



**UNIVERSITY OF<sup>TM</sup>  
KWAZULU-NATAL**

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**INYUVESI  
YAKWAZULU-NATALI**

**Dietary practices as a lifestyle risk factor for non-communicable diseases among the elderly in a rural setting in KwaZulu-Natal.**

**By**

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**Submitted in partial fulfilment of the academic requirements for the degree of Master in Population Studies in the School of Built Environment and Development Studies, University of KwaZulu-Natal Howard College Campus**

**Durban**

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**DECLARATION - PLAGIARISM**

I, Maxwell Mbuso Zulu declare that:

This dissertation is my original research except where otherwise indicated. This dissertation has not been submitted for any degree or examination at any other university.

This dissertation does not contain other people’s data, unless specifically acknowledged as been sourced.

This dissertation does not have other people’s writing, unless specifically acknowledged. All the quoted sources have been referenced.

Where the exact words of participants have been used, their words has been placed in italics and inside quotation marks, and referenced.

Signed

.....

Date

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## **Abstract**

Increases in non-communicable diseases (NCDs) prevalence have been noted in low and middle income countries (LMICs). As a result, poor dietary practices have been identified as one of the leading modifiable risk factors for NCDs (Lim, Vos et al, 2012). This is because LMICs are undergoing through nutrition transition stage in the 21<sup>st</sup> century. However, studies have shown that there is a lack of research about NCDs prevalence in South Africa, in the population aged 50 years and above, even though South Africa has largest population aged 60 years and above in Sub-Saharan Africa (Phaswana-Mafuya et al, 2013, 2). Therefore, a qualitative study was conducted among 20 elderly participants, from age 65 years and above in a rural setting in KwaZulu-Natal. This was conducted through a semi-structured, in-depth interviews in Nyangwini, a rural setting in the South Coast of KwaZulu-Natal.

Health Belief Model (HBM) seven theoretical constructs were used in analysing the findings of this study. Among twenty participants of this study, nineteen participants had at least two to four NCDs, and only one participant had one NCD. These NCDs included high blood pressure, sugar diabetes, arthritis, cardio vascular diseases, cancer, kidney diseases and foot disease. According to this study, the most vulnerable age group to NCDs are the elderly, from age 60-70 years and above.

The major themes that emerged from this study, related to poor dietary practices, the frailty of old age, awareness about diet in relation to NCDs, no land to cultivate, lack of money, high costs of food, unappetizing healthy meals, scarcity of fresh/quality produce, poor quality of available healthful food, scarcity of seeds, scarcity of vegetables, scarcity of fruits and geographical isolation of the rural setting to healthy food, high sodium intake in food, high fat intake in food, eating too much and low food variety and dietary diversity . As a result, participants had a low consumption of fruits and vegetables. Moreover, due to poor status of the elderly participants in a rural setting, they had a high consumption of chicken and a low consumption of red meat.

This study has justified or established as a premise, the need for more research to be conducted about dietary practices as a lifestyle risk factor for NCDs among the elderly in a rural setting in KwaZulu-Natal.

Key concepts: dietary practices, nutrition transition, lifestyle, elderly, modifiable and non-communicable diseases.

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## **Definition of Terms**

The following definitions are presented for clear understanding of the terms and concepts used in this study. The list of acronyms used in this study follows next.

**Dietary Diversity (DD):** “Number of different foods or food groups consumed over a given reference period.” (Ruel, 2003, p. 3912 and Oldewage-Theron and Kruger, 2011, p.421).

**Dietary Practices:** Foods that are consumed on daily bases and the methods regularly used when preparing them.

**Food Coping Strategies (FCS):** “Mechanisms employed by households when the means of meeting needs are disrupted by one or a combination of factors, including drought, low income, or high food prices.” (Kruger et al, 2008, p.4).

**Food environments:** “The collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people’s food and beverage choices and nutritional status.” (Swinburn et al, 2013, p.25).

**International Network for Food and Obesity/NCD Research, Monitoring and Action Support:** It is a global network of public-interest organizations and researchers that aims to monitor, benchmark and support public and private sector actions to create healthy food environments and reduce obesity, NCDs and their inequalities.” (Swinburn et al, 2013, p.25).

**Modifiable Risk Factor:** It is a “behavioural risk factor that can be reduced or prevented by intervention, thereby reducing the probability of disease.” (CDC, 2015).

**Non-Communicable Diseases (NCDs):** “Chronic conditions that do not result from an (acute) infectious process and hence are “not communicable.” A disease that has a prolonged course, that does not resolve spontaneously, and for which a complete cure is rarely achieved. (McKenna, et al, 1998)” (CDC, 2015).

**Non-Modifiable Risk Factors:** Risk factors that cannot be controlled or be prevented by an intervention.

**Nutrition Transition:** “Changes in dietary patterns and nutrient intakes when populations adopt modern lifestyles during economic and social development, urbanization and acculturation is associated with the documented increases in NCDs.” (Vorster et al, 2011, 430).

Risk Factor: “An aspect of personal behaviour or lifestyle, an environmental exposure, or a hereditary characteristic that is associated with an increase in the occurrence of a particular disease, injury, or other health condition.” (CDC, 2015).

## **List of Acronyms**

CVD:	Cardiovascular Disease
CDC:	Centres for Disease Control and Prevention
DR-NCD:	Diet-Related Non-Communicable Disease
DALYs:	Disability-Adjusted Life Years
FAO:	Food and Agriculture Organization
FBDG:	Food-Based Dietary Guidelines
GBD:	Global Burden of Disease
HBM:	Health Belief Model
LMICs:	Low Middle Income Countries
MNA:	Mini Nutritional Assessment
NSP:	Non-Starch Polysaccharides
NSI:	Nutritional Screening Initiative
PURE:	Prospective Urban Rural Epidemiology
RA:	Rheumatoid arthritis
TNC:	Trade Negotiations Committee
WTO:	World Trade Organisation
WHO:	World Health Organisation

# Chapter 1

## Introduction

### 1.1 Introduction

Non-communicable diseases (NCDs) have become the leading cause of mortality in the 21st century. In the year 2017, World Health Organization (WHO) estimated that NCDs are responsible for 40 million deaths every year that is equivalent to 70% of deaths globally (WHO, 2017). Of even more concern was that NCDs were the cause of 17 million premature deaths (deaths before the age of 70). “Of these "premature" deaths, 87% are estimated to occur in low- and middle-income countries (LMICs)” (WHO, 2017). “Nearly 75 percent of NCDs deaths and 82 percent of premature NCD deaths (i.e. those occurring before the age of 70) – occur in low- and middle-income countries (LMICs)” (WHO, 2017). Cardiovascular diseases, cancers, respiratory diseases and diabetes, are the four leading morbidity and mortality NCDs, as they account for 81% of all NCD deaths (WHO, 2017).

In the light of the above, WHO, claims that these four leading NCDs were the principal causes of NCDs deaths in 2012. As a result, cardiovascular diseases contributed to 17.5 million deaths, cancers 8.2 million deaths, respiratory diseases, including asthma and chronic obstructive pulmonary disease 4.0 million deaths and diabetes 1.5 million deaths (WHO, 2014). Research has shown that, “causes of NCDs are multifactorial; these diseases may arise from any combination of underlying, modifiable, non-modifiable and intermediate risk factors” (Manning et al, 2016, p.1).

However, studies have shown that modifiable lifestyle risk factors are the most common causes of NCDs, which are “tobacco use, physical inactivity, unhealthy diets (with increased fat and sodium, with low fruit and vegetable intake) and excessive alcohol consumption that translate into cardiovascular disease, diabetes, and cancer” (CDC, 2015, Manyosi et al, 2009, p.3 and WHO, 2017). Of these lifestyle risk factors, poor diet causes a greater population burden of morbidity and mortality from NCDs than tobacco, alcohol and physical activity combined, according to the findings presented by the Global Burden of Diseases Study 2010 (Lim et al, 2012). Henceforth, this study’s main focus is about dietary practices as the lifestyle risk factors for NCDs.

## **1.2 The Problem Statement**

Researched evidence has indicated that dietary practices remains the major lifestyle risk factor for NCDs in the world today. “Nonetheless, degenerative aging processes are the major underlying cause for NCDs, including cancer, ischemic heart disease, stroke, type 2 diabetes, Alzheimer's disease and others” (Jin et al, 2015, p.2). This statement is a call for researchers, health practitioners, world governments, international organizations and non-governmental organizations, to prioritise research on older adults and the elderly. NCDs are regarded as “diseases of long duration generally slow progression and they are the major cause of adult mortality and morbidity worldwide” (Kwan, 2013, p.6). Moreover, studies are showing that specifically, there is a lack of research about NCDs prevalence in South Africa among the adult and elderly people. Even though South Africa “has the second largest population aged 60 years or above in sub-Saharan Africa. Yet, little is known about the prevalence of chronic NCDs in the population aged 50 years and above in South Africa” (Phaswana-Mafuya et al, 2013, p.2).

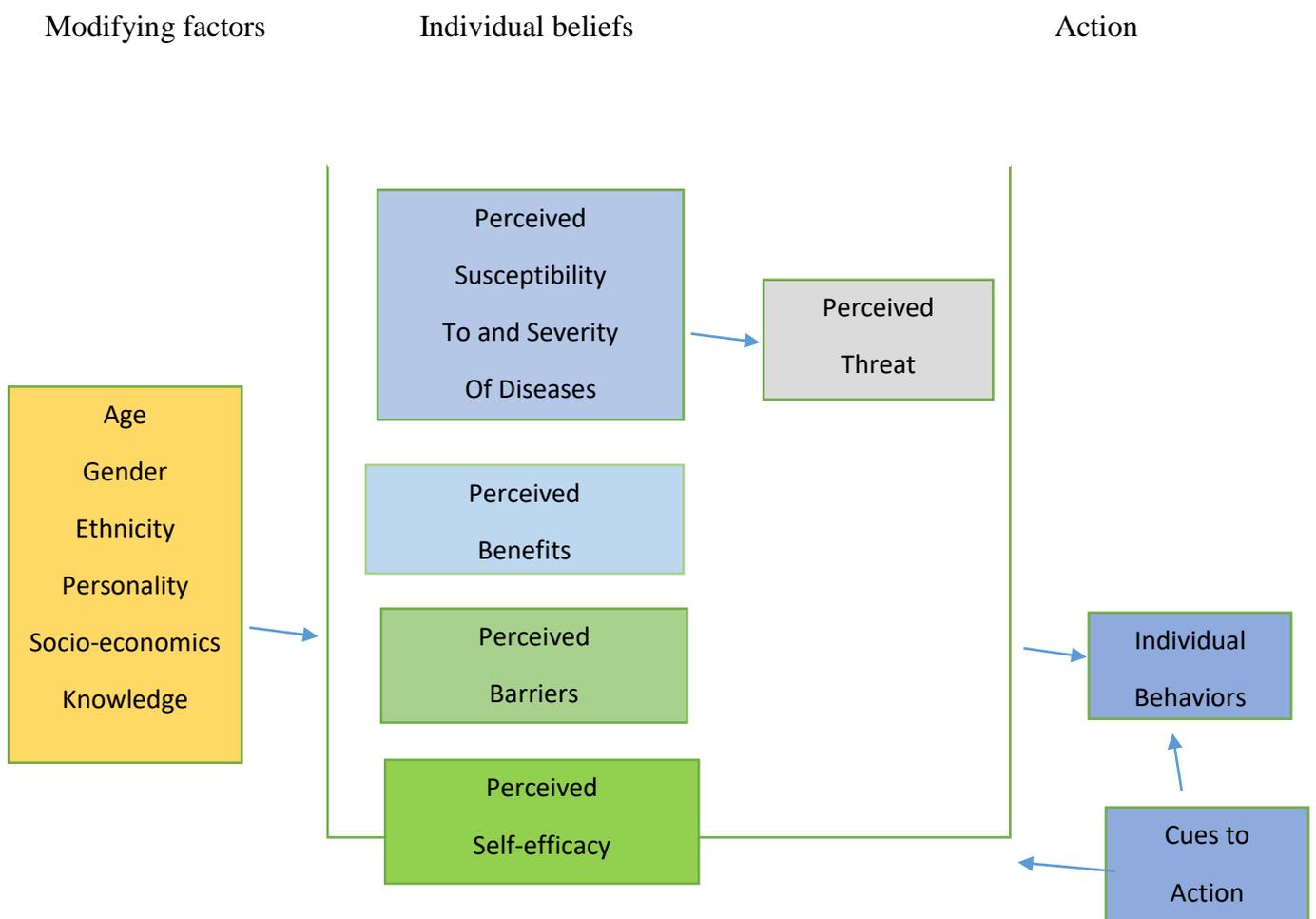
In addition, although studies have been conducted about lifestyle risk factors for NCDs in South Africa, the focus has been mainly in the urban settings. This was because historically, the urban population has been the most vulnerable to NCDs because of the nutrition transition that comes with economic and social development in urban settings (Vorster et al, 2011). However, research evidence has shown that, in the 21st century nutrition transition has taken place both in the high income and the low and middle income countries, between the rich and the poor, in the urban and the rural areas (Evans et al, 2015, Foley and BeLue, 2016, Holms et al 2010, Manyosi, et al, 2009 and Narayan et al, 2016). As a result, nutrition transition/dietary transition had been highlighted as the most common cause of NCDs in developing countries (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.55). In this way, this investigation will be focusing on the dietary practices as a lifestyle risk factor for NCDs among the elderly in rural areas of KwaZulu-Natal, in South Africa.

## **1.3 Theoretical Framework**

The Health Belief Model (HBM) is a theoretical framework typically thought to be developed by Rosenstock (1974), a United States public health researcher. However, he attributes the HBM to Hochbaum (1958) (Sheeran and Abraham, 2005). Hochbaum had conducted research, where he discovered that individuals who believed that they were susceptible to tuberculosis were keen to change their behaviours to reduce their risk. The focus of the HBM is to assess

health behaviour of individuals through examination of perceptions and attitudes someone may have towards disease and negative outcomes of certain actions. Skinner et al, describe the HBM in seven constructs/components (Skinner et al, 2015, p.76). Presented below is a diagram of HBM seven constructs:

**Figure 1.3** Constructs of Health Belief Model



Source: Skinner, Tiro and Champion, 2015, p.79

These constructs would “predict whether and why people took action to prevent, detect and control illness conditions.” (Skinner et al, 2015, p.76).

- Perceived susceptibility is a belief about the chances of experiencing a risk or getting a condition or disease (Champion and Skinner, 2008).
- Perceived severity is a belief about how serious a condition and its possible outcomes would be to the individual (Champion and Skinner, 2008).
- Perceived benefits, is a belief in the efficacy of the advised action to reduce risk or seriousness of impact (Champion and Skinner, 2008).
- Perceived barriers, is a belief about the tangible and psychological costs of the advised action (Champion and Skinner, 2008).
- Cues to action, are the strategies to activate readiness (Champion and Skinner, 2008). “Cues could be internal (e.g., feeling a symptom that increased perceived threat) or external (media publicity, a recommendation from a physician during an office visit, receipt of a free sample, or even a friend diagnosis)” (Skinner et al, 2015, p.77).
- Self-efficacy is “the conviction that one can successfully execute the behaviour required to produce outcomes” (Champion and Skinner, 2008).
- “Perceived threat is the construct formed by the combination of susceptibility and severity. Perceived susceptibility should be multiplied by perceived severity to calculate perceived threat; thus if either of these components is zero, the perceived threat would be zero.” (Skinner et al, 2015, p.77).

The overall statement of HBM is that people are likely to engage in health behaviour if they believe that:

1. “They are susceptible to a condition (at risk for a disease).
2. The condition could have potentially severe consequences.
3. A course of action (behaviour) available to them would be of benefit in reducing either their susceptibility to or the severity of the condition.
4. There are perceived benefits to taking action.
5. Their perceived barriers (or costs) are outweighed by the benefits and are not strong enough to prevent action.” (Skinner et al, 2015, p.77).

“The HBM applies to behaviours with the potential to reduce risk of developing a diseases as well as the effects of an existing disease. (e.g., medication adherence).” (Skinner et al, 2015, p.77). Therefore, HBM will help in exploring the elderly’s beliefs, to assist in developing changes from unhealthy diets, into healthy diets among the elderly in the rural areas of KwaZulu-Natal.

## **1.4 The Main Purpose**

Dietary practices as a lifestyle risk factor for non-communicable diseases among the elderly in a rural setting in KwaZulu-Natal.

## **1.5 Objectives**

In addition, the research intends to achieve the following aims, which are an extended tool for the main objective:

1. To describe the perceived susceptibility to NCDs among the elderly in a rural setting.
2. To describe the perceived severity of NCDs among the elderly in a rural setting.
3. To describe awareness of dietary practices that reduce the susceptibility or severity of NCDs exists among the elderly.
4. To identify the perceived benefits of a healthy diet among the elderly in a rural setting.
5. To identify barriers to adopting healthier eating patterns among the elderly in a rural setting.
6. To describe potential cues to action in adopting a healthy diet among the elderly in a rural setting.
7. To describe the self-efficacy of a required behaviour, in order to produce a required outcome.
8. To describe the perceived threats of NCDs among the elderly in a rural setting.

## **1.6 Questions to be asked**

In addition, this research seeks to answer the following questions:

1. What are the factors associated with the elderly perceiving themselves to be at risk of NCD?
2. What is the perceived severity of NCDs among the elderly in a rural setting?
3. What awareness of dietary practices that reduce the susceptibility or severity of NCDs that exists among the elderly, the elderly are aware of, as related to NCDs?
4. What are the perceived benefits of a healthy diet among the elderly in a rural setting?
5. What are the perceived barriers prohibiting healthier eating patterns among the elderly?
6. What could be the potential cues for a healthy diet among the elderly in a rural setting?

7. What is the self-efficacy of a required behaviour, in order to produce a required outcome, among the elderly in a rural setting?
8. What are the perceived threats of NCDs among the elderly in a rural setting?

### **1.7 Location of the Study**

The location of the study was at Mthwalume, a rural setting at the south coast of KwaZulu-Natal, 8 kilometres away from Port Shepstone. The identified area is under Luthuli Tribal Authority and falls under Umzumbe municipal district. The targeted area in Luthuli tribal authority is, Nyangwini. The research focused on Africans, of whom the majority of the elderly among them is without secondary education. The majority among them rely on government pension fund for a living.

### **1.8 Non-Communicable Diseases in Urban and Rural South Africa**

“Heart disease, diabetes, and stroke together constitute the second most important cause of death in adult South Africans” (Manyosi, 2009). As a result, data from Statistics South Africa (Stats-SA) for (1999-2006) suggest that adult deaths (15-64 years) from strokes increased by 28% in 2003 and deaths from ischaemic heart disease increased by 17% in 2003. In a recent study high blood pressure, “heart disease and stroke were found to be more prevalent amongst diabetic individuals compared to non-diabetics,” in South Africa (Mutymbizi, 2017, p.6). In addition, it was found to be very common among the elderly. As a result, it is said that the assertion that the risk of acquiring cardiovascular disease is more than double to those who are diagnosed with diabetics might be true. Once again this finding raises the question about the elderly and NCDs.

“The past 15 years of political transition in South Africa have seen a rise in non-communicable diseases, driven by an increase in relevant risk factors in urban and rural areas, and by an ageing population despite the substantial overall reduction in life expectancy as a result of HIV/AIDS” (Manyosi, et al, 2009, p.934). Political transition was a very critical period in South African history in relation to health care. For instance, for the first time in history of South Africa, the government provided a Constitution, under section 2.7 in chapter 2 as a public health policy, in which it’s stipulated the right of every person to “access health care services, including reproductive health care.” Now, the question remains. Why at this transitional period, South Africa saw a rise in NCDs? Several reasons can be given, to justify why this health transition took place particularly, at this point in time in South African history:

- This coincided with health transition in which South Africa saw the rise in NCDs due to dietary transition that was promoted by an urban influx, as a result, people having access to processed foods both in urban and rural areas where diet has also changed (Manyosi et al, 2009).
- Secondly, South Africa was having an increase in ageing population, although this remains an ambiguous phenomenon due to reduced life expectancy in the country because of HIV/AIDs. Statistically, South African life expectancy at birth was 53 years in 2006, improved in 2016 to “59, 7 years for males and 65, 1 years for females and improved in 2017 to “61,2 years for males and 66,7 years for females” (Stats SA, 2016 and 2017).
- Thirdly, it is already stated that South Africa is the second largest country aged 60 years or above in Sub-Saharan Africa (Phaswana-Mafuya et al, 2013).
- Fourthly, a study conducted in a rural setting in Limpopo found that the “leading causes of death in men and women aged 50–64 years and 65 years and older draws attention to the rise in deaths from cardiovascular disease, notably in women aged 65 years and older” (Manyosi, et al, 2009, p.935). In this finding the elderly are presented as being in the spotlight of NCDs.
- In a study conducted in Cape Town “people living in the poor sub-district of Khayelitsha have 856.4 deaths per 100 000 attributable to NCDs compared with rates of 450–500 per 100 000 in the wealthy northern and southern sub-districts of Cape Town” (Manyosi, 2009). The figures presented above are showing that NCDs are deeply rooted in South Africa, both these rates for urban rich and urban poor are high.
- Finally, in 2001 South African population census, stated that, the country had 7.3% of the elderly aged 60 years and older. In addition, “the population aged 60 years and older is projected to rise almost three-fold, growing by 189%” from 1985 to 2025 (Manyosi, et al, 2009, p.936).

All of the above validates the fact that the elderly people in South Africa are growing at a high rate and therefore, NCDs prevalence particularly among the elderly cannot be overlooked. As a result, “Leeds and colleagues” are projecting that CVD mortality will result, in doubling the number by 2040 (Manyosi, et al, 2009). This implies that CVD mortality would increase from 12% in 2004 to 24% by 2040 in South Africa. This calls for an urgent attention, to have an action plan in place to prevent the escalation of the NCDs, or else, South Africa is yet to see an increase in CVD deaths among the elderly.

## **1.9 Conclusion**

In relation to the above discussion, it is clear that NCDs are increasingly becoming an epidemic to eradicate the elderly community in the 21st century. Evidence, has shown that the most vulnerable victims are the poor elderly in LMICs. However, the evidence already provided, has also indicated that some of the developing upper middle-income countries, like South Africa for instance, lack the adequate research about the in-depth growth of NCDs. As a result, South Africa is lacking policies and proper mechanisms to curb the outbreak of NCDs. In addition, NCDs have made their mark in the rural settings and are bound to escalate, as South Africa is the “fastest-growing elderly population in the Southern African region” (Mkhize et al, 2013, p.1). Given the fact that South Africa is largely rural, more research about NCDs need to be conducted in the rural areas.

## **1.10 Organization of the remainder of the Study**

**Chapter 2** outlines a review of the literature about dietary practices, in relation to the problem being investigated. Sub-topics that will be covered are the following: Introduction, The Nutrition Transition, Dietary Measures to Prevent DR-NCDs, Dietary Practices in Urban and Rural South Africa, Dietary Practices of the Elderly in the 21st Century, Dietary Practices of the Elderly in South Africa and Conclusion.

**Chapter 3** presents methodology and the procedures that will be applied in collecting the data. Therefore, the following sub-topics will be covered: Introduction, Qualitative Research, Health Belief Model, Sampling Method, Study Approach Applied, and Delimitation of the Study, The Study Settings, Nyangwini Sample Account, Ethical Guidelines Undertaken, Thematic Analysis, Coding, Validity, Reliability and Rigour, Credibility, Transferability, Dependability, Conformability and Conclusion.

**Chapter 4** presents data analysis, the results and findings that will emerge from the study. Summery about the findings of the study will also be included in this chapter.

**Chapter 5** outlines discussion, and recommendations, for further study. In addition, conclusion drawn from the findings of this study will be part of chapter 5.

## **Chapter 2**

### **Literature Review**

#### **2.1 Introduction**

The intention of this chapter is to show the parallel relationship that exists between the nutrition transition and non-communicable diseases in the 21st century. In addition, it seeks to justify why NCDs are a relevant case study for societies both in urban and rural settings, in the 21st century. Therefore, processed foods are increasingly becoming the most favourable meals because of their added, (man-produced) flavours. In this way, traditional healthy diets, rich in low glycaemic index carbohydrates and dietary fibre are replaced by processed unhealthy diets however, in a long run are being discovered to be detrimental to people's health, hence people suffers from DR-NCDs. This chapter will also present the historical background on the nutrition transition in 21st century. Measures of dietary practices recommended by WHO and Food Agriculture Organization (FAO), to control the prevalence of NCDs will be discussed. The special focus about dietary practices is applied to the elderly in the rural settings, in different parts of the world and South Africa in particular. This is because the elderly are the most vulnerable to DR-NCDs, because of the frailty of their health status.

#### **2.2 The Nutrition Transition**

Due to industrial revolution, the western world adapted to “radical changes in methods of food production, processing, storage, and distribution.” As a result, this has “modified dietary preferences, and consequently, led to major changes in the composition of diet” (Uusitalo et al, 2002, p.1). “Changes in the composition of diet” therefore, meaning dietary or nutrition transition in the 21st century. Dietary or nutrition transition can be defined as “changes in production, processing, availability, and consumption of foods as well as changes in nutrient intake, when populations adopt modern lifestyles during economic and social development, therefore, urbanization and acculturation is associated with the documented increases in non-communicable diseases.” This also includes “anthropometrical measures and physical activity” (Uusitalo et al, 2002, p.1 and Vorster et al, 2011, p.430). However, dietary transitions did not only occur in the developed western countries, but over time globalisation became the contributing factor to dietary shifts which are taking place in low and middle income countries around the world. Consequently, globalisation has directly or indirectly affected the entire world on food and dietary composition through “large transnational corporations that

increasingly organize food production, distribution and marketing on a global scale” (Uusitalo et al, 2002, p.5). This was happening through the dominant world and regional transnational corporations such as World Trade Organisation (WTO) and Trade Negotiations Committee (TNC). These two organizations are part of the most influential organisations that control food in the world. In addition, Popkin 2002 observed that while dietary shifts took place for a period between 100 and 200 years in developed countries, the shift has been rapid, occurring over a period of decades in the developing countries. As a result, Popkin claims that “even the poor nations had access to a relatively high-fat diet by 1990,” and “large shifts toward increased edible oil intake, and increased sweetening of the diet by dramatic jumps in added sugar intake,” (the latter is based on Popkin’s unpublished research) (Popkin, 2002, p.207 and 2004, p.141). In addition, Popkin states that the rising burden of non-communicable diseases is “the most globally pervasive change among nutrition health related transitions” (Popkin, 2003, p.590). The prevalence of NCDs have affected many of the regions of the developing world to the extent that the “NCDs prevalence is equal or greater than in the United States” (Popkin, 2003, p.590).

Comparative measures were undertaken to project the costs between malnutrition and diet related non-communicable diseases (DR-NCDs) in China and India. Data from research conducted “in 2000-2002, using large National Health Service cost data obtained from the 1998 National Survey of Health Services for China, and the 1995-96 National Sample Survey for India was linked with the undernutrition study undertaken by (Popkin et al, 2001a, b, Horton, 1999, Ross and Horton, 1998).” Therefore, the results are showing that the costs of DR-NCDs will dominate in China by 2025 and “for India the current costs of under-nutrition are greater, but the two are more likely to become equal by 2025” (Popkin, 2003, p.591-592). This implies that in the developing world burden of NCDs is increasing at high rate.

Popkin, in this instance is used as a secondary source quoted by Piot, elaborates on how nutrition transition has related to demographic changes over the past centuries and its continuing relationship to demographic changes in the 21st century. Therefore, he claims, “the pace of dietary change appears to have accelerated to varying degrees in different regions of the world...and it is paralleled by major changes in health status as well as by major demographic and socioeconomic changes” (Piot, 2008, p.601). Thus Popkin illustrates that “two extant theories of change address key factors that affect and are affected by nutritional change.” In addition, he states that they mirror the demographic and disease change:

- Demographic transition-“the shift from a pattern of high fertility and high mortality to one of low fertility and low mortality (typical of modern industrialized nations).
- The epidemiologic transition- the shift from a pattern of high prevalence of infectious diseases and malnutrition, resulting from pestilence, famine, and poor environmental sanitation, to a pattern of high prevalence of chronic and degenerative diseases strongly associated with lifestyle.” (Piot, 2008).

**Table 2.1** below depicts the pattern of the nutrition transition

Transition profile	R	Pattern 2: Famine	Pattern 3: Receding famine	Pattern 4: Degenerative disease	Pattern 5: Behavioural change
1. Nutrition profile Diet	Plants, low-fat wild animals; varied diet	Cereals predominant, diet less varied	Fewer starchy staples; more fruits, vegetables, animal protein; low variety continues	More fat (especially from animal products), sugar, and processed foods; less fibre	Less fat and processing; increased carbohydrates, fruits, and vegetables
Nutritional status	Robust, lean, few nutritional deficiencies	Children, women suffer most from low fat intake; nutritional deficiency diseases emerge stature declines	Continued maternal and child (MCH) nutrition problems; many deficiencies disappear; weaning diseases emerge; stature grows	Obesity; problems for elderly (bone health, etc.); many disabling conditions	Reduced body-fat levels and obesity; improved bone health
2. Economy	Hunter-gatherers	Agriculture, animal husbandry, homemaking begin; shift	Second agricultural revolution (crop rotation, fertilizer); Industrial	Fewer jobs with heavy physical activity; service sector and	Service sector mechanization, industrial robotization dominate;

		to monocultures	Revolution; women join labour force	mechanization ; household technology revolution	leisure exercise grows to offset sedentary jobs
Household production	Primitive; onset of fire	Labour-intensive, primitive technology begins (clay cooking vessels)	Primitive water systems; clay stoves; cooking technology advances	Household technology mechanizes and proliferates	Food preparation cost falls significantly with technological change
Income and assets	Subsistence ; primitive stone tools	Subsistence; few tools	Increasing income disparity; agricultural tools; industrialization rises	Rapid growth in income and income disparities; technology proliferation	Income growth slows; home and leisure technologies increase
3. Demographic profile Mortality/ Fertility	Low fertility, high mortality, low life expectancy	Age of Malthus; high natural fertility, low life expectancy, high infant and maternal mortality	Slow mortality decline, later rapid; fertility static, then declines; small, cumulative population growth, later explosion	Life expectancy hits unique levels (60s–70s); huge fertility declines and fluctuations (e.g., post-war baby boom)	Life expectancy extends to 70s, 80s; disability free period increases
Morbidity	Much infectious disease; no epidemics	Epidemics; endemic disease (plague, smallpox, polio, tuberculosis) ; deficiency disease begins; starving common	Tuberculosis, smallpox, infection, parasitic disease, polio, weaning disease (diarrhoea-retarded growth) expand, later decline	Chronic disease related to diet, pollution (heart disease, cancer); infectious disease declines	Increased health promotion (preventive and therapeutic); rapid decline in coronary heart disease, slower change in age-specific cancer profile
Age structure	Young population	Young, very few elderly	Chiefly young; shift To older population	Rapid fertility decline; elderly proportion	Increasing proportion of elderly > 75

			begins	increases rapidly	
Residence patterns	Rural, low, density	Rural, a few small crowded cities	Chiefly rural; move to cities increases; international migration begins; megacities develop	Urban population disperses; rural green space reduced	Lower-density cities rejuvenate; urbanization of rural areas encircling cities increases
4. Food processing	Non-existence	Food storage begins	Storage process (drying, salting); canning and processing technologies; increased food refining and milling	Numerous food-transforming technologies	Technologies create foods and food constituent substitutes (e.g., macronutrient substitutes)

Source: Piot, 2008, p.603-604

Table 2.2 depicts how nutrition transitions patterns have developed over the past three centuries, until now. This has occurred in five consecutive patterns of nutrition transition:

- Pattern 1, was characterised by Collection of food period, having good diet that was “high carbohydrates and fibre and low in fat, especially saturated fat.” As a result, “activities were high and obesity levels low.”
- Pattern 2, was characterised by Famine period, as a result, many societies of the world were living in chronic poverty, due the scarcity food, even though these changes are “related to shift toward settlements and cultivation, first of crops and later also livestock and poultry”
- Pattern 3, Receding famine period was characterised by the increased animal protein, fruit and vegetable consumption, and this was the “development of a more technically advanced and productive agriculture.”
- Pattern 4, Degenerative disease period is characterised by a diet that is “high in total fat, cholesterol, sugar, and other refined carbohydrates and low in polyunsaturated fatty acids and fibre, often accompanying an increasingly sedentary life.”
- Pattern 5, is a “newfound pattern” according to Popkin. Behavioural change period is therefore, characterised by the “increased intake of fruits, vegetables, and

carbohydrates and reduced intake of processed foods, meat, and dairy products.” (Abrahams et al, 2011, p.2 and Piot, 2008, p.605).

The main objective of this dietary pattern (Behavioural Change) is to “prevent or delay degenerative diseases” and prolong people’s health. (Piot, 2008, p.605). This is not about merely understanding the relationship about dietary and health transitions, however, it is about redefining “program and policy changes that could redirect the nutrition transition in many regions of the world,” Popkin emphasised. If all regions and countries of the world could adhere to the final stage, NCDs will be prevented or delayed, and as a result, more of the elderly would have a longer life expectancy. It is therefore, important to acknowledge that most high-income countries are currently undergoing through the final stage, while the developing countries are still experiencing the burden of degenerative disease risk factors, at different stages.

“Furthermore, rural and urban areas within the same country may be at different stages of the transition” (Abrahams et al, 2011, p.2). For instance, it may happen that in the urban areas the population may have undergone through the fourth stage, which is degenerative disease and therefore, improved to the last stage, which is behavioural change. This will than mean that urban population is able to avoid NCDs, by having access to healthy diet. On the other hand, a population in a rural area may be still undergoing through stage four, which is degenerative disease, implying that will be having the burden of disease. That will mean that the rural population will be feeding on an unhealthy diet at that stage, however, it is important to note that due to poorer background, an unhealthy diet might be the only affordable option for such population.

According to researchers, food systems also play the vital role in influencing the dietary transition of the 21st century. “Food systems comprise all the processes involved in keeping us fed: growing, harvesting, packing, processing, transforming, transporting, marketing, consuming and disposing of food” (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.82). As a result, food processing “affects our health directly and indirectly by the quantity, quality, and safety of the food we eat” (Shannon et al, 2015, p.157). For instance, the radical shifting of dietary patterns has resulted, in the “substantial increases in the consumption of soft drinks, snack foods, high fat dairy, added sugars and other energy-dens, poor nutrients food and beverages” (Shannon et al, 2015) in the United States. Henceforth, this has led to the increasing morbidity of DR-NCDs in the developed world and then developing world respectively. Consequently, in the United States DR-NCDs are among the leading causes

of premature “morbidity and mortality.” These DR-NCDs, includes, “cardiovascular disease, type 2 diabetes, metabolic syndrome, and certain types of cancers have been associated with elevated intake of red meat and processed meat, added sugars, saturated fats and trans fats.” In addition, poor diets has alarming effects on malnutrition, obesity and DR-NCDs, in low-income minority populations of urban and rural areas in the United States (Shannon et al, 2015).

Food systems are in a profit-making scheme, as a result, they do not care for the health of the population they are serving, and this cause the world population to be susceptible to NCDs. It is now the time for the world governments and the international communities’ structures to put control mechanism structures on how food systems should operate, in order to eliminate unhealthy diets in the food industry.

Studies reveals that low and middle-income countries of the developing world are “showing the fastest growth in sales for processed foods that contribute calories, sugars, salt and fats, but little in the form of fruits and vegetables, legumes, wholegrains and micronutrients” (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.52). For instance, among the high income group, “highly processed foods take 65% of the value of the food basket compared to 35% for this group in rural areas” in both Eastern and Southern regions of Africa (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.55). There are several reasons that can be given which may be considered the underlying factors to this:

More than 54% of the world’s population lives in urban areas than in rural areas (United Nations 2014, p.2 and 8).Secondly, “the rate of urbanization, measured as the average annual rate of change of the percentage urban, is highest in Asia and Africa, where currently the proportion urban is increasing by 1.5 and 1.1 per cent per annum, respectively” (United Nations 2014, p.2 and 8). Thirdly, urban areas are “adopting a more Westernized diet owing to a greater availability of such foods in urban areas” (Steyn et al, 2014, p.90). Fifth, people with more disposable income at the household level, with the high level of education are used in adopting “new dietary patterns, particularly when trade policies have made convenience foods available and prolific” (Steyn et al, 2014, p.90). Sixth, rapid economic growth is a key factor to dietary transition. (Piot, 2008, p.647). Finally, above all, “mankind has an inherent preference for energy dense, smooth (refined, highly processed), salty, fatty and sweet convenience foods and snacks,” having this in mind the industry made them accessible at affordable prices in the developing world (Vorster et al, 2011, p.434).

In addition, studies have shown that “more than 60% of women surveyed in six African countries report not consuming any fruits and vegetables rich in vitamin A in the previous 24 hours.” Above all, the Global Panel on Agriculture and Food Systems for Nutrition recommends that “an individual’s nutrient needs change with age; as certain nutrients become harder to absorb via diets (e.g. vitamin B12), in part because older adults often eat less, but also because their diets change.” Therefore it is essential that the “diet quality of adults becomes more important as populations age as mortality becomes related to non-communicable rather than communicable diseases” (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.72).

The significance of the above statement gives an explanation on why the NCDs are predominantly associated with the elderly in the population age groups. In addition, Solomons and Bermudez gives an analysis to this with insightful specifications about the adaptation functioning, the elderly bodies become predisposed into, as they grow older. They start by explaining that, “aging affects the structure and function of the digestive system from the oral cavity with loosening or loss of dentition and decreased saliva flow to slowing of propulsive (peristaltic) motility throughout the entire length of the tract” (Solomons and Bermudez, 2008, p.581). Therefore, faecal excretion becomes less frequent and more difficult, thus causing constipation among the elderly. Meanwhile, “the parietal cells lining the stomach of older persons, however, often suffer exhaustion.” The nutritional consequences will be the “reduced iron solubility and insufficient intrinsic factor for vitamin B12 absorption” (Solomons and Bermudez, 2008, p.581). However, the more fibre-rich traditional diets of rural cultures in developing societies would tend to counteract the constipating features of neural aging (Piot, 2008). The latter would mean that the elderly in some developing countries should be encouraged to eat more of their indigenous diets, as they are healthier, health protective and richer in carbohydrates, “than more modern ones” (Solomons and Bermudez, 2008, p.591). However, Piot conclude that the outcomes for diet and nutrition of the elderly in the developing world have been little examined, thus are poorly understood. Furthermore, the nutrition transition in the developing world “is bringing forth a dual burden of malnutrition, with problems of under- and overweight” (Solomons and Bermudez, 2008, p.595).

The Prospective Urban Rural Epidemiology (PURE) established an unexpected link between sodium intake and cardiovascular mortality PURE researchers concluded, “for those without hypertension, an inverse relationship might exist between sodium intake, all-cause mortality,

and cardiovascular events” (Feigin, 2016, p.1708). This was then, perceived as a challenge to the longstanding beliefs in public health about sodium intake at population level. As a result, proponents objected to the findings arguing: “the cohort studies that generally show rising mortality at levels below 3–5 g per day might have the issue of reverse causation because ill individuals reduce sodium consumption.” There is still a continuing debate about the findings and no consensus has been reached at this stage. However, there is a general consensus at international level based on the “evidence that links sodium intake and systolic blood pressure, which shows increases in systolic blood pressure with increases in sodium above 1 g per day” (Feigin, 2016, p.1709).

### **2.3 Dietary Measures to Prevent DR-NCDs**

DR-NCDs to the large extent, remains the primary cause for the prevalence of NCDs in 21st century. However, the food systems in a long run did not have the proper mechanisms in place to prevent DR-NCDs. Therefore, certain precautions had to be outlined, established and implemented as dietary measures to prevent DR-NCDs. In addition, adequate evidence based research was needed to strengthen and validate these measures. In this way, WHO, gathered the group of international experts to forge the way forward in preventing DR-NCDs. This group of international experts came up with the standardized ‘population nutrient intake goals’, as control measure for the healthy diets in a given population. “Population nutrient intake goals represent the population average intake that is judged to be consistent with the maintenance of health in a population” (WHO, 2003, p.54). Health, in this context is signified by the reduced prevalence of DR-NCDs in a given population. These population nutrient intake goals help in identifying whether there is ‘an increased or a decreased risk’ of DR-NCDs in the health status of individuals in a given population. For instance, if the population average falls outside or within the recommended nutrients intake in a given population, it signifies the increased risk or the decreased risk (respectively) of DR-NCDs in that population. Secondly, ‘randomised control trials of interventions’ on sample populations was a challenge, as a result, the criteria that was used as a foundational evidence, was borrowed from “World Cancer Research Fund but was modified by the Expert Consultation to include the results of controlled trials where relevant and available” (WHO, 2003, p.54).

In order to reduce or eliminate DR-NCDs, the world governments and international agencies, such as the United Nations recommends that people should eat high quality diets. “High-quality diets are those that eliminate hunger, are safe, reduce all forms of malnutrition, promote health

and are produced sustainably i.e. without undermining the environmental basis to generate high-quality diets for future generations” (Global Panel on Agriculture and Food Systems for Nutrition, 2016 p.32). High quality diets are in essence the healthy diets and are therefore highly considered to prevent the prevalence of DR-NCDs. The World Health Organisation defines a healthy diet as achieving energy balance, limiting energy intake from total fats, free sugars and salt and increasing consumption of fruits and vegetables, legumes, whole grains and nuts (WHO, 2014). To secure that, the status quo of healthy diets reaches the entire world population, (the rich and the poor and the educated and uneducated), an international group of experts developed dietary recommendations as the essential component to reduce the prevalence of NCDs. As a result, after thorough research and intense deliberations, these international group of experts recommended that healthy diets be once again revived and be promoted, as intervention remedies to stabilize the prevalence of NCDs. This was in a conference held in Geneva in 2003 (WHO, 2003). The dietary recommendations were for preventing cardiovascular disease, diabetes, cancer, dental diseases and osteoporosis.

Nutrition transition in the 21st century has brought about the emergency of the DR-NCDs such as CVDs and others. As a result, the research based evidence is showing that saturated fatty acid intake is linked to CVD risk, countries are admonished to “restrict the intake of saturated fatty acids to less than 10%, of daily energy intake and less than 7% for high-risk groups,” in promoting CVD health. Bearing in mind that fat supply is essential for energy that is required by the body, therefore, “coconut and palm oil, provide low-cost energy and may be an important source of energy for the poor” (WHO, 2003, p.89). Thus the energy intake from fats on a daily basis should be reduced to less than 1%. In order to achieve these goals, consumers should avoid fats from dairy and meat sources. In this way, lean meat is highly recommended. In addition, ‘hydrogenated oils and fats’ should not be added when cooking. Consumers should ensure that they have regular fish intake twice or at least once a week and those who are vegetarians should take plant sources of a-linoleic acid. Above all, “preference should be given to food preparation practices that employ non-frying methods” (WHO, 2003, p.89). Daily intake of fruit and vegetables is essential for “cardiovascular health through the variety of phytonutrients, potassium and fibre that they contain.” These includes, “berries, green leafy and cruciferous vegetables and legumes, in an adequate quantity (400--500 g per day),” thus, reducing the risk of “coronary heart disease, stroke and high blood pressure” (WHO, 2003, p.89). Furthermore, the evidence shows that salt intake in food increases ‘blood pressure levels’ and thus should be limited “to reduce the risk of coronary heart disease and both forms of

stroke.” The experts are claiming, “1.7 g of sodium per day is beneficial in reducing blood pressure.” Therefore, the intake of less than 5 grams of salt per day is enough to attain a goal of a free coronary heart diseases generation. It is established that “potassium lowers blood pressure and is protective against stroke and cardiac arrhythmias.” This is attainable “by daily consumption of fruits and vegetables.” Fibre, which is acquired through the intake of ‘fruits, vegetables and wholegrain cereals,’ “is protective against coronary heart disease and has also been used in diets to lower blood pressure” (WHO, 2003, p. 90). Finally, physical activity of at least 30 minutes per day is recommended, “to raise cardiorespiratory fitness to the level that has been shown to be related to decreased risk of cardiovascular disease” (WHO, 2003, p.91).

#### **2.4 Dietary Practices in Urban and Rural South Africa**

Researchers investigating healthy diet in South Africa have also described the major shift from healthy to an unhealthy diet as “decreases in staple foods rich in starch and dietary fibre, increases in foods from animal origin rich in total fat and saturated fatty acids and decreases in plant protein sources such as legumes. This also includes increases in energy-dense snack foods, carbonated sweetened beverages, commercially available alcoholic beverages, as well as added sugar, fats and oils in preparation of food” (Vorster, 2011, p.430). Vorster et al, further states that these new found dietary patterns changes to more palatable diets. As a result, they contain “snack foods, fast and convenience foods, but also more meat and fruit, translated to a nutrient intake pattern in which the macronutrient pattern (total energy, total fat, type of fat, total carbohydrate, dietary fibre, and animal-derived protein) could already be associated with an increased risk of overweight, obesity and other NCDs” (Vorster et al, 2011). Consequently, the effect is that due to the modified nutrients, improvement in micro-nutrients (such as calcium, iron, zinc and some vitamins) in urban intakes could not reach recommended values, hence “it is conceivable that in many overweight and obese subjects, sub-optimal micronutrient intakes could lead to a “double burden” of co-existence of under- and over-nutrition in the same person” (Vorster et al, 2011). It is therefore observable, according to Vorster et al that the micronutrients deficiencies could than contribute to the increased risk of DR-NCDs in these subjects. In addition, “...staple foods are becoming more refined and processed...while larger numbers of meals are consumed outside the home, making households more reliant on the food industry” (Naicker et al, 2015). This is due to complex nature of the modern world where people spend most of their day outside home, in the work place. Hence, people depends more on fast food. Manufactured foods (food from the industry) tends to be unhealthy, and in this

way, people are exposed to DR-NCDs. This is because industrial food processing is for preservation purposes, as it is prepared for the multitudes and for a longer duration.

Research findings states that “South African population consumes diets low in nutrient density, specifically vitamin A, thiamine, riboflavin, niacin, folic acid, vitamin B6, iron, zinc, and calcium” (Msaki and Hendriks, 2013, p.165). This is a dietary challenge for South Africa, as it may increase the risk of DR-NCDs. WHO and Food and Agriculture Organization (FAO), which is the United Nations division, recommended the development of food-based dietary guidelines (FBDG) for the world countries to promote healthy diets. Furthermore, WHO and FAO highly recommended these guidelines should “be based on prevailing eating patterns of the population; include traditional and indigenous foods; ... expressed in a positive way to motivate people to change dietary habits where necessary” (Msaki and Hendriks, 2013, p.166).

Undoubtedly, South Africa complied with this recommendation by developing South African food based dietary guidelines initiated in 1998. These guidelines are as follows:

**“Enjoy a variety of foods.** A lack of dietary variety could contribute to low micronutrient intakes, low energy intakes and chronic diseases of lifestyle.

**Be active.** This is based on the well-established link between physical activity and lowered risk of mortality and morbidity associated with many chronic diseases of lifestyle. It encourages living a healthy lifestyle and habitual physical activity, including household and gardening activities, transport and leisure time.

**Make starchy foods the basis of most meals.** Unrefined or minimally processed cereals and grains... should be the central or main food, and the rest of the meal be planned around this food. The aim of this guideline is to promote an increased intake of carbohydrate-rich foods in those people who have low intakes, and to maintain optimal intakes among those currently eating high-carbohydrate diets.

**Eat plenty of fruit and vegetables.** Fruit and vegetables provide a good source of fibre-rich carbohydrate and additionally supply many cardio protective nutrients. These include potassium (lowers blood pressure), folate (can reduce plasma homocysteine), vitamin C and many polyphenolic compounds (with antioxidant activities) and soluble fibre (lowers cholesterol). Green leafy vegetables are also high in magnesium, which has also been

associated with lower CVD risk. The FBDGs, therefore, recommends an intake of 5 to 8 portions (400 to 600g) of fruit and vegetables daily.

**Eat dry beans, peas, lentils, and soya often.** These foods are an excellent source of soluble fibre and micronutrients and an economical source of plant protein.

**Meat, fish, chicken, milk, and eggs can be eaten every day.** Literature indicates that it is possible, but difficult, to achieve adequate and balanced diets without inclusion of foods from animals. It is, however, very important to choose low-fat products and fats should be used sparingly in the preparation, cooking and serving of these foods. Although expensive, even small amounts will add valuable nutrients, such as calcium, iron, zinc and the essential omega-3 fatty acids, to the diet.

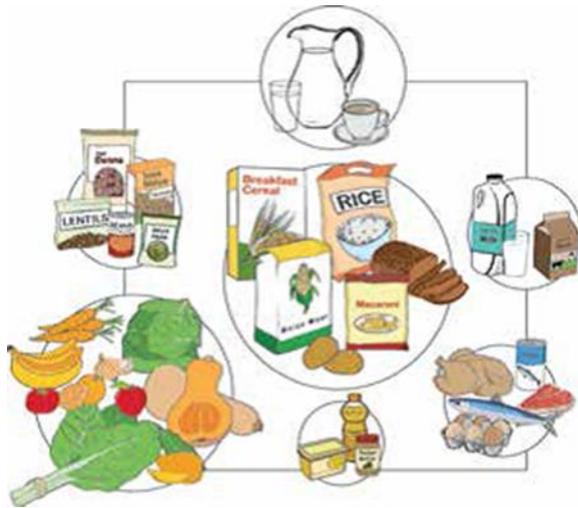
**Eat fats sparingly.** The aim would be to lower fat intakes, especially the intake of saturated fatty acids (SFAs) among those who follow a typical Western diet high in fat, and to control the fat intake in those following a diet low in fat.

**Use salt sparingly.** Salt should be used sparingly, if at all, at the table and in the preparation of meals and the intake of processed foods high in salt should be limited.

Drink lots of clean, safe water. Water is an essential nutrient and the recommended intake is 1ml/kcal energy expenditure for adults. This equates to 2.9l/day for men and 2.2 l/day for women under average conditions. Children require 50% more water per kcal energy expenditure. Water loss occurs via the lungs, sweat glands and kidneys.

**If you drink alcohol, drink sensibly.** This guideline seeks to encourage members of the South African population who misuse alcohol, particularly by binge drinking, to engage in “low-risk drinking” or “sensible drinking”. “Low-risk drinking” is defined as no more than four units of alcohol per day for men and no more than two units for women, with at least two alcohol-free days per week.” In addition, sorghum beer, a traditional African beverage, makes positive contribution to dietary intake, particularly when the beer is brewed with sorghum adjunct. (Msaki and Hendriks, 2013, p.166 and Pretorius and Sliwa, 2011, p.180-181).

**Figure 2.4** Diagram of recommended healthy food guide in South Africa



Source: Classen et al, 2016, p.17

FBDGs and food guide are meant for “South Africa’s diverse population with different cultural backgrounds and income levels.” However, evidence is needed to establish whether this “provides a meaningful education tool for healthy eating”, among South Africans (Classen et al, 2016, p.17). Besides, “the schematic and basic display of processed and packaged foods in the food guide could be viewed as controversial against a background of increasing evidence of their negative health implications” (Classen et al, 2016, p.17).

In a study conducted in Embo, a rural settlement, near Durban in the province of KwaZulu-Natal, based on the findings, the rural households partly comply with the South African FBDG (Msaki and Hendriks, 2013). As a result, starchy foods were the most consumed, but there was low consumption of fruits and vegetables, legumes, fats and animal sourced foods. As Embo is a rural settlement, people are more likely to rely on small-scale farming and home gardening, as households seem to have more legumes, at a second round of data collection. The existing gap between round one and two, which is for the positive change, implies that rural households should be encouraged to eat more of the legumes as they are essential for their health. However, overall the authors concluded that rural households are increasingly at risk of developing DR-NCDs.

In an observed study by Mchiza et al, “...intakes of fruit and vegetables are very low in South Africans” (Mchiza et al, 2015, p.8243). For instance, “The PURE study reported median intake values of less than 150 g for rural and urban men and women, in comparison with the

recommendation of at least 400 g per day” (Dolman et al, 2013). According to a recent review South Africans consume less fruit and vegetables than required and in return, this is “impacting on the level of micronutrients and fibre in their diet.” Evidence in relation to the burden of diseases in South Africa, “suggests low fruit and vegetable intake to account for 3.2% of total deaths and 1.1% of the 16.2 million attributable to disability-adjusted life years (DALYs) (Mchiza et al, 2015). PURE also relates that, South Africans in urban settings have the high micronutrients intakes than those in rural settings, in both cases with large percentages not meeting the Dietary Reference Intakes (DRIs). Mchiza et al also states, the South African government introduced compulsory food fortification in 2005, therefore, South Africans overconsumed the fortified staple foods (maize porridge and bread), dietary fat and added sugar, which is not fortified is likely to put the South Africans at risk of non-communicable diseases, which has been highlighted as health crises in the country (Shisana et al, 2013, SADH, 2015 and Vorster et al, 2014). In this way, people in the rural settings benefit a lot in this compulsory food fortification by the government, as they rely more on it as their affordable staple food. As a result, they have a similar chance (with the urban settings) as means of exposure to DR-NCDs. Another fact is that in South Africa salt is added on food when it is prepared, “when eating at the table, and during food processing, and could contribute on average 40% to total sodium intake. This causes concern since increased salt intake leads to an increase in blood pressure,” thus making salt “a major risk factor for cardiovascular diseases” (Wentzel-Viljoen, 2013 and Peters et al, 2017, p.2). In addition, South Africa is a country that frequently takes an average of two cups of tea and coffee a day with sugar added and “other products like sucrose-sweetened beverages also increase the intake of sugar. The high sugar intake in all the studies is confirmed by the studies reporting the most frequently consumed food” (Nel et al 2002 and Tydeman-Edwards, 2012). Studies have revealed that “overconsumption of foods that are high in refined sugar promote weight gain, which in turn is a risk factor for the development of NCDs” ( Vorster et al, 2014). In addition, documents are showing that overconsumption of foods that are high in refined cereals, sugar and fat promote weight gain in South Africa and the evidence regarding the burden of diseases, “suggests that excess weight gain has caused 36,504 deaths of all deaths in 2000.” The most affected are women as they had the double burden of diseases than men. This may be of special relevance to people who are living in urban areas as they are more exposed to processed foods than those in rural areas. Having observed this, Manyosi et al (2009) admonishes that, “both too high energy intake especially from fat and sugars and too low micronutrient intakes are contributors to risk for CVDs that are alarmingly on the rise in Sub Saharan Africa” (Manyosi et al, 2009).

Another finding was that as red meat is very expensive in South Africa, therefore, the majority of the poorer households cannot afford to buy it, which implies that chicken is the main protein they rely on. As a result, studies conducted reveal that calcium intake of both men and women “of all studies reported were below the recommendation implying that the portions consumed were smaller than the recommendations. This could have an impact on the high incidence of hypertension seen in South Africa” (Mchiza et al, 2015). It is evident that this affects the majority of those who are in rural areas due to their poorer background. Above all, one could also argue that in terms of food consumption rural settings in South Africa have similar dietary practices with the urban settings, hence there is increasing prevalence of NCDs in rural settings.

Rural settings have adapted greatly towards the urban dietary patterns. For instance, Holms et al, claims that, “longitudinal studies track changes in risk factors over time and provide health planners with information on disease burden” (Holmes et al, 2010, p.4). Hypertension prevalence has been associated with only the “wealthy sedentary and obese urban” population in Africa, but not rural, Holmes et al claims. However, the cross sectional studies in some rural African populations have “found a hypertension prevalence of 11%–25%, similar to that in the cities and in high income countries” (Holmes et al, 2010). These findings may imply that the dietary practices of the people in urban and rural settings are similar to a certain extent, although they differ in terms of lifestyle. More importantly, cross sectional studies, according to Holmes et al, in some African countries have found hypertension associated with diet with a mean body mass index of 21 kg/m<sup>2</sup>. All the above facts validate the fact that NCDs can also be associated with the rural setting.

Dietary practices of the rural settings, in KwaZulu-Natal could increase the risk of DR-NCDs among the rural population. This could be the conclusion; one would have, after having learned about the dietary preparation of 16 composite dishes commonly consumed in Empangeni, the rural settlement in KwaZulu-Natal, South Africa. The dishes had 79 recipes and seven of these dishes were “meat-based, five starch-based and four legume/vegetable based,” in addition were found to be “good sources of protein, vitamins and minerals, they also contain substantial amounts of fat.” (Kolahdooz et al, 2013, p.1). The dishes were essentially healthy, in the sense that they had all the nutrients a healthy body needs. However, the large amounts of oil added when preparing the food and considerable amount of salt added could increase the risk of DR-NCDs in the rural community of Empangeni. Hence, Kolahdooz et al proceeds to say, “Foods

fried in hydrogenated vegetable oils contain trans fatty acids (TFA),” which may increase the risk of CVD. Furthermore, “excess dietary sodium intake” could lead to “high blood pressure and an associated increased risk of stroke, coronary heart disease and heart failure.” (Kolahdooz et al, 2013). As a result, Kolahdooz et al, recommends that, “an alternative method of cooking should be considered as a key strategy in the development of a dietary intervention in this community.” (Kolahdooz et al, 2013, p.4). Seemingly, some people may not be aware of South African FBDG, which promotes that people should eat and use fat and salt sparingly.

Food security is an important subject in the world today, therefore it is “considered an important measure of health and well-being and is universally used to design nutrition interventions in rural and/or low-income areas.” (Oldewage-Theron and Kruger, 2011, p.420). Household food measured nutrition interventions helps in identifying whether the households afford to have the variety of foods on daily bases, in line with South African FBDG in this instance. In addition, this helps to measure the quality of food they have, in order to safeguard their health status. Therefore, this can be achieved by means of dietary diversity measures. A study was therefore, conducted in the informal settlement, among the black women caregivers, belonging to 357 households in the Vaal region. These were illiterate women, in a poverty stricken community, the majority of whom were single and their income was less than R1000 and month, which is equivalent to 143US\$. This is far below the poverty line measure which is living on 2US\$ a day. The aim of the study was to determine these caregivers household food security, by proxy. This was achieved through DD measures and food coping strategies (FCS) they employ. FCS do not have a universal set, but can follow the same pattern and all households make use of FCS, with the intention to “preserve productive assets that are needed to sustain living in the future.” Households that are not in desperate need of food can use FCS to “add variety to their monotonous diet, whereas households that run short of food employ strategies to increase the availability of food.” FCS can be divided into four categories: “altering the diet, food rationing, food-seeking strategies, and altering the household.” FCS can be measured through coping strategy index, which is “a food consumption related coping strategy instrument that includes the generic list of coping strategies.” (Kruger et al, 2008, p.4). The aim of using coping strategy index tool is to measure the frequency and severity of FCS.

**Table 2.2** The four generic categories of food-coping strategies (FCS)

Category	Explanation	Examples
Altering the diet (dietary change strategies)	Use of less preferred or cheaper food items	Substituting milk, fish, or eggs for meat
Food rationing (managing insufficiency)	Skipping meals Staying hungry the whole day, without meals.  Feeding working members at the expense of nonworking members (buffering)  Limiting portion sizes	Eating 1 or 2 meals instead of at least 3 per day Giving fathers larger shares while other members (especially women and children) receive small portions
Food seeking (increasing the amount of food available in the short term)	Borrowing food or money  Gathering wild food	Borrowing money to buy food Borrowing food Purchasing food on credit
Altering the household (household structure strategies)	Sending children away  Decreasing the number of people to be fed in the short term	Sending children to eat or stay with friends or relatives

Source: Kruger et al, 2008, p.4

As a result, the study revealed that the majority of the women caregivers' procured food once a month from the local tuckshops, while the 24h- recall data showed inadequate nutrient intakes except in carbohydrates. Their food intake patterns was fashioned in this order: Obviously, the most frequently consumed food source by these caregivers was the stiff maize porridge. The minority among them consumed 'beef stew, beef brisket, boerewors, boiled chicken.' Also, only a limited number among them consumed dairy food products and their vegetable consumption was far low. Absolutely, fruits were not part of diet among these households

(Oldewage-Theron and Kruger, 2011). Food variety among these caregivers ranged between zeros to eight individual nutritious foods, of the total number of forty individual food items consumed in seven days, thus indicating poor variety. Furthermore, the majority of the individual respondents (340), consumed only ‘two to four individual foods in seven days’, while the other fourteen individuals consumed only on tea and sugar in and two individuals consumed variety of eight foods. As a result, this indicates poor DD among these individual caregiver’s households. Coping strategies employed by women for coping with limited funds were the following: “buying and cooking a limited variety of foods (82.1% and 74.7%), maternal buffering by limiting food intake to ensure food availability for the children (84.7% and 80%), passing over meals (81.6% and 68.4%), and cutting portion sizes (84.7% and 75.8%)” (Oldewage-Theron and Kruger, 2011, p.425). Therefore, the majority of the population in South Africa, of whom are the poor do not ‘enjoy the variety of foods’, as it is stipulated in South African FBDG. “These guidelines may remain “academic” in nature as the poor, in many instances, lack the resources to obtain a variety of foods” (Drimie et al, 2013, p.7). In this instance, they lack income, employability to the skilled job market economy, as they are illiterate, and infrastructure development as they live in the underdeveloped areas. Therefore, this implies that the food insecurity remains a challenge among the majority of poor communities in South Africa; hence, it was confirmed by Lemke’s findings (Oldewage-Theron and Kruger, 2011).

## **2.5 Dietary Practices of the Elderly in the 21st Century**

Nutritional status of the elderly depends on the physiological, socioeconomic and psychological changes occurring, in their elderly life (De Morais et al, 2013). These changes emanates from the physiological changes such as “appetite loss, changes in taste and drug–nutrient interactions, to social and economic factors such as income, living circumstances and lifestyle” (De Morais et al, 2013, p.1215). Two groups determines the nutritional status of the elderly: the intrinsic, which is physical and extrinsic which is about society and environment (De Morais et al, 2013). Both these aging determinants can contribute to the negative nutritional status of the elderly, malnutrition. Malnutrition is ‘any nutritional imbalance’, of those who suffer from over-nutrition/obesity and on the other hand those who suffer undernutrition and remains the common problem among the elderly (De Morais et al, 2013 and Edfors and Westergren, 2012, p.1). De Morais et al claims that malnutrition is less estimated and poorly understood among the elderly individuals living in the community, due to the lack

of research, however, in the institutionalized centres adequate research has been made, therefore malnutrition is well understood. Furthermore, De Morais et al states that nutrition screening and evaluation of older people has focused on anthropometric and biological parameters. The ‘Determine your nutritional health’ questionnaire “is a checklist based on warning signs of poor nutrition for: disease; eating poorly; tooth loss and mouth pain; economic hardship; reduced social contact; multiple medicines; involuntary weight loss or gain; needs assistance in self-care; and older than 80 years” (De Morais et al, 2013). According to de Morais et al, this tool was designed for Nutritional Screening Initiative (NSI) for health professionals working with older people and was “designed to be self-administrated or administrated by a health professional, it includes yes/no statements about dietary, general and social conditions” (De Morais et al, 2013, p.1215). Another modified version was used within a baseline survey, according to De Morais et al, as a result, was proven to “identify elders with an increased risk for several nutrition-related health problems.” However, this instrument has proven to have a limited capacity as it has shown “poor sensibility and specificity, suggesting it should be used more efficiently as an educational tool, promoting the awareness of older people at risk in the community” (De Morais et al, 2013, p.1215). Another tool that has been used to the great extent is Mini Nutritional Assessment (MNA). However, MNA “presents limitations for the nutritional assessment of healthy elderly populations, as the NSI checklist” (De Morais et al, 2015, p.1215). As a result, MNA has been partly successful in the sense that it was able to detect dietary-related items, but could not detect the age group, gender and body mass index (BMI). In this way, MNA is considered, the only useful tool for daily clinical practice and in detecting undernutrition among the elderly home based-care centres and public health institutions. However, scientist suggest, “screening tools should consider the age group of the population as well as risk factors to detect malnutrition or predict disease outcomes” (De Morais et al, 2013, p.1215). Screening in general helps in determining and predicting “the risk of a developing condition and the features associated with it, such as s complications, including death, resource use, and cost.” Secondly, screening may help in identifying “individuals who are and are not likely to benefit from treatment” (Elia et al, 2012, p.477). “Many nutrition screening tools were originally developed as diagnostic instruments (tools) for the purpose of detecting malnutrition, whereas others were developed as prognostic instruments for the purpose of predicting clinical outcomes or health care use” (Elia et al, 2012, p. 477). Screening tools that were designed for older adults includes: MNA, Geriatric Nutritional Risk Index and the tool of Wolinsky et al. Age was included at a later stage in nutrition screening tools and the basis for this might be the fact that, “age was included because of the belief that older people

are more likely to be malnourished” (Elia et al, 2012, p.481). In addition, Elia et al, argues that, “older people tend to recover from illness more slowly, take longer to mobilize, and run a greater risk of becoming dependent on others, especially when they are close to the threshold of disability.” In this way, the risk of malnutrition can be recognised at an earlier stage in “older than in younger individuals so that interventions can be put in place to prevent deterioration and the development of overt malnutrition” (Elia et al, 2012, p.481).

“Aging process is associated with a number of physiological, pathological, psychosocial, and environmental changes, which may adversely impact food choice and dietary intake,” among the elderly (Host et al, 2016, p.68). As a result, these changes contributes in an unhealthy eating manner, the elderly adopts as their lifestyle behaviour. Three dimensions of aging processes informs these changes and are associated with aging: physiological, psychosocial aspects and personal resources.

Physiological changes that are associated with aging emanates from a number of factors: “Taste acuity and ‘chemosensory losses’ often declines with age” (Host et al, 2016, p.88). Therefore, the elderly are mostly affected by this change, as taste governs their food choice. Furthermore, the elderly are at most instances exposed to medications intake due to their health status that is informed by the increasing frailty of old age and ill health. As a result, these medications have a contributing factor in compromising flavour sensation. All these factors detract food enjoyment and thus reduce the appetite of the elderly. In order to compensate the loss of food flavour, the elderly have a tendency to select “food high in salt and sugar” (Host et al, 2016). In this way, the food choices the elderly make, tends to be aligned with the taste flavour rather than its healthiness and this has a negative impact on their health status, hence they are the most vulnerable age group to DR-NCDs.

Secondly, “poor dentition, dentures and difficulty with chewing also limit the range of foods eaten in particular, protein-rich foods (such as meat and nuts) and fruits and vegetables” among the elderly. (Host et al, 2016, p.88). Poor dentition that normally affects the elderly because of age and dentures, for those with artificial teeth determines the choices they make about the foods they buy and the foods they eat. Therefore, the chewing ability of the elderly plays a crucial role in determining the type of food they buy, not dietary knowledge they have. (Brennan and Singh, 2010, p.1282). For instance, when they buy foods they are more selective, avoiding even foods that are essentially good for their nutritional health status in order to avoid difficulty in the chewing ability. In this way, elderly are more likely to avoid healthy diets, as

studies have shown that this has a negative impact on their nutritional and health status. As a result, they are easily exposed to DR-NCDs. As it has been mentioned before, this is because changes that occurs in older ages affect their digestive system starting from oral cavity, with the loss of teeth, decreasing of saliva and down to their digestive tract. As a result, they avoid eating “things that are hard to digest, such as brown beans, pea soup and stuff ...and whole meat.” (No. 2, male, age 90) for they have difficulty in chewing such foods (Edfors and Westergren, 2012, p.6). The implication of this is that it increases the nutritional risk since the reduced food intake “provides good source of protein, vitamins, and minerals ...which are needed in higher amounts during old age” (Host et al, 2016, p.88).

Thirdly, the “loss of appetite, due to factors such as reduced activity, loneliness, or the onset of medical conditions increases risk for an inadequate intake, which, in turn, can both cause and exacerbate health problems” (Host et al, 2016, p.88). The above stated elderly challenges, in various ways contributes to their unhealthy eating, which, in turn is likely to increase the chances of acquiring DR-NCDs among the elderly and likewise they remain the psychosocial factors which largely contributes to the elderly unhealthy status. For instance, studies have shown that for widowed older women, it takes quite some time for them to regain appetite for food, as they have to eat all alone due to the loss of a partner. In addition, as they are growing older, meanwhile their children are becoming adults; they become independent from their parents and leave them to secure their residences away from them. As a result, the older women responsibilities in the house, such as cooking and being in control are reduced; causing her to lose appetite with food as there is no one to cook for and is all alone. Furthermore, Host et al, points out that, for many elderly people, eating is considered as a social activity, “and thus an absence of companionship manifests in loss of pleasure normally associated with both cooking and eating” (Host et al, 2016, p.89). Above all a survey was conducted where it was established that the elderly people living all alone, “eat less and are at higher risk of poor nutritional status” (Brownie, 2006, p.115). Brownie has also observed that, “medication can interfere with the way in which nutrients are absorbed, metabolized and excreted, resulting in altered food choices and subsequent weight loss” among the elderly (Brownie, 2006, p.115). This is because, according to Brownie, some medication have an ‘unpleasant taste that might interfere with food intake’, thus causing the loss of appetite and food choices that might result into unhealthy lifestyle among the elderly.

The variety of factors that contributes to the difficulties of food purchasing decision, facing the elderly in the low-income communities, which are predominantly rural are: “high cost of healthful foods, inadequate geographical access to healthful food, poor quality of available healthful food, and lack of overall quality of the proximate retail stores” (Evans, et al, 2015, p.6). The above-mentioned circumstantial conditions, remains the detrimental effects to the healthy status of the elderly in the rural settings or low-income communities and are also determined by the personal resources of the elderly individuals. As a result, the elderly are facing the difficulty in acquiring nutritious and healthful foods. For instance, high costs remains the barrier in purchasing healthful foods, as it more expensive than unhealthy foods (Carnahan, et al, 2016, p.3, Evans et al, 2015, p.5, Foley and BeLue, 2016, p.354 and Haynes-Maslow et al, 2013, p.2). Because of the low-income status the elderly they have, in the rural areas, they resort in buying what is affordable. As a result, one of the elderly put it in this way, “We always look for what’s more economical” (Evans, et al, 2015, p.6). ‘More economical’ would mean for the elderly, not being able to buy meat, vegetables and fruits as they are regarded as more expensive. Furthermore, a 69 year old, literate woman puts it in this way, “It is more expensive to buy healthy foods than a fast food. Unhealthy foods are cheaper than healthy foods” (Alizadeh and Salehi, 2015 p.291). As a result, she added, at many instances they cannot afford fruits and vegetables that are recommended by the doctors to eat more when they are sick. However, another difficulty the elderly are facing with in the rural areas is that they rely in purchasing their food from the so-called ‘convenience stores’. Convenience stores increase the prices of food in an unbelievable way as they are not faced with the competition of other retailers and are the only source of provision for the local communities. The rural areas they serve are sometimes known as the desert areas due to the lack of infrastructure. Above all, they do not sell the high quality food or healthful food, but they sell less healthful food or else, according to one of the respondent, they only sell processed foods. As a result, the elderly resorts in looking for an alternative, to travel miles away to get healthful foods in distant malls in town or resort to expensive gas stations in their districts. This is not an easy step to take for the rural elderly, due to their low-income status. It involves the high costs, for both healthful food and transportation (Carnahan, et al, 2016, Evans et al, 2015, Foley and BeLue, 2016 and Haynes-Maslow et al, 2013). In many instances, transportation remains the barrier to access healthful food for low-income communities, which may be miles away.

According to the study comparison that was made in Poland between urban and rural settings, it was discovered that “geographical isolation has an adverse effect on nutritional status among

the elderly.” In this way, “an urban-rural difference in meal structure was observed in Poland”, where it was discovered that the elderly from rural places had a low consumption of healthy foods, such as fruits, eggs, meat, fats and oils (Payette and Shatenstein, 2005, p.29). Another study was conducted in Botswana whereby it was discovered that the older people’s food intake profile in rural areas had the ‘low food variety and dietary diversity.’ As a result, the following independent risk factors were identified among the elderly “to predict low food variety: consumption of only one or two meals a day, having no formal education, not owning cattle and living in a rural area” (Clausen et al, 2005, p.7). In addition, inequality in the distribution of wealth remains the big problem facing with the elderly in Botswana. For instance, the elderly have not been part of the “rapid wealth increase experienced by younger and more economically productive segments of the population” (Clausen et al, 2005, p.7). DD is essential for a healthy lifestyle as it is “universally identified as a key element of high quality diets” (Rathnayake et al, 2012, p.1). In this way, the elderly in rural settings consumes less healthy foods than the elderly living in urban areas. This is promoted by the rural geographical isolation, with less infrastructure, associated with low-income status, thus causing the rural elderly to be vulnerable to DR-NCDs. In addition, the lack of DD particularly remains the “considerable problem among poor populations of developing world as their diets are predominantly based on starchy staples” (Rathnayake et al, 2012, p.4). For example, in a study conducted in Sri Lanka, it was discovered that cereal consumption was 100 percent; all other food group consumption was low, except the carbohydrate is the “main energy contributor to the diet than other macronutrients” (Rathnayake et al, 2012). As it is stated above, dietary diversity is more likely to be a common problem in the rural settings, compared to the urban settings due to the nature of low-income status and low quality of healthy foods than in high-income societies.

Evidently, studies have shown that “elderly people are at a greater risk of nutritional deficiencies due to physiological changes associated with aging, acute and chronic diseases, financial and social status and functional decline” (Rathnayake et al, 2012, p.1). On the contrary, studies are also evidently revealing that older persons may take specific nutritious measures as precautions “to preserve existing health status and to forestall much of the onset of disability and death” (Rivlin, 2007, p.1575). Diet is thus considered as the key element in preserving the healthy status of the elderly. For instance, studies were conducted whereby it was established that nutritious diets play a key role in reducing and preventing NCDs and mortality among the elderly. Nutritious diets reduced the relative risk (RR) of cancer among

the elderly women that were diagnosed with breast, colon, rectal and lung cancers. These Iowa and Midwestern women adhered to the recommended food score of 14 nutritional recommendations by the American Institute for Cancer Research (AICR), an independent foundation based in Washington DC (Cerhan et al, 2004, p.1117 and Rivlin, 2007, p.1575).

“Diet and physical activity are lifestyle behaviours that are learned, developed, and practiced throughout an individual’s lifetime, with behaviours in early life often predicting later-life behaviours” (Bardach et al, 2016, p.22). The above-mentioned statement signifies that dietary practices of the elderly and their lifestyle behaviours are the learned outcomes of the lifestyle behaviours from the early stages of their lives. As a result, this has a great impact in determining their health status in elderly life. Thus unhealthy eating and physical inactivity, as a lifestyle behaviour from the early stages of one’s life may result in an unhealthy elderly lifestyle behaviour. Whereas, healthy eating and physical activity as a lifestyle behaviours from childhood throughout adult life remains the essential components of health for the elderly, both in urban and rural settings (Alizadeh and Salehi, 2015). One elder (an illiterate man, 72 years of age) from a case study conducted in Iran described health as the “complete body wellbeing, complete individual satisfaction and absence of pain and disorder” (Alizadeh and Salehi, 2015 p.290). Therefore, from the onset of one’s life, it is recommended that individuals learn and develop healthy eating and physical activity as a lifestyle behaviour that will carry on to their elderly stage of life, that he/she may prevent vulnerability to DR-NCDs. In addition, Rivlin recommends that older individuals needs regular physical activity as their daily lifestyle. This helps in decreasing “body weight, total body fat, percentage body fat, and body mass index (BMI), while increasing muscle and bone mass.” Rivlin therefore, concludes by adding that the older individuals needs three type of exercise as a complement to their healthy diet:

- “Cardiovascular, with increases in heart rate.”
- “Weight-bearing, such as lifting small amounts of weight, which improves both muscle and bone.”
- “Flexibility, such as stretching and bending.” Together these exercises “improves the movement ability and posture, thus helping to retain balance and easing the pain from arthritic joints” among the elderly (Rivlin, 2007, p.1574).

## 2.6 Dietary Practices of the Elderly in South Africa

A cross-sectional study was conducted in 2008 among the elderly attending a day care centre in Sharpeville, for two days a week in a Gauteng based township in South Africa. The intention was to establish a “comprehensive nutrition and health assessment to provide a basis for future intervention strategies” among the elderly. Using 24-hour recalls, it was discovered that the majority of food items that were being consumed were ‘carbohydrates based’, with only the minority among the elders consumed meat and eggs as a protein source. “The majority of elderly persons did not consume any fruit or vegetables” (Oldewage-Theron et al, 2008, p.7 and Oldewage-Theron and Kruger, 2008, p.116-117). The minority that was having vegetables consumed only “cabbage, coleslaw, spinach, pumpkin, carrots, beetroot and tomato and onion mix.” Fruits that were consumed were only apples, pear, banana and oranges. As a result, the consumption of fruit and vegetable was very low and did not meet the recommended 400 grams per month. These elderly were pensioners and their income ranged between ‘R501 and R1000 (78–154 US\$) a month.’ This implies that the elderly were living below the poverty line of 2US\$ a day. The majority of women among the elderly were obese. The elderly mean daily intake of proteins was sufficient and elderly women derived half of it from plants sources. In addition, women had inadequate total energy, dietary fibre and large number of micro nutrient intakes, including “calcium, magnesium, zinc, copper, selenium, iodine, vitamins A, B1, B2, B3, B12, C, D, E, folate, biotin, and pantothenate, compared with men who had deficient intakes of calcium, selenium, iodine, Vitamins A, B2, B6, C, D, E, folate, and biotin” (Oldewage-Theron et al, 2008, p.7 and Oldewage-Theron and Kruger, 2008, p.111). Unexpectedly these elderly had the ‘very low zinc status’, including ‘dietary intake as well as serum values.’ Maize meal was the only predominant source of zinc among the elderly, whereas the ‘bioavailability of zinc’, studies have shown ‘is better from animal sources than plant sources.’ This is because presence of phytate in diets reduces zinc absorption. As a result, ‘poor bioavailability of zinc has been reported among populations consuming a predominantly maize based diet and this is a hindrance to achieving adequate zinc nutriture.” In addition, studies have revealed that cereals also “contains a high content of the anti-nutritional factor phytate which reduces the bioavailability of zinc” in the diet (Oldewage-Theron et al, 2008, p.12). None of the elderly respondents consumed all nine nutritious food groups during the seven-day data collection period, hence, the majority could be categorized with a low dietary diversity score and food variety score, respectively. The findings of Oldewage-Theron et al and Oldewage-Theron and Kruger, confirmed poverty, which is manifested by poor dietary variety,

thus indicating household food insecurity, due to income shortage and as a result, showing detrimental effects to poor health, in turn increasing the risk of DR-NCD among the elderly in Sharpeville.

Another study was conducted among the free-living elderly in Umlazi, the biggest township of KwaZulu-Natal Province in South Africa. Their ages began from 60 years of age upwards. The total number of respondents was 270. Dietary intake data revealed the following:

- Maize-meal porridge, tea and chicken stew were the most consumed, thus were considered the most popular food items in the food list, respectively.
- The few number of people in the group consumed cabbage and spinach, and they took number 10 and 11 respectively in the top 20 of food list. As a result, this reflected the low dietary intake of vegetables.
- Furthermore, the fruit intake was very low and its portion sizes did not meet required recommendation of daily intake of 400 gram a day.
- The majority derived their protein from chicken and milk, although the consumption of milk was in small quantities. Very few derived their protein from beef, beans and pilchards.
- The elderly population were found to be in various stages of hypertension, with six percent in pre-hypertension stage, 28 and 62 percent in stage I and 2 of hypertension respectively (Mkhize et al, 2013, p.4-6).

Poor nutritional status is reflected in the study, due to food insecurity and low financial status.

## **2.7 Conclusion**

Nutrition transition has contributed immensely to NCDs epidemic around the world. Evidently, dietary practices remain the major contributor to the prevailing NCDs, as they are mainly driven by dietary practices that have been adopted as the lifestyle behaviour in the world today. This would mean that NCDs are modifiable, as the dietary practices are a behavioural lifestyle and therefore, are subject to change. Thus, five stages of nutrition transition attest to this phenomenon. LMICs (and to the great extent many of the upper and middle-income countries, including South Africa) are the most vulnerable NCDs victims in the 21st century, as they are in the stage whereby, they are on the fourth stage of the nutrition transition. Furthermore, rural populations are becoming more vulnerable to NCDs. This is due to unhealthy diet that is

affordable, as it is available at low prices. On the contrary, healthy diet is available on high prices and is thus unaffordable for most of the rural populations as they are poor. DD and dietary variety is not an option or a possibility as the poor and rural populations survives on the diet they can afford. Food preparation also adds more risk of NCDs among these population groups, due to sodium and fat intake they consume when cooking. Research based evidence has indicated that the elderly are the most victims of DR-NCDs, due to the frailty of their health as they are more becoming older. Therefore, healthy diets consumption need to be maintained among the elderly, in order to ensure healthy lifestyles in their lives. Thus, dietary measures and nutrients intake goals recommended by WHO and FAO, can serve as control mechanisms for NCDs, if are adopted by the food manufacturers and world governments at large. In this way, governments should formulate policies as guidelines upon which food manufacturers and the population will operate.

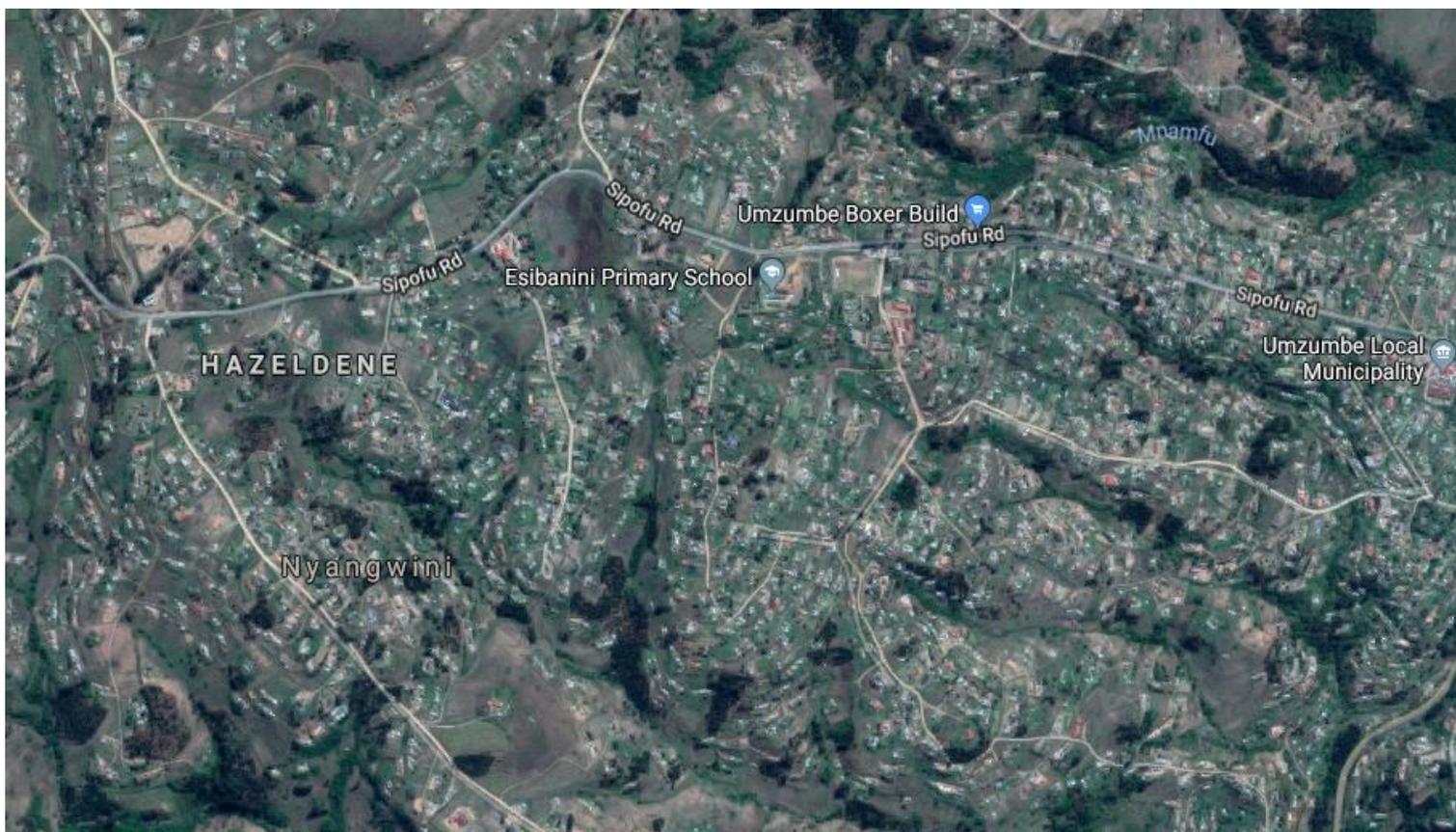
## Chapter 3

### Methodology

#### 3.1 Introduction

As it is already stated in chapter 1, that this study aimed in describing the dietary practices as a lifestyle risk factor for non-communicable diseases among the elderly in a rural setting in KwaZulu-Natal. This chapter gives a detailed version about the methodology that was followed in conducting this study.

**Figure 3.1** Study Location: Map of Nyangwini



Source: Google Map

Nyangwini is an area where the study was conducted and it is one of the rural areas in Mthwalume.

### **3.1.1 Nyangwini Background Account**

Nyangwini is a small rural settlement at Mthwalume, nevertheless, it is one of the most prominent areas under Luthuli tribal authority. Several reasons can be given as an account to that: 1. Nyangwini is the residential area of Inkosi (Chief) Luthuli. 2. The tribal court is erected at Nyangwini. 3. The clinic that is serving the whole of Mthwalume villages is located at Nyangwini. 4. The Umzumbe Local Municipality Offices are also located at Nyangwini. 5. The taxi rank for Mthwalume villages is only found in Nyangwini. The routes found in this taxi rank include the following: Nyangwini to Hibberdene, Nyangwini to Umzinto, Nyangwini to Port Shepstone and Nyangwini to Durban. In addition, several routes to the remote rural areas outside of Mthwalume and to the other neighbouring tribal authorities are also found in this taxi rank. This would mean that Nyangwini serves as a departure zone for Mthwalume residents on public transport. 6. Several primary and high schools are located in the area. 7. A small shopping complex was being erected when I was busy doing my field research, for the Mthwalume communities to have convenience shopping.

Even though Nyangwini has all the above mentioned advantages, which serves as catalyst for development in the area, the majority of its local communities are poor. For instance, the majority of the elderly depends on government grants for a living and at most instances they are the bread winners in their own families. Second, most of the professional jobs in the area are awarded to the outsiders, who meet the requirements. As a result, Nyangwini has a lot of rented residential buildings for outsiders. Third, the majority of Nyangwini youth is unemployed. Fourth, the majority of the families in Nyangwini has secured to have the running/tap water in their homes. This is because of the two dams erected at the hilltop in area, by Umzumbe municipality. Fifth, the roads in the area are predominantly gravel or unpaved. There is only one tar road that passes through the area, namely: Siphofu Road. Finally, the buildings of houses in the area are a combination of both traditional Zulu huts and modern houses and in addition, Nyangwini communities do not keep livestock.

### **3.2 Qualitative Research**

Morrow began by quoting Polkinghorne, who explained that the “primary purpose of qualitative research, is to describe and clarify experience as it is lived and constituted in awareness” (Morrow, 2007, p.211). Moreover, Morrow added, by articulating that the researcher’s task is to “use language as a tool in plumbing the depths of this experience to glean

meanings that are not otherwise observable and that cannot be gathered using survey or other data-gathering strategies” (Morrow, 2007, p.211). Language used in data collection was IsiZulu, which is the native language of all the participants of the study, including the researcher. As a result, language was not the barrier in the study; this was witnessed by the fact that participants expressed themselves freely and without fear. In this way, they articulated their lived experience without reservation. Moreover, the open-ended questions and all other transcripts involved were written in IsiZulu, therefore, all the participants were able to read for themselves and had clear understanding.

### **3.3 Health Belief Model**

The HBM was presented in chapter 1 and was selected as a suitable theory that was used towards achieving the desired outcome. Thus, HBM would be able to assess whether the dietary practices of the elderly, as the lifestyle risk factors, are detrimental to the health behaviour of elderly through examination of perceptions and attitudes they may have towards NCDs and negative outcomes of certain actions. Hence, the open-ended questions formulated and discussed were based on HBM seven constructs. The data was then, transcribed and coded along with HBM theoretical constructs, the results and findings will be presented in chapter 4.

### **3.4 Sampling Method**

It should be noted that my targeted population was the elderly population, beginning from the age of 65 years and above, but excluded the elderly population from the age of 60-64 years, which are also categorised as the elderly. For instance, the older people are defined “as those aged 60 years and above” (WHO, 2003, p.39). Intentionally, I chose to exclude the 60 - 64 years elderly population, as many among them are still actively involved in the work place. Thus at this stage, it should be noted that all the elderly, who undertook this study, have retired from work. In this way, the sampling method that was used in this study is snowball-sampling method, which is also known as “chain or referral sampling” method. (Mack et al, 2005, p.5 and Bless et al, 2006, p.176). What happens in snowball sampling is that, the researcher or investigator approach the participants with the suitable qualities, who then use their “social networks to refer the researcher to other people who could potentially participate in or contribute to the study,” having same qualities as the criteria (Alvi, 2016, p.33 and Mack et al, 2005, p.5). This was a preferred approach, as the participants were eager to take part. Therefore, the following three steps of the selection procedure was followed:

- As a researcher, I selected a person who matched the criteria of the research (Alvi, 2016, p.33).
- The first participant was then asked to refer the researcher to another person who met the same criteria (Alvi, 2016, p.33).
- Then the second participant approached was asked to refer the researcher to another one. In this way, a chain was made (Alvi, 2016, p.33).

As a result, I approached some individuals among the elderly, who then referred me to other elderly citizens of Nyangwini and those did the same, hence I ended up having 20 participants.

### **3.5 Sampling Approach Applied**

The study approaches that were used as sampling methods were the focus groups and a couple interview. “A focus group is a qualitative data collection method in which one or two researchers and several participants meet as a group to discuss a given research topic. These sessions are usually tape-recorded and sometimes videotaped” (Mack et al, 2005, p.51) “Focus groups are effective in eliciting data on the cultural norms of a group and in generating broad overviews of issues of concern to the cultural groups or subgroups represented.” (Mack et al, 2005, p.2). This was good as the focus groups brought out the prevalent communal norms of Nyangwini dietary practices. The focus group had 15 elderly participants, which consisted of 10 elderly females and 5 elderly males. The duration of this focus group lasted for one hour, twenty-two minutes and fifty-five seconds (1:22:55). It was recorded and the minutes of the focus group discussion were taken by the note taker. There was no break taken during the interview process of the focus group. The second focus group had only three elderly participants, consisted of 2 elderly females and 1 elderly male. The duration of the interview, for this focus group lasted for forty-five minutes and fifty-five seconds (45:55). It was also recorded and the minutes of the focus group discussion were taken by the note taker. There was no break taken during the interview process of the focus group. Finally, the last two elderly participants was a married couple and the duration of their interview lasted for thirty-six minutes and fourteen seconds. It was recorded and the note taker took the minutes of the interview (36:14). The last two interviews helped in strengthening, validating the evidence and in acquiring the in-depth information about the findings discovered in the first focus group that was interviewed.

Morrow support my statement, when she claims, “additional data always add richness and complexity to the analysis” (p.217). However, this does not indicate that, the first focus group was not sufficient for the study by itself. Hence, Morrow agree with my opinion when she says Patton argued that: “There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know; the purpose of the inquiry; what’s at stake, what will be useful, what will have credibility, and what can be done with available time and resources” (Morrow, 2007, p.217).

### **3.6 Data Collection Procedure**

In order to ensure the smooth functioning of the focus groups discussion and that the records were kept during the interview, two researchers conducted the study. One was the moderator and the other was the note taker. “Documenting the focus group consists of making tape recordings and writing notes. The note taker is responsible for taking detailed notes of the discussion and often for operating the recording equipment. The moderator takes brief notes.” (Mack et al, 2011, 58). As the moderator/facilitator, I executed the following tasks:

- I facilitated the discussion about the study, in order to ensure the smooth functioning of the discussion.
- I asked the respondents open ended questions, to reinforce a conducive discussions environment. These were the questions that “required an in-depth response rather than a single phrase or simple “yes” or “no” for an answer” (Mack et al, 2005, p.51).
- The facilitator, as follow up questions, asked probing questions for clarity and more information in order to have more knowledge on an important subject matter.
- The facilitator took brief notes, in order to have the records of key points on the discussions.

The note taker’s responsibilities were the following:

- Took detailed notes throughout the discussions, as the formal way of collecting data.
- Ensuring that an audio tape recorder was properly functioning during the focus group discussion and interview sessions we had, in order to ensure that the researchers have all the knowledge recorded, gained from the discussions.

### **3.7 The Study Settings**

The settings of the three interviews were different: The setting of the first focus group with 15 participants was in a very cool, relaxed and friendly environment. It was conducted on Saturday afternoon, on 28 October 2017, at 2:30 p.m. The venue for the interview was in a very spacious open plan seating and dining rooms. The weather outside was cool and the elderly people inside the house were in an exuberant mood, as some among them had not seen their counterparts for about three to seven weeks, even though they were all in the same neighbourhood. However, they had not seen one another for ages, as they are no longer able to visit households around the community because of ailing health, due to aging. Looking at their eyes and facial expressions, I could see curiosity and determination in understanding what dietary practices entails. All the 15 participants freely participated in the study and were able to discuss and even teach about the importance of the subject matter to one another, in the presence of the researchers. As a result, these discussions were fruitful and rewarding, to both participants and the researchers.

The second focus group had only three participants. Its setting was in a relaxed and friendly environment. It was conducted on Monday at 12:00 p.m. The venue for the interview was in a very spacious open plan seating room. The weather outside was warm and the elderly people inside the house were in a serious mood, ready to answer all the questions the researcher might have. They all welcomed the researchers with a friendly smile, as one of the researchers (the facilitator) was a known person among them. The participants gave their best and reaffirmed in many ways what the participants of the first focus group said. I was amazed about the in-depth knowledge; they had about effects of dietary practices as a lifestyle.

The last interview conducted, was an elderly couple interview. It was conducted in a thatched Zulu hut, in the early hours of the day, at 10:30 a.m. The weather outside was warm and inside the house it was cool. In this hut, I could see that the elderly couple was in a difficult health condition. The old woman was snoozing on her bed, while her husband was seating on his chair, with a white bandage wrapped around his left leg. They both welcomed me into their house. The old man could easily express himself in speech and on the other hand, the old woman had difficulty in expressing herself in speech. As we were talking, I realized that due to unstable health condition, she had difficulty with breathing. As a result, I was not sure whether we ought to proceed with the interview or not. However, when I inquired, they both encouraged me to proceed according to plan. It was only then that I regained my confidence

about the interview. I thought that the old man would be the main participant; however, the old woman participated in the discussions more than I anticipated. I was surprised by the insight and valuable contribution she added in this study. Honestly, they responded to the questions, and drew from their experiences in life, as examples. In many ways, the interview was a success and in this way, I am indebted to that elderly couple.

**Table 3.1** Nyangwini sample account of the 20 elderly participants in the study

Participants	Occupation	Status	Age	Education	NCDs
Mrs. A	pensioner and bread winner	widow	89 years	Unschooler	HBP and Arthritis
Mrs. B	pensioner and bread winner	widow	80 years	Staff Nurse	HBP, Sugar Diabetes and CVD
Mrs. C	pensioner	widow	83 years	Unschooler	HBP, Sugar Diabetes, Arthritis and CVD
Mrs. D	pensioner	Married	79 years	Unschooler	HBP, Sugar Diabetes, Arthritis, CVD and kidney disease
Mrs. E	pensioner	widow	77 years	Unschooler	HBP, Sugar Diabetes and Arthritis
Mrs. F	pensioner and bread winner	widow	74 years	Lower Primary Education	HBP, Sugar Diabetes, CVD and Arthritis
Mrs. G	pensioner and bread winner	widow	78 years	Unschooler	HBP, Sugar Diabetes, Arthritis and CVD

Mrs. H	pensioner and bread winner	married	67 years	Junior Secondary Education	HBP, CVD and Cancer
Mrs. I	pensioner and bread winner	divorced	67 years	Higher Primary Education	HBP, Sugar Diabetes and Arthritis
Mrs. J	pensioner and bread winner	married	65 years	Higher Primary Education	HBP
Mrs. K	pensioner and bread winner	widow	70 years	Lower Primary Education	HBP, Sugar Diabetes and Arthritis
Mrs. L	Pensioner and bread winner	married	66 years	Staff Nurse	HBP, Sugar Diabetes and Arthritis
Mrs. M	Pensioner and bread winner	widow	69 years	Junior Secondary Education	HBP, Sugar Diabetes and Arthritis
Mr. AA	Pensioner and bread winner	married	81 years	Unschooler	HBP, Prostrate Cancer and Arthritis
Mr. BB	pensioner and bread winner	married	76 years	Matric	HBP, Sugar Diabetes and CVD
Mr. CC	Pensioner and bread winner	married,	67 years	Junior Secondary Education	HBP, Sugar Diabetes, Arthritis and Foot Disease
Mr. DD	pensioner and bread winner	married,	66 years	Unschooler	HBP, Sugar Diabetes, CVD and Arthritis

Mr. EE	pensioner and bread winner	single	65 years	Higher Primary Education	HBP and Sugar Diabetes
Mr. FF	pensioner and bread winner	married,	70 years	Higher Primary Education	HBP, Sugar Diabetes and Arthritis
M GG	Pensioner and bread winner	married,	66 years	Higher Primary Education	HBP, Sugar Diabetes and Arthritis
Total	20 participants				

### 3.8.1 Nyangwini Sample Account

Table 3.8, gives the detailed information about twenty participants in the study. The participant's names are not real, but only the codes were given to each of them, in the form of letters. All twenty participants are pensioners. Seventeen among them are also breadwinners in their families. In most cases, they provide for their grandchildren, of whom the majority of their parents are unemployed and some deceased. In addition, many of these grandchildren are born to single parents. Eight of the elderly women are widows, four are married and one is divorced. Six of the elderly men are married and only one is single. Their age is ranging between 65 and 89 years. Five of the elderly women and two elderly men had never been to the classroom. In total seven of the participants could not read and write. Only two of the elderly women had lower primary education. Two of the elderly women and three of the elderly men had higher primary education. Two of the elderly women and only one man had a junior secondary education. Only one man had passed matric. Finally, only two of the elderly women had passed matric and in addition, had acquired enrolment as Staff Nurses in South Africa. Moreover, all of them were affected by NCDs. The detailed account about their health status will be given in chapter four.

### **3.9 Ethical Guidelines Undertaken**

Ethical approval was received from the Humanities and Social Sciences Research Ethics Committee, Protocol reference number HSS/11/23/017M. Prior to the study, participants were informed about the nature of the study. Participants' had a choice to be part of the study or withdraw from the study. In addition, the participants were allowed to withdraw at any time during the study sessions, if they do not feel comfortable about being part of the study at that moment. An informed consent form was then given to them, on which they had their signatures indicating their voluntary agreement of partaking in the study. Privacy of the focus groups members together with couple interviewed and the confidentiality about what they shared was in the highest regard. As a result, names used in this study are not the real names, but only the codes in the form of letters that were given to each of them.

### **3.10 Thematic Analysis**

Thematic analysis approach was a tool used when analysing the data. This is because “thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data” (Braun and Clarke, 2006, p.78). In essence, “thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data” (Braun and Clarke, 2006, 78). ). In this way, the following thematic analysis methods were useful in analysing the data: Essentialist or realist method, it reports experiences, meanings and the reality of participants (Braun and Clarke, 2006). Constructionist method, it examines the ways in which events, realities meanings and experiences are the effects of a range of discourses operating within society (Braun and Clarke, 2006). Contextualist method, it acknowledges the ways individuals make meaning of their experience, and, in turn, the ways the broader social context impinges on those meanings, while retaining focus on the material and other limits of ‘reality’ (Braun and Clarke, 2006).

#### **3.10.1 Coding**

The data was transcribed and thereafter coded. Bowen claims “codes are nascent theory’ and helps in theory development, in this way coding process is “important to avoid forcing the data into ready-made categories” (Bowen, 2009, p.311). Data coding used both inductive or bottom up way analysis and theoretical or deductive or top down way analysis. Braun and Clarke defines inductive analysis as the process of coding the data without trying to fit it into a pre-existing coding frame, or the researcher’s analytic preconceptions. As a result, this method of

analysis is data driven. On the contrary, theoretical thematic analysis “would tend to be driven by the researcher’s theoretical or analytic interest in the area, and is thus more explicitly analyst driven” (Braun and Clarke, 2006). The following six phases were applied when coding the data in thematic analysis:

- 1) “Familiarisation with the data.” I transcribed and repeatedly listened and read through the data several times.
- 2) Coding the data. I classified my data into separate codes, in order to search for themes of the data, using HBM.
- 3) Searching for themes, using HBM constructs I searched for relevant themes in the data.
- 4) Reviewing themes, coded data was reviewed several times, with the intention of finding themes to help in the analysis of the data.
- 5) Defining and naming themes. Applying HBM constructs I categorised data into relevant themes in order to analyse my study findings.
- 6) Writing up” (Braun and Clarke, p.2006, p.87-93 and Clarke and Braun, 2013, p.120-123). Therefore, having used both these analysis, my research did not demonstrate biasness due to my preconceived ideas about dietary practices of the elderly. Finally, semantic and latent themes were applied as the useful methods in identifying themes of the data. Semantic approach meant that the researcher identified themes in explicit or surface meanings of the data. Latent approach meant that the researcher “examined the underlying ideas, assumptions, and conceptualizations and ideologies that are theorized as shaping or informing the semantic content of the data” (Braun and Clarke, 2006, p.86).

### **3.11 Validity, Reliability and Rigour**

Rigour, validity and reliability are important parameters in ensuring the trustworthiness of a qualitative research. “Trustworthiness refers to the conceptual soundness from which the value of qualitative research may be judged.” (Bowen, 2009, p.306). As a result, Guba proposed four criteria through which qualitative researchers will ensure the trustworthiness of their studies:

- Credibility (in preference to internal validity) (Shenton, 2004, p.64).

- Transferability (in preference to external validity/generalisability) (Shenton, p.2004, 64).
- Dependability (in preference to reliability) (Shenton, 2004, p.64).
- Confirmability (in preference to objectivity) (Shenton, 2004, p.64).

### **3.11.1 Credibility**

“Credibility refers to the confidence one can have in the truth of the findings.” (Bowen, 2009, p.306). Shenton quotes Lincoln and Guba stating that credibility is among the most important factors in establishing trustworthiness of the research. The main concern here is asking: “How congruent are the findings with reality” (Shenton, 2004, p.64)? This is the most important question under scrutiny by qualitative researchers, through which they internally validate the credibility of their findings. Therefore, Shenton suggest that the researchers make certain provisions, in order to promote the accuracy of records in their studies. In my study, therefore, I applied the following recommended provisions by Shenton:

1. Familiarity with the culture of the participants before data collection occurs. This was through preliminary visits.
2. Participants were encouraged to participate voluntarily in the study.
3. Frequent debriefing sessions between my supervisor and the researcher took place
4. Peer scrutiny of my research project was essential, for strengthening my analysis of the study. As a result, this was done with the assistance of my research assistant.
5. Reflective commentary writing on the field study as a researcher is important for establishing credibility of research.
6. Thick description of the study under scrutiny (Shenton, 2004, p.64-68).

### **3.11.2 Transferability**

“Transferability means that other researchers can apply the findings of the particular study to their own” (Bowen, 2009, p.306). Shenton quotes Miriam stating that external validity “is concerned with the extent to which the findings of one study can be applied to other situations” (Shenton, 2004, p.69). This is about the generalisability of particular study findings, in a specific area envisaged as relevant to other areas. Although there is much debate about this, Lincoln and Guba “suggest that it is the responsibility of the investigator to ensure that sufficient contextual information about the fieldwork sites is provided to enable the reader to make such a transfer” (Shenton, 2004, p.69-70). In addition, they state that “the researcher

knows only the “sending context,” he or she cannot make transferability inferences,” (p.70) as he or she knows nothing about the receiving context. In drawing a line in this debate, Shenton advice that, “the results of a qualitative study must be understood within the context of the particular characteristics of the organisation or organisations and, perhaps, geographical area in which the fieldwork was carried out” (p.70). Therefore, the results and findings of this study are applying specifically to the elderly community of Nyangwini. However, behavioural lifestyles of societies in many instances have proven to be influenced by acculturation, which also plays a vital role in nutrition transition, across geographical areas. In this way, this study may be relevant to other rural settings in South Africa. Moreover, dietary practices from urban settings may have a great impact in influencing dietary practices in the rural settings.

### **3.11.3 Dependability**

“Dependability refers to the stability of the findings over time” (Bowen, 2009, p.306). Lincoln and Guba states that there are close ties between credibility and dependability. As a result, demonstration of the former ensures the latter. As a result, reliability is drawn in the study. Therefore, according to Shenton this calls for the processes of reporting in the study to be in detail, to draw the attention of the future researcher in repeating the study. Given the above statement, my research report included the following three points by Shenton:

- “The research design and its implementation, describing what was planned and executed on a strategic level” (Shenton, 2004, p.71).
- “The operational detail of data gathering, addressing the minutiae of what was done in the field” (Shenton, 2004, p.72).
- “Reflective appraisal of the project, evaluating the effectiveness of the process of inquiry undertaken” (Shenton, 2004, p.72).

### **3.11.4 Confirmability**

“Confirmability refers to the internal coherence of the data in relation to the findings, interpretations, and recommendations” (Bowen, 2009, p.306). In this way “confirmability is the qualitative investigator’s comparable concern to objectivity” (Shenton, 2004, p.72). Objectivity about the study findings is vital. Therefore, participants experiences and ideas were only the bases upon which findings were drawn.

### **3.12 Conclusion**

This research was conducted along the parameters of a qualitative study. HBM was the theoretical framework used when interpreting the data. In addition, thematic analysis approach was used for data collection, data coding and data analysis.

## **Chapter 4**

### **Data Analysis**

#### **4.1 Introduction**

This chapter outlines the findings of the study, and is organised to allow the reader to understand the nature of the NCDs reported by participants in relation to dietary practices as a lifestyle behaviour among the elderly participants of Nyangwini.

#### **4.2 NCDs Perceived Susceptibility**

Table 4.2 notes the NCDs reported by participants. All twenty participants reported that they suffered at least one NCD, with sixteen of them reporting that they had two or more NCDs. The most commonly reported conditions were HBP, followed by sugar diabetes. Arthritis is the third reported condition in this study, particularly rheumatoid arthritis (RA). “Rheumatoid arthritis is a multifactorial chronic inflammatory disease that results from interactions between genetic and environmental factors, in addition, personal and lifestyle factors influence the course of the disease, thus leading to progressive disability and a reduction in life expectancy” (Oliviero et al, 2009, p.237 and Tobón et al, 2010, p.3).

Researchers claimed, “Given the strong inflammatory nature of RA, patients are at increased risk for comorbidities such as coronary heart disease and osteoporosis”. Therefore, they conclude that it is “reasonable to hypothesize that dietary factors may influence the etiology of inflammatory joint disease and also alleviate the symptoms of RA” (Oliviero et al, 2009, p.237). As a result, they have concluded, “higher intakes of meat and total protein, as well as lower intakes of fruit, vegetables, and vitamin C, are associated with an increased risk of inflammatory polyarthritis or rheumatoid arthritis.” Whereas, some studies had recommended “Mediterranean-type diet or its main components may have protective effects on the development or severity of rheumatoid arthritis” (Oliviero et al, 2009, p.237 and Tobón et al, 2010, p.3). Furthermore, researchers had stated that, “as macro- and micronutrients in the diet are essential for maintaining the function of immune cells, one could therefore, speculate that a dietary pattern rich in nutrients with favourable anti-inflammatory properties and poor in pro-inflammatory nutrients may protect from autoimmune or other chronic diseases that are related to chronic inflammation (e.g., visceral obesity, type 2 diabetes mellitus, or atherosclerosis)”

(Oliviero et al, 2009, p.237). CVD is rated number four in this study and it is caused by high consumption of fats, added in food.

**Table 4.1** Nyangwini NCDs account of the elderly respondents

NCDs	Women	Men	Total
HBP	13	7	20
Sugar Diabetes	10	6	16
Arthritis	10	5	15
CVD	6	2	8
Cancer	1	1	2
Kidney diseases	1	1	2
Foot disease	1	0	1
Number of Diseases	42	22	64

A question was asked through which the respondents had to give their own perspectives about the susceptibility of NCDs in South Africa. They were expected to draw from their own experience. Moreover, they had to state the age group that is most vulnerable to NCDs:

*“NCDs in reality begins at age 45, even though they are not common at this stage, but are common among the elderly” (Mrs. H, 67 years, and has a junior secondary education).*

*“NCDs are common among the elderly” (Mr BB, 76 years and has passed matric).*

*“NCDs usually starts to affect people at the age of 50 years, as a result, at the age 50 years is the beginning of troublesome/ unhealthy life. However, but these days even the adult people at age 35 - 45 years have the same disease, even though it is not common” (Mrs. B, 80 years, and is a staff nurse).*

*“NCDs are common among the elderly, especially from the age group of 60-70 years and above” (Mrs. J, 65 years and has a higher primary education).*

According to the respondents, it is clear that NCDs begins to affect people, from as early as age 35 to age 45, but remains uncommon at this stage. However, at age 50 NCDs momentum grows higher and becomes more complicated as this population group becomes unhealthier. At age 60 and above NCDs were thought to be very common among the elderly. The specific response that can be given as a cause to this, is the one already stated in chapter 2, “that certain nutrients become harder to absorb via diets (e.g. vitamin B12), in part because older adults often eat less, but also because their diets change. Moreover, mortality becomes related to non-communicable rather than communicable diseases” among the elderly (Global Panel on Agriculture and Food Systems for Nutrition, 2016).

### **4.3 NCDs Perceived Severity**

The perceived severity related to osteoporosis. One of the respondents had this to say:

*“I am having pains problem with my hip bone and leg, as a result I can't walk. When I try to walk, I need to hold my stick with both hands. My knees are also painful. As a result, this is the second year sitting down” (Mrs. D, 79 years and unschooled).*

*“My right leg is sometimes painful up to my hipbone and my knee would be swollen. As a result, sometimes I find it difficult to rise up” (Mrs. L, 66 years and is a staff nurse).*

*“We have back pains, knee pains and the whole body is painful, and as a result, we find it difficult to walk and to do the house duties” (Mrs. M, 69 years, and has a junior secondary education).*

*“I have pain all over my body. All the joints of my body are painful, this includes my feet, ankles, wrists of my hands and knees. The doctor told me that I have arthritis” (Mrs. M, 69 years, junior secondary education).*

*“My legs are painful, as a result, I use this walking stick when I am walking. The white bondage you see, always wrapped around my left leg is because of the unhealing wound that has affected my whole leg” (Mr. AA, 81 years and unschooled).*

“Osteoporosis is characterized by low bone mass and micro-architectural deterioration of bone tissue, leading to bone fragility and a consequent increase in risk of fracture,” and it affects millions of people worldwide. In addition, the evidence suggest that the “incidence of vertebral and hip fractures increases exponentially with advancing age of elderly, after age of 60” (WHO, 2002, p.129). Furthermore, osteoporosis fractures are to the large extent the cause of “morbidity and disability in older people and, in the case of hip fractures, can lead to premature deaths,” according to WHO findings. Diet has a moderate relationship to osteoporosis, however, the convincing evidence indicates that sufficient intake of both calcium and vitamin D are essential for reducing the risk of osteoporosis, more importantly to older persons. Above all, it is stated that ‘calcium is one of the main bone-forming minerals, therefore, it is an appropriate supply to bone and it is essential at all stages of life. Vitamin D is acquired either from the diet or by synthesis in the skin under the action of sunlight. The evidence also shows that lack of vitamin D causes “rickets in children and osteomalacia in adults, conditions where the ratio of mineral to osteoid in bone is reduced.” Lastly, poor vitamin D status in the elderly, at plasma levels of 25-hydroxyvitamin D above those associated with osteomalacia, has been linked to age-related bone loss and osteoporotic fracture, where the ratio of mineral to osteoid remains normal” (WHO, 2002, p.130).

One of the participants had a severe foot disease, as a result, he finds it difficult walking and he spent most of his time during the day indoors.

*“My feet are painful and swollen. As a result, I cannot go out to see the places I would like to visit. My life is confined in this house” (Mr CC, 67 years, has a junior secondary education).*

In addition, one of the participants admitted that he had prostate cancer.

*“It is painful when I am urinating and my kidneys are not functioning well. My whole body is painful and I am always tired.” (Did they tell you the cause of this sickness?)  
“One of the doctors told me it is prostate cancer” (Mr. AA, 81 years and unschooled).*

The evidence presented by the researchers claims that, “the adoption of lifestyle behaviours that are known to increase cancer risk, such as smoking, poor diet, physical inactivity, and reproductive changes (including lower parity and later age at first birth), have further increased the cancer burden in less economically developed countries” (Torre et al, 2012, p.87). Research evidence also shows that the ‘incidence rates’ of prostate cancer are relatively high in other

developing regions, including Sub-Saharan Africa. Therefore, “prostate cancer is the second most frequently diagnosed cancer of men (914,000 new cases, 13.8% of the total) and the fifth most common cancer overall” (Ferlay et al, 2008, p.2906). As a result, prostate cancer, is one of the cancers that has affected the elderly participant in the rural setting of Nyangwini.

Eating too much fat causes heart diseases, this is also one of the problems, among the elderly participants.

*“The doctor told me that my heart has too much fat, this is because I used to like eating meat with fat. Sometimes, I would feel the chest discomfort and my heart will beat very fast, feel that it is hot, lose my strength and would feel that I should rest. I am also having a problem with my kidneys” (Mrs. D, 79 years and unschooled).*

#### **4.4 Awareness of diet as it is related to NCDs**

Two participants who had worked as professional nurses had knowledge about NCDs, due to their career. However, the answers that are given below, in relation to this question are particularly from those who did not have such knowledge. As a result, their answers are of great significance to this study. However, answers from those who had some knowledge would be presented towards the end of the analysis of this question.

*“It is the type food we eat at this stage, when we grew up we did not eat food from the retail shops. Times have changed, we are not ploughing anymore and therefore, we are depending on the retail shops for the food we eat” (Mr. AA, 81 years and unschooled).*

*“The doctors are telling us that the food we often eat these days is the primary cause of NCDs. We are eating too much of junk food, food we buy from the shops” (Mr BB, 76 years and has passed matric).*

In the above quotations, the respondents perceived that the burden of NCDs they had, is caused by the food they eat, of which in most cases is procured from the retail shops. These retail shops predominantly sell ‘processed and convenience’ foods which are more likely to “contribute to the development of newer forms of heart diseases and other chronic diseases of lifestyle, such as diabetes and high blood pressure...” (Pretorius and Sliwa, 2011, p.179). This is supported by the fact that, the latter respondents acknowledged that they are not ploughing anymore, and therefore, had to abandon the traditional diets they used eat when they were

growing up. As a result they had resorted to Western diet, which is largely associated with being urban and is “typified by decreases in carbohydrate and fibre and increases in fat” (p.180).

Traditional diets are in most instances associated with being rural. However, from the respondents’ answers, it is clear that although they are in a rural area, they had taken a step further towards nutrition transition; hence, they are absolutely dependent on the western diet for the food they eat. Western diet is therefore, associated with increased prevalence of degenerative diseases (p.180.). Thus, it is not surprising that each of the above quoted respondents had self-confessed to have some of the following NCDs: CVD, arthritis, cancer, sugar diabetes and kidney diseases.

*“It is the genetically modified chickens we eat, knorrox, processed soups and spices we add in the meals we eat that causes NCDs” (Tell us how?) “We did not have these diseases before, now that we eat in this way everybody has these diseases.” (Mr. DD, 66 years and unschooled).*

*“This chicken is injected and as a result, chicken grows within 2 weeks. It is not good for our health” (Mrs. F, 74 years and has Lower Primary school education).*

Studies had shown that chicken meat is the most consumed, than beef meat in South Africa. (Mchiza et al, 2015). This is because beef meat is very expensive and the majority of the poor cannot afford to buy beef. However, six of the elderly, respondents, reported to eating a lot of red meat as well.

Each of the 20 elderly respondents had self-confessed to have HBP. Studies had shown that there is a high level of salt consumption in South Africa. It is stated that salt is used when cooking food, added when eating on the table and it contributes up to 46% of sodium intake (Claasen et al, 2016, p.20, Ogah and Rayner, 2013, p.6, Peters et al, 2017, p.2 and Wentzel-Viljoen, 2013). As a result, these researchers claim that the increased salt intake leads to increase in blood pressure, thus making salt a major risk factor for CVDs. Claasen et al also pointed out that high salt intake in South Africa is the determinant factor of up to 30% of hypertension among the adult population.

In lowering a high sodium intake among the South Africans, which is in line with WHO recommended guidelines, the Medical Research Council of South Africa and three food

industry partners” lowered the sodium content of five commonly consumed food in the country, which are “brown bread, brick margarine, soup mix, stock cubes, and a flavour enhancer” (Ogah and Rayner, 2013, p.6). As a result, the South African government, through the National Department of Health gazetted regulations related on limiting sodium on these foods. Sodium reduction is thus “implemented in two phases in 2016 and 2019, to allow consumers to adapt to the taste of lower-sodium foods” (Claasen et al, 2016, p.20). In addition, the South African food based dietary guidelines, cautioned South Africans to use salt sparingly, “if at all, at the table and in the preparation of meals, and the intake of processed foods high in salt should be limited” (Pretorius and Sliwa, 2011, p.181).

However, respondents’ answers had indicated that South Africa still has a high sodium intake, because equally, salt and processed foods high in salt are used when preparing food. This is done to add more taste and flavour in the food.

Some of the respondents claimed that it is a common practice of the Zulu adult people to ask for raw salt to be brought forward, so that it may be added on their food when they eat their daily meals in their homes. This also customarily happens when they have their banquets as families, neighbours or communities that the adults would prefer to eat their meat with raw salt.

*“It is salt that causes NCDs” (Mrs. G, 78 years, unschooled).*

*“At many instances when food is cooked and is served, already seasoned with salt. The elderly/adults will ask for more salt, (raw salt) to be seasoned on their food, while they eat and that salt causes sickness in the body. Raw salt directly seasoned on food causes death” (Mrs. B, 80 years, and is a staff nurse).*

When a follow up question was asked: Why the processed soups contributes to the NCDs? One of the respondents had this to say:

*“You cannot eat food without Knorrox” (Mr. EE, 65 years and has a higher primary education.)*

*“Knorrox and the processed soups we add in our stews for flavour are made up of salt and they make a tasty stew. As a result, you will find that some when cooking, they will add salt, knorrox and processed soups, all in one stew. This means that in one pot you*

*add salt upon salt. All this is done in the name of tasty food” (Mrs. B, 80 years, and is a staff nurse).*

Studies had shown that too much oil used when preparing food, increase the risk of NCDs in South Africa. For example, in chapter 2, it was indicated that Empangeni participants were found frying food in ‘hydrogenated vegetable oils’, which contained Trans fatty acids, and therefore, were likely to increase the risk of developing CVDs (Kolahdooz et al, 2013).

Likewise, in this study, almost half of the elderly respondents indicated that, they are used to frying when they cook, using ‘hydrogenated vegetable oils’.

*“We also add too much oil when we cook. We also eat meat with too much fat” (Mrs. B, 80 years, and is a staff nurse).*

Moreover, about half of them indicated that, they have CVDs. Steyna has indicated that “calorie intake is responsible for the development of obesity”, furthermore, he claimed “high-fat diets promote fat accumulation significantly more than high-carbohydrate diets because of the high energy density, metabolic efficiency, palatability, poor regulation and weak satiating effect of fat” (Steyna, 2006, p.71).

A question about obesity was asked as a follow up question. Question asked: How can we prevent being obese? One of the respondents had this to say:

*“It is also sugar that causes NCDs” (Mrs. C, 83 years and unschooled).*

*“Soft drinks that we drink these days contributes in having NCDs and some of them have a lot of sugar and acid, which is detrimental to our health” (Mrs. B, 80 years, and is a staff nurse).*

Myers et al stated that, South Africa is ranked number eight globally for sugar consumption. “In SA, ‘sugar’ typically refers to white granular sucrose, which is refined from sugarcane sap. ‘Free’ sugars on the other hand “refer to ‘monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit concentrates” (Myers et al, 2017, p.99). The findings of this study showed that out of 20 respondents, 16 had reported they had been diagnosed as diabetic. At this stage, evidence, indicates that a tax on sugar-sweetened beverages (SSBs) would be effective in reducing obesity and associated NCDs in South Africa (Myers et al, 2017, p.100).

However, researchers concluded that, SSB tax alone would not be sufficient; “it should rather be seen as one of a raft of measures that might be taken to limit the public’s consumption of sugar” (Myers et al, 2017, p.100). Although, South African National Department of Health (NDoH) considers a “tax on unhealthy foods – specifically those ‘high in fats and sugar’ – to be ‘very’ cost-effective” (Myers et al, 2017, p.100). Moreover, it is worth mentioning that at this stage NDoH has not embarked on making regulatory framework for limiting sugar consumption among the South African citizens. This might not be straightforward formulation, as researchers assume that, “significant resistance can be expected from related industry sectors, chiefly sugar and soft drinks” (p.100).

*“This is caused by the method of eating at some instances we are often used to, hence we have become obese. (Please explain). We eat too much, throughout the day and we need to have specific times of eating. For example, you find that in some families, in preparation for a breakfast in the morning, they cook porridge; serve it as the first dish, thereafter bread with eggs and tea shall be immediately served. At lunch time full meal shall be served and again at dinner time full meal will be served” (Mrs. B, 80 years, and is a staff nurse).*

Eating too much also contributes to the prevalence of obesity and related NCDs, according to Mrs B. Therefore, it is important that people be taught the healthy ways of eating, so that they do not become obese. This confirmed by study conducted about dietary intake and body weight conducted in the rural setting of KwaZulu-Natal. Although, “only 26% of the participants associated overweight with dietary factors” (Faber and Kruger, 2005, p.241).

*“In addition, we are used to sitting all day long doing nothing. Staying inactive also contributes to obesity” (Mrs. B, 80 years, and is a staff nurse).*

#### **4.5 Perceived Benefits of adopting a healthy diet**

Participants identified the following perceived benefits of adopting a healthy diet:

*“I have discovered that one can live with these NCDs, if he or she takes care of his or her health. (How?) By exercising, and taking care of what you eat, do not eat whatever comes your way. You must eat healthy. As a result, you become healthier and regain the energy to cope with the challenges of your adult life” (Mr BB, 76 years and has passed matric).*

*“For instance, follow the doctors’ instructions about living a healthy life, which can help you to live longer. In this way you control the diseases in your body. In addition, I am actively ploughing in my garden on regular bases, which is an exercise for me. In this way, my health status is much better now, than it used to be. I am no longer feeling those painful inches in my body that used to make it difficult for me to move around” (Mrs. H, 67 years, and has a junior secondary education).*

The following interaction recorded between participants highlights the perceived benefits of fresh produce

*“When my daughter goes to work every morning, she gives me some fruits to eat” (Mrs. A, 89 years and unschooled).*

In response to this Mrs. B appreciated:

*“Oh! That is why you look so good and healthy.” (80 years, and is a staff nurse.)*

*“Preferable, when one buys from the shop, should buy more of raw vegetables from the market, not processed foods. This will help in living a healthy life and in this way; help to prevent NCDs when one gets older” (Mr. GG, 66 years and has a higher primary education).*

*“Eating a lot of traditional foods, vegetables and fruits keeps us healthy” (Mrs. I, 67 years and has a higher primary education).*

Mrs A enjoys a variety of fruits daily because her daughter is a fruit seller. In addition, Mrs A is always having access to a variety of vegetables she plants seasonally in her gardening. Above all she enjoys eating traditional foods.

*“Let us also drink a lot of water, to help our kidneys to function properly and have sufficient water in our bodies” (80 years, and is a staff nurse).*

Water is essential for a healthy living and the smooth functioning of the body organs.

*“We need to exercise and run in order to have control of our body weight, so that we can prevent being obese and in doing so, stay healthy and prevent NCDs” (Mrs. I, 67 years and has a higher primary education).*

Eating healthy and exercising regularly is essential for a healthy lifestyle. According to Rivlin, this helps in decreasing “body weight, total body fat, percentage body fat, and body mass index (BMI), while increasing muscle and bone mass” (Rivlin, 2007).

#### **4.6 Dietary Practices Perceived Barriers**

One of the questions related to the challenges the elderly respondents were facing, as a result could not afford to have a healthy diet.

Question asked: What are the challenges (or difficulties) with eating a healthy diet? Some of the respondents had this to say:

*“We can’t cultivate the soil anymore because we are very old and we are sick” (Mr. AA, 81 years and unschooled).*

Frailty, because of growing older and sickness was barrier to healthy eating among the elderly. They considered vegetables as the essential part of a healthy diet, however due to their frail bodies are no longer having the strength to plough vegetables for themselves and they are sick. As a result, they cannot have access to healthy diet, for there is nothing they can do for themselves. Even cooking was no longer part of their domestic chores.

*“Challenges we have are the following, we do not have money, and as a result, we do not have seeds to plough vegetables. As a result, we are no longer used to eating vegetables as before” (Mrs. B 80 years, and is a staff nurse.)*

*“The income, we have is only pension, that we get once a month and it is not enough for a healthy living” (Mrs. M, 69 years and has a junior secondary school).*

Income was also the barrier to healthy eating among the elderly. As a result, they cannot afford to buy healthful food. The money they earn is not adequate for a healthful living. It is approximately one thousand five hundred rand (R1500) a month.

*“We do not have fields and land that we may plough. As a result, our lives depend more on food we buy from the shops” (Mr BB, 76 years and has passed matric).*

*“We do not have fields to plough, our residential plots are small and even ourselves are no longer having the strength to plough” (Mrs. B 80 years, and is a staff nurse.)*

Probing question: In your own assessment, is food from the industries healthy? Some of the respondents had this to say:

*“It is difficult to answer this question because at this stage we are absolutely dependent on the retail shops and that by itself has changed healthiness of the food we eat. (How?). For example, samp bought from the shops is not healthy compared to the one we used to stone grind for ourselves in our homes. It is not fresh, not healthy, for it stays longer in the ware house and in the super market and has different taste.” The one we used to have in our homes, used to be fresh, healthier and tastier, compared to the one we are having from the shops” (Mr BB, 76 years and has passed matric).*

*“It is not healthy, although we eat it. We do not have a choice, for we do not plough anymore” (Mrs. D, 79 years and unschooled and Mr. AA, 81 years and unschooled).*

Another big challenge the rural elderly of Nyangwini, were faced with, was that they stay in small residential plots, meaning that, they could not have big enough garden plots, to feed their extended families. Moreover, they did not have fields and land that they may utilize for having access to healthy food. As a result, they depend on the retail shops, and sometimes in their cases, they depend even on spaza shops in order to have their own food. Moreover, from their own description, industries and shops have a limited timeframe to healthy diet. In this way, shops may be barrier to healthy eating.

*“We are no longer able to cook for ourselves. Our children and grandchildren cook for us, thus we eat what they give to us, as cooking separate meals for our health benefit is time consuming for them” (Mrs. D, 79 years and unschooled).*

*“Also cooking one healthy meal for everybody is not appetizing, as it will mean none or less ingredients should be added for food flavour. Children likes appetizing meals” (Mrs. D, 79 years and unschooled).*

*“We can’t afford healthy meals, as they are expensive. For example, at most instances we can afford to cook two pots, such as pap and vleis (meat curry) or phutu and cabbage. Other healthy dishes are for a luxurious living and cannot be for us” (Mrs. J, 65 years and has a higher primary education).*

Moreover, respondents were asked: When was the last time you ate some fruits? Some of them had this to say:

*“We do not eat fruits on regular bases, for sometimes we do not have money to buy them” (Mrs. J, 65 years and has a higher primary education).*

*“Fruits are scarce in this area; in most cases we do not have them in our homes and spaza shops in this area sell fruits that are not fresh” (Mrs. L, 66 years and is a stuff nurse).*

About eighteen of the respondents, reported not eating fruits on daily bases. As, all of them were pensioners, expressed that the lack of money was the barrier that prevented them from buying fruits. In addition, the scarcity of fruits in the area and in most cases in the nearby spaza shops contributes in the low consumption of fruits among the elderly. However, all of them reported that they consume vegetables, such as cabbage, spinach, dried beans, potatoes, sweet potatoes, taro and sometimes amaranth. They stated that this does not happen every day. Moreover, with those vegetables that are seasonal, they admitted that sometimes it depends on whether they have money to buy them.

World health organisation, recommends an intake of a minimum of 400 g or five servings of fruits and vegetables per day for the prevention of chronic diseases, such as obesity, heart diseases, cancer, and diabetes (Peltzer and Phaswana-Mafuya, 2012, p.1). The World Health Survey showed that among an adult population (18-99 years), the low fruits and vegetables (FV) consumption prevalence in 52 mainly low- and middle-income countries was 77.6% for men and 78.4% for women in 2009 (Peltzer and Phaswana-Mafuya, 2012, p.1)

The amount of fruit and vegetables (FVs) consumed by older South African participants was considerably lower than current recommendations. For example, national population-based cross-sectional study conducted in 2008 with a sample of 3,840 participants, aged 50 years or older, in South Africa, showed significant prevalence rates of insufficient FV intake (68.5%; male 64.8%, female 71.4%), with a mean intake of 4.0 servings of FVs (Peltzer and Phaswana-Mafuya, 2012, p.5).

When the respondents asked: Where do you purchase your fruits and vegetables? Some of them had this to say:

*“We get our fruits and vegetables in Port Shepstone, for we do not have fruit and vegetables market in our local area” (Mrs. L, 66 years and is a staff nurse).*

*“Port Shepstone is the only reliable town, where we can have the variety of fresh fruits and vegetables we need. However, travelling to Port Shepstone is costly as it is far from us, and the only reliable means of transportation we have is by taxis” (Mrs. I. 67 years, and has a higher primary school education.)*

Unavailability of fruits and vegetables at a local produce is highly costly for the elderly participants of Nyangwini. As a result, they had to travel eight kilometres, all the way from Nyangwini to Port Shepstone. In most cases this remains a barrier to healthy eating, as the majority among them could not afford the taxi fare and in their elderly stage, they are not used to travelling.

*“Another challenge we have is that, unlike the past years, where women use to stay at home and help in their homes garden work, you will find that, even in rural areas like ours, most of women are working. This implies that, there is no one left at home to work the small plots we have in our homes. As a result, our lives depends more on food we buy from the shops” (Mrs. H, 67 years, and has a junior secondary education).*

Women employment was perceived by some elderly women as a barrier to healthy eating, as majority among them no longer get involved in home gardening.

At the end of the focus group discussion, I opened an opportunity for asking questions and making comments. In response, a comment was made by Mr. CC, one of the respondents towards the end of the focus group discussions. The comment he made, remains the barrier that hinders many from preventing NCDs. He had this to say:

*“Please let me comment about this issue. We seem to believe that if we take a step back in life, by forsaking the modern ways of cooking and the processed foods we eat at this stage and begin to adopt the traditional ways of cooking we used to have and in addition, eat more of the traditional meals, we used to eat, we shall live healthy lives. This seems very impossible to me. For we seem to believe that these NCDs will be controlled. I do not see this happening” (Mr CC, 67 years, has a junior secondary education).*

The perceived barrier in this statement was the negative attitude, which portrayed resistance in finding ways that would be a solution in controlling the prevalence of NCDs. Undoubtedly, it is normal for people to resist change in their lives, even if, it is for their own benefit.

Moreover, when answering a follow up question about: Why the processed soups contributes to the NCDs? Some of the respondents had this to say:

*“Food with knorrox is nice and tasty” (Mrs. D, 79 years and unschooled)*

*“I agree, knorrox is very tasty” (Mrs. C, 83 years and unschooled).*

*“I like food that is tasty and is nicely cooked” (Mrs. E, 77years and unschooled).*

It was stated that, the elderly tends to select foods that are tasty, due to ‘taste acuity and ‘chemosensory losses’ that often declines with age” Best and Appleton, 2013 and Host et al, 2016). Therefore, they select foods that are high in salt and sugar (Host et al, 2016).

When the respondents asked about physical exercise as part of physical well-being, in keeping up with the healthy diet. Some of them had this to say:

*“I am finding it difficult to walk; my feet are painful and swollen, exercising is worse than walking” (Mr CC, 67 years, has a junior secondary education).*

*“My body is falling apart, I can’t control it anymore and pain is all over my body” (Mrs. D, 79 years and unschooled).*

*“I had never exercise before, now that I am very old, I should learn how to exercise? This is difficult and my body can’t do it. Even if I try to exercise there is no one to help or teach me basic body exercises” (Mrs. G, 78 years, unschooled).*

Frailty because of age is a signified challenge among the elderly in a rural setting in KwaZulu-Natal.

#### **4.7 Cues to Action**

There were few cues to take action to change unhealthy eating habits as respondents noted that their primary cue were health service providers:

*“We are told in the clinics what we are supposed to eat.” (Mrs. K, 70 years and has a lower primary education).*

*“My doctor told me that I should eat a lot vegetables, such as spinach, amaranth, beetroot and so on, instead of eating only meat in my diet” (Mrs. E, 77years and unschooled).*

*“The nurses at the clinic are telling us that we should be used in having traditional meals in our diets” (Mrs. F, 74 years, lower primary education).*

In addition to advice, some participants received practical help from their medical practitioners to reduce the high risk of NCDs prevalence in their lives.

*“My doctor told me that my sugar level was very high, as a result she suggested that when I drink my tea every morning, I should add metformin pills instead of sugar” (Mr BB, 76 years and has passed matric).*

*“The clinic provides me with metformin pills to use instead of sugar, every time when I am taking my tea. As a result, this helps in controlling my sugar level” (Mr. AA, 81 years and unschooled).*

While, this means that knowledge and education can be used to motivate people to eat healthy diet, or change dietary practices, regrettably only health care providers are prompting these behaviour changes, typically when the participant had already developed the NCDs.

#### **4.8 Self-Efficacy**

When the respondents asked, what the doctors were telling them to do, in order to control NCDs. Some of them had this to say:

*“The doctor told me to avoid eating cakes and sweets, but I cannot resist these and therefore, I take small portions when it is offered to me.” (Mrs. K, 70 years and has a lower primary education).*

Mrs K noted that although she did not believe she could avoid the temptation of additional sugar altogether, but in order to minimise the negative impact she reduced the quantity.

*“The doctors and nurses told me to have vegetables in my meals, even though I do not enjoy eating them, I have started eating them on my meals” (Mr CC, 67 years, has a junior secondary education).*

Some participants noted that they had been able to act on the advice that they had been given.

*“Now that I am old I like eating sweet flavoured and tasty foods, however, doctors have told me it is not healthy for my body, as a result, I have told my children to have the simple boiled meals for me” (Mrs. G, 78 years, unschooled).*

*“I was not used to drinking water before, but ever since nurses advised me to drink lot of water, the nurses are no longer telling me that my body is dehydrated” (Mr. FF, 70 years, higher primary education).*

*“I do not drink soft drinks anymore. My doctor has recommended that I drink only water and fruit juices” (Mrs. F, 74 years, lower primary education).*

#### **4.9 Dietary Practices of the Perceived Threat**

One of the questions asked related to a healthy diet. The respondents were asked about how they intend to improve their diet to be healthier?

Question asked: In what ways can we change our diet to be healthier? Some of the respondents had this to say:

*“There is no better way because all the food we eat is bought from the shops. Food we buy from the industries and shops is having chemicals, food we used to eat before, home produced food, directly from the fields did not have chemicals. As a result, we are having NCDs” (Mrs. D, 79 years and unschooled).*

Another question that was asked was about the consequences of not eating a healthy diet.

Question asked: What happens if we do not eat a healthy diet? One of the respondents had this to say:

*“We eat a lot of tin stuff; it has a lot of preservative chemicals in it, so that food may stay longer without decay. As a result, the chemicals used are not good for our health, as we are sick” (Mr. GG, 66 years and has a higher primary education).*

Judging from the respondents' perspectives and interpretations about changing to healthier diet, it is clear that the industrial revolution I have spoken about earlier on, has a negative impact in producing healthier foods and thus it remains a perceived threat of NCDs. As a result, food production, processing, storage, and distribution has greatly affected the composition of diet (Uusitalo et al, 2002).

When the respondents asked, as a follow up question: How often do you eat meat? Some of them had this to say:

*“The doctor told me to eat chicken, but, I do not like chicken at all and I enjoy eating red meat instead. As a result, we are used to eating red meat at all times” (Mrs. D, 79 years and unschooled).*

*“What else can we eat, meat is always the first choice in our diet, we eat a lot of chicken because it is cheap, but we do the best we can to have red meat in our diets. We are used to eating meat almost every day” (Mr BB, 76 years and has passed matric and Mrs. L, 66 years and is a staff nurse).*

*“We are all used to eating chicken almost every day, for we enjoy meat. (What about red meat?). We every now and then, eat red meat when it is slaughtered during our customary festivities. Red meat is expensive to buy at the shops, as a result, we resort to buying chicken” (Mrs. E, 77years and unschooled and Mr. DD, 66 years and unschooled).*

It was stated earlier on, in this chapter that “higher intakes of meat and total protein, as well as lower intakes of fruit, vegetables, and vitamin C, are associated with an increased risk of inflammatory polyarthritis or rheumatoid arthritis.” Whereas, some studies had recommended “Mediterranean-type diet or its main components may have protective effects on the development or severity of rheumatoid arthritis” (Oliviero et al, 2009, p.237 and Tobón et al, 2010, p.3).

Many issues about healthy diet were discussed, relating to dietary practices people are often used to. In addition, alcohol became an issue that was reflected upon at this stage. Alcohol was then perceived a threat of NCDs treatment. As a result, one of the respondents had this to say about liquor:

*“Treatment for NCDs is not effective when you take too much alcohol” (Mr BB, 76 years and has passed matric).*

The following part of the respondents answers related specifically on the question about changing our diet to be healthier. A probing question was asked: What else do we drink beside cool drinks? Two among the respondents had this to say:

*“We drink alcohol. It is not advisable to take too much alcohol, especially when you are taking treatment for NCDs. As one is having NCDs, alcohol destroys the treatment in his or her blood system, beside the disease he or she is getting from it, as a result, he or she may die. Too much alcohol kills” (Mrs. B, 80 years, and is a staff nurse).*

*“Too much alcohol causes liver to become dry” (Mrs. L, 66 years and is a staff nurse).*

“There is a strong link between alcohol and NCDs, particularly cancer, cardiovascular disease, liver disease, pancreatitis and diabetes and these findings support calls by WHO to implement evidence-based strategies to reduce harmful use of alcohol” (Parry et al, 2011, p.1). The

International Agency for Research on Cancer declared in 2007, that there was enough evidence for a “causal link between alcohol and cancer of the oral cavity, pharynx, larynx, oesophagus, liver, colon, rectum, and female breast” (p.3). In addition, alcohol is related to the following, types of liver disease, “with fatty liver, alcoholic hepatitis and cirrhosis being the most common” (p.4). Development of liver disease is contributed by both the duration and the amount of heavy drinking. For instance, studies had shown that, “for men drinking 30 g of absolute alcohol per day is associated with a relative risk (RR) of 2.8 of dying from liver cirrhosis and 7.7 for females. Concerning morbidity, “the RRs for males and females for drinking the same amount of alcohol per day were 0.7 and 2.4” respectively. “For men drinking 54 g of alcohol per day was associated with a relative risk of 2.3 for acquiring liver cirrhosis. For both morbidity and mortality, the RR increases with the volume consumed per day” (Parry et al, 2011, p.1). Out of seven male respondents, which participated in this study, five of them admitted that were alcohol heavy drinkers.

#### **4.10 Summary**

All participants in this study, had a high risk of NCDs, as each of them had at least one or more NCDs. The majority of the participants had two to three NCDs. Four leading NCDs in this

study findings were: HBP, sugar diabetes, arthritis, and CVD. The least common NCDs were: cancer, kidney diseases and foot disease. Unhealthy diets were the lifestyle risk factor for NCDs among the elderly in the rural setting. These include the following: genetically modified chickens, high salt intake, knorrox and processed soups, high fat intake, high intake of sugar sucrose beverages and too much eating ( especially, of carbohydrates), water shortage among the elderly bodies and low consumption of fruits and vegetables among the elderly in a rural setting.

The perceived susceptibility to NCDs according to this study findings is common among the elderly, from age 60-70 and above. The severity of the NCDs, according to this study findings is caused by the ill health, which is at most instances promoted by poor diet lifestyle among the elderly. The perceived benefits in this study session were, exercising regularly, observing the medical practitioners instructions, drinking lot of water, eating healthy, eating a lot of vegetables, fruits, and traditional diet.

Frailty of old age, knorrox, taste, fields, land, money, high costs, time, unappetizing healthy meals, scarcity of fresh/quality produce, scarcity of seeds, scarcity of vegetables, scarcity of fruits and geographical isolation to healthful food were considered barriers to healthy eating among the elderly in a rural setting. Old age and physiological changes, such as frailty, osteoporosis, rheumatoid arthritis and foot diseases were found as barriers to physical exercise and healthy lifestyle among the elderly in a rural setting.

Professional knowledge is essential for a healthy living, according to the findings of this study, doctors and professional nurses plays a vital role in educating people about healthy diets. Processed foods from the retail shops, chemicals used to preserve food, rheumatoid arthritis and harmful use of alcohol were perceived threats of NCDs among the elderly in the rural setting.

## **Chapter 5**

### **5.1 Introduction**

This chapter encompasses the discussion of the study findings presented in chapter four. In addition, it contains specific recommendations obtained from the study findings of chapter four for further study. Finally, conclusion drawn from the study findings would be included.

### **5.2 Discussion**

The relatively greater burden of NCDs related to dietary practices in LMICs are attributed to the nutrition transition phase these countries are theorised to be in. By contrast, residents in high income countries are thought to have modified their diets in relation to the current awareness of the increased risk of NCDs related to poor dietary practices, which is thought to occur in the final phase of the nutrition transition, the Behavioural Change period, which is about preventing NCDs, while prolonging people's health (Piot, 2008). Within LMICs, it has been noted that NCDs are no longer typically associated with urban areas, but are becoming increasingly prevalent in rural settings as well (Holmes et al, 2010 and Manyosi et al, 2009).

Historical evidence had shown that nutrition transition, was accompanied by the paralleled significant changes of health transition and significant demographic and socio-economic changes that took place around the world. (Piot, 2008). In addition, it should be noted that the health transition took place at the peak of political transition in the history of South Africa. As a result, the political transition was characterised by major demographic and socio-economic changes, which was accompanied by health or epidemiologic transition due to nutrition transition which took place at that period in the history of South Africa. Therefore, it is important to admit that South Africa, at this stage, is still undergoing through the same demographic and socio-economic and health transitions.

The main purpose of this study was to describe dietary practices as a lifestyle risk factor for non-communicable diseases among the elderly in a rural setting in KwaZulu-Natal. The Health Belief Model constructs were than used in analysing the awareness, perceptions and behavioural practices of the Nyangwini elderly participants. Although processed foods or unhealthy diet bought from the retail shops was considered a lifestyle risk factor for NCDs among the elderly participants, all unanimously agreed that, they only get their food is sourced primarily from retail shops, and includes the processed and unhealthy options for these were less costly. This concurs with the previous studies that had confirmed that unhealthy diets had increased in replacing healthy diets in South Africa (Vorster et al, 2011). Without access to

land to plant food, household are increasingly reliant on the food industry, and at the same time, staple foods are more refined and processed (Naicker et al, 2015). As a result, this has remained a huge barrier for healthy eating among the elderly in a rural setting, in KwaZulu-Natal, according to this study findings. Second, chickens that were reared using the addition of routine anti-biotic and hormone treatments were reported to be the main source of meat protein the elderly participants eat, as red meat is expensive. Third, there was a reported high level of salt intake, used when preparing food in South Africa among the elderly participants. Fourth, knorrox and processed soups, were commonly used when preparing food in South Africa. Previous studies had shown that, knorrox and processed soups are among the top five commonly consumed food in South Africa with sodium content. In attempting lowering a high sodium intake among the South Africans, which is in line with WHO recommended guidelines and the Medical Research Council of South Africa, three food industry partners “lowered the sodium content of five of the most commonly consumed foods in the country, which are brown bread, brick margarine, soup mix, stock cubes, and a flavour enhancer” (Ogah and Rayner, 2013, p.6). However, participants’ indicated that in addition to using these flavour additives, salt was also used when preparing food. This was done to add more taste and flavour in the food. Therefore, there is a need to awaken or educate elderly in rural populations about detrimental effects of high sodium consumption. Fifth, too much oil intake used when preparing food in South Africa is also a lifestyle risk factor of NCDs among the elderly in a rural setting. Studies confirmed that, too much oil used when preparing food, increase the risk of NCDs in South Africa (Steyna, 2006 and Kolahdooz et al, 2013). According to this study finding, almost half of the elderly respondents indicated that, they are used to frying when they cook, using ‘hydrogenated vegetable oils’. As a result, high sodium intake in food and high fat intake in food are some of the themes that emerged from this study. Sixth, sugar and sucrose sweetened beverages, were consumed frequently although participants noted that these increased the risk of NCDs among the elderly in a rural setting. As it was indicated in chapter 4, out of 20 respondents, 16 had reported they had been diagnosed as diabetic.

Seventh, simple overconsumption of any food was identified as related to obesity and related NCDs among the elderly in a rural setting. This study has found that NCDs are common among the elderly and all the elderly participants in this study, had a high risk of NCDs. As a result, numerous studies had confirmed that this may be due poor health status and more importantly, the poor diet the elderly lead as a lifestyle. As a result, this study findings matches up with the previous study findings, mentioned in my literature review. Concerning the perceived severity, the elderly respondents complained about their poor health status and pains they often suffer because of ill health, which is a common health lifestyle among the elderly. Hence, frailty of old age was one of the themes that emerged from this study. The pain experienced in joints as a result of arthritis would be exacerbated by pressure of on these joints of being overweight, and the self-reports of e a sedentary lifestyle. It was also evident from this study that the elderly participants likes appetizing food or nice and tasty food. Moreover, as many among them are no longer cooking, they had their meals prepared by their children and grandchildren and are exposed to cooking practices thought to produce appetizing meals by others. As a result, unappetizing healthy meals emerged as a theme among other themes from this study. Researchers claim that taste governs the food choice of the elderly. Furthermore, they claim that elderly are at most instances exposed to medications intake due to their health status that is informed by the increasing frailty of old age and ill health. As a result, these medications have a contributing factor in compromising flavour sensation. All these factors detract food enjoyment and thus reduce the appetite of the elderly for simple flavours. In order to compensate the loss of food flavour, the elderly have a tendency to select “food high in salt and sugar” (Host et al, 2016). In this way, the food choices the elderly make, tends to be aligned with the taste flavour rather than its healthiness and this has a negative impact on their health status, hence they are the most vulnerable age group to DR-NCDs. Themes that also emerged from this study are the following: lack of money, high costs of food, scarcity of fresh/quality produce, poor quality of available healthful food, geographical isolation of the rural setting to healthful food, low food variety and dietary diversity, scarcity of vegetables and scarcity of fruits. Several studies were conducted in different rural settings around the world: Senegal, Texas and North Carolina in USA, Poland and Botswana. Their findings are comparable to the findings discovered in this study, hence the same themes emerged from those studies and they are: “high cost of healthful foods, inadequate geographical access to healthful food, poor quality of available healthful food, and lack of overall quality of the proximate retail stores” (Clausen et al, 2005, p.7, Evans, et al, 2015, p.6, Foley and BeLue, 2016, p.354, Haynes-Maslow et al, 2013, p.2 and Payette and Shatenstein, 2005, p.29). All of the above mentioned

themes and others that were mentioned prior to these, relates to poor dietary practices among the elderly in a rural setting and in addition, they serve as a barrier to healthy eating among the elderly in a rural setting. Participants in this study noted that healthy eating was expensive as the cost of ingredients of healthy dishes were considered a luxury. This was echoed in the findings of Evans et al (2015, p.6) who noted that an elderly participants in a study conducted in Texas (USA) said: “We always look for what’s more economical” (Evans, et al, 2015, p.6). ‘More economical’ would mean for the elderly, not being able to buy meat, vegetables and fruits as they are regarded as more expensive. This is highlighted in other settings by the statement of 69 year old, literate woman from Tehran, who puts it in this way, “It is more expensive to buy healthy foods than a fast food. Unhealthy foods are cheaper than healthy foods” (Alizadeh and Salehi, 2015 p.291). This study supports the findings of other studies on the low income profile of elderly participants in other rural settings which impacts on their poor dietary diversity. This is problematic as dietary diversity (in this case ‘other healthy dishes’) is “universally identified as a key element of high quality diets” (Rathnayake et al, 2012, p.1). Moreover, the local spaza shops the elderly participants mentioned in this study provided them with poor quality of available healthful food, as the fruits and vegetables they sold were not fresh. In the previous studies, the local shops are called convenience shops, as they are easy to reach. The elderly from these studies expressed that, these convenience shops do not sell the high quality food or healthful food, but they sell less healthful food or else, according to one of the respondent, they only sell processed foods. Therefore, this means that, in order to get quality produce they had to travel far and it is expensive for them as they do not have sufficient money to live on (Evans et al, 2015, Foley and BeLue, 2016 and Haynes-Maslow et al, 2013). This was similar case with the elderly participants in this study, the only reliable area for the quality produce they needed, was Port Shepstone and it is 8 kilometres away from Nyangwini, their resident area. Reaching to Port Shepstone would mean high costs involved, of which they could not afford as they are all pensioners. However, participants in this study noted their reliance on shop bought food and the lack of control they had on the chemicals used such as fertilizers and pesticides to improve yields. Globalisation of food marketing has thus, affected even the rural settings in LMICs. As a result, this is one of the big challenges, according to this study that might have contributed greatly to the prevalence of NCDs in the rural settings of KwaZulu-Natal. However, the elderly participants had indicated that eating healthy and living a healthy lifestyle, such as eating a lot of vegetables and fruits, eating traditional foods, executing instructions about healthy diet from the medical

practitioners and exercising regularly can prevent NCDs. Other studies, related in this study have the similar recommendations.

Finally, having no land to cultivate and scarcity of seeds also emerged as themes in this study. However, these themes did not relate to other studies mentioned in this study. Thus, these two themes are limited to this study findings. This is due to the historical and political background South Africa experienced during the apartheid regime. For instance, the country was divided into two categories for agricultural use: Vast productive hectares of land were given to the minority white South Africans, who are farmers for commercial use, while, on the other hand small unproductive hectares of land were given to the majority black South Africans for a living. As a result, researchers claim that, “the most salient feature of the agro-food system in South Africa is that it still mirrors the apartheid era. It is a dual system comprising of a dominant yet small, well-capitalized, highly technical and productive white commercial sector (under 40,000 farming units) on one hand and a vast group of black subsistence farmers in the hinterlands on mostly unproductive land in the former Bantustans on the other” (Ngcoya et al, 2016, 482). Moreover researchers claim that “although small in number, the former produce about 70 per cent of the country’s food” (Ngcoya et al, 2016, 482). Land, is therefore, a priority for rural settings in South Africa. Rural settings economy is predominantly agricultural, without land to cultivate, rural residents do not have a decent living.

“Seeds have been the focus of debate in relation to food sovereignty.” As a result, researchers claim that, “seed sovereignty is key for food sovereignty, but has been undermined by the extension of intellectual property rights in the biotech industry and the enactment of international treaties that favour the rights of corporate plant breeders over farmers (Ngcoya et al, 2016, 488). Food sovereignty (FS), can be defined “as the right of nations and peoples to control their own food systems, including their own markets, production modes, food cultures and environments ... as a critical alternative to the dominant neoliberal model for agriculture and trade.” (Bernstein, 2014, 1031). To conclude this discussion, researchers hinted that “the price of a packet of spinach has increased over the years, add the transport costs and it digs a hole in your pocket. You have to be stupid not to see that because the companies own the seeds, in 50 years we will not have any seeds because they will be too expensive” (Ngcoya et al, 2016, 488). Participants in this study reported that, one of the challenges (that remains a barrier) they are were facing within their rural setting is that they did not have the resources to purchase seeds.

### **5.3 Recommendations**

According to the results of this study, the elderly in a rural setting need education about healthy diet. They need to be taught about what constitute a healthy diet and the healthy benefits the elderly could have on a healthy diet. The emphasis should be put more on the consumption of fruits and vegetables as part of a healthy diet, as the study had shown there is low consumption of fruits and vegetables among the elderly in a rural setting in KwaZulu-Natal. Moreover, the emphasis should be put more on the importance of having gardens in their homes. Secondly, the elderly needs to be taught about healthy ways of cooking, versus the unhealthy ways of cooking. Thirdly, the elderly in a rural setting needs to be educated about the health benefits of physical exercise, considering the frailty of their health due to physiological and psychosocial changes that are taking place in their elderly stage. This implies that, in the context of South Africa, the elderly should be educated about South African FBDG. Therefore, the government needs to reach out to them through the following means: Community health care centres such as clinics and hospitals, should conduct regular community based educational seminars about dietary practices as a lifestyle risk factor for NCDs among the elderly in the rural communities. Moreover, they should use their knowledge in monitoring the effectiveness of national government policies, “within nutrition and health plans,” to reduce DR-NCDs in that specific rural area (Swinburn et al, 2013, 29).

Dietitians should be distributed as full time workers to conduct educational seminars promoting healthy diet in the rural communities. Community centres, churches, hospitals, government departments and public schools should be targeted as food promotion and provision domains in the rural communities. There should be deployed government dietitians to monitor the food environments and diet, in all public institutions. Moreover, there should be statutory guidelines about healthy diet these centres should provide (Swinburn et al, 2013, p.27).

Physiotherapists should be distributed as full time workers to conduct educational seminars promoting physical wellness in the rural communities. Therefore, government should establish gymnastics centres in the rural communities. There should be gymnastics for the youth and adults separately. As a result, this will help in offsetting the prevalence of rheumatoid arthritis and osteoporosis among the elderly in the rural setting. This is about ‘developing workforce skills and capacity to improve food environments and diet’ (Swinburn et al, 201

The elderly in a rural setting had some knowledge about what constituted an unhealthy diet and the negative effects it contributed in their lives. However, due to the fact that retail shops and super markets are the only dominant and visible structures in food industry, the elderly were having no choice but to rely on them as a source of provision for their food in a rural setting. For example, research has shown that “community food environments are subject to local ordinances and zoning regulations which could include requirements or targets on the density of different types of food outlets within a community...” (Swinburn et al, 2013, p.27, 29). Therefore, an alternative mechanism need to be formulated to counteract the effect these retail shops contributes to the unhealthy diet prevalence in rural settings: Statements of good practice in this domain include the implementation of zoning policies to attract food retailers to low-income neighbourhoods to expand healthy food availability (e.g. supporting farmers’ markets and fresh fruit and vegetable outlets), and to limit the availability of unhealthy food (e.g. fast-food outlets) around schools through zoning restrictions.” (Swinburn et al, 2013, p.27, 29).

In addition, community based gardening projects, funded and supervised by the government workers who are professionals in the field of agriculture should be established in all rural areas. All families in that rural community should be encouraged to be the registered beneficiaries of that project. As a result, this will ensure that rural families have an adequate amount of land to utilise for a healthy diet. Political involvement of leadership, for the provision of land and governance is of paramount importance in this regard (Swinburn et al, 2013).

Swinburn et al, argues that “The level of funding for population prevention of diet-related NCDs, however, is likely to be low and insufficient, but it has not been comprehensively monitored, ... and this include the ‘Population Nutrition Promotion’ as an integrated measure of the level of this prevention investment” (2013). Efforts to promote food security through an emphasis on traditional vegetables in communities is an idea that is currently being expressed by Ngcoya (2016). . The idea is that by being able to control their own food system, by having their own seeds, especially the indigenous seeds and marketing their own traditional food, individuals will become “independent of agro-industrial food (Ngcoya et al, 2016, 2). Therefore, the government needs to ensure that there are funds available and resources (an adequate amount of land) for traditional subsistence farmers which will re-promote the healthier traditional diet consumed in rural areas in South Africa.

Finally, the elderly participants in this study were silent about the role of the media in promoting healthy diets to the general public. As a result, media has failed many among the elderly and the public in general, who would have benefited from its publicity. In essence, media is supposed to be the instrumental tool that can be used by both the government and professionals to educate people about the effects of eating the unhealthy diets and benefits from eating healthy diets. It is therefore, the high time that media, through radio, television, magazines and newspapers promotes healthy eating. Government, professionals in the food industry, non-profit organisations and all other stake holders involved should make use of the media publicity. For example, research evidence had shown that, there is “association between unhealthy food promotion to children and childhood obesity. To effectively limit unhealthy food promotion to children, strong government intervention, such as statutory regulations (rather than self-regulation by the food industry), is likely to be needed.” (Swinburn et al, 2013, p.25). As a result, the statements of good practice by the government and the professionals involved will be using the media to caution the citizens and even limiting the media advertisements of the ill-health foods and beverages, among the elderly in the rural setting.

#### **5.4 Conclusion**

This study has justified or established as a premise, the need for more research to be conducted about dietary practices as a lifestyle risk factor for NCDs among the elderly in a rural setting in KwaZulu-Natal. Even though, this was a small study, conducted in a small village, its findings had shown their relevance to other studies in different rural settings around the world.

#### **5.5 Limitations of the Study**

The results of the study were self-reported by the study participants on voluntary bases, therefore, there may be discrepancies about these results when compared to other findings elsewhere. Thus, these results are unique to their related study setting.

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## Appendices

### Appendix 1: Approval letter from UKZN Ethics Committee



UNIVERSITY  
OF  
**KWAZULU-NATAL**  
INYUVESI  
YAKWAZULU.NATALI

8 August 2017

Mr Maxwell Mbuso Zulu 9407655  
School of Built Environment and Development  
Studies Howard College Campus

Dear Mr Zulu

Protocol reference number: HSS/1123/017M

Project title: Describing dietary practices as a lifestyle risk factor for non-communicable diseases among the elderly in a rural setting in KwaZulu-Natal

Full Approval Expedited

Application in response to your application received 14 July 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted FULL APPROVAL.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

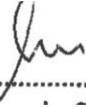
The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

[www.ukzn.ac.za](http://www.ukzn.ac.za)

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t take this opportunity of wishing you everything of the best with your study.

Yours faithfully



-----  
Dr Shenuka Singh (Chair)  
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Dr Kerry Vermaak cc.  
Academic Leader Research: Professor  
Oliver Mtapuri cc. School Administrator: Ms  
Nolundi Mzolo

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Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag Durban 4000

Telephone: +27 (0) 31 260 3587/d350/4557 Facsimile: +27 (0) 31 260 4609 Email: [ximbap@ulgn.acu](mailto:ximbap@ulgn.acu) f [snymanm@ukzn.ac.za/](mailto:snymanm@ukzn.ac.za/)

[mohun@ukzn.ac.za](mailto:mohun@ukzn.ac.za) Website:

YEARS OF

EXCELLENCE

Edgewood

HowardPietermaritzburg

Westville

## **Appendix 2: Informed consent form**

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE  
(HSSREC)

INFORMED CONSENT

### Information Sheet and Consent to Participate in Research

Dear Sir/Miss/Madam

My name is Mbuso Zulu from department of Population Studies at the University of KwaZulu-Natal. My mobile number is 072 649 8799 and my email address is [9407655@stu.ukzn.ac.za](mailto:9407655@stu.ukzn.ac.za)

You are being invited to consider taking part in a study about dietary practices among the elderly in a rural setting in KwaZulu-Natal. The aim and purpose of this research is to find out whether foods that is, eaten by the elderly has contributing factors to non-communicable diseases in their lives. The study is expected to enroll 24 people in Turton. It will involve the following procedures: a group discussion. The duration of your participation if you choose to enroll and remain in the study is expected to be 2hours. The study is not funded.

The study will not involve risks and/or discomforts. We hope that the study will create the following benefits:

- Broaden the participant's knowledge about dietary practices causes for non-communicable diseases.
- The participants will understand the benefits of healthy diet.
- The elders will potential cues to action in adopting a healthy diet.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number \_\_\_\_\_).

In the event of any problems or concerns/questions you may contact the researcher at 072 649 8799 or email address [9407655@stu.ukzn.ac.za](mailto:9407655@stu.ukzn.ac.za) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001  
Durban  
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

The participation criteria on this study is on voluntary bases. If the participants feel that somehow are no longer comfortable to participate in the study, they have the right to withdraw from the study at any time. The participants will not be liable for any penalties in the event of refusal/withdrawal from the study. However, participants will be required to notify the researcher about their withdrawal privately. The researcher does not intend to terminate any participant from the study, at any given circumstances.

There are no incentives or reimbursements for participation in the study will be given to the participants. Only refreshments will be served during the tea break.

The information disclosed by the participants in the study session will remain personal and confidential. Their names will remain anonymous at any given point in time. The digital recordings and electronic transcripts will be kept in a password protected folder on my memory stick. The hard copies will be locked in a filing cabinet. No identifying information (such as consent forms) will be kept with the digital or hard copies. On completion of the project, the research data (notes, audio records etc.) will be stored in the supervisor's office for five years after which it will be permanently destroyed.

-----  
CONSENT

I (Name) have been informed about the study entitled (provide details) by (provide name of researcher/fieldworker).

I understand the purpose and procedures of the study (add these again if appropriate).

I have been given an opportunity to answer 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 of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag 54001  
Durban  
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion YES

Video-record my interview / focus group discussion NO

Use of my photographs for research purposes NO

---

Signature of Participant

---

Date

---

Signature of Witness  
(Where applicable)

---

Date

---

Signature of Translator  
(Where applicable)

---

Date

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE  
(HSSREC)

Informed Consent (IsiZulu)

Incwadi yesivulelwano socwaningo

Mnumzane/Nkasikazi/Nkosazana

Igama lami ngingu Maxwell Mbuso Zulu, ngingumfundi waseNyuvesi yakwaZulu-Natali. Inombolo yokuba umfundi kanye nekheli ithi: 9407655. Inombolo yami yocingo ithi: 072 649 8799. Uyamenywa ukuba uhlanganyele nami ocwaningeni olumaqondana nesihloko esithi: Umthelela wendlela okudliwa ngayo ekubeni yimbangela yezifo ezingalaphekiyo, maqondana nabantu abadala (ogogo nomkhulu) abahlala ezindaweni zasemakhaya esifundazweni saKwa Zulu-Natal.

Lolucwaningo luzoba nenani labantu abangu 24 endaweni yaseNyangwini. Indlela oluzoqhutshwa ngayo: INgxoxo ngokwamaqoqo (group discussions). Lamaqoqo azohlukaniswa kabili, abantu abangu 12 iqoqo ngalinye. Isikhathi sengxoxo sizoba amahora amabili. Lengxoxo izobe ihambisana nokuphendula imibuzo, ezobe ibuzwa umcwaningi maqondana nesihloko. Lolucwaningo aluxhasangwa ngezimali. Ngiyabonga ukuthi uvume ukuba yingxenye yalolu cwaningo. Inhloso yemibuzo ukuthi Kobe nengxoxo phakathi kwethu, ngizocela ukhululeke ukuzwakalisa imibono yakho ngokuphelele. Ngicela imvume yokuba ngiqophe inkulumo yethu. Engikutholayo kulolu daba esikhuluma ngalo ngizokusebenzisa ukubhala umbiko.

Kulideleke ukuba lolucwaningo:

- Luthuthukise ulwazi maqondana nendlela yokudla eyimbangela yezifo ezingalaphekiyo.

- Labo abayingxenywe yocwaningo bazoqonda ukuthi ukudla ngokunempilo kusiza kanganani.
- Ogogo nomkhulu bazofunda ukuba badle ngendlela enempilo.

Lolu cwaningo lusingethwe nguDokotela Kerry Vermaak ngaphansi kwesikole seBuilt Environment and Development Studies eNyuvesi yakwaZulu-Natali lapho ngifunda khona. Yimi ozobe enza ucwaningo, uma unemibuzo ungabuza:

Isikole seBuilt Environment and Development Studies, eNyuvesi yakwaZulu Natali, Howard College, eThekwini. Imininigwane yami ukuze ngithinteke ungathumela umyalezo wombani kuleli kheli: 9407655@stu.ukzn.ac.za.

Uma udinga ulwazi oludlulele ungathinta: HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609 Email: HSSREC@ukzn.ac.za.

Ngaphambi kokuba siqale ngithanda ukugcizelela ukuthi ukuvuma kwakho ube ingxenye yocwaningo kukuwena. Esikukhulumayo kuphakathi kwethu, igama neminingwane yakho ngeke idalulwe.

Ayikho inkokhelo noma ingozi ekubeni ingxenye yalolu phenyo. Ungahoxa noma inini futhi uvumelekile ukungaphenduli enye yemibuzo uma ungakhululekile. Ungabuza noma imiphi imibuzo noma inini.

Ngicela usayine isivumelwano ngenzansi.

Mina ..... (Igama) ngiyakuqinikisekisa ukuthi ngiyifundile futhi ngayiqondisisa imibandela ethulwa NGU: Mbuso Zulu mayelana nocwaningo lwakhe. Nginalo ithuba lokubuza imibuzo futhi ngiyagculiseka ngezimpendulo ezibekiwe. Nginalo ulwazi lokukhetha ukuba inkulumo iqoshwe.

Nginalo ulwazi ukuthi ngingahoxa noma inini.

Ngiyaqonda ukuthi awukho umnikelo engizowuthola kulolu cwaningo

YEBO CHA

Ngineminyaka engaphezulu kuka-18 futhi ngivumelekile

Ngiyavuma ukuzibandakanya kulolu cwaningo

Ngiyavuma ukuba inkulumo iqoshwe

Igama \_\_\_\_\_

Isiginesha \_\_\_\_\_

Usuku \_\_\_\_\_

### **Appendix 3: Questionnaire**

1. What are your views about non-communicable diseases?
2. What are the causes of non-communicable diseases?
3. What types of non-communicable diseases are prevalent in South Africa today?
4. What are the most common non-communicable diseases in our country?
5. Which age group is most vulnerable to non-communicable diseases?
6. Do you identify yourself with any of the non-communicable diseases?
7. How can we prevent non-communicable diseases?
8. To what extent are we able to control our own health?
9. What are some of the things we can do to stay healthy?
10. What is a healthy diet?
11. In what ways can we change our diet to be healthier?
12. What motivates a person to eat a healthy diet?
13. What are the things that can make it easy (or preferable) to eat a healthy diet?
14. What are the challenges (or difficulties) with eating a healthy diet?
15. What happens if we do not eat a healthy diet?

## Imibuzo

1. Yimiphi imibono onayo ngezifo ezingalaphekiyo?
2. Iyini imbangela yezifo ezingalaphekiyo?
3. Yiziphi izifo ezingalaphekiyo ezikhona eNingizimu neAfrica kulesisikhathi esikuso?
4. Yiziphi izifo ezijwayelekile kwezingalaphekiyo ezikhona ezweni lethu?
5. Abantu abangakanani ubudala ngokujwayelekile abaphathwa izifo ezingalaphekiyo?
6. Ingabe wena uyazibandakanya yini nalezizifo ezingalaphekiyo?
7. Singazigwema noma singazivikela kanjani kulezizifo ezingalaphekiyo?
8. Sikwazi kangakanani ukuphatha imizimba yethu ngendlela enempilo?
9. Yini enye yezinto esingazenza ukuze sihlale sinempilo emizimbeni yethu?
10. Ngokunjani ukudla okunempilo/umsoco?
11. Yiziphi izindlela esingazisebenzisa ekwenzeni kangcono ukuba ukudla esikudlayo kunempilo/umsoco?
12. Yini ekhuthaza umuntu ukuba adle ukudla okunempilo/umsoco?
13. Yiziphi izindlela esingazisebenzisa ukuze kubelula ukuba sidle ukudla okunempilo noma okunomsoco?
14. Yiziphi izinqinamba esihlangabezana nazo ezingenza ukuba singatholi ukudla okunempilo noma okunomsoco?
15. Yimiphi imiphumela ebangwa ukungadli ukudla okunempilo?

