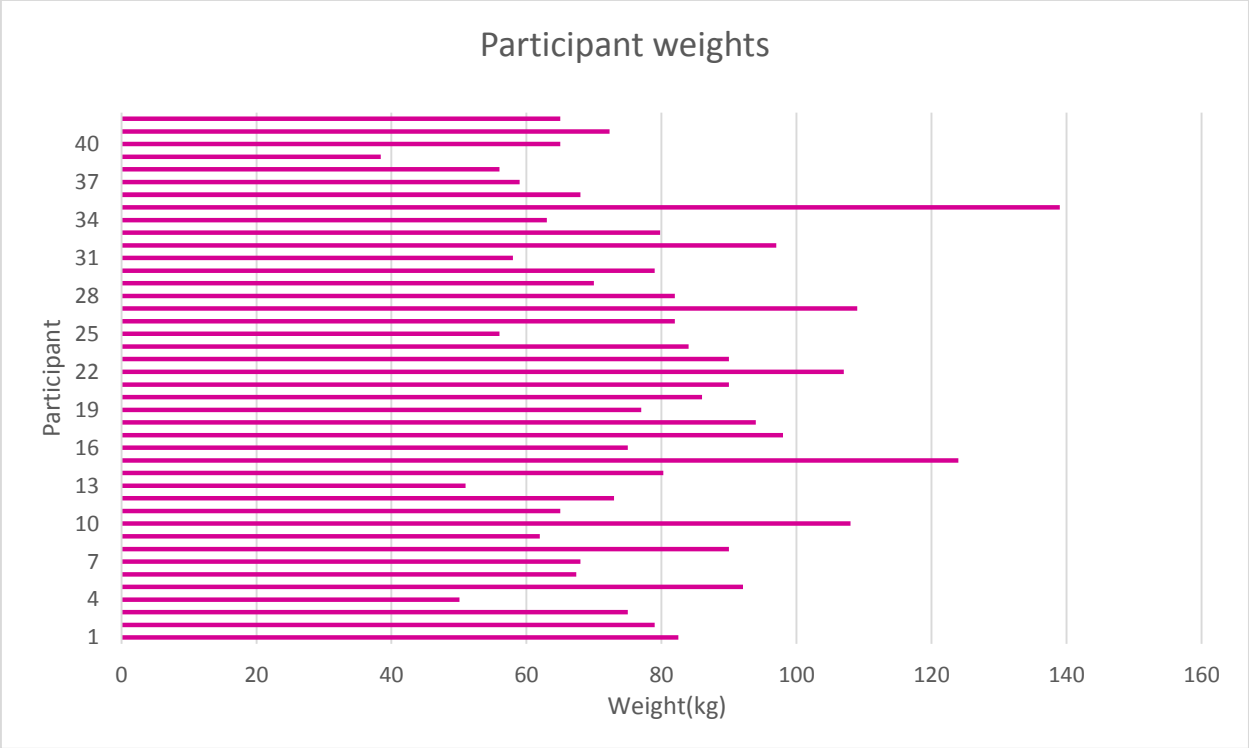
The average height of the participants was 1,54m. The tallest participant was 1,78m and the shortest participant was 1,29m. This is shown in **Figure 4.4.**

Figure 4.4. Height distribution of patients



The average weight of the participants was 78,7kg. The highest weight out of the participants was 139kg, the lowest weight was 38.4kg. This is shown in **Figure 4.5.**

Figure 4.5. Weight distribution of patient



BMI distribution of participants is shown in **Table 4.6.** BMI is a calculation used to determine and compare whether you are at an ideal weight, overweight or underweight for your height. It applies to both men and women. It is calculated by squaring a person's height in meters, then taking the person's weight and dividing it by the height in meters squared.

Table 4.7. BMI distribution of patients

BMI (kg/m^2)	Weight status	Number of participants	Percentage
Under 18.5	Underweight	1	2,4%
18.5 – 24.9	Normal	3	7.1%
25 – 29.9	Overweight	11	26.2%
30+	Obese	27	64.3%

The average BMI of the participants was 33.1, which indicates that on average the study sample was overweight. Out of the 42 participants, 38 or 90% had a BMI above 25 which confirms this. The highest BMI was 58.6 this indicates that the participant was severely overweight. The lowest was 17.3, indicating that this participant was underweight.

4.2 Emerging themes and sub-themes

There were four major themes as can be seen; these will be discussed in the next sub-sections where supporting quotes will be provided.

Table 4.8 provides a tabulated overview of themes that emerged from the data analysis.

Themes	Sub-themes
1.Dietary preferences	1.1. Breakfast 1.2. Lunch 1.3. Supper 1.4. Favourite foods 1.5. Least favourite foods
2. Factors that influence dietary choices	2.1. Affordability 2.2. Taste 2.3. Health reasons
3. Health implications of dietary choices	3.1. Weight gain 3.2. High blood pressure 3.3. High cholesterol and heart disease 3.4. Low energy 3.5. Other health implications
4. Benefits of plant-based foods vs animal-sourced foods on health	4.1. Plant-based foods 4.2. Animal-sourced foods

4.3. Detailed findings of themes and sub-themes

4.3.1. **Theme 1**: Dietary preferences

There are a lot of choices that can be made by individuals and by a community at large when it comes to deciding what foods they want to eat. Dietary preferences can be defined as the foods that one would generally prefer to eat over other foods. This theme will be further explored under the sub-themes that follow as summarized in the table above.

4.3.1.1. Breakfast

Breakfast is typically the first meal of the day that one has after waking up in the morning. The most frequently preferred breakfast was porridge with cow's milk. Porridge was normally that of mielie meal, others mentioned were morvite and future life which are specific commercial name brands of breakfast porridges. Cereals were also mentioned, also usually eaten with milk, such as cornflakes and weet-bix. In addition to milk some participants added sugar, peanut butter and margarine to their porridge. This was shown by the responses of the participants;

"In the morning I like to eat porridge of miele meal, I add rama, or peanut butter or milk, or whatever else I can find at home." R5, HCW

"In the morning I eat porridge, if I make oats I have it with milk, if it's mielie meal I put some peanut butter and sugar" R6, HCW

Other foods also mentioned included African salad, which is a combination of mielie meal and sour milk (amasi), sandwiches, boiled eggs, bread, fruits and fatcakes. It was found that some participants skipped breakfast, having their first meal later on in the day.

4.3.1.2. Lunch

This is typically the second meal that one has in the day around midday or noon. One participant mentioned that she only ate one meal a day. As she stated; *"I eat once a day, I eat around lunch time, when I get home, sometimes I eat or sometimes I just sleep" R1, HCW.* Another participant said that she didn't eat lunch altogether.

Participants who have lunch at work most frequently mentioned foods such as fried chips, bread, butter, polony, russians, fatcakes and eggs. One participant stated that; *"I have lunch at work, so I buy food from food stall vendors, there is no time to pack lunch before work" R2, HCW.* Participants who have lunch at work preferred certain foods, that are easy to prepare, pack and carry well. Another said; *"In the afternoon I bring bread and eggs to work and have it with tea or soup." R2, HCW*. Other respondents mentioned that they ate samp and beans, rice, fish, meat and vegetables.

4.3.1.3. Supper

Supper is typically the last meal of the day that is had in the evening. Generally, supper was seen to be the largest meal of the day often referred to as a full meal. Almost all respondents mentioned that they have some sort of starch, together with an animal protein and sometimes vegetables for supper. Foods mentioned included rice, samp and beans, stiff mielie meal, potatoes meat, beef, chicken, chicken livers and canned pilchards. This is illustrated by the following responses*;*

"Then supper, we don't like eating vegetables, we only eat meat and also rice. I do like potatoes." R3, HCW.

"Usually for supper I eat samp and beans or stiff miele meal or rice and veggies with meat" R5, HCW.

"Supper I have rice, veggies and meat, chicken or beef" R2, HCW.

One interesting response was*; "I'm too lazy to cook, so I eat cereal for lunch and supper also." F6, PT.*

4.3.1.4. Favourite foods

These are simply the foods that the respondents most preferred to eat. Some of the participants mentioned that they like junk food like pizza, chocolates and fried chips. Other foods frequently mentioned included African salad, samp and beans, miele meal, rice, pasta, vegetables, green salad, samp, fruits, amasi, cheese, meat, minced meat, fish and Xhosa chicken. The vegetables mentioned specifically were potatoes, spinach, butternut and carrot. No specific fruit was mentioned. The food combination that a number of respondents said they especially liked was mielie meal and meat. A participant also mentioned that she liked drinking juice mixed from concentrates. The above is substantiated by the following;

"My favourite food is junk like chips and chocolates, I like to eat African salad which is maas and miele meal, I love that and also samp and beans." R3, HCW

"My favourite food to eat, I eat it the whole week is stiff pap with meat! (Laughing) I sometimes for a change make rice with some veggies or salad on Sundays. Heyi, but otherwise stiff pap and meat is my favourite." R6, HCW

"Miele meal and meat! Mielie meal and meat! (Exclaiming, laughter) I also like to drink juice like drink-o-pop or oros" R5, HCW

"Ey, my favorite food is meat stew with miele meal" F6, PT

4.3.1.5. Least favourite foods

These are simply the foods that respondents' least preferred to eat. The food least favoured, that was strongly expressed by some of the participants was vegetables. Other foods mentioned were rice, samp and beans, bread, pilchards, African salad. Participants who did not like samp and beans mentioned, it was because they were

tired of eating it, as they had been eating it, from the time they were young. A number of participants also did not like African salad also because they ate it too much. It was interesting to note that none of the participants expressed any dislike towards meat and meat products. The following responses further substantiate the above; *"Uhm I don't have fruits and vegetables really, sometimes I eat fruit. I don't like vegetables, I just don't like how they taste" R1, HCW*

"I don't like vegetables, *I don't know why, I just don't like them, they don't taste nice to me, I know they are healthy I have to eat them, but I don't take them. I have vegetables maybe two times a month, just to boost my iron, sometimes I make and eat spinach, carrots here and there. But I also eat raw carrots" R3, HCW*

"I don't like veggies, after I eat them I feel hungry again" R5, HCW

"I don't like samp and beans because I ate a lot of samp growing up, so I'm tired of it now, I don't buy it when I'm doing groceries" F4, PT.

"I don't like rice; it doesn't make me full; so it's better to eat it with vegetables" F5, PT.

4.3.2. **Theme 2:** Factors that influence dietary choices

These are the different factors that respondents looked at when they decide to eat certain foods. The factors that emerged as sub-themes to be most influential in this study were affordability, taste and health reasons. The participants generally expressed that, out of these factors, taste was the most critical when deciding what foods, they eat, followed by affordability and health reasons last.

4.3.2.1 Affordability

This is a factor that people consider before deciding to buy certain foods, whether the price of a certain food is within the capacity of an individual to purchase i.e. if they have enough money to buy the food. Participants expressed that when deciding to buy certain foods they first checked the price of the food. They preferred to buy food that was reasonably priced, and would give them more value for their money. Some only

looked at the price of food regardless of how it tasted and whether it was good for their health. The following responses from participants further corroborate this;

"Depending on how much money I have, I check the prices, if there is a brand that is cheaper I will buy that. If morvite is cheaper than future life I will buy it, if weet-bix is cheaper I will buy that. I won't lie, I don't look at which one is healthier. Sometimes future life is R50 but when I buy- it only lasts two days, so I rather buy morvite, which will last at least one week, even though it's not the healthy one. I don't look at which one tastes better, it depends on how much money I have." R5, HCW.

"We look at the prices because we don't have money to buy fancy things. I need to support my children, so I need to buy cheap food, but I make it taste good when I'm eating, even though it's not healthy" F4, PT.

4.3.2.2. Taste

This is an influential factor that participants looked at when deciding to eat certain foods. It is a measure of how appealing a certain food is to the sense of taste. Participants mentioned that they found that foods that are cheaper often don't taste nice, so they prefer to buy foods that taste better even though they may be more expensive. This was vocalized by the following responses;

"I look at all the factors. Have you seen that mielie meal that says instant, it is cheap but I don't buy it, it tastes bad. I like to buy food that is tasty, but I also check the prices. Even if I have no money, I don't buy things that don't taste nice." R6, HCW.

"I like to buy according to taste, white star mielie meal tastes nice, other miele meal are not as nice, so even though white star is more I expensive I rather buy that." F5, PT.

"I don't worry about how much money the food cost, I just buy and eat foods that taste nice" F6, PT.

4.3.2.3. Health reasons

The food choices we make also have effects on health. This is a factor that is also considered when making food choices. There was a general sense that most participants were not as concerned about the health effects of their food choices as opposed to taste and affordability of food. It was mentioned that you need to take care of your body by eating healthy foods and that it was important to eat foods of varying color so that you can be healthy. This was expressed through the following examples;

"I don't care about how healthy is the food for me, I just buy whatever is cheap. I compare the prices of foods at the different shops, and buy the cheaper one." F2, PT.

"I also try to eat foods that have different colours like the 7 colours of the rainbow, so that I look healthy as you can see, even if it is expensive, don't change the brand of the food because you don't have money, eat what you want." F1, PT.

"I am very careful about what I buy because of my age, I need to look after my body, so I try to buy healthy food" F4, PT.

An interesting response from a participant was that she looked for foods that were nice, but that were priced cheaper and felt that it was not healthy to have oily foods for breakfast;

"I look for something appealing, it must taste good, the appearance of the food, how it looks, look at the prices, health wise I also check, for breakfast I cannot have oily foods, also at supper. I look at cheap prices, because I don't have money. R3, HCW.

4.3.3. **Theme 3**: Health implications of dietary choices

The dietary choices made by individuals have an effect on health. The various implications that these dietary choices can have on health were further explored in this theme. The most common disease condition that the participants were under treatment for was hypertension, followed by diabetics, heart disease and HIV/Aids. Out of all the participants, 8 stated that they were taking treatment for hypertension, 6 were on

treatment for diabetics, 1 on treatment for heart disease and 1 on treatment for HIV/Aids. Participants were all aware that certain food choices could impact a person's health in a positive or negative way. Certain foods were seen to be particularly unhealthy, however these tended to be the food that they typically ate. The findings under this theme will be presented under the 5 sub-themes that follow.

4.3.3.1. Weight gain

Participants expressed that there were certain unhealthy foods that they eat which causes them to gain weight. They felt that fatty foods most contributed to weight gain. Foods such as fried chips, fat cakes, fatty meats and fast food were found to be the most commonly mentioned fatty foods. This was confirmed by the following statements;

"I feel fried chips are unhealthy because its fatty, and cause me to gain weight. Fried foods are not healthy and uhh fast foods" R1, HCW.

"Potato chips fried ones, burgers, hamburgers, sometimes because they have a lot of sauce, they have the burger then there is the cheese, we like to add a lot of things that are not healthy, like more mayonnaise which has more fat. I like to add a lot of sauce." R2, HCW.

"Eating meat can cause obesity, which is not good for health, I am trying to limit myself from eating meat" F5, PT.

4.3.3.2. High blood pressure

Participants shared that a common disease condition that resulted from consumption of certain foods was high blood pressure. Although they were aware that these foods caused high blood pressure, they still liked to eat them. Salty foods were identified as contributing to high blood pressure. Eating meat was also mentioned as causing high blood pressure, particularly red meat. The problem with high blood pressure in the long term was that it increased the risk of developing a stroke. The following responses help to substantiate this;

"It's not good for my health, I know that some of the things I eat are really not good for me. Because I love salty foods, and you know that salty foods become high blood pressure at a later stage and stuff. But sometimes I do look just to balance I eat something healthy, but I know that most foods I take are unhealthy." R3, HCW.

"Eating mielie meal and meat often, I think I'm eating too much starch. Also I'm eating too much meat which will give me problems with my health, like high blood pressure. But so far I don't have any problems from eating mielie meal." R5, HCW.

4.3.3.3. High cholesterol and heart disease

Some of the foods that were identified by the respondents as causing weight gain and high blood pressure was also seen to cause high cholesterol and heart disease. Specifically, meat and fatty or oily foods. Oily foods mentioned included chips, potato chips and fatcakes. The fat from meat, especially red meat, was also particularly dangerous as it causes heart disease. Eggs were also mentioned as a food that contributed to high cholesterol and that it was better to eat meat as a source of protein. This is corroborated by the following responses;

"Ey! I think meat with a lot of fat is very dangerous, it can make your cholesterol go high. The meat from the cow is especially bad, you can see that with chicken there is less fat. I do eat tinned fish, the pilchards, it is better for your health." R5, HCW

"Oily foods are not good, chips, potato chips, fat cakes that's oil, oil, oil, oil. It does affect your health, it doesn't affect me now, but it will affect me at a later stage I know, so I'm trying my best to. Oily foods can cause heart problems and high cholesterol." R3, HCW.

"Eggs can be very harmful, because of cholesterol, so I like to get my protein from meat." F5, PT.

4.3.3.4. Low energy

Another implication on health frequently mentioned was that of low energy or fatigue after eating certain foods. Eating unhealthy foods for a long period of time, tended to make one's body feel tired and even result in skin conditions. However, when eating healthy foods for even just a week, you feel more lively and energetic. Junk food and miele meal were found to be the foods that caused low energy, as verbalized through the following responses;

"Stiff mielie meal is harmful to health, it gives me problems when I eat it I feel tired, with low energy, I can't move around afterwards and it makes me full so I have to rest the whole day" F4, PT.

"Like even if it's only a week when you eat healthy you can feel your body, you are improving, you are much more refreshed, energetic. But if you're eating and you take a week, you notice you have been taking a lot of junk food you notice, I notice that my body is down, I don't have energy, I'm tired all the time, and I struggle with a lot of things even with my skin. R2, HCW.

4.3.3.5. Other health implications

There were a number of other health implications that participants associated with different food choices, although they were less frequently mentioned. These implications were difficulty breathing, stomach ulcers, iron deficiency, migraines, constipation and piles.

Eating fatty foods was associated with making breathing difficult. As the participants stated; *"Fat! (exclaims)I have asthma so if I eat a lot of fatty foods, I struggle to breathe sometimes, I don't know if it's the fat or because I'm just full" R1, HCW.*

"Also when I eat fatty meat, I struggle to breathe properly and I start to hyperventilate." F5, PT.

Carbonated beverages or fizzy/acidic drinks and fatty foods with lots of spices were thought of as being the cause of stomach ulcers. As substantiated by the following statements; “Fatty foods are not good for you, especially if you put too much spices because it can give you constipation and ulcers in your stomach.” F4, PT.

“Also the acid from fizzy drinks is bad for you. I used to drink them but I stopped, because I got an ulcer from it.” R6, HCW.

Nutritional deficiencies from not eating certain foods was also expressed, such as iron deficiency-anemia. Food and supplements to correct the deficiency are taken for some time and then stopped. As shown by the following response; “*I used to take treatment for anaemia, because of iron deficiency. Was told to take spinach, liver, folic and ferrous supplements. I have stopped taking them now, have not gone for checkup since.” R1, HCW.*

An interesting response from one of the participants was that she used to suffer from migraines, and that after changing her diet by not eating flavored crisps and junk food her condition improved. As she stated; *“I did have migraines but I don’t suffer from them anymore, I had to change diet because of the migraines, so I had to look at the chips that I eat, like chips that change colour, like Fritos, Doritos, those chips that are strong, then junk food. I try to limit how much junk food I eat. The migraines improved a lot after stopping those foods” R2, HCW.*

Foods such as bread and mielie meal were seen to cause constipation and piles, especially if eaten without drinking enough water. The following response substantiates this; *If you eat a lot of bread you will end up getting piles and constipation. Also mielie meal can cause piles, I like to eat African salad a lot, which is made with mielie meal, so I have piles now. Also I don’t drink enough water, I don’t like to drink plain water maybe that’s the reason why I have problem of constipation” F4, PT.*

4.3.4. **Theme 4**: Benefits of plant-based foods vs animal-sourced foods

All foods are either of animal or plant origin. Under this theme, the views that participants had on the benefits of plant-based foods vs animal sourced foods are

discussed. Most participants felt that plant-based foods were healthier than animal-sourced foods. Others felt that both plant-based and animal sourced foods are good for health. In order to be healthy you should not eat too much animal-sourced foods or too much plant-based foods, but eat a little of each. Fewer participants felt that animal-sourced foods were healthier than plant-based foods. This theme will be discussed further under the sub-themes that follow.

4.3.4.1. Plant-based foods

Food from plants were healthier than food from animals, as plant foods come from a variety of different fruits and vegetable that have an abundance of necessary vitamins and minerals. It was also expressed that it was easier to get food from plants, as you can plant seeds of a variety of different vegetables in the soil and harvest them when they are ready. Although this requires a lot of effort and time.

Planting a garden was seen to be beneficial to health as you get exercise preparing the garden, and you get fresh vegetables to eat too. Fresh fruits and vegetables from the garden were expressed as being the healthiest food. It was also cheaper to get fresh vegetables from the garden as opposed to buying them from the shop. The vegetables from the shop are also not healthy because they use pesticides and chemical fertilizers. Plant-based foods are also cheaper than animal based foods at the shops. The above is supported by the following participant responses;

"I think that's it's better to eat food from plants. You can grow your own garden from planting seeds, and you will get more veggies that way. That way you can get it fresh out of the garden. You can get potatoes, carrots, spinach and cabbage. I think food from animals like milk, eggs and meat are not good for health and veggies are better. It is easy to get eggs and milk from the shop, but it's better to get veggies from your garden but it takes time." R5, HCW.

"I think that food we get from plants are healthier, because it is fresh and comes straight from the soil. You don't get sickness from this food because we don't put fertilizer. Eating vegetables is good because it makes your eyes bright." F4, PT.

"The foods you buy from the shop are too expensive, so it's better to plant some vegetables in your garden. Also making a garden is healthy for you because your body gets moving and you will get some exercise. The vegetables from the shop are also not good, because they have chemicals on them. During the lockdown there was no spinach available at the shops, so my neighbours used to come get spinach from my garden." F6, PT.

4.3.4.2. Animal-sourced foods

A few participants expressed that depending on which animal foods are eaten and how they are prepared and cooked they can be healthy for you. When eating meat, you should eat lean meats, with less fats. Animal foods are important to eat so that you can get sufficient protein. Cow milk was found to be healthy. Animal foods also taste better than plant-based foods.

It is easier to get food from plants, because you can grow them in a garden. With animals it not as easy, as you have to raise and then slaughter the animal first, which is very rarely done at home. Animal foods are easily available at the shop, which makes it convenient to buy. It is more expensive though, because they do all the slaughtering and cleaning for you. Certain animal foods like eggs are easy to buy from the shop, and are easy and quick to make when you are hungry. It takes time to plant and grow a garden, so it's easier to go to the shop and buy what is available whether it is animal-sourced or plant-based foods. Others felt animal-sourced foods are more harmful than plant-based foods. The above is confirmed by the following statements of the participants;

"I feel that a bit of both animal and plant sourced foods are good for your health, plant foods are much healthier. Depending on how meat foods are cooked, try to buy less fat, lean meats. It's easier to get food from plants. Animal foods are expensive, like meat" R1, HCW.

"Plants foods are healthier, because they are vegetables and they have vitamins and healthy stuff, but I also think animal wise, because you need the protein from the meat. But I think mostly plants. I prefer animal foods, I like meat, because of the taste. Easier to get food from plants because you can grow it in a garden, it will grow and then you can eat, with animals it's rare to slaughter, for example beef at home, so you have to go buy it. So I think it's easier to get food from plants. Meats available at the shops makes it convenient, just take it and go. Animal-foods are more expensive because there at the shop they do everything for you that you don't want to do, like the slaughtering the cleaning, the whatever, whatever, they do everything for you, they pack for you, you just take them." R3, HCW.

"Food from both plants and animals are good. Milk is a food that you get from a cow, and it's good for my health. The veggies you get from the garden is also good is for my health. When you're eating food, you shouldn't eat too much animal or plant foods, you should eat a little bit of each and you will be healthy. I don't have a garden, so when I go to the shop I buy both foods, it easy to get it there." R6, HCW.

"The food from animals is also too expensive because we buy it ready made. Plants are cheaper, animal foods are bad because they cost too much. It's easier to get plant foods, but it's also easy to get animal foods like eggs when you are hungry, so eggs makes things easy." F4, PT.

CHAPTER 5:

Discussion, limitations, conclusion and recommendations/future directions

5.1. Discussion

In this section the findings that were presented in chapter 4 will be discussed further, comparing and contrasting with the literature reviewed. The discussion will be done under the 3 research objectives linked to the main emerging themes that were determined for the study. The main research objectives achieved from the study will be discussed below.

5.1.1. Dietary preferences

In this study, the dietary preferences of the research participants were determined answering the first research question; 'What are the current dietary preferences by sampled patients and health care workers at Nontyatyambo CHC, Eastern Cape, South Africa?' The dietary patterns that were followed on a daily basis were also determined, specifically the foods that were normally consumed at meal times.

Dietary patterns can be defined as the amount, proportions, combinations and variety of foods and beverages as part of normal daily diet and how frequently they are consumed (Nelson et al., 2016). Out of all the recognized dietary patterns, all the participants in this study followed a fully omnivorous diet i.e. their diets included plant-based foods and animal-sourced foods. This corroborates Springmann (2018), that there is a shift of dietary patterns to refined animal-based foods.

According to Mchiza et al (2015), Oldewage-Theron and Kruger (2017) and Tydeman-Edwards et al (2018) in South Africa the food group generally most consumed was high in bread and cereals, as the cost per unit energy of these staples was much less than an equivalent unit of energy of fruits and vegetables. This made them the preferred food

of choice by most communities. In this study, almost all the research participants ate refined mielie meal or cereal with cow's milk and sugar for breakfast on a daily basis, which substantiates this.

Dietary patterns in urbanized areas are usually high in fat and low in fibre, compared to low-fat, high-fibre diets in rural areas (Tydeman-Edwards et al., 2018; Lopes et al., 2020). The influence of urbanization in the district is confirmed by the dietary choices of the participants. Foods preferred at lunch were fried-foods, such as chips and fatcakes together with refined animal-sourced food like polony and russians. Most commonly, bread together with some form of animal-sourced food like eggs.

According Mchiza et al (2015) and Hemler and Hu (2019), developing countries such as South Africa are experiencing an increase in the consumption of refined grains and animal products, especially meat. This is shown in this study by the preferred choice of foods, that were eaten at supper universally, by all the participants. The dietary preference was always some form of refined grain such as rice, mielie meal or samp together with animal-sourced foods such as meat, chicken or fish.

In South Africa, fruits and vegetables have been identified as the food group that is most lacking in dietary intake (Mchiza et al., 2015; Oldewage-Theron and Kruger, 2017; Tydeman-Edwards et al., 2018). Plant-based foods that are high in fiber such as fruits and vegetable were much less frequently preferred by the research participants. A number of participants expressed that vegetables were, in fact, their least favorite food, whilst the favorite food of most participants tended to be a refined grain together with an animal-sourced food.

Other foods that were common included junk food and carbonated sugary beverages. This indicates an influence of westernized diet in the study group characterized by increased consumption of energy-dense and processed foods, with high content of saturated fat, mainly from animal-sourced foods, and refined sugar, from fast-foods and soft-drinks.

5.1.2. Health Implications of dietary choices

Participants shared their perceptions of the health implications of their dietary choices. The findings from the study helped to answer the second research question: 'How are the implications of these dietary choices on health perceived by sampled participants?' This section focuses on the perceptions of CMD as a health implication of dietary choices. According to Kahleova et al (2017), improper dietary choices are a leading contributing factor to premature deaths and to the development of CMD. In the study group the most common disease condition that participants were on treatment for were HPT and DM2, which are CMD.

Across the world poor dietary choices are causing an increase in mortality and morbidity rates (Hemler and Hu, 2019). Dietary choices that result in the inclusion/exclusion of certain foods may lead to development of specific disease conditions (Mozaffarian, 2016). Participants were all aware that certain food-choices could impact a person's health in a positive or negative way. Certain foods were seen to be particularly unhealthy, however these tended to be the food that they typically ate.

Today's lifestyle and dietary choices worldwide result in a net-surplus of caloric intake that contributes to an increase in cardio-metabolic diseases (CMD) (Castro-Barquero et al., 2020). A commonly mentioned health implication by participants was weight gain. Fatty foods such as fried chips, fatty meats and fat-cakes were identified as the foods that most contributed to weight gain. According to Barnard et al (2014) and Castro-Barquero et al (2020), the consumption of energy dense animal-sourced foods promotes long-term weight gain, especially when consumed together with processed carbohydrates. Although in the study the participants did not emphasize the point that fatty foods promoted weight gain when eaten together with processed carbohydrates.

Recent statistics from South Africa reports that 31% of men and 68% of women in South Africa are obese/overweight, with women being more likely to be affected (Lopes et al., 2020). The average BMI of the participants in this study was 33,1, which indicates

that on average the study sample was overweight. 27 out of the 42 participants or 64% of the participants had a BMI above 30 which confirms this. The highest BMI was 58,6 that indicates that the participant was severely overweight. Excess abdominal weight, in particular, impacts metabolic health, and has been shown to increase incidence rates of HPT and T2DM (Mozaffarian, 2016 & Castro-Barquero et al., 2020) Having higher body weight in relation to height or body mass index(BMI), correlates to higher BPs, whilst lower BMIs are associated with lower BP measurements (Joshi et al., 2019).

HPT or high blood pressure is one of the most prevalent disease conditions worldwide (Cappuccio and Miller, 2016; Joshi et al., 2019). In this study HPT was the most prevalent disease condition that participants suffered from, with 19% of them being on treatment. Foods identified by participants that contributed to high blood pressure were red meat and salt. The mechanism by which these foods contributed to HPT were not understood by participants. According to Borgi et al (2015), eating animal flesh once a day increased the risk of developing HPT by 30% compared to eating animal flesh less than once a month. Participants did not associate the consumption of other animal meats with developing HPT.

According to Van Hecke et al (2017), processed meats are classified as group 1, carcinogenic to humans, whilst red meat is classified as group 2A, probably carcinogenic to humans, by the International Agency for Research on Cancer. There is a high amount of salt and nitrites used as preservative agents in processed meat which can contribute the development of HPT and other CMD (Mari-Sanchis et al., 2016; Chen et al., 2019). On average the amount of salt in processed meats is four (4) times higher than in unprocessed meats (Mari-Sanchis et al., 2016). Participants mentioned that processed meats such as russians and polony are eaten together with bread most often for lunch.

Some of the foods that were identified by the respondents as causing weight gain and high blood pressure was also seen to cause high cholesterol and heart disease. Specifically, meat and fatty or oily foods. Eggs were also mentioned as a food that contributed to high cholesterol and that it was better to eat meat as a source of protein. Having high cholesterol is a recognized risk factor for development of CVD. Eggs are a

major source of dietary cholesterol, with a medium sized egg having about 225mg of cholesterol (Shin et al., 2013). According to Shin et al (2013) & Mozaffarian (2016), meta-analysis of some studies have shown that those who eat 1 egg per day have a 42% increased chance of developing type 2 diabetes. Although 6 of the 42 were suffering from T2DM, none of the participants made any association of dietary choices with its development. Studies have shown that PBDs are associated with a lower risk of T2DM; in contrast ASFs are consistently associated with higher risk of T2DM (Barnard et al., 2014; Mari-Sanchis et al., 2016; Chen et al., 2019).

5.1.3. Benefits of plant-based foods vs animal-sourced foods

In this section the findings of the study were able to provide an answer to the third research question: 'What are the perceptions on the value of shifting dietary patterns to adopting a plant-based diet by sampled participants?'. In this study, most participants felt that PBFs were healthier than ASFs. Even though they felt PBFs were healthier, none followed exclusively PBDs.

Participants shared their view that food from plants were healthier than food from animals, as plant foods come from a variety of different fruits and vegetables that have an abundance of necessary vitamins and minerals. According to Tuso et al (2015), adopting PBDs results in an increased intake of nutrient-dense plant foods, whilst minimizing intake of ASFs which contribute to CMD.

It was also expressed that it was easier to get food from plants, as you can plant seeds of a variety of different vegetables in the soil and harvest them when they are ready. Adopting diets that are more plant- based orientated can contribute to increasingly sustainable use of land and water resources (Nelson et al., 2016; Lynch et al., 2018; Springmann et al., 2018). Planting a garden was seen to be beneficial to health as you get exercise preparing the garden, and you get fresh vegetables to eat too. Fresh fruits and vegetables from the garden were expressed as being the healthiest food. Fresh fruits are generally consumed raw, without any cooking processes, thus maximizing

their potential health benefits when incorporated in a healthy diet. Fresh fruits are a rich source of phytochemicals, antioxidants, dietary fiber, vitamins and minerals, which all potentiate their cardio-protective effects (Du et al., 2016).

Improving dietary patterns are also associated with economic benefits. They felt it was also cheaper to get fresh vegetables from the garden as opposed to buying them from the shop. Adoptions of vegan and lacto-ovo vegetarian diets have been shown to reduce healthcare costs, compared with diets meeting current global dietary guidelines (Gardner and Hauser, 2017; Fresán and Sabaté, 2019; Wilson et al., 2019). They also noted that PBFs are cheaper than ASFs at the shops.

They expressed their view that vegetables from the shop are also not healthy because they use pesticides and chemical fertilizers. According to Nelson et al (2016); Fresan & Sabate (2019) & Wilson et al (2019) the dietary patterns found to be most favourable in terms of reducing GHGEs, cropland requirements and all-cause mortality were vegan, vegetarian, pescatarian, Mediterranean and the normal omnivorous diet in descending order. Although participants were relatively well informed with regards to the benefits of PBDs, all still followed an omnivorous diet.

5.2. Limitations

Due to the nature of qualitative research design applied, the generalizability of study might be a concern as the findings are based on a smaller sample size that was purposively sampled compared to a quantitative study. Although the results of the study may not be wholly generalizable, the research design maybe applied to different study settings, hence maintaining transferability. Furthermore, outcomes of the study may vary due to the personal attributes and skills of the researcher.

5.3. Conclusion

This study was qualitative in nature and aimed to explore the dietary preference and perceptions of health implications from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa. The research objectives of the study were accomplished.

It was found that all participants in this study were following an omnivorous dietary pattern. Foods that were typically eaten during the day included refined carbohydrates such as grains, cereals and bread, ASFs and other PBFs. The most frequent and favoured food combination was a refined carbohydrate together with an ASF, mainly meats. Vegetables were the least favoured food group as they appealed less to the sense of taste. The food group most lacking in consumption was fruits and vegetables.

Patient were well aware of the implications that dietary choices have on health and shared a number of perspectives. Although they were aware of the health implications, they did not seem to have an understanding of the underlying mechanisms through which dietary choices result in disease conditions. Interestingly, most of the participants were overweight/obese; reflecting the role of dietary preference among other lifestyle factors.

Although most saw value in adopting PBD, most preferred to eat a diet inclusive of ASFs. Thus interventions focusing on shifting diet and lifestyles towards incorporating more PBFs and fewer ASFs could be effective in the prevention and management of CMD. This calls for urgent public health intervention to improve nutritional uptake as a strategy to reduce potential CMD including CVD.

5.4. Recommendations/future directions

The food group most lacking in diet are fruits and vegetables as their cost per unit energy is generally more than staple refined carbohydrates. Food producers should be given incentives to grow more fruits and vegetables and raise less animals for food. This should assist to make them more affordable. Health education and promotion campaigns should be planned and carried out that aims to spread awareness of the benefits of adopting a predominantly PBDs and the risk associated with ASFs and junk food. The underlying disease mechanisms that link dietary choices to specific diseases should also be included in campaigns. Local PBFs' farming practices should be promoted and incentivized; as this will increase local food production, reducing the need to transport food from long distances, bringing down costs associated with PBFs. Cooking techniques that make PBDs more palatable should be used to promote their usage and sales, as opposed to ASFs and junk food.

Compared with conventional medical procedures, surgeries and drug therapy, adopting plant-based diets is a less invasive, less costly and simpler intervention that plays an important role reversing and preventing CMD including CVD (Tuso et al., 2015; Hemler and Hu, 2019). Since individual and public health are inter-connected and negatively affected by poor diet choices, transforming global dietary patterns to contain wholesome plant-based diets is evidently a critical factor in reversing these harmful effects on health and the environment (Tonstad et al., 2015; Hemler and Hu, 2019).

REFERENCES

Brink, H., Van Der Walt, C. & Van Rensburg, G.,(2014). Fundamentals of Research Methodology for Health Care Professionals. 3ed. Cape Town: Juta & Co. Pvt Ltd.

Barnard, N., Levin, S., Trapp, C., (2014). Meat consumption as a risk factor for type 2 diabetes. Nutrients 6, 897–910.

Borgi, L., Curhan, G.C., Willett, W.C., Hu, F.B., Satija, A., Forman, J.P., (2015). Long-term intake of animal flesh and risk of developing hypertension in three prospective cohort studies. J Hypertens 33, 2231–2238.

BMI Calculator – Havard health. Available: health.harvard.edu/diet-and-weight-loss/bmi-calculator (Accessed 25 May 2022)

Buffalo city map. Available: https://municipalities.co.za/map/7/buffalo-city-metropolitan-municipality (Accessed: 27 May 2022)

Cappuccio, F.P., Miller, M.A., (2016). Cardiovascular disease and hypertension in sub-Saharan Africa: burden, risk and interventions. Intern Emerg Med 11, 299–305.

Castro-Barquero, S., Ruiz-León, A.M., Sierra-Pérez, M., Estruch, R., Casas, R., (2020). Dietary Strategies for Metabolic Syndrome: A Comprehensive Review. Nutrients 12, 2983.

Chen, P., Antonelli, M. (2020) Conceptual models of food choice: influential factors related to foods, individual differences and society. Foods, 9, 1898; doi:10.3390/foods9121898

Chen, C., Chaudhary, A., Mathys, A., (2019). Dietary Change Scenarios and Implications for Environmental, Nutrition, Human Health and Economic Dimensions of Food Sustainability. Nutrients 11, 856.

Cypress, B.S., (2017). Rigour, reliability and validity in qualitative research: perspectives, strategies, reconceptualization, and recommendations. Dimens crit care nurs. 2017;36(4):253/263]

Daftary A., (2017). Qualitative methods in global infectious diseases research: Study design. Mcgill summer institute in infectious diseases and global health

District health plan, Amathole 2018/19-2020/21, National Department of Health

Du, H., Li, L., Bennett, D., Guo, Y., Key, T.J., Bian, Z., Sherliker, P., Gao, H., Chen, Y., Yang, L., Chen, J., Wang, S., Du, R., Su, H., Collins, R., Peto, R., Chen, Z., China Kadoorie Biobank Study, (2016). Fresh Fruit Consumption and Major Cardiovascular Disease in China. N Engl J Med 374, 1332–1343.

Fresán, U., Sabaté, J., (2019). Vegetarian Diets: Planetary Health and Its Alignment with Human Health. Adv Nutr 10, S380–S388.

Gardner, C.D., Hauser, M.E., (2017). Food Revolution. Am J Lifestyle Med 11, 387–396.

Gizzi,M.C. & Rädiker, S., (2021). The practice of qualitative data analysis, research examples using MAXQDA. 1ed. Berlin: MAXQDA press

Hemler, E.C., Hu, F.B., (2019). Plant-Based Diets for Personal, Population, and Planetary Health. Adv Nutr 10, S275–S283.

Joshi, S., Ettinger, L., Liebman, S.E., (2019). Plant-Based Diets and Hypertension. Am J Lifestyle Med 14, 397–405.

Kahleova,H., Klementova,M., Herynek, V., Skoch, A., Herynek, S., Hill,M., Mari, A., Pelikanova, T., (2017). The effect of a vegetarian vs conventional hypocaloric diet on thigh adipose tissue distribution in subjects with type 2 diabetes: a randomized study Journal of the American College of Nutrition, 36:5, 364-369.

Kahleova,H., Levin,S., Barnard,N. (2017). Cardio-metabolic benefits of plant-based diets, Nutrients, 9, 848.

Kerley, C.P., (2018). A Review of Plant-based Diets to Prevent and Treat Heart Failure. Card Fail Rev 4, 54–61. https://doi.org/10.15420/cfr.2018:1:1

Kim, K., Hyeon, J., Lee, S.A., Kwon, S.O., Lee, H., Keum, N., Lee, J.-K., Park, S.M., (2017). Role of Total, Red, Processed, and White Meat Consumption in Stroke Incidence and Mortality: A Systematic Review and Meta-Analysis of Prospective Cohort Studies. J Am Heart Assoc 6, e005983.

Lassen, A. D., Christensen, L. M., & Trolle, E., (2020). Development of a Danish Adapted Healthy Plant-Based Diet Based on the EAT-Lancet Reference Diet. Nutrients, 12(3), 738. PubMed.

Lewins, A., Taylor, C. & Gibbs, G., (2005). What is qualitative data analysis? School of Human & Health Sciences, University of Huddersfield. United Kingdome.

Lincoln Y.S, Guba E.G, 1985. Naturalistic inquiry. Beverly Hills, CA: Sage.

Lopes, T., Zemlin, A.E., Erasmus, R.T., Faber, M., Kengne, A.P., (2020). Assessment of the association of plant-based diets with cardiovascular disease risk profile in Africa: a systematic review and meta-analysis protocol. BMJ Open 10, e036792–e036792.

Lynch, H., Johnston, C., Wharton, C., (2018). Plant-Based Diets: Considerations for Environmental Impact, Protein Quality, and Exercise Performance. Nutrients 10, 1841.

Mari-Sanchis, A., Gea, A., Basterra-Gortari, F.J., Martinez-Gonzalez, M.A., Beunza, J.J., Bes-Rastrollo, M., (2016). Meat Consumption and Risk of Developing Type 2 Diabetes in the SUN Project: A Highly Educated Middle-Class Population. PLoS One 11, e0157990–e0157990.

Mattei, J., Malik, V., Wedick, N.M., Hu, F.B., Spiegelman, D., Willett, W.C., Campos, H., Global Nutrition Epidemiologic Transition Initiative, (2015). Reducing the global burden of type 2 diabetes by improving the quality of staple foods: The Global Nutrition and Epidemiologic Transition Initiative. Global Health 11, 23–23.

Mchiza, Z.J., Steyn, N.P., Hill, J., Kruger, A., Schönfeldt, H., Nel, J., Wentzel-Viljoen, E., (2015). A Review of Dietary Surveys in the Adult South African Population from 2000 to 2015. Nutrients 7, 8227–8250.

Medawar, E., Sebastian, H., Villringer, A., Witte,V., (2019). The effects of plant-based diets on the body and the brain: A systematic review. Translational Psychiatry, 9:226.

Miles, M. B., Huberman, A. M., & Saldaña, J., (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE

Moser, A., Korstjens, I., (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. Eur J Gen Pract 24, 9–18.

Mozaffarian, D., (2016). Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity: A Comprehensive Review. Circulation 133, 187–225.

Nelson, M.E., Hamm, M.W., Hu, F.B., Abrams, S.A., Griffin, T.S., (2016). Alignment of Healthy Dietary Patterns and Environmental Sustainability: A Systematic Review. Adv Nutr 7, 1005–1025.

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. Evidence-Based Nursing, 18(2), 34-5.

Oldewage-Theron, W., Kruger, R., (2017). The association between diet quality and subclinical inflammation among children aged 6–18 years in the Eastern Cape, South Africa. Public Health Nutrition 20, 102–111.

Perignon, M., Vieux, F., Soler, L.-G., Masset, G., Darmon, N., (2017). Improving diet sustainability through evolution of food choices: review of epidemiological studies on the environmental impact of diets. Nutr Rev 75, 2–17.

Rädiker, S. & Kuckhartz, U., (2020). Focused analysis of qualitative interviews with MAXQDA. 1ed. Berlin: MAXQDA Press

Saldaña, J., (2015). The coding manual for qualitative researchers (3rd ed.). SAGE.

Sanches Machado d'Almeida, K., Ronchi Spillere, S., Zuchinali, P., Corrêa Souza, G., (2018). Mediterranean Diet and Other Dietary Patterns in Primary Prevention of Heart Failure and Changes in Cardiac Function Markers: A Systematic Review. Nutrients 10, 58.

Segovia-Siapco, G., Rajaram, S., Sabaté, J., (2019). Proceedings of the Seventh International Congress on Vegetarian Nutrition: Introduction. Adv Nutr 10, S273–S274. https://doi.org/10.1093/advances/nmy088

Shin, J.Y., Xun, P., Nakamura, Y., He, K., (2013). Egg consumption in relation to risk of cardiovascular disease and diabetes: a systematic review and meta-analysis. Am J Clin Nutr 98, 146–159.

Smethers, A.D., Rolls, B.J., (2018). Dietary Management of Obesity: Cornerstones of Healthy Eating Patterns. Med Clin North Am 102, 107–124.

Springmann, M., Wiebe, K., Mason-D'Croz, D., Sulser, T.B., Rayner, M., Scarborough, P., (2018a). Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: a global modelling analysis with country-level detail. Lancet Planet Health 2, e451–e461.

Springmann, M., Wiebe, K., Mason-D'Croz, D., Sulser, T.B., Rayner, M., Scarborough, P., (2018b). Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: a global modelling analysis with country-level detail. Lancet Planet Health 2, e451–e461.

Szczebyło, A., Rejman, K., Halicka, E., & Laskowski, W., (2020). Towards More Sustainable Diets-Attitudes, Opportunities and Barriers to Fostering Pulse Consumption in Polish Cities. Nutrients, 12(6), 1589. PubMed.

Tonstad, S., Nathan, E., Oda, K., Fraser, G.E., (2015). Prevalence of hyperthyroidism according to type of vegetarian diet. Public Health Nutr 18, 1482–1487.

Tuso, P., Stoll, S.R., Li, W.W., (2015). A plant-based diet, atherogenesis, and coronary artery disease prevention. Perm J 19, 62–67. https://doi.org/10.7812/TPP/14-036

Tydeman-Edwards, R., Van Rooyen, F.C., Walsh, C.M., (2018). Obesity, undernutrition and the double burden of malnutrition in the urban and rural southern Free State, South Africa. Heliyon 4, e00983–e00983.

Van Hecke, T., Van Camp, J., De Smet, S., (2017). Oxidation During Digestion of Meat: Interactions with the Diet and Helicobacter pylori Gastritis, and Implications on Human Health. Comprehensive Reviews in Food Science and Food Safety 16, 214–233.

Verstraeten R, Van Royen K, Ochoa-Avile´s A, Penafiel D, Holdsworth M, et al., (2014). A Conceptual Framework for Healthy Eating Behavior in EcuadorianAdolescents: A Qualitative Study. PLoS ONE 9(1): e87183.

Vieux, F., Perignon, M., Gazan, R., Darmon, N., (2018). Dietary changes needed to improve diet sustainability: are they similar across Europe? Eur J Clin Nutr 72, 951–960.

Wilson, N., Cleghorn, C.L., Cobiac, L.J., Mizdrak, A., Nghiem, N., (2019). Achieving Healthy and Sustainable Diets: A Review of the Results of Recent Mathematical Optimization Studies. Adv Nutr 10, S389–S403.

APPENDICES

Appendix 1. Ethical clearance certificate

University of Fort Hare
Together in Excellence

HEALTH RESEARCH ETHICS COMMITTEE

P.O Box 1054
East London 5200
Tel: +27 (0) 43 704 7368
E-mail: dgoon@ufh.ac.za

ETHICAL CLEARANCE CERTIFICATE
REC-100118-054

Certificate Reference Number:	**Ref #2021=09=02=ChockoR**
Project title:	Dietary choice preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo community health centre, Eastern Cape, South Africa
Nature of Project:	Masters of Public Health
Principal Researcher:	Chocko R
Student Number:	202008585
Supervisor:	Dr KE Oladimeji

On behalf of the University of Fort Hare Health Research Ethics Committee (HREC), I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instruments(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the HREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the HREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

The HREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
  - Any unethical principles or practices are revealed or suspected
  - relevant information has been withheld or misrepresented
  - regulatory changes of whatsoever nature so require
  - the conditions contained in the Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project.

Appendix 2.1. Gatekeepers letter

University of Fort Hare
Together in Excellence

04 March 2021

The Office of the District Manager
BCM
ECDOH

Request for Permission to Conduct Research[1]

Dear Sir

My name is Ronnie, I am a Master's in Public Health (MPH) student at the University of Fort Hare. The research I wish to conduct for my master's dissertation, is entitled "Dietary choice preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa".

I am hereby seeking your consent to conduct research at the health facility for the partial fulfillment of my degree. I have provided you with a copy of my proposal which includes copies of the data collection tools and consent and/or assent forms to be used in the research process. Also please see copy of ethical approval letter from the IRB of University of Fort Hare Research Ethics Committee (UREC).

If you require any further information, please do not hesitate to contact me on 0747931553 or 202008585@ufh.ac.za. Thank you for your time and consideration in this matter.

Yours sincerely,
Ronnie

Appendix 2.2. Gatekeepers approval

Province of the
EASTERN CAPE
HEALTH

Enquiries: Yvonne Gixela Tel no: 079 074 0859

Email: Yvonne.Gixela@ecdoh.gov.za / vgixela@gmail.com

Date: 17 February 2022

Dietary choice preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo community health centre, Eastern Cape, South Africa. (EC_202202_017)

Dear Dr. R. Chocko

The department would like to inform you that your application for the above mentioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.

2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.

3. The Department of Health expects you to provide a progress update on your study every 3 months (from date you received this letter) in writing.

4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.

5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTE

2030 NDP

TOGETHER, MOVING THE HEALTH SYSTEM FORWARD

Appendix 2.3. Permission letter

Province of the
EASTERN CAPE
HEALTH

BUFFALO CITY METRO HEALTH DISTRICT
OFFICE OF THE DISTRICT MANAGER
18 Sheffield Road • Westbank •East London •5200, Eastern Cape
Private Bag X 9015 •Main Post Office, East London • 5200 • Eastern Cape
Tel. +27 (0)43 708 1797 • Fax +27 (0)43 708 1836/ 086 245 6023 • Website: www.ecdoh.gov.za
Enquiries: Ms Z Mncuvodwa

29 March 2022

Dr. R Choko
c/o University of Fort Hare
EAST LONDON

Re: Permission to Conduct Research Study

Permission is herewith granted to conduct research in Buffalo City Metro Health District as requested. Kindly familiarize yourself with the conditions below before commencing with your study.

1. The Researcher will conduct research study without compromising client's confidentiality and the smooth running of the service.
2. The Researcher will not provide/publish any reports/statements without prior discussion with and permission of the District.
3. ID must be submitted to the District office before commencing the study.
4. The District will not be held liable for any loss, damage or injury suffered by the Researcher in the process of conducting the study.

DM Lusasa
Acting District Manager: BCMHD

29/03/2022
Date

I accept the conditions as stated in the abbreviated version of Department of Health Agreement Clause for Researchers.

RONNIE CHOKO		31/03/2022
Full Name & Surname	Signature	Date
Nombekhaya Mzamo		31/03/2022
Witness Name & Surname	Signature	Date

United in achieving quality health care for all

Fraud prevention line: 0800 701 701
24 hour Call Centre: 0800 032 364
Website: www.ecdoh.gov.za

Appendix 3.1. Individual information sheet and consent form, English

University of Fort Hare
Together in Excellence

INDIVIDUAL INFORMATION SHEET AND INFORMED CONSENT FORM[1]

(AGES 18 YEARS AND ABOVE)

Please note:

This form is to be completed by the researcher(s) as well as by the interviewee before the commencement of the research. Copies of the signed form must be filed and kept on record

Title of Study: Dietary choice preference and perceptions of health implications - A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa

Dear participant,

I am Dr. Chocko and I am studying at the University of Fort Hare.

I am conducting a research study on dietary preferences and perceptions of the implications of dietary choices on health.

Purpose of Study: To explore dietary preferences, and perceived health implications to help inform future public health interventions.

[1]Approved by UREC (13 November 2019)

We would like you to allow us to conduct a brief 45-minute interview with you about your dietary preferences and your perceptions of the health implications of certain dietary choices.

Study Procedure: With your consent, we request you to answer some questions related to the study in the form of a one on one interview.

Some questions may be of a personal and/or sensitive nature. I will be asking some questions that you may not have thought about before. We know that you cannot be absolutely certain about the answers to these questions, but we ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers.

Please understand that **your participation is voluntary** and you are not being forced to take part in this study. The choice of whether to participate or not, is yours. However, we would really appreciate it if you do share your thoughts with us. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way.

The information will remain confidential. This means that your name and address will not be linked in any way to the answers you give. We study and report on the answers given by all the people we interview and not on an individual basis. The research data will be anonymous – with all personal respondent information removed and will be archived at the University.

At the present time, we do not see any risks in your participation. The risks associated with participation in this study are no greater than those encountered in daily life.

There are no immediate benefits to you from participating in this study. However, this study will be helpful in making effective future public health interventions regarding diet.

Risk-Benefit Ratio *(benefits hoped for from this study and the risks involved for the participant)***:** The study will help to inform future public health interventions, particular with regards to diet, and risk of harm to you, the participant, is virtually none, as the study is done through a verbal interview, if you are willing to participate.

Who to contact if you have been harmed or have any concerns

This research has been approved by the Inter-Faculties Research Ethics Committee (IFREC) as per delegated authority of the University Research Ethics Committee (UREC). If you have anycomplaintsabout ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

Reporting and Complaints

If you have questions at any time about this study, or if you have concerns/questions you may contact the researcher/project leader whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the researcher/project leader, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

If you have concerns or questions about this study, please feel free to contact the project coordinators:

Researcher/Project Leader: Dr. RJ Chocko

Name: Ronnie J A V Chocko

Department: Public health

Address: Ntselamazi road, Alice, Eastern Cape

Phone: 0747931553

Email: 202008585@ufh.ac.za

INFORMED CONSENT FORM

I *(name of participant)* …….
have been informed about the study by Dr. RJ Chocko.

I understand the purpose, procedures, and risk-benefit ratio of the study.

I have been given opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any procedurals that I would usually be entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as result of study-related procedures

I understand that I will be given a copy of this informed consent.

I understand that if I have any questions or complaints about my rights as a study participant, or if I may have concerns about any aspect of the study or the researcher/s then I may contact the Chairperson of the Inter-Faculty Research Ethics Committee, Prof. Pumla Gqola or Chairperson of University Research Ethics Committee, Prof Renuka Vithal (details available from the Researcher or by contacting the University of Fort Hare or Website www.ufh.ac.za)

Participant signature: ……

Consenting for Audio Recording– when necessary
YES / OR
Participant signature: ……

Witness signature: ……...

(to be altered according to the study)

Translator signature: ……...
(to be altered according to the study)

Data curation – I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage (to be altered according to the study)

Participant signature: ……

Date: ……

Reporting and Complaints

If you have questions at any time about this study, or if you have concerns/questions you may contact the researcher/project leader whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the researcher/project leader, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

If you have concerns or questions about this study, please feel free to contact the project coordinators:

Researcher/Project Leader: Dr. RJ Chocko

Name: Ronnie J A V Chocko

Department: Public health

Address: Ntselamazi road, Alice, Eastern Cape

Phone: 0747931553

Email: 202008585@ufh.ac.za

Appendix 3.2. Individual information sheet and consent form, IsiXhosa

University of Fort Hare
Together in Excellence

IPHEPHA LEENKCUKACHA ZOMNTU NGAMNYE NEFOMU YESIVUMELWANO ESIQINISEKISIWEYO
(IMINYAKA EYI-18 NANGAPHAYA)

Nceda Qaphela:

Oku, kumele ukugcwaliswa ngumphandi kunye nalawo uthabatha inxaxheba koluphando phambi kokuba olu phando lwezemfundo luqale. Ikopi ezityikityiweyo zale form zigciniwe kwi rekhodi.

Isihloko sophando: Dietary choice preference and perceptions of health implications; A qualitative study on perspectives from outpatients and health care providers in Victoria hospital in Alice, Eastern Cape.

Mthathi-nxaxheba obekekileyo

Ndingu Dr Chocko, ndifunda kwiDyunivesithi yaseFort Hare.

Ndenza isifundo sophando ngokhetho lokutya kunye nemibono malunga neziphumo zokutya okuthile kwezempilo.

Injongo yesisifundo: kukuphononongo ukhetho lokutya kunye nemibono ngeziphumo zolukhetho kwezempilo. Oku kuzakunceda ukwazisa ngongenelelo lwempilo yoluntu kwixa elizayo.

Besicela Imvume yakho yoba senze udliwonandlebe kunye nawe malunga nokutya okuthandayo kunye nemibono yakho malunga nefuthe lezempilo kukhetho okuthile lokutya. Olu dliwonandlebe luzakuthatha imizuzu engamashumi amane anesihlunu(45).

Inkqubo yoFundo: Ngemvume yakho, siyakucela ukuba uphendule imibuzo ethile enxulumene nesifundo ngohlobo lodliwanondlebe oluyobe luphakathi kwakho noMphandi. Eminye imibuzo ibuthakathaka. Ndiza kube ndibuza imibuzo ekunokwenzeka ukuba awuzange ucinge ngayo ngaphambili Siyazi ukuba awunakuqiniseka ngeempendulo zale mibuzo, kodwa sicela ukuba uzame ukucinga ngale mibuzo. Xa kuziwa ekuphenduleni imibuzo akukho mpendulo zichanekileyo nezingalunganga.

Nceda uqonde ukuba **ukuthatha kwakho inxaxheba kwenziwa ngokuzithandela kwaye awunyanzelwa** ukuba uthathe inxaxheba kolu phando.Nangona kunjalo, singavuya kakhulu ukuba ungabelana nathi ngengcinga zakho. Ukuba ukhetha ukungathathi nxaxheba, awuyi kuchaphazeleka nangayiphi na indlela. Ukuba uyavuma ukuthatha inxaxheba, ungandimisa nanini na kwaye undixelele ukuba awufuni kuqhubeka nodliwanondlebe. Ukuba wenza oku akuyi kubakho zohlwayo kwaye ngekhe ubekhethwe nangayiphi na indlela.

Ulwazi luya kuhlala luyimfihlo. Oku kuthetha ukuba igama lakho nedilesi azizukunxibelelana nangayiphi na indlela kwiimpendulo ozinikayo. Sifunda kwaye sinika ingxelo ngeempendulo ezinikwe ngabo bonke abantu esidlan 'indlebe nabo hayi ngokomntu ngamnye. Idatha yophando ayizukuchazwa - nayo yonke ingcaciso yomphenduli isuswe kwaye iya kugcinwa kwiDyunivesithi.

Ubungozi ne Nzuzo

Asikaboni bungozi abunothi benziwe kukuthabatha inxaxheba kolu phando lwemfundo. Umngcioheko ohlangabezana nabo imihla ngemihla bodlula ohlangabezana nabo koluphando.

Akukho nzuzo ozakuyifumana ekhawulezileyo wena ngokuthatha inxaxheba kolu phando. Nangona kunjalo, olu phononongo luya kuba luncedo kakhulu kuthi kuba sinethemba lokuphucula ungenelelo lwezempilo loluntu ngokubhekisele kukutya.

Ngubani onokuqhagamshelana naye ukuba wenzakalisiwe okanye unayo nayiphi na inkxalabo

Olu phando luvunyiwe yi komiti ye Inter-Faculties Research Ethics (IFREC) ngokwegunya le University Research Ethics Committee (UREC). Ukuba uziva wenzakalisiwe nangayiphi na indlela ngoku thatha inxaxheba koluphando okanye unezikhalazo onazo, Nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ingxelo kunye nezikhalazo

Nceda uqhagamshelane no mphandi malunga ne mibuzo okanye inkxalabo onazo malunga no luphando lwemfundo;inkcukacha zoqhagamshwelwano zomphandi okwayiyo ne nkokheki yale projeti zifumaneka kwi phepha lokuqala. Ukuba unemibuzo malunga namalungelo akho njengo mthathi nxaxheba, okanye une nkxalabo oziva ungakhululekanga uzothetha ku Mphandi nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ukuba unemibuzo okanye inkxalabo malunga nesisifundo nceda uqhagamshelane ngokukhululwkiyo nomququzeli woluphando:

Umphandi / iNkokeli yeProjekthi: UGqirha RJ Chocko

Igama: URonnie J A V Chocko

Icandelo / iSebe: Faculty of Health Sciences

Idilesi: Kuntselamazi road, Alice Eastern Cape

Ifowuni: 0747931553

I-imeyile: 202008585@ufh.ac.za

IFomu yemvume enolwazi

Mna(igama)…… ndiyavuma ukuba u Dr Chocko undichazele malunga nesisifundo.

Ndiyayiqonda injongo yesisifundo, ikqubo, kunye nomyinge wenzuzo nomgcipheko waso.

Ndilinikiwe ithuba lokubuza imibuzo malunga nesi sifundo kwanye ndaphendulwa ngokwanelisekileyo.

Ndiyaxela ukuba Ukuthatha kwam inxaxheba akusosinyanzeliso kwaye ndinalo ilungelo lokuxhoxa koluphando nanini na.

Ndixelelwe ngembuyekezo nangonyango olufumanekayo xa ndinokuthi ndenzakaliswe zinkqubo ezinxulumene nesisifundo.

Ndiyayiqonda uba ndizakunikwa ikopi yalemvume.

Ndiyayiqonda uba ndingaqhagamshelana nosihlalo we-Inter-Faculties Ethics Committee (IFREC) u-Prof. Pumla Gqola okanye usihlalo we-University Research Ethics Committee u -Prof Renuka Vithal malunga ne mibuzo okanye izikhalazo endinazo ngamalungelo am njengo mthathi-nxaxheba okanye inkxalabo endinazo ngesifundo okanye Umphandi. (Inkcuka ziyafumaneka kwi website ye Dyunivesithi yase Fort Hare www.ufh.ac.za)

Utyikityo lomthathi-nxaxheba……

Imvume ye rekhodi
Ewe / Hayi
Utyikityo……..

Utyikityo lwengqina:……

Utyikityo lomguquli:……

Ndiyayiqonda ukuba inkcukacha endizkuzinikeza koluphndo zizakugcinwa kwi komputha kwaye zizakusetyenziselwa uphando lwemfundo ngoku okanye kwixesha elizayo.

Utyikityo lomthathi nxaxheba:……

Umhla:……

Ingxelo kunye nezikhalazo

Nceda uqhagamshelane no mphandi malunga ne mibuzo okanye inkxalabo onazo malunga no luphando lwemfundo;inkcukacha zoqhagamshwelwano zomphandi okwayiyo ne nkokheki yale projeti zifumaneka kwi phepha lokuqala. Ukuba unemibuzo malunga namalungelo akho njengo mthathi nxaxheba, okanye une nkxalabo oziva ungakhululekanga uzothetha ku Mphandi nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ukuba unemibuzo okanye inkxalabo malunga nesisifundo nceda uqhagamshelane ngokukhululwkiyo nomququzeli woluphando:

Umphandi / iNkokeli yeProjekthi: UGqirha RJ Chocko

Igama: URonnie J A V Chocko

Icandelo / iSebe: Faculty of Health Sciences

Idilesi: Kuntselamazi road, Alice Eastern Cape

Ifowuni: 0747931553

I-imeyile: 202008585@ufh.ac.za

Appendix 3.3. Focus group information sheet and consent form, English

University of Fort Hare
Together in Excellence

FOCUS GROUP INFORMATION SHEET AND CONSENT FORM[2]

(18 YEARS AND ABOVE)

Please note:

This form is to be completed by the researcher(s) as well as by the interviewee before the commencement of the research. Copies of the signed form must be filed and kept on record

Title of Research: Dietary choice preference and perceptions of health implications; A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa

Who we are

Hello, I am Dr.Chocko from the University of Fort Hare.

What we are doing

We are conducting research on *Dietary choice preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa*

Your participation

We are asking you to participate in a focus group discussion. A focus group is when a group of people are asked about their perceptions and knowledge on a particular issue or product. While every effort will be made by the study team to protect the confidentiality of your information, we

[2] Approved by UREC (13 November 2019)

cannot guarantee that other participants in the focus group will respect confidentiality, even though every member will be asked to do so. For this reason, you are advised not to disclose personally sensitive information in the focus group. This focus group discussion will take approximately 1 hour

Please understand that **your participation is voluntary**. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop participating in the research at any time and tell me that you don't want to go continue. If you do this, there will be no penalties and you will not be prejudiced in anyway.

What we are asking you to do?

We are asking you to share your dietary preferences and your perceptions and experiences of the health implications of your dietary choices.

Confidentiality

All the information collected from you and all recordings will be kept in an electronic computer file with a password that will be given to only a few researchers on the study. The password will not be available to others and will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the ethics committee at the University of Fort Hare. (All of these people are required to keep your identity confidential.) Otherwise, records that may identify you will be available only to people working on the study, unless you give permission for other people to see the records.

We are asking you, where required, to give us permission to tape-record the focus group so that we can accurately record what is said.

Your answers will be stored electronically in a secure environment and used for research or academic purposes now or at a later date in ways that will not reveal who you are. All future use of the stored data will be subject to further Research Ethics Committee review and approval.

We will not record your name anywhere and no one will be able to connect you to the answers you give should you request non-disclosure of your identity. Your answers will be linked to a fictitious code number or a pseudonym (another name) and we will refer to you in this way in the data, any publication, report or other research output

Confidentiality for focus group cannot be guaranteed

Risks/discomforts

At the present time, we do not see any risk of harm from your participation. The risks associated with participation in this study are no greater than those encountered in daily life.

Benefits

There are no immediate benefits to you from participating in this study. However, this study will be extremely helpful to us in that we hope will improve public health interventions with regards to diet.

Who to contact if you have been harmed or have any concerns

This research has been approved by the Inter-Faculties Research Ethics Committee (IFREC) as per delegated authority of the University Research Ethics Committee (UREC). If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

Reporting and Complaints

If you have questions at any time about this study, or if you have concerns/questions you may contact the researcher/project leader whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the researcher/project leader, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

If you have concerns or questions about this study please feel free to contact the project coordinators:

Researcher/Project Leader: Dr. RJ Chocko

Name: Ronnie J A V Chocko

Faculty/Department: Faculty of Health Sciences

Address: Ntselamazi road, Alice Eastern Cape

Phone: 0747931553

Email: 202008585@ufh.ac.za

INFORMED CONSENT FORM

I, (name of participant)……have been informed about the study by Dr. Chocko.

I understand the purpose, procedures, and risk-benefit ratio of the study.

I have been given opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any procedurals that I would usually be entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as result of study-related procedures

I understand that I will be given a copy of this informed consent.

I understand that if I have any questions or complaints about my rights as a study participant, or if I may have concerns about any aspect of the study or the researcher/s then I may contact the Inter-Faculties Ethics Committee (IFREC) or the University Research Ethics Committee (UREC).

Participant signature: ……

Consenting for Audio – when necessary
YES / OR
Participant signature: ……

Witness signature: ……... (to be altered according to the study)

Translator signature: ……... (to be altered according to the study)

Data curation – I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage (to be altered according to the study)

Participant signature: ……

Date: ……

Reporting and Complaints

If you have questions at any time about this study, or if you have concerns/questions you may contact the researcher/project leader whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the researcher/project leader, please contact the HREC Chairperson, Prof. DT Goon on dgoon@ufh.ac.za or Prof. RL van Niekerk at leonvn@ufh.ac.za.

If you have concerns or questions about this study please feel free to contact the project coordinators:

Researcher/Project Leader: Dr. RJ Chocko

Name: Ronnie J A V Chocko

Faculty/Department: Faculty of Health Sciences

Address: Ntselamazi road, Alice Eastern Cape

Phone: 0747931553

Email: 202008585@ufh.ac.za

Appendix 3.4: Focus group information sheet and consent form, IsiXhosa

University of Fort Hare
Together in Excellence

IQELA LENGXOXO NE FOMU YEMVUME ENOLWAZI

(IMINYAKA ELISHUMI ELINESIBHOZO 18 UNYUKA)

Nceda Qaphela:

Oku, kumele ukugcwaliswa ngumphandi kunye nalawo uthabatha inxaxheba koluphando phambi kokuba olu phando lwezemfundo luqale. Ikopi ezityikityiweyo zale form zigciniwe kwi rekhodi.

Isihloko sophando: Dietary choice preference and perceptions of health implications; A qualitative study on perspectives from outpatients and health care providers in Victoria hospital in Alice, Eastern Cape.

Singobani

Molo, Ndingu Dr Chocko ndiphuma kwi dyunivesithi yase Fort hare.

Eyona nto esiyenzayo.

Senza uphando malunga nokukhethwa kokutya kunye nemibono ngeziphumo zako kwezempilo: Olu luphononongo olusemgangathweni malunga nezimvo ezivela kwizigulana kunye nabasebenzi kwisibhedlele iVictoria eAlice, eMpuma Koloni.

Ukuthatha kwakho inxaxheba

Uyacelwa ukuba uthabathe inxaxheba kwi qela le ngxoxo ekugxilwe kuyo. Oku kuthetha ukuba iqela labantu lizakubuzwa ukuba liveze imibono okanye ulwazi malunga nomba othile. Siliqela elenza uphando lwezemfundo, sizokwenza konke esinako ukuba inkcukacha zakho zihlale ziyimfihlo kwaye namanye amalungu eqela sizakuwacela ukuba enze njalo, kodwa asinako

ukukuthembisa uba bayakusigcina isivumelwano. Ngenxa yesisizathu besicela ukucebisa ukuba ungavezi inkcukacha zakho ezibuthathaka kwi qela le ngxoxo. Le ngxoxo izothatha ubude be hure enye.

Nceda uqonde oku; **ukuthabatha kwakho inxaxheba ayisosinyanzeliso koko kwenziwa ngokozithandela kwakho,** ukuba ukhetha ungathathi nxaxheba awuyikuchaphazeleka nangayiphi na indlela. Xa uthe wathatha inxaxheba unalo ilungelo lokuyeka nangaliphi na ithuba uthanda kwaye akuzubakho zohlwayo zaluphi na umhlobo.

Isicelo sethu kuwe

Siyakuceka ukuba wabelane nathi malunga nokutya okuthandayo, imibono kunye namava wakho malunga ne galelo okunako oku kutya kwezempilo.

Imfihlo

Lonke uluzwazi kunye noku rekhodwe kuwe kuzakugcinwa kwi Khomputha, inkcukacha zokuyivula zizokwaziwa ngabaphandi abathile kuphela. Abantu abangengabo abaphandi inkcukacha zokuvula le Khomputha zizobayimfihlo kubo kangangoko kunokwenzeka ngokusemthethweni. Ukuqinisekisa ukuba uphando lwenziwe ngokukuko, Ingxelo osinike yona ingaphononongwa ngamalungu e-Ethics Committee ase Dyunivesithi yase Fort hare.

Apho kuyimfuneko khona, uyacelwa ukuba usinike imvume yokurekhoda iqela ekugxilwe kulo ukuze sikwazi ukurekhoda ngokuchanekileyo oko kuthethiweyo.

Iimpendulo zakho ziya kugcinwa ekhompyutheni kwindawo ekhuselekileyo kwaye zisetyenziselwe uphando okanye iinjongo zemfundo ngoku okanye kwixla elizayo ngeendlela ezingazukuveza ukuba ungubani. Konke ukusetyenziswa kwedatha egciniweyo kuya kuxhomekeka kuphononongo lwe Research Ethics Committee.

Asizukurekhoda igama lakho naphina kwaye akukho mntu uya kuba nakho ukunxibelelana neempendulo ozinikayo ukuba ucela ukungachazwa kwesazisi sakho. Iimpendulo zakho ziya kudityaniswa nenombolo yekhowudi eyintsomi okanye isiteketiso (elinye igama) kwaye siya kubhekisa kuwe ngale ndlela kwidatha, nakuphi na ukupapashwa, ingxelo okanye ezinye iziphumo zophando.

Asinako ukuqinisekisa ukuba amalungu eqele azakugcina inkcukacha kunye nokuxoxiweyo kuyimfihlo

Ubungozi

Asikaboni bungozi abunothi benziwe kukuthabatha inxaxheba kolu phando lwemfundo. Ngokokubona kwethu umngcipheko ohlangabezana nabo imihla ngemihla bodlula ohlangabezana nabo koluphando.

Inzuzo

Akukho nzuzo ozakuyifumana ekhawulezileyo wena ngokuthatha inxaxheba kolu phando. Nangona kunjalo, olu phononongo luya kuba luncedo kakhulu kuthi kuba sinethemba lokuphucula ungenelelo lwezempilo loluntu ngokubhekisele kukutya.

Ngubani onokuqhagamshelana naye ukuba wenzakalisiwe okanye unayo nayiphi na inkxalabo

Olu phando luvunyiwe yi komiti ye Inter-Faculties Research Ethics (IFREC) ngokwegunya le University Research Ethics Committee (UREC). Ukuba uziva wenzakalisiwe nangayiphi na indlela ngoku thatha inxaxheba koluphando okanye unezikhalazo onazo, Nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ingxelo kunye nezikhalazo

Nceda uqhagamshelane no mphandi malunga nemibuzo okanye inkxalabo onazo malunga no luphando lwemfundo;inkcukacha zoqhagamshwelwano zomphandi okwayiyo ne nkokheki yale projeti zifumaneka kwi phepha lokuqala. Ukuba unemibuzo malunga namalungelo akho njengo mthathi nxaxheba, okanye une nkxalabo oziva ungakhululekanga ukuyithetha ku Mphandi nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ukuba unemibuzo okanye inkxalabo malunga nesisifundo nceda uqhagamshelane ngokukhululekiyo nomququzeli woluphando:

Umphandi / iNkokeli yeProjekthi: Dr RJ Chocko

Igama: U-Ronnie J A V Chocko

Icandelo / iSebe: Faculty of Health Sciences

Idilesi: Kuntselamazi road, Alice Eastern Cape
Ifowuni: 0747931553
I-imeyile: 202008585@ufh.ac.za

IFOMU YEMVUME ENOLWAZI

Mna(igama)…….. ndiyavuma ukuba u Dr Chocko undichazele malunga nesisifundo.

Ndiyayiqonda injongo yesisifundo, ikqubo, kunye nomyinge wenzuzo nomgcipheko waso.

Ndilinikiwe ithuba lokubuza imibuzo malunga nesi sifundo kwaye ndaphendulwa ngokwanelisekileyo.

Ndiyaxela ukuba Ukuthatha kwam inxaxheba akusosinyanzeliso kwaye ndinalo ilungelo lokuxhoxa koluphando nanini na.

(Ndixelelwe ngembuyekezo nangonyango olufumanekayo xa ndinokuthi ndenzakaliswe zikqubo ezinxulumene nesisifundo.)

Ndiyayiqonda uba ndizakunikwa ikopi yalemvume.

Ndiyayiqonda uba ndingaqhagamshelana ne Inter-Faculties Ethics Committee (IFREC) okanye i University Research Ethics Committee malunga ne mibuzo okanye izikhalazo endinazo ngamalungelo am njengo mthathi-nxaxheba okanye inkxalabo endisinazo ngesisifundo okanye Umphandi.

Utyikityo lomthathi-nxaxheba……

Imvume ye rekhodi- apho kuyimfuneko
Ewe/Hayi

Utyikityo…….

Utyikityo lwengqina……..

Utyikityo lomguquli……....

Ndiyayiqonda ukuba inkcukacha endizkuzinikeza koluphndo zizakugcinwa kwi komputha kwaye zizakusetyenziselwa uphando lwemfundo ngoku okanye kwixesha elizayo.

Utyikityo lomthathi nxaxheba:……

Umhla:……

Ingxelo kunye nezikhalazo

Nceda uqhagamshelane no mphandi malunga ne mibuzo okanye inkxalabo onazo malunga no luphando lwemfundo;inkcukacha zoxhagamshwelwano zomphandi okwayiyo ne nkokheki yale projeti zifumaneka kwi phepha lokuqala. Ukuba unemibuzo malunga namalungelo akho njengo mthathi nxaxheba L, okanye une nkxalabo oziva ungakhululekanga uzothetha ku Mphandi nceda uqhagamshelane nosihlalo we-UREC u-Prof. DT Goon ku dgoon@ufh.ac.za okanye u-Prof. RL van Niekerk ku leonvn@ufh.ac.za.

Ukuba unemibuzo okanye inkxalabo malunga nesisifundo nceda uqhagamshelane ngokukhululwkiyo nomququzeli woluphando:

Umphandi / iNkokeli yeProjekthi: UGqirha RJ Chocko

Igama: URonnie J A V Chocko

Icandelo / iSebe: Faculty of Health Sciences

Idilesi: Kuntselamazi road, Alice Eastern Cape

Ifowuni: 0747931553

I-imeyile: 202008585@ufh.ac.za

Appendix 4.1. English FGD interview guide

University of Fort Hare
Together in Excellence

Interview guide: Focus group discussion

CONFIDENTIAL: FOR ACADEMIC PURPOSES ONLY

Dear respondent, I am Dr. Chocko a Masters student at the Department of public health at the University of Fort Hare. I am conducting a research study on health care practitioners and patients at Victoria hospital in Alice. It would be greatly appreciated if you kindly participate in completing the following questions in total honesty. All information supplied is strictly confidential and is for academic purposes only.

Thank you.

Yours faithfully,

Dr. RJ Chocko

Section A: Biographical details

Instructions: Please fill in answers

1. Gender

Male ☐ **Female** ☐

2. Age group

18-24 ☐ **25-30** ☐ **31-40** ☐ **41-50** ☐ **50-60** ☐ **60-70** ☐ **70-80** ☐

80+ ☐

3. Race

African ☐ **Asian** ☐ **Caucasian** ☐ **Other** ☐

4. Home language

Afrikaans ☐ **English** ☐ **IsiXhosa** ☐ **Other** ☐

5. Formal education

None ☐ **Primary school** ☐ **High school** ☐ **Matriculant** ☐

Higher education ☐

6. Employment status

Employed ☐ **Unemployed** ☐ **Retired** ☐

7. Marital status

Never married ☐ **Married** ☐ **Divorced** ☐ **Widowed** ☐

8. Number of household members

---

9. **Biometrics and clinical data**

• Height _____

• Weight_____

•BMI_____

P.T.O.

Section B: Interview Guide

Questions;

1. **Please tell me about about the all the foods you normally eat during the day**
   Probes: Breakfast, lunch, supper, snacks, sweets, chips, cool drinks

2. **What are your favorite foods?**
   Probes: Meat, eggs, milk, fruits and vegetables, cooked, hot, fresh

3. **What are your least favorite foods?**
   Probes: Meat, eggs, milk, fruits and vegetables, cooked, hot, fresh

4. **What do you look at when deciding to eat certain foods?**
   Probes: Health reasons, affordability, taste

5. **Have you been diagnosed with and treated for any medical conditions?**
   Probes: Hypertension, diabetes, heart disease

6. **What do feel are the health consequences of eating the food you normally eat as part of your diet?**
   Probes: Gaining weight, heart disease, tooth decay

7. **What kinds of food do you feel will cause the most harm to ones' health?**

8. **Do you feel that adopting a diet with more plant-based foods (grains, fruits and vegetables) will result in better health condition compared to a diet with more animal-sourced foods (meat, eggs, milk)?**
   Probes: Why/ why not?

Appendix 4.2. IsiXhosa FGD interview guide

University of Fort Hare
Together in Excellence

Isikhokhelo sodliwonandlebe: iqela lengxoxo

UPHANDO LWEZEMFUNDO:OKUYIMFIHLO

Mthathi-nxaxheba obekekileyo

Ndingu Dr Chocko,ndenza izifundo ze-Masters in public health kwi dyunivesithi yase fort hare. Ndenza uphando lwezemfundo kubasebenzi kunye nezigulane Kwisiphedlele iVictoria eAlice. Ndingayivuyela kakhulu into yoba uthabathe inxaxheba koluphando ngokuthi uphendule lemibuzo ilandeyo ngokunyaniseka nangokuthembeka okupheleleyo. Ndicela ukugxinisisa oku kulandelayo: konke ozakuthi ukuphendule apha kuzogcinwa kuyimfihlo , kokwenjongo yezifundo kuphela kwaye kuzakusetsenziselwa izifundo kuphela.

OZITHOBILEYO

Dr RJ Chocko

ICANDELO A:inkcukacha zobume bomntu

Imiyalelo: Nceda ugcwalise Iimpendulo.

1.Isini

Indoda ☐ **ibhinqa** ☐

2. Ubudala

18-24 ☐ **25-30** ☐ **31-40** ☐ **41-50** ☐ **50-60** ☐

60-70 ☐ **70-80** ☐ **80+** ☐

3. Uhlanga

iAfrican ☐ **iAsian** ☐ **iCaucasian** ☐ **Okunye** ☐

4. Ulwimi lwasekhaya

iAfrikaans ☐ **iEnglish** ☐ **IsiXhosa** ☐ **Okunye** ☐

5. Imfundo esesikweni

Akhukho nanye ☐ **Amabanga aphantsi** ☐ **Amabanga aphezulu** ☐

Imatriki ☐ **Iziko lemfundo eliphakamileyo** ☐

6.Ubume benggesho

Uqeshiwe ☐ **Awuqeshwanga** ☐ **Umhlala phantsi** ☐

7.Ubume bomtshato

Awutshatanga ☐ **Utshatile** ☐ **Uwuqhawule umtshato** ☐

Umhlolo okanye umhlolokazi ☐

8. Mangaphi abalungu ekhaya

_____

9. Inkcukacha ngezempilo

• Ubude _____

• Ubunzima_____

• I-BMI_____

ICANDELO B: Isikhokhelo sodliwonandlebe

1. Nceda undichazele banzi malunga nokutya okutyayo ngemini yakho eqhelekileyo

(Umzekelo: Isidlo sakusasa, isidlo sasemini, isidlo sangokuhlwa, amashwamshwam, iilekese, iichips, iziselo ezipholileyo)

2. Kokuphi ukutya okuthandayo?

(Umzekelo: Inyama, amaqanda, ubisi, iziqhamo kunye nemifuno, okuphekiweyo, okushushu)

3. Kokuphi ukutya ongakuthandiyo?

(Umzekelo: Inyama, amaqanda ubisi, iziqhamo kunye nemifumo)

4. Zeziphi izinto ozijongayo xa uthatha isigqibo soba utye ukutya okuthile?

(Umzekelo:Izizathu zempilo, ukufikeleleka ngokwe xabiso, incasa)

5. Ingaba sikhona isifo sonyango onaso okanye owawukhe wanyangelwa sona?

(Umzekelo:Uxinzelelo lwegazi, isifo seswekile, isifo sentliziyo)

6. Xa ujonga ukutya okutyayo imihla ngemihla, zingathini iziphumo zako?

(Umzekelo: Weight gain, isifo sentliziyo, ukubola kwamazinyo

7. Kokuphi okona kutya ocinga kuyingozi kwezempilo?

8. Xa uthelekisa ukutya okunezityalo ezininzi (ukutya okuzinqozo, iziqhamo kunye nemifuno) kunye nokutya okufumana kwizilwanyane (nyama, smaqanda kunye no bisi) ucinga yeyiphi enokhokelela kwimeko yempilo engcono.

(Nceda ucacise)

Appendix 4.3. English KII interview guide

University of Fort Hare
Together in Excellence

Interview guide: Key-in-depth interview

CONFIDENTIAL: FOR ACADEMIC PURPOSES ONLY

Dear respondent, I am Dr. Chocko a Masters student at the Department of public health at the University of Fort Hare. I am conducting a research study on health care practitioners and patients at Victoria hospital in Alice. It would be greatly appreciated if you kindly participate in completing the following questions in total honesty. All information supplied is strictly confidential and is for academic purposes only.

Thank you.

Yours faithfully,

Dr. RJ Chocko

Section A: Biographical details

Instructions: Please fill in answers

1. Gender

Male ☐ **Female** ☐

2. Age group

18-24 ☐ **25-30** ☐ **31-40** ☐ **41-50** ☐ **50-60** ☐ **60-70** ☐ **70-80** ☐

80+ ☐

3. Race

African ☐ **Asian** ☐ **Caucasian** ☐ **Other** ☐

4. Home language

Afrikaans ☐ **English** ☐ **IsiXhosa** ☐ **Other** ☐

5. Formal education

None ☐ **Primary school** ☐ **High school** ☐ **Matriculant** ☐

Higher education ☐

6. Employment status

Employed ☐ **Unemployed** ☐ **Retired** ☐

7. Marital status

Never married ☐ **Married** ☐ **Divorced** ☐ **Widowed** ☐

8. Number of household members

---

9. **Biometrics and clinical data**

• Height _____

• Weight_____

•BMI_____

P.T.O.

Section B: Interview Guide

Questions;

1. **Please tell me about about the all the foods you normally eat during the day**
   Probes: Breakfast, lunch, supper, snacks, sweets, chips, cool drinks

2. **What are your favorite foods?**
   Probes: Meat, eggs, milk, fruits and vegetables, cooked, hot, fresh

3. **What are your least favorite foods?**
   Probes: Meat, eggs, milk, fruits and vegetables, cooked, hot, fresh

4. **What do you look at when deciding to eat certain foods?**
   Probes: Health reasons, affordability, taste

5. **Have you been diagnosed with and treated for any medical conditions?**
   Probes: Hypertension, diabetes, heart disease

6. **What do feel are the health consequences of eating the food you normally eat as part of your diet?**
   Probes: Gaining weight, heart disease, tooth decay

7. **What kinds of food do you feel will cause the most harm to ones' health?**

8. **Do you feel that adopting a diet with more plant-based foods (grains, fruits and vegetables) will result in better health condition compared to a diet with more animal-sourced foods (meat, eggs, milk)?**
   Probes: Why/ why not?

Appendix 4.4. IsiXhosa KII interview guide

University of Fort Hare
Together in Excellence

Isikhokhelo sodliwonandlebe: Udliwonandlebe olunzulu

UPHANDO LWEZEMFUNDO:OKUYIMFIHLO

Mthathi-nxaxheba obekekileyo

Ndingu Dr Chocko,ndenza izifundo ze-Masters in public health kwi dyunivesithi yase fort hare. Ndenza uphando lwezemfundo kubasebenzi kunye nezigulane Kwisiphedlele iVictoria eAlice. Ndingayivuyela kakhulu into yoba uthabathe inxaxheba koluphando ngokuthi uphendule lemibuzo ilandeyo ngokunyaniseka nangokuthembeka okupheleleyo. Ndicela ukugxinisisa oku kulandelayo: konke ozakuthi ukuphendule apha kuzogcinwa kuyimfihlo , kokwenjongo yezifundo kuphela kwaye kuzakusetsenziselwa izifundo kuphela.

OZITHOBILEYO

Dr RJ Chocko

ICANDELO A:inkcukacha zobume bomntu

Imiyalelo: Nceda ugcwalise Iimpendulo.

1.Isini

Indoda ☐ **ibhinqa** ☐

2. Ubudala

18-24 ☐ **25-30** ☐ **31-40** ☐ **41-50** ☐ **50-60** ☐

60-70 ☐ **70-80** ☐ **80+** ☐

3. Uhlanga

iAfrican ☐ **iAsian** ☐ **iCaucasian** ☐ **Okunye** ☐

4. Ulwimi lwasekhaya

iAfrikaans ☐ **iEnglish** ☐ **IsiXhosa** ☐ **Okunye** ☐

5. Imfundo esesikweni

Akhukho nanye ☐ **Amabanga aphantsi** ☐ **Amabanga aphezulu** ☐

Imatriki ☐ **Iziko lemfundo eliphakamileyo** ☐

6.Ubume benggesho

Uqeshiwe ☐ **Awuqeshwanga** ☐ **Umhlala phantsi** ☐

7.Ubume bomtshato

Awutshatanga ☐ **Utshatile** ☐ **Uwuqhawule umtshato** ☐

Umhlolo okanye umhlolokazi ☐

8. Mangaphi abalungu ekhaya

_____

9. Inkcukacha ngezempilo

• Ubude _____

• Ubunzima_____

• I-BMI_____

ICANDELO B: Isikhokhelo sodliwonandlebe

1. Nceda undichazele banzi malunga nokutya okutyayo ngemini yakho eqhelekileyo

(Umzekelo: Isidlo sakusasa, isidlo sasemini, isidlo sangokuhlwa, amashwamshwam, iilekese, iichips, iziselo ezipholileyo)

2. Kokuphi ukutya okuthandayo?

(Umzekelo: Inyama, amaqanda, ubisi, iziqhamo kunye nemifuno, okuphekiweyo, okushushu)

3. Kokuphi ukutya ongakuthandiyo?

(Umzekelo: Inyama, amaqanda ubisi, iziqhamo kunye nemifumo)

4. Zeziphi izinto ozijongayo xa uthatha isigqibo soba utye ukutya okuthile?

(Umzekelo:Izizathu zempilo, ukufikeleleka ngokwe xabiso, incasa)

5. Ingaba sikhona isifo sonyango onaso okanye owawukhe wanyangelwa sona?

(Umzekelo:Uxinzelelo lwegazi, isifo seswekile, isifo sentliziyo)

6. Xa ujonga ukutya okutyayo imihla ngemihla, zingathini iziphumo zako?

(Umzekelo: Weight gain, isifo sentliziyo, ukubola kwamazinyo

7. Kokuphi okona kutya ocinga kuyingozi kwezempilo?

8. Xa uthelekisa ukutya okunezityalo ezininzi (ukutya okuzinqozo, iziqhamo kunye nemifuno) kunye nokutya okufumana kwizilwanyane (nyama, smaqanda kunye no bisi) ucinga yeyiphi enokhokelela kwimeko yempilo engcono.

(Nceda ucacise)

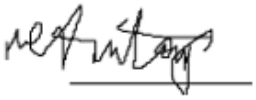
Appendix 5: Editing/proofreading confirmation

80 Currie Road
Berea
Durban
4001
27 July 2022

EDITING/PROOF READING CONFIRMATION

I hereby confirm that I have edited and proof read the Master's dissertation entitled: "Dietary preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa" by Ronnie J A V Chocko.

The dissertation has been edited and proof read for proper English language, grammar, punctuation, spelling and syntax. I believe the work to be free from errors. Although I have made comments and suggested corrections, the responsibility for the quality of the final document rests with the respective student.



V.C. Antony
B.A., B.Ed., M.A.(English)

Email: r.c.va.antony@gmail.com
Cell: 0828259493

Appendix 6: Turnitin report

Dietary preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa

by Ronnie J A V Chocko

Submission date: 03-Aug-2022 02:22PM (UTC+0200)
Submission ID: 1873746392
File name: research_dissertation_corrected.pdf (1.03M)
Word count: 20948
Character count: 119602

Dietary preference and perceptions of health implications: A qualitative study on perspectives from outpatients and health care providers at Nontyatyambo CHC, Eastern Cape, South Africa

ORIGINALITY REPORT

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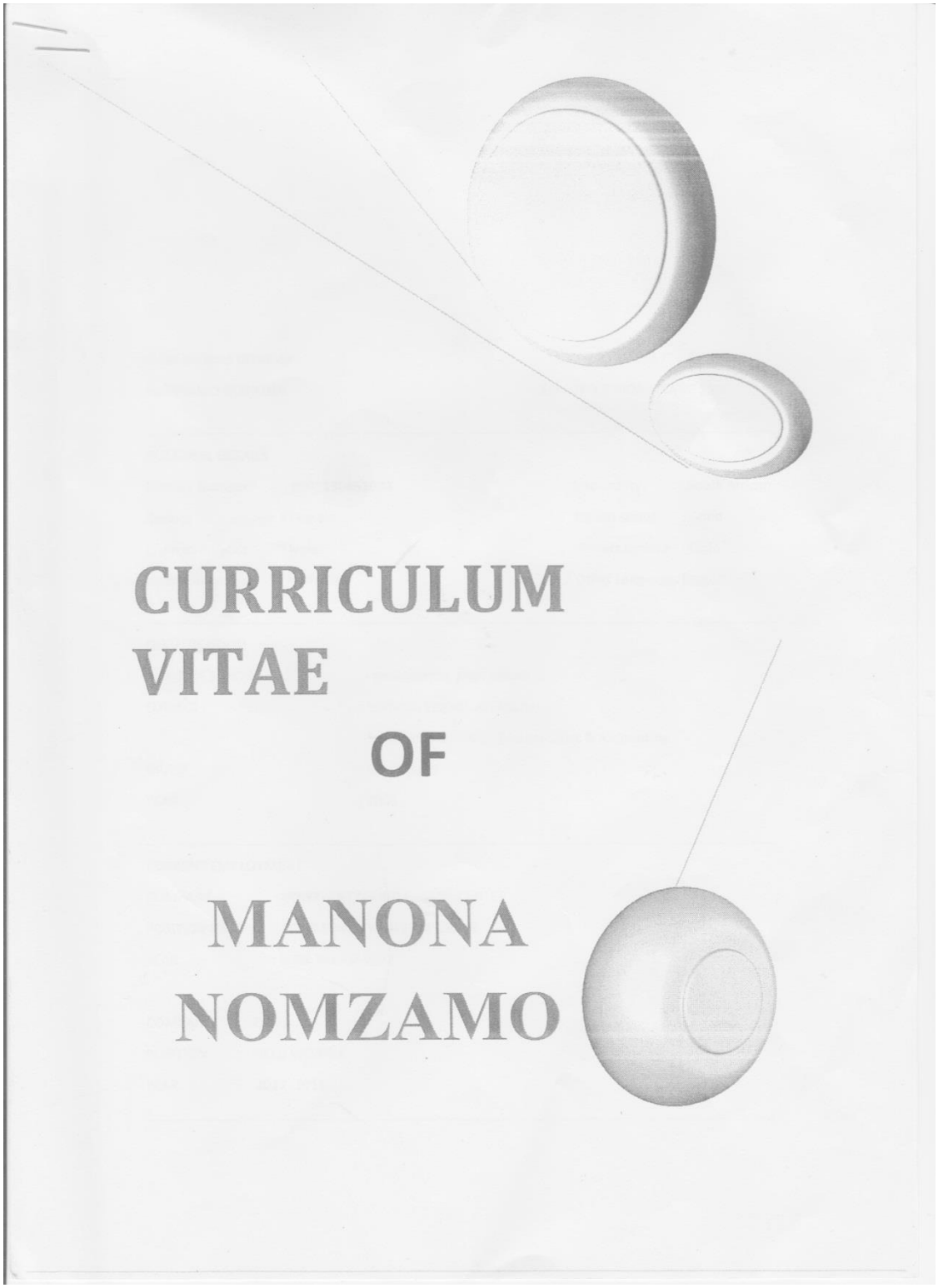
Appendix 7: CV of research assistant



CURRICULUM VITAE OF

NOMZAMO MANONA

082 674 5577

5636 N.U.2 MDANTSANE 5219

PERSONAL DETAILS

Identity Number	: 8903130863084	Nationality	: South African
Gender	: Female	Health status	: Good
Criminal Offence	: None	Drivers Licence	: Code
Home Language	: IsiXhosa	Other Language	: English

QUALIFICATION

NAME OF SCHOOL	: Wongalethu High School
SUBJECT	: IsiXhosa, English, Afrikaans, Business Economics, Mathematics & Accounting
GRADE	: Standard 9
YEAR	: 2006

CURRENT EMPLOYMENT

COMPANY	: NONTYANTYAMBO HEALTH CENTER
POSITION HELD	: COMMUNITY HEALTH WORKER
YEAR	: 2008 TILL TO DATE

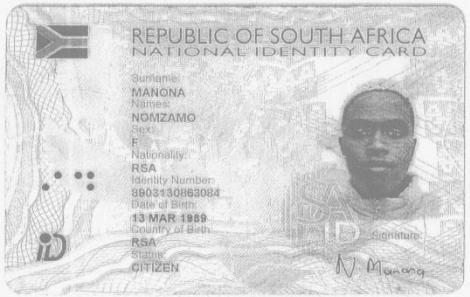
COMPANY	: ECRU
POSITION	: FIELD WORKER
YEAR	: 2017 -2018

REFFERENCE

MS.Z.NTANGA - 0725399400

MS.P.BOOI -043 7600420

MS.N.MISILE -0814049518


REPUBLIC OF SOUTH AFRICA
NATIONAL IDENTITY CARD
Surname:
MANONA
Names:
NOMZAMO
Sex:
F
Nationality:
RSA
Identity Number:
8903130863084
Date of Birth:
13 MAR 1989
Country of Birth:
RSA
Status:
CITIZEN
Signature:


Conditions:
This card has been issued by the Department of Home Affairs in terms of the Identification Act, Act 68 of 1997
Date of Issue:
14 AUG 2019
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