Contextual and Socio-economic Factors that Impact Food Purchasing Patterns of Health Club Members residing in a Predominantly Black- Urban Township in South Africa

Moïse Muzigaba

2768076

A mini-thesis submitted in partial fulfillment of the requirements for the degree of

Masters in Public Health

In the faculty of Community Health Sciences at the School of Public Health**,**

University of the Western Cape

Supervisor: Professor Thandi. Puoane

ACKNOWLEDGEMENTS

First and foremost I would like to acknowledge and thank the Lord my savior for making my dream to pursue a career in Public Health a reality. Without the Lord almighty this work would never have come to completion. My heartfelt thanks are extended to my family who, through thick and thin, have treasured my education and brought out the best in me by affording me the opportunity to come this far. Similar recognitions go to my extended family members who have had to step in through various ways to make my dream come a reality.

I would also like to extend my sincere appreciation to my supervisor Professor Thandi Puoane (Mom) whose unwavering support has been consistent from the very onset of my MPH through to this final work. I recognize and value dearly her continued support as a mentor as well as her willingness to act as a catalyst for the funding of my studies. Peer input from Lungiswa Nkonki, a Health Economist from the Medical Research Council of South Africa, is also acknowledged and her guidance in the development of the study questionnaire is highly appreciated.

A special note of thanks also goes to the staff of the School of Public Health at the University of the Western Cape whose support has been rendered in various forms. I recognize your efforts in making me feel welcome to the team and for providing technical assistance whenever I required it.

The final gratitude goes to the Community Health Workers and Mrs Cybil Xhapa for their assistance during data collection. Correspondingly, I wish to extend a word of appreciation to the Health Club Members who participated in this study. Without your willingness for participation this work would never have come to completion.

Table of Contents

ABSTRACT

"Contextual and Socio-economic Factors that Impact Food Purchasing Patterns of Health Club Members residing in a Predominantly Black- Urban Township in South Africa"

KEY WORDS

Contextual, Compositional, Socioeconomic, Factors, Dietary quality, Health club members, Black-Urban Township, South Africa

Background: It is gradually being recognized that understanding individual-level socioeconomic and environmental predictors of food purchasing and thus healthy eating, is imperative in order to develop appropriate nutrition and health interventions. Understanding the complex world of food choice requires a meticulous examination of stimuli and deterrents of food choice all of which should be viewed comprehensively to include micro-level compositional socioeconomic aspects of individuals as well as macro-level contextual influences of food cost, availability and accessibility.

Aim: This study sought to uncover some of the widely known environmental (contextual) and compositional (individual-level) socioeconomic factors that influence Health Club Members' (HCMs) ability to access and afford healthy foods within the community where they live.

Study design: The research employed both descriptive quantitative and qualitative study designs.

Study population and sample: The target population which was also the sample comprised 50 Health Club Members who were residing in Harare and the surrounding area within Khayelitsha at the time of the study.

Data collection and analysis: Data was collected by means of face to face quantitative interviews with 46 HCMs using questionnaires, in-depth interviews with 10 HCMs, Key informant interviews with 2 Community Health Workers, as well as observations of the community food environment. Quantitative data was analyzed using SPSS version 16.0 and MS Excel 2007 for Windows. Qualitative analysis was executed using framework and content analysis techniques.

Results and conclusion: The study established that low socioeconomic status, poor access to healthy food choices, and lack of constant availability of such foods were primary challenges facing some of the HCMs in their quest to afford and access healthy food. In order to promote access to and availability of affordable healthy foods in the study setting, there may be a need for addressing not only individual socioeconomic challenges but also more upstream environmental drivers of food purchasing.

DECLARATION

I declare that **"Contextual and Socio-economic Factors that Impact Food Purchasing Patterns of Health Club Members residing in a predominantly Black- Urban Township in South Africa"** is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources used or quoted have been indicated and acknowledged by means of complete references

Moïse Muzigaba

Signed:

02/01/2010

LIST OF ACRONYMS

HCM	**:**	Health Club Members
CHW	**:**	Community Health Workers
W.H.O	**:**	World Health Organization
F.A.O	**:**	Food and Agricultural Organization
CNCDs	**:**	Chronic Non-Communicable Diseases
FBDGs	**:**	Food-based Dietary Guidelines
IUGR	**:**	Intrauterine Growth Retardation

DEFINITION OF TERMS

- **Chronic Non-communicable diseases**: While the term chronic diseases is emblematically defined as '*illnesses that are prolonged, do not resolve spontaneously and are rarely cured completely*'[17], in this study, only conditions related to diet such as obesity will form the basis of the research.
- **Compositional socioeconomic factors**: These refer to individual-level socioeconomic characteristics and for the sake of this study only those factors affecting food purchasing behavior at individual level such as: Occupations, education, income levels, household size, as well as possession of assets and other household resources; were of interest to the researcher.
- **Contextual factors**: These include characteristics of an environment external to a person which influence food access and choice. They may include the built environment such as local shops selling healthier or less healthy foods, location of shopping outlets that sell or do not sell healthy food, local transportation system, area of residence, as well as relative pricing of healthy foods among various categories of food retail outlets etc.
- **Healthier food vs. less healthy food:** The terms "**healthier food and their less healthy/regular counterparts**" may be confusing. In this report the term **healthier food** is utilized to indicate that from a scientific point of view, not every food presumed to be purchased by HCMs is **completely** unhealthy. Those food items otherwise referred to as "**unhealthy**" also contain certain amounts and types of nutrients required by the body in addition to other nutrients perceived to be undesirable to the body. Therefore the term "food" is used in a **relative manner** (i.e. as **healthier** or **less healthy/regular**). Put more

explicitly, healthier foods in this report have a comparatively ***higher fiber*** content and ***lesser fat, salt and sugar*** than their less healthy/regular counterparts. Furthermore, "***less healthy food***" and "***regular counterparts of healthier foods***" are used interchangeably in this report.

- **Diet*:*** Pattern of eating. The quality, quantity, and times of the day a person eats[18]

- **Various food retail outlets**: for the sake of this study these included commercial areas that stock and sell food substances such as: large supermarkets, convenient stores(medium and small), corner stores (medium and small), free markets, specialty stores such as fruit and vegetable stores and butcheries, fast food restaurants, sit down restaurants, and street markets/vending stands.

- **Socio-economically disadvantaged community:** This is a relative term to describe a community which generally has poor infrastructure, poor access to amenities indispensable for their wellbeing, and within which the demographic composition is chiefly characterized by less educated residents who are for the most part unemployed or employed but on an unskilled basis and by and large earning a meager salary.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

This study was undertaken with a quest to understand contextual and compositional socioeconomic factors that affect HCMs' ability to afford, and access healthy food in a Khayelitsha community where they live. There is today a plethora of studies that have explored ways in which aspects of the environment (also referred to as "context", e.g. obesogenic environment) and individual-level (compositional) socioeconomic dimensions affect dietary behavior. Evidence from most of this work consistently points to the need to acknowledge the notion that an understating of the determinants of a healthy diet should go beyond the concept of 'wrong' health behavior and genetics among other traditionally known determinants of health. In addition to individual responsibility towards their own health, contextual and compositional socioeconomic forces which shape decisions we make and the behaviors we engage in should not be downplayed if determinants of obesity and related chronic non-communicable disease (CNCDs) are to be lucidly understood.

It is important to take recognition of the fact that environmental and the households' socioeconomic position, which form part of the social determinants of health, establish the extent to which individuals obtain the physical, social and personal resources indispensable to their wellbeing. This investigation was thus aimed at examining the extent to which such factors impact on the ease with which community members in a

socio-economically disadvantaged and environmentally unfavorable setting acquire healthy food which could prevent development of obesity and associated chronic health conditions.

1.2 Background to the study

A joint World Health Organization/Food and Agricultural Organization Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases[1] corroborates the view that the growing epidemic of CNCDs afflicting both developed and developing nations is related to dietary and lifestyle changes which are attributed partly to industrialization, urbanization, economic development and market globalization. Arguably, dynamics in the global food economy have led to a shift in dietary patterns and as a result there is to date an increased consumption of energy dense foods high in fat and low in unrefined carbohydrates among some population groups [1].

Since the long term health status of an individual may also be determined by the food consumed throughout the life cycle[2], it is important for individuals to ensure that they develop and pursue healthy food consumption habits. Nutrition has come to the fore as an important modifiable determinant of obesity and overweight conditions and there is documented evidence suggesting that dietary changes have both positive and negative effects on health[1]. The latest scientific evidence has led to the recognition of the interplay between dietary intake and diabetes[3], hypertension[4-5], cancer[6-7], and heart disease[8] among other diet-related CNCDs. This has as a result necessitated the development of public

health interventions that strive to curtail the impact of such long-lasting ailments on the overall health of the population.

Globally there are numerous strands of nutrition interventions which have chiefly focused on education and promotion of behavioral change with regards to dietary modification. For the most part however, this effort has proved ineffectual with poor overall success[5]. It is now argued that although the onus may rest on individuals to ensure proper dietary habits, their eating patterns and habits may also be determined by factors such as food availability, accessibility and affordability[2]. Household socioeconomic gradients and neighborhood characteristics associated with food stores and service location may determine what type of food people buy and where they buy it which in turn reflects in the quality of their diet.

South Africa has one of the most significant disparities between the wealthiest and the poor. There is hitherto a continuing influx of people from rural to urban areas in search of better living conditions, a situation which, by the year 2001 saw close to 56% of the population living in urban centers[9]. Along with such rapid urbanization and globalization came major alterations in health patterns in South Africa leading to an increase in the prevalence of, among other diseases, CNCDs such as ischemic heart diseases and stroke, hypertensive diseases and diabetes mellitus[10]. A guide to healthy eating[11] indicates that there is a growing body of evidence that many South Africans are not eating as healthily as they should. For example a national survey conducted among youth revealed that even though some of them consumed a fair amount of fruits and vegetables, an unacceptable number of them still consumed fast foods and other food and beverages containing empty

calories[12]. The guide also goes further to indicate that individuals who excessively consume foods high in fat, salt and/or sugar with limited physical activities are likely to be overweight and at risk of chronic diseases such as diabetes mellitus, heart diseases, hypertension and stroke among others.

1.3 Rationale of the study

Despite significant advances in efforts aimed at reducing the global burden of diet related CNCDs, a great deal of individuals who reside in socio-economically disadvantaged communities still face a multitude of challenges to adopt healthy eating habits. A working group from South Africa consisting of nutrition scientists and other professionals developed Food Based Dietary guidelines (FBDGs) [11] based on prevailing eating patterns and diet related health concerns. These FBDGs, as pointed out in an unpublished report[13] are by-and-large defined as recommendations about the selection of appropriate types and quantities of food for consumption in order to ameliorate nutrition and health status right through the life cycle. However, such nutrition education and promotion tools may carry little relevance in settings where there are high levels of inaccessibility to and availability of healthy foods as well as financial constraints in food purchasing.

Accordingly, nutrition education is likely to constantly fall on deaf ears if the influence of food prices, accessibility and availability on food purchasing behavior is still poorly understood in such communities. There is to date a dearth of evidence around contextual challenges of food affordability, accessibility and availability and how these impact the

dietary quality of people with low socioeconomic status in South Africa. These are the key issues that this study sought to investigate.

1.4 Statement of the problem

A 2004 report from the Human Sciences Research Council of South Africa[14] argues that South Africa is unlikely to appear in the 'high risk' category in any international rating of food security. The report goes further to argue that despite South Africa's comparatively unfavorable natural resource base, in most years, it is a net exporter of agricultural commodities. It is not landlocked and its transport infrastructure is by and large good. Furthermore the constitution recognizes the right to adequate nutrition for all and it has devised a national Integrated Food Security Strategy (IFSS). In spite of this however, South Africa has not hitherto ensured security of quality and nutritious food at household level in certain population groups. This may essentially be explained by the fact that ensuring adequate access to and availability of healthy food at household level depends not only on sufficient and consistent food production and supplies, but also on households' food purchasing power[15] as well as the ease with which they access and find food and related resources on the market. Consequently, despite useful nutrition messages contained in the FBDGs, such messages may find little relevance in areas where poverty is rampant.

Some researchers from the School of Public Health at the University of Western Cape have been working with a number of CHW from Khayelitsha to develop a community-based model to address lifestyle factors that contribute to the CNCD burden in Khayelitsha [16]. These CHWs have been trained by researchers to run a Khayelitsha-based

health club whereby they interact with HCMs from the surrounding communities for various nutritional education and physical activity sessions. Of the skills imparted to these HCMs, those pertinent to healthy eating were also a priority. Despite this educational effort however, CHWs had realized that some of the HCMs still made unhealthy food choices which may promote the development of obesity and some diet-related CNCDs in the long run [14]. It was hypothesized that challenges to consume healthy food were probably centered on their failure to access, afford, and find healthier foods [*] and various other indispensable resources for adopting healthy eating habits within the communities where they live.

1.5. Significance of the study

By bringing forth individual-level socioeconomic barriers that the community of Khayelitsha and possibly similar settings are facing in their effort to adopt healthy eating habits and contextualizing the food purchasing environment, the proposed study will single out strategic areas to be considered if further interventions are to be formulated. Correspondingly, the findings may advance the effort being made to substantiate the role of "upstream" factors on food purchasing behaviors among low socioeconomic classes in South Africa. The outcome of this investigation could also be one step in the direction of future policy formulation for public health nutrition in South Africa and elsewhere.

[*] The term "**healthier foods**" may be confusing. In this report this term is utilized to indicate that from a scientific point of view, not every food presumed to be purchased by HCMs is **completely** unhealthy. Those food items otherwise referred to as "unhealthy" also contain certain levels of nutrients required by the body in addition to kind and quantity of other nutrients perceived to be undesirable to the body. Therefore the term "healthy food" is used **relatively** in this report suggesting that it can only be nutritionally sound to refer to food as **healthier** or **less healthy**.

1.6 Aim of the study

The aim of the study was to develop an understanding of contextual and individual-level socioeconomic factors which influence HCMs' ability to adopt healthy food purchasing behaviours.

1.7 Objectives of the study

In line with the above aim, the study set out to address the following objectives:

1. To describe demographic and socioeconomic characteristics of the study sample,

2. To explore with Health Club Members compositional socioeconomic factors that influence their healthy eating practices,

3. To uncover contextual factors related to local food environment which determine accessibility to and availability of healthy foods,

4. To explore Community Health Workers' perceptions and opinions around socioeconomic and environmental factors that influence Health Club Members' food purchasing behavior,

5. To describe physical accessibility to and availability of healthy foods around the community's food retail environment in Harare, Khayelitsha.

6. To compare price differences between purposely selected healthier food and their regular counterparts in various food retail outlets.

1.8 Structure of the Mini-Thesis

Chapter one introduced the background to the research topic. The rationale and statement of the problem behind the research topic were highlighted and the aims as well as the objectives which describe how the problem was researched were outlined. Finally the somewhat confusing terminologies were clarified.

In addition to chapter one there are five more chapters: Chapter two is the literature review which explores more extensively the background and the context of the research problem through a critical appraisal of past and recent studies closely related to the one the researcher conducted and by providing a framework for establishing its importance. Chapter three outlines methodological steps that were taken to address each study objective. Research methodology and design, sampling procedure, data collection methods and instruments, data handling and analysis as well as study limitations and ethical consideration are presented in this chapter. Results are discussed and interpreted in chapter four, whereas chapter five discusses study findings in relation to the literature. Chapter six will present the conclusions of the study and give recommendations emanating from the findings of the research.

CHAPTER TWO

LITARATURE REVIEW

2.1 Introduction

Over the past few decades, there has been a shift in the way public health researchers understand factors that contribute to the development of obesity. Prior to this considerable expansion in knowledge, biomedical aspects of ill-health, often coupled with detrimental lifestyle choices, were largely regarded as primary drivers of CNCD development[17]. The advent of the social dimension in disease development, however, brought with it a cogent perspective on how health can be affected by a wide spectrum of social factors. Compositional socioeconomic factors (such as income, occupation and education level,) as well as contextual parameters (notably the physical environment, political/economic conditions and other material aspects) are increasingly being linked with the development of obesity and related CNCDs[19].

This chapter will build on the above to provide a selective account of some of these factors and how they relate to development of obesity and certain CNCDs. The chapter will discuss what kind of work has been done so far, and what have been the gaps and key findings around this issue. Methodological approaches to, and findings from some studies undertaken around the same topic will be appraised and an attempt will be made to provide an overview of a global and national status quo on the issue of nutrition security.

2.2 Determinants of diet-related chronic conditions

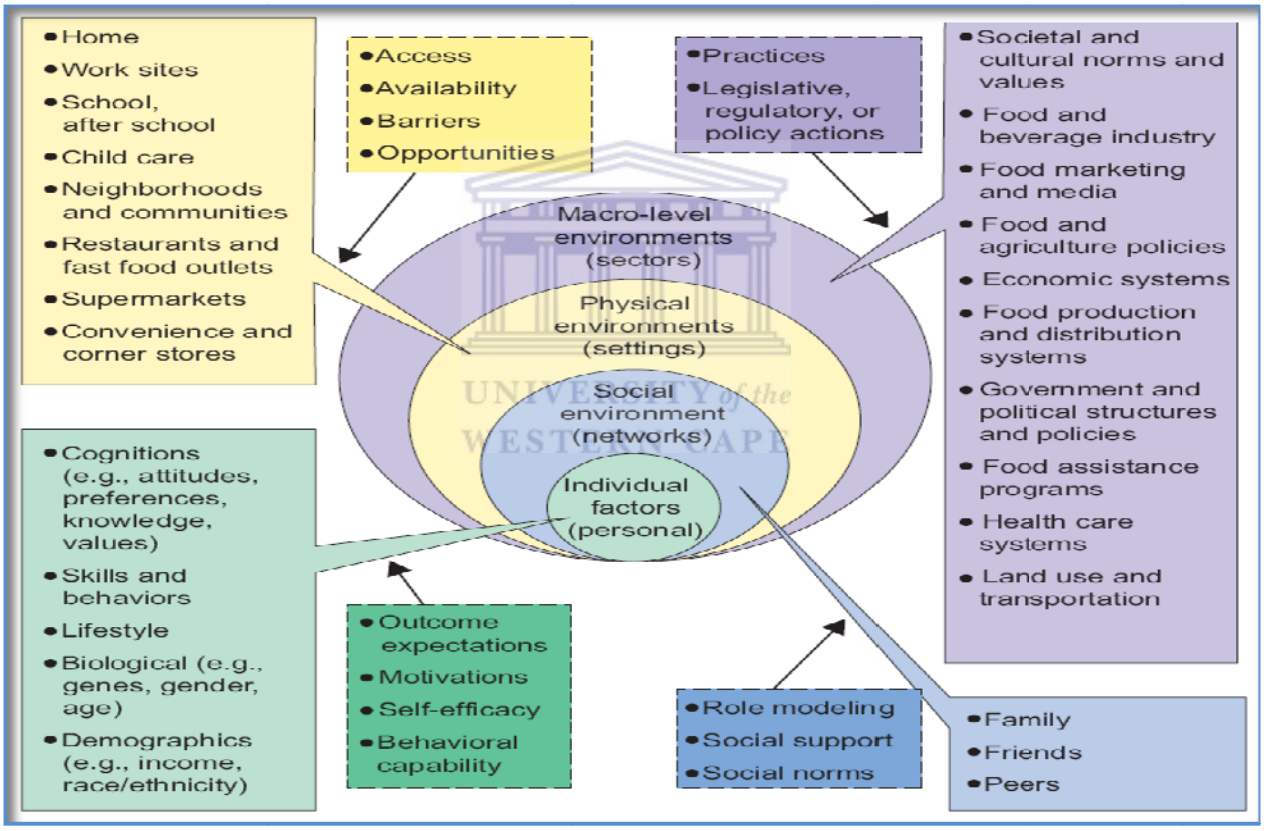
Numerous studies have been undertaken to establish the role of nutrition and diet in promoting and maintaining good health throughout the whole life cycle. A huge volume of such work has documented the nature and strength of the link between diet and CNCDs and the contribution of such diseases to the overall burden of disease[20]. It is now documented that the burden of chronic diseases is increasing rapidly in many parts of the world[20]. A projected proportion of the burden of CNCDs is estimated at about 57% by the year 2020 and around the same year NDCs are likely to account for almost three quarters of all deaths worldwide[21].

Contrary to a wide-held misapprehension that CNCDs are primarily confined to more affluent societies, it is now increasingly being attested that such diseases are equally posing public health concerns to less affluent nations due to the rapidity with which traditional diets and lifestyles are changing. There is therefore a duality of nutrition-related problems in developing countries which needs to be addressed comprehensively by taking into recognition the fact that both facets of malnutrition may prevail simultaneously in such societies.

Although it has been argued that further research may be required to investigate other aspects of the mechanisms through which diet impacts on health[22], available evidence today provides a plausible basis upon which strategic interventions can be developed to address the burden of CNCDs. Chronic diseases are non-communicable conditions associated with a number of risk factors that can be prevented if a concerted effort and political will are exercised to make changes towards health promoting environments within which people can make positive decisions about their health. More recent evidence suggest that risk factors of obesity and

overweight conditions range from micro-level environment of the gene to macro-level environment such as political dynamics, socio-cultural norms, food production and distribution systems, agricultural policies and economic dimensions amongst others. These factors and other widely known determinants of chronic NCDs are discussed in the next sections of this chapter and Figure 1 below provides an ecological framework that summarizes how these factors can interact at different levels to influence dietary quality.

Figure 1 Ecological Framework of determinants of diet



Adapted from Story M et al. (2008)[125]

2.2.1. Bio-medical determinants of chronic non-communicable diseases.

There is increasing evidence to suggest that CNCDs risks also begin in fetal life and continue into old age [24]. Research shows that in many developed countries, intrauterine growth retardation

(IUGR) is associated with increased risk of coronary heart diseases, diabetes, stroke and hypertension, due to abnormal patterns of growth such as postnatal catch up growth or large size at birth (macrosomia) [25, 26]. Intergenerational effects of obesity have also been documented. There is also some scientific evidence that show that young girls who grow poorly become stunted and are more likely to give birth to low-birth-weight children who are at risk of being obese later in life [25]. Several other studies have also shown that children born to obese parents or a mother with maternal gestational diabetes may also acquire the same health conditions [25].

The relationship between gene-nutrient interaction and chronic disease development has also been established. Findings from one scientific work revealed that nutrients from some of the food we eat may influence gene expression which could in turn change human genotype and hence their susceptibility to certain chronic diseases [27]. The same study has however highlighted that gene-nutrient interaction may be influenced by environmental conditions to which individuals are exposed in order for susceptibility to chronic diseases to take effect [27].

2.2.2 Behavioral risk factors of chronic non-communicable diseases.

There is solid evidence that regular physical activity is protective against unhealthy weight gain, osteoporosis, colon cancer and stress [28]. On the contrary however, sedentary lifestyle, particularly sedentary occupation and inactive recreation such as watching television may present the opposite [29].

Behavioral unhealthy eating patterns have been linked with chronic diseases such as type 2 diabetes, hypertension, cardiovascular diseases, stroke, arthritis, gall bladder disease, some types of cancer and asthma [29]. Obesity and overweight (conditions which result from imbalance

between energy intake and energy expenditure) have causally been linked to consumption of large portions of take-away foods [30] and soft drinks [31] as well as skipping breakfast and inadequate intake of fruits and vegetables[32]. Therefore, consumption of energy dense foods, particularly of animal origin, and foods processed or prepared with added fat, sugar and salt may increase an individual's risk of developing diet-related chronic diseases[33].

Inappropriate use of alcohol and excessive tobacco smoking has also been shown to lead to development of heart, liver and lung diseases among others[34].

2.2.3 Social determinants of obesity and related chronic noncommunicable diseases

As has been mentioned in preceding sections of this chapter, over the last five decades risk factors of CNCDs were commonly understood within the context of bio-medical cause and effect as well as negative lifestyle choices [29]. The declaration of the WHO that '*health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity*' and the Ottawa Charter for Health Promotion which recognizes health as '*created and lived by people within a setting of their everyday life; where they learn, work, play and love*', made many public health professionals begin to understand determinants of health from a broader perceptive [29]. Social interactions and characteristics that may influence diet and health are now known to include: Religion, employment, gender, culture, education and literacy, income, social and physical environment, working conditions as well as urbanization amongst others. This has been evident from a number of multi-level studies which have affirmed the role that a number of social factors acting at different structural levels (i.e. from the global to the individual level) can play on the development of obesity and other chronic health conditions[35]

Therefore, in order to understand the complex world of food choice and hence diet, there is a need for a meticulous scrutiny of stimuli of and impediments to healthy food choices which will, in this chapter, be viewed from the perspective of the environment and individual characteristics. Emphasis will be placed on a selective rather than an exhaustive overview of compositional and contextual (the so called obesogenic environment) determinants of diet which are widely known drivers of obesity and some CNCDs

2.2.3.1 Contextualization of the term "obesogenic environment"

The quality of diet may be influenced by the environment. The environment can be linked to diet through, to name but a few, its physical design (built environment- geographical distribution of food retail markets), transportation systems (food distribution and access) and the political atmosphere of that environment (food and nutrition policy). The current modern society is generally characterized by environmental conditions unsupportive of healthy eating patterns - the so called obesogenic environments[36]. Swinburn and Egger defined obesogenicity of an environment as *"the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations*"[37]. A selective account of some of the parameters that may determine the obesogenicity of an environment is given below.

(i) Global food systems and their implications for nutrition adequacy

Many food items which are integral to a healthy diet such as vegetables, fruits and fish, have been criticized as being a luxury by those with low household income since in most instances such foods often carry a price premium [38]. In a report released by FAO in 2008 [39], it was indicated that international prices of many basic food commodities were progressively soaring

given the prevailing economic conditions. This situation has raised concerns on the part of policy makers taking into account a large number of countries worldwide currently facing a food crisis situation. According to FAO, many countries worldwide are presently moving in the direction of food insecurity[40] yet at macro-level food security is a key determinant of dietary adequacy of the population[35]. Food security is by and large being adversely affected by unprecedented price hikes for basic and healthy food owing to historically low food stocks, droughts and floods linked to climate change, high oil prices and growing demand for bio-fuels[40]. The implications of such hikes in food prices on those with a lower socioeconomic status is that very few of them will be able to afford recommended foods and consequently most likely opt for cheaper, less healthy foods.

South Africa has also not been spared with regard to food insecurity both at household and national level. Food insecurity at national as well as household levels is partly attributed to inadequate safety nets and week disaster management systems [14]. This often translates into short term and sometime chronic food shortages which affect largely vulnerable households.

(ii) The price and availability of healthy foods

The major thrust of research on nutrition and health in the past hundred years has fundamentally been on the relationship between nutrient intake and disease development at physiological level. Current research on this issue however, has broadened to the establishment of the ways in which food cost and availability are linked to dietary intake. Separate strands of such work have emerged mainly in some European countries, USA and Australia where the focus has principally been to inform policy development aimed at preventing CNCDs. It is now believed that a

number of researchers from other regions have as well attempted to replicate this work although findings have not necessarily been consistent partly due to the fact that this issue is to some degree context-specific. Therefore variability of findings is highly probable among different countries.

Some studies have employed various methodologies to investigate how the cost and availability of healthy foods impacts on nutritional adequacy although few have nonetheless demonstrated contradicting findings. A study which examined if prices are a barrier to eating more fruits and vegetables for low income families [41] revealed that low income families would be required to spend 43% to 70% of their food budget to fruits and vegetables. Another dietary survey conducted to investigate the effect of replacing fats and refined sugars with vegetables and fruits reported similar findings [42]. The results from the last-mentioned study showed that diets high in fats and refined sugars represented a perceived low cost option as opposed to a more prudent fruit and vegetable diet. An inverse relationship was also established between energy density of foods and their cost in a study conducted by Drewnowski and Darmon[23] who found that fruits and vegetables were 100 times more expensive per unit of energy compared to fats and sugar. In Elinder and Jansson's view, these findings would imply that energy dense diets from refined grains, added sugars and fats would be more affordable per unit energy than healthy diets from lean meat, fruits and vegetables as well as fish [35].

Jetter and Cassady also examined how eating healthy is related to affordability and availability of healthy food alternatives in the USA[43]. Comparison of the cost of a standard market basket to that of a healthier market basket revealed that a healthier market basket was $36 higher than a standard one. Even more interesting about the findings of this study was that in neighborhoods

served by smaller grocery stores, some healthy food items such as whole grain products, low fat cheese were not readily available. One study in Canada[44] and another one by Barratt on the cost and availability of healthy food choices in Southern Derbyshire[45] have reported similar findings. Smaller shops were less likely to have special food items that are cheap. Healthy foods as carrots, fruit juice, peanuts, and many more were at least twice as expensive in smaller shops than in bigger supermarkets. A study in the United Kingdom[46], however, reported the opposite.

One other study worthy of note used economic analysis to predict food choices low-income French consumers might make in order to reduce the budget they allocate to food. Findings from this study showed that decreasing their food budget decreased the proportion of energy contributed to diet by vegetables, fruits, meat and added fats and hence reduced nutrient density [47]. This could imply that the price elasticity (which is a measure of the responsiveness of the quantity demanded to the unit change in price[35]) of various healthy foods is bound to increase with income. Therefore, as consumers get richer the response to price changes of food becomes less[48]. This could mean that despite a reliable availability of healthy food, if affordability is not guaranteed, acquiring healthy food may still be a challenge.

Experimental studies in closed systems such as canteens in schools or workplaces have also been carried out to investigate the effect of reducing the price of healthy food on consumers' food purchasing habits. In a study by French[49], when the price of low fat food items in vending machines was reduced by between 10 to 50 percent, it was observed that the purchase of low fat snacks increased by 9-93%. Price of food may therefore be an important predictor of food choice although it should not be viewed singly. Other factors such as food taste, palatability as well as

socio-cultural values towards certain foods could equally, as they often do, play a role in individuals' food purchasing habits.

(iii) Food retail environment and access to healthy food

While food availability may be determined by food supply, transport and storage among other things, physical access to food on the other hand is a key determinant of food accessibility[50]. Achieving optimal nutrition within low socioeconomic settings is an endeavor which is more and more being known to be affected by the absence of bigger chain supermarkets which often offer healthy foods at a relatively lower price and in variety. In most low socioeconomic settings there are high levels of price inconsistencies in shops, with food being more expensive in corner shops, independent supermarkets and convenience stores than is in bigger supermarkets[51]. The later are mostly not easily accessible and sparsely situated[52]. Lack of transportation to go food-shopping as well as inadequate food storage facilities in such settings compel people to consume foods less frequently and when they do, the meals are bulky. Infrequent consumption or disrupted eating habits of bulky foods may give rise to weight gain due to metabolic changes that take place[50].

Cummins and McIntyre[44] have suggested two pathways of food access in relation to the food retail environment namely: food from supermarkets and grocery shops (for consumption at home) and ready-made food from restaurants and take-away outlets (for home and/or out of home consumption). Some researchers who have used these food access pathways to explore how they could be linked to dietary patterns of the population have often come up with findings providing contentious conclusions. While some have shown that access to neighborhood food

shops is an important predictor of dietary quality others have not. An example of a study which confirmed this relationship employed secondary data from an atherosclerosis-risk-in-communities study in order to investigate ecological variations in fruit and vegetable intake among communities with more supermarkets and those with less. Results from this study revealed that in both white and black communities, fruit and vegetable consumption was higher in census tracts with larger supermarkets. Although the study assumed that individuals purchased their food in supermarkets "exclusively" – a fact that is potentially implausible according to other studies [53, 54, 55,] - authors concluded that the local food environment is an important predictor of access to healthy food [56].

In a USA study by Morland et al.[57], a cross-sectional examination of the food retail environment and location of households revealed that there was a 35% high risk of obesity in areas with access to only grocery and/or convenience stores but without access to supermarkets. A cross-sectional study among low income African Americans has also shown that this population group has poor access to healthy food and better access to unhealthy foods[58] which justifies a higher prevalence of obesity in this racial group compared to others[59]. In a New Zealand nationwide study Pearce et al. demonstrated that there was a strong association between living in a deprived neighborhood and having more access to fast-food retail shops[60]. Similar findings were also noted from a study by Cummins who found that the more people were living in deprived neighborhoods the more access they had to McDonald's fast food outlets[61].

On the contrary, a study by White[62] and other researchers from the United Kingdom[63-64] and Australia[65] have failed to confirm this association. Their findings generally revealed that geographical food retail distribution was not an important determinant of access to healthy food.

British researchers in particular concluded that food retail access in urban areas has no long-term effect on dietary patterns of the British population[35]. In low income settings, however, determining the association between food retail access and nutritional outcomes may be difficult. This could partly be due to possible adaptive mechanisms people tend to adopt in order to survive. These may include gardening, begging for food, and food supply from extended families outside the concerned neighborhood food retail system.

In such settings therefore, observational methods, as Cummins and Macintyre have suggested, may be unreliable to measure the association between food retail distribution and access to healthy food[44]. Objective investigations may therefore be required to provide a more credible relationship.

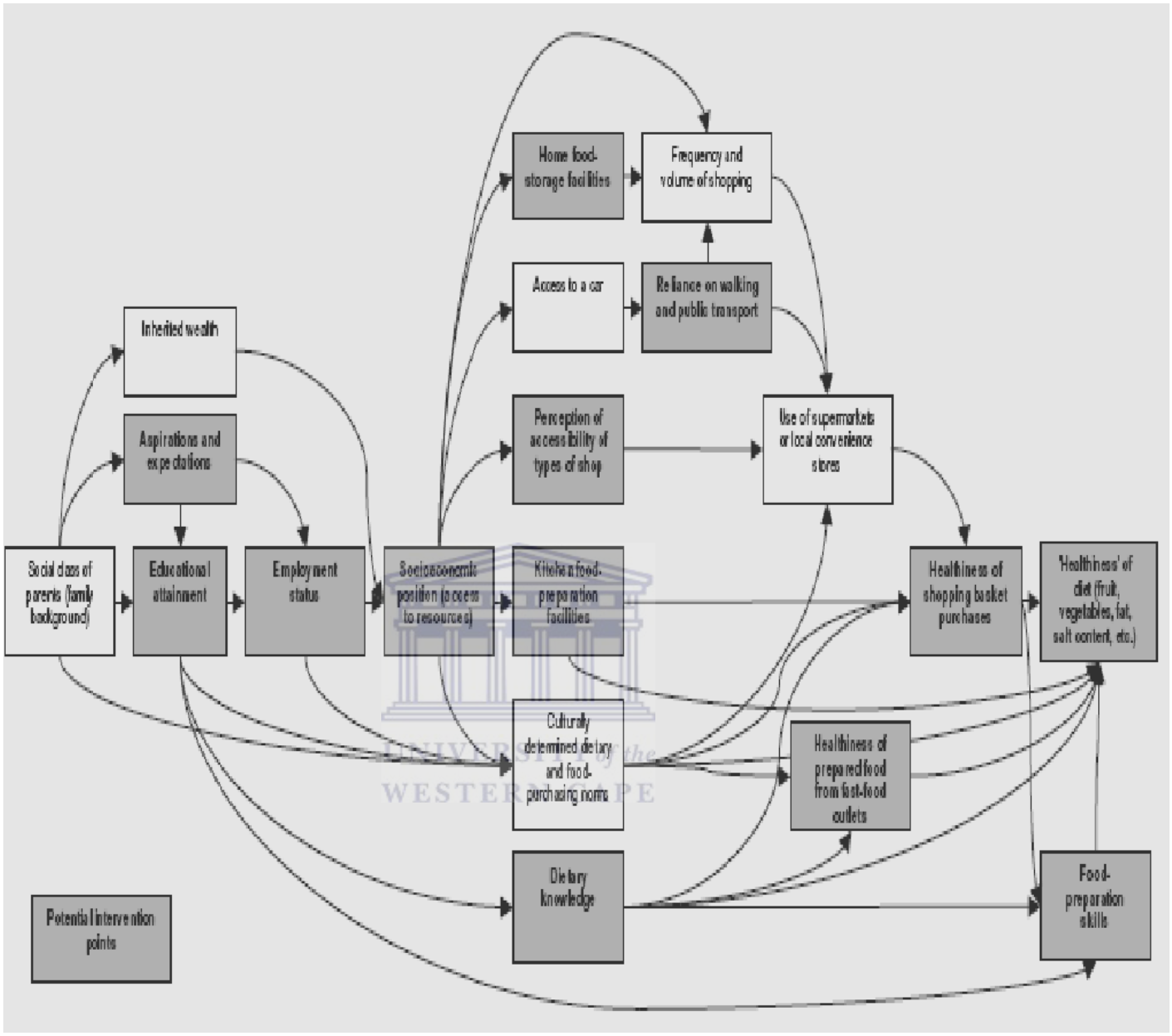
2.2.3.2 Compositional determinants of dietary quality

Much work has constantly established a number of possible individual level factors known to influence dietary behavior at household level. These range from: inherited wealth and social class of parents to disposable income, gender, the knowledge and skills of main food purchaser, availability and adequacy of food preparation resources, food storage facilities etc[56]. Figure 2 below illustrates interrelationships among various aspects of compositional characteristics of individuals and how these may impact on household or individual nutritional status. White suggested that darker shaded areas are potential points from which interventions can be developed to promote healthy eating[56].

Although this graphical illustration is not exhaustive, it provides an overview of currently known compositional factors and how they interact to determine the acquisition of healthy food. There

is today a large body of literature suggesting that social class, often characterized by income, occupation and literacy, is a primary underlying determinant of obesity[66-68]. These compositional moderators, however, do not always act singly to influence diet. They may interact with various environmental parameters in a very significant way. White's theoretical framework has been laid out below to provide a more explicit explanation of how some of these factors may interact with the environment to impact on consumers' food purchasing patterns.

Figure 2: Hypothesized causal model to illustrate the relationship between socioeconomic factors and dietary intake, mediated by food retailing



Adapted from M. White, Obesity review (2007) 8 (Suppl.1)

A hypothetical model illustrating relationship between some individual-level factors and the food retail environment on Consumer Food Choice

The household economic model has always been used by some economists to illustrate how various factors affect consumer choices. This model is premised on the notion that households

make dietary decisions based on their economic position in addition to psychological, sociologic and spiritual considerations[69]. Therefore these parameters are very pivotal if one has to comprehend the intricate concept of food choice, dietary quality, and change. Blaylock [69] further substantiates this argument with a quote by Winikoff of the Rockefeller Foundation who postulated that;

> *"Nutrition is affected by governmental decisions in the area of agricultural policy, economic and tax policy, export and import policy, and involves questions of food production, transportation, processing, marketing, consumer choice, income and education, as well as food palatability and availability. Nutrition is the end result of pushes and pulls in many directions, a response to the multiple forces creating the 'national nutrition environment".*

Promotion of healthy dietary choices as a way of reducing obesity therefore requires a multisectoral approach involving various sectors in the society.

In many developing countries including South Africa the level of economic development follows a dual pattern[33]. There is a mixture of developed and developing areas which often results in some areas being poorer than others. In most areas where poverty is rife, income constraints ensure that the household overall expenditure on purchased goods does not exceed household income. It follows that the demand for certain food items is essentially affected by their relative prices and by the budget allocated to food[70]. Under such circumstances household income is an important determinant of food choices with direct implications for nutrient adequacy. Thus, an increase in food budget would most likely translate to ameliorated nutrition security. Such

dynamics have often been linked with a number of tradeoffs, for example “good nutrition and costs” with an adage that “it costs too much to eat healthy”.

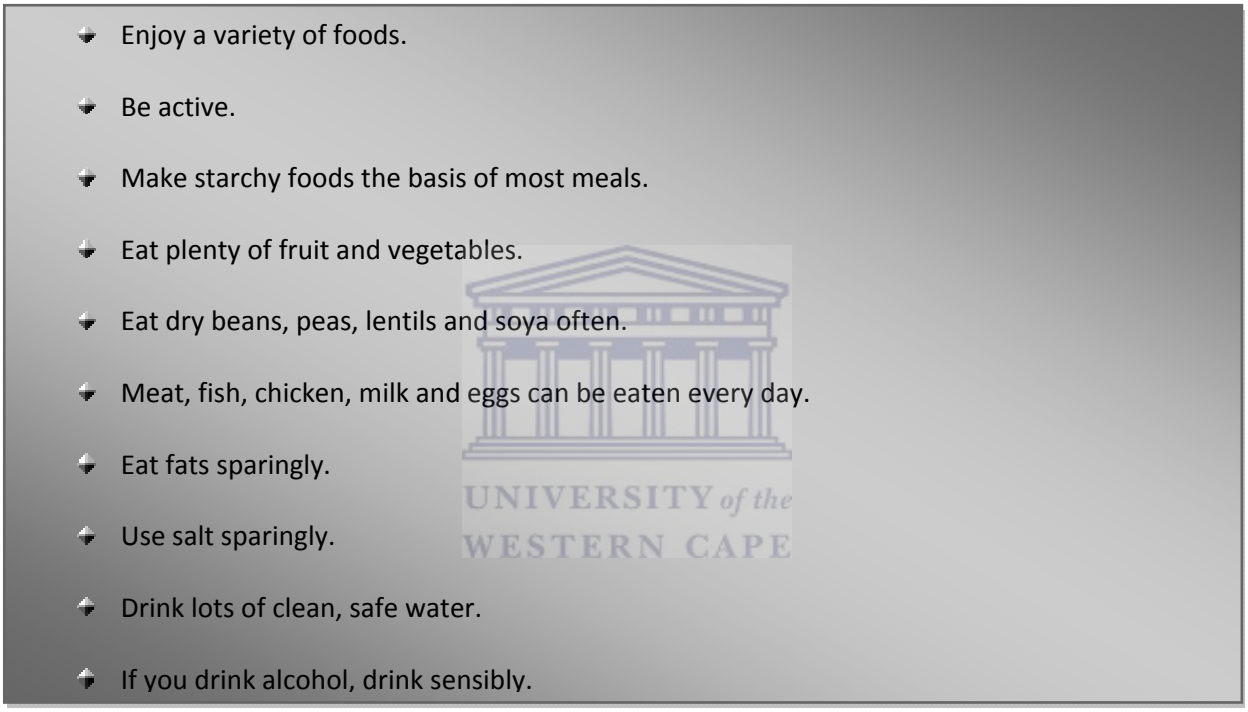
To illustrate such a perception, an example of a price increase of brown whole-wheat bread in contrast to constant pricing of white bread within the context of a fixed household income can be used. Clearly, an average consumer on a below average salary will choose to purchase white bread rather than a more expensive brown bread, when price is held as the only distinguishing factor.

2.2.3.3 South African Food–based Dietary Guidelines and the issue of food access and availability among low income groups in South Africa.

The FBDGs for South Africa were developed in an attempt to achieve optimal nutrition for all South Africans 5 years and older and without special dietary needs [17]. Dietary recommendations from FBDGs direct people through nutritional ways in which they can protect themselves from under-nutrition conditions as well as obesity and other diseases such as hypertension, diabetes, stroke, and other forms of cancers [17]. These guidelines can be used as a constant communication tool for consumers to make wise decisions with regards to their dietary intake[71]. In South Africa, these guidelines have been developed based on prevailing eating patterns and diet related issues. It is however important to note that in order to implement these guidelines within different social groups, factors such as existing lifestyles, social , economic, environmental and attitudinal parameters should be considered. Figure 3 outlines the 10 messages of the guidelines as developed by South African health and nutrition specialists. The implementation stage has nevertheless been difficult[12] even though the guidelines have been tested for comprehension, appropriateness and application in consumer groups of different communities

Despite a dearth of evidence around the aspect of the cost and availability of healthy food among various South African population groups, few of the studies that have explored this area - though not sufficiently – have suggested that food price and access in low social class settings are important determinants of consumption of healthy foods.

Box 1. Food-based dietary guidelines for South Africa



South Africa is currently facing a crisis of rising food prices and food insecurity[72]. In a study on experiences and perceptions of poverty in South Africa, May[73] used indirect economic indicators to measure levels of food insecurity in South Africa and found that they were indeed high. These results were similar to those from a National Food Consumption survey[74] that used direct measurements of food present in low income households. Adhering to nutrition education messages may therefore be a difficult endeavor to pursue under poverty conditions. For example

the South African FBDGs recommends that it is important to eat a variety of food and plenty of fruits and vegetables. Both these may require a certain level of financial stability.

Another study conducted in KwaZulu Natal and the Western Cape also reported affordability as a potential setback to effective implementation of diet-related messages contained in these guidelines due to perceived high prices of food. Food items identified from the focus group discussion as more expensive were those of animal origin as well as fruits and vegetables[75]. A Western Cape baseline study conducted in Khayelitsha as part of a Community Health Workers' Intervention Program for Primary Prevention of Non-Communicable Diseases [16] also revealed that eating patterns among community members were by and large characterized by consumption of cheap fatty fried foods.

Watkinson and Makgetle [76] as well as De Swart et all[77] are few of South African authors who have documented differential pricing of certain foods between low income areas and formal suburbs. Although reported findings do not refer to differences in prices with regards to healthy food, the fact that prices paid for food in general by consumers in low income areas (informal settlements, townships and rural areas) were higher than in formal suburbs may be an indirect indicator of the likely differential pricing of healthy foods in both areas. One reason stated for this pattern was the presence of more large retail chain stores in formal suburbs than in low income areas.

2.3 Interventions to promote availability of and accessibility to affordable healthy foods

Enough evidence exists today to inform formulation of appropriate programmatic and policy interventions aimed at promoting availability of and access to affordable healthy foods. Researchers from various disciplines have enquired into an array of barriers and promoters of healthy eating and their findings have proved to be useful to various public health policy makers. It has however been shown that in order to design interventions that will effectively address these issues, an ecological approach as well as macro-scale policy adjustments need to be considered. For most individual-level factors of dietary behaviour, nutrition education and promotion programs aimed at individuals or small population groups can be initiated. Such behavioural approaches have however shown negligible success[35]. According to Swinburn and Egger[78], employing environmental strategies would be the more realistic approach to reach what they termed "the harder to reach" and attain sustainable results.

Some countries, particularly more developed nations, have designed and attempted to implement a number of crosscutting interventions[49, 79-81, 83] to modify the food environment in such a way as to support healthy food purchasing behaviour. Some of these interventions have used economic instruments such as removing sales taxes on healthy foods and to subsidize healthy foods with a primary aim to promote healthy food purchasing behavior. Other interventions have employed price reduction policies on healthy foods within worksite environments, increasing access to healthy food through healthy corner store initiatives and government policies to increase availability of and access to fresh fruits and vegetables within schooling environments.

The literature reviewed in this report has highlighted that much research on a global scale have by and large used quantitative methodologies to investigate the role of food retail access as well as food price and availability in food purchasing behavior using objective measures. However, there are also few qualitative studies that explored this area[84-87]. This review also revealed contrasting findings from various researchers. Majority of researchers however tended to argue that area deprivation (poor access to food retain markets that sell healthy food items), lower household socioeconomic position and obesogenic environments have negative influences on healthy food purchasing patterns.

South Africa on the other hand has thus far a relatively negligible volume of documented qualitative and quantitative work in this field. Evidence demonstrating the impact of food retail environment on food purchasing behaviour using both quantitative and qualitative methodologies therefore has relevance to the South Africa's context.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Chapter two critically reviewed the literature that relates to the research problem. Chapter three presents the research methods used in order to achieve the aim and objectives of the study. An account is provided on the research design and methodologies, the sampling techniques, sample size, data collection process, data collection instruments as well as data capturing and analysis. Finally the ethical procedure followed will be outlined.

3.2. Study design

A Cross-sectional Descriptive Study Design with a combination of both quantitative and qualitative research methods was employed. The researcher's choice to use a cross sectional study design was informed by the aim to measure various contextual as well as compositional socioeconomic aspects affecting the study sample's food purchasing behavior over a short period of time. Polit, Beck and Hungler[88] assert that this kind of study design is suitable where data collection is done at one particular point in time. Furthermore, it was suitable for this research since the targeted sample could be recruited in one area. This kind of design is economical and relatively easy to manage within a short timeframe[88]. Some authors have also observed that results are relatively easy to analyze[89, 90].

Currier also supports the usefulness of this kind of study design by highlighting its suitability in making inferences about the population from which the sample was recruited[91]. It is also suitable for exploring conditions that are quantitatively measurable. This renders this kind of study design useful to the present study since the quantitative research method sought to quantify participants' differentials in socioeconomic position, demographics and their reported ability to comply with healthy eating guidelines among other pertinent numerically analyzable variables.

The qualitative research methodology, on the other hand, was chosen on the basis of the notion that it would enable the researcher to develop an in-depth understanding of the context within which consumers make food purchasing choices. Some authors have highlighted that this kind of research method enables the researcher to gain deeper insights into the respondents' views, opinions, feelings and beliefs in their natural settings[92, 93]. Furthermore, it has widely been recognized that qualitative findings may enrich findings obtained from quantitative methods around the same topic[94, 95].

Thus, the researcher employed a triangulation method with an anticipation to increase the reliability of the study and increase confidence in the results. Triangulation method entails the use of two or more methods of data collection in one study[96,] the process of which, according to Treece and Treece[97], bears the advantage of uncovering some unique information that could have been omitted through the exclusive use of one method of data collection.

3.3. Study setting.

This study was undertaken in Harare, an area in Khayelitsha district which is a predominantly black-urban township. Harare is the area wherein the study subjects dwell and attend a health

club on specific days in order to meet CHWs for various health promotion and education sessions. The area is situated in the southern part of Khayelitsha node and socio-demographic and environmental characteristics of this area are emblematic of many other informal settlements in South Africa where living conditions are generally poor. The Arrow in figure 3 below shows the location of Khayelitsha node in the city of Cape Town and Appendix 7 depicts the location of the study setting in Khayelitsha and the surrounding neighborhoods.

Figure 3: Location of Khayelitsha Node within the City of Cape Town

In a report compiled by the city of Cape Town following a survey on socioeconomic profiling of urban renewal nodes[98], it was indicated that by the year 2006 Khayelitsha had a relatively younger population with the majority (65%) of the population younger than 30 years. Khayelitsha has a growing population of about 330 000 people and with respect to gender the population had more females (56%), than males (44%). At the time of the survey, 29% of the population in Khayelitsha was involved in some kind of educational training and only 20% of this population had completed grade 12 whereas 19% indicated to have completed between grade 1 and grade 2. The survey also indicated that approximately 52% of the total Khayelitsha population could be defined as economically active but of this group only 25% was employed and 28% unemployed and looking for a job at the time of the survey. It was also noted that majority of household heads were younger than 60 years, with 45% headed by males, 39% by female heads and 1.4% by a person 18 years or younger.

3.4. Study population

The study population consisted of all HCMs, men and women, who were residing in Khayelitsha at the time of the study and attended the health club in Harare. Prior to the study, health club attendance ranged between 25 and 50 HCMs depending on individuals' availability during a particular period of time. They had more or less comparable socioeconomic and cultural characteristics and were living in or at least near Harare.

3.5. Inclusion criteria for study subjects

The quantitative phase of the present research study only targeted HCMs who had been trained by CHWs about healthy eating. Therefore every man and woman under this category was invited

to participate in the study. For the qualitative phase, only participants who reported to have poor compliance with regard to healthy eating were eligible for inclusion in the qualitative sample. Equally eligible for inclusion under this category were two CHWs who worked closely with HCMs.

3.6. Sampling methods

In quantitative enquiry sampling techniques are often referred to as procedures for deciding specific groups or individuals in the population to be included in the study sample[99]. For the first part of the study - the quantitative phase- every HCM who had previously received a lecture on food based guidelines was included in the sample to participate in the preliminary quantitative survey.

Unlike in quantitative research, the fundamental objective of sampling in qualitative research is to identify the cases that will provide a maximum understanding of all aspects of the phenomenon[100]. Therefore researchers are faced with a task to select information-rich cases for studying in depth. In order to achieve this, the researcher should first define the sampling frame and then explain what sampling method or selection criteria will be employed to select respondents from this sampling frame[100]. In the current study the sampling frame comprised all respondents who had participated in the quantitative phase of the study. Purposive sampling based on predetermined criteria was used to obtain the first qualitative sample - HCMs. This sampling method was guided by the last question of the quantitative questionnaire which examined participants' ability to comply with healthy eating guidelines. The selection process is described in later sections of this chapter.

The second qualitative sample involved two CHWs who, by virtue of interacting quite extensively with HCMs were deemed conversant with their day to day experiences in acquiring healthy foods within their community. Added to this was also the fact that they were familiar with the food purchasing milieu in Khayelitsha. A third qualitative method was observational in nature and involved random sampling of market places selling foods within and around Harare where most participants reside. Food market places which were selected include the only one supermarket, 4 medium/small grocery shops, 3 inform/street vending stands, 4 fast-food outlets, and 2 seat-down restaurants.

3.7. Sample size

A total of 50 HCMs participated in the quantitative phase of the study. For the qualitative phase, a total of 10 HCMs (selected from the analytical sample comprising the initial 50 HCMs) who yielded a lower percentage score after assessing their compliance with healthy food consumption patterns participated in the study. Two CHWs were also selected to participate during key informant interviews.

3.8. Data collection methods

In order to appropriately answer the research problem it is crucial that the researcher chooses the most appropriate data collection procedure[101]. Therefore the nature of the data to be collected and the purpose of the research have to be carried forward throughout the conceptualization of the research. The following three data collection methods namely: Face-to-face quantitative interviews, qualitative interviews, and observations were used in this study:

3.8.1. Face-to-face structured interviews

The quantitative phase of this research used structured interviews. The choice to use a questionnaire was in line with Burn's view that such an instrument allows every participant to get a similar assessing tool to complete which may result in standardized responses. Moreover, the anonymity of questionnaires allows the researcher to obtain information about unusual behaviors or discomforting characteristics [99], leading to a high response rate and improved survey quality.

The qualitative phase on the other hand employed two data collection methods namely interviews (both in-depth individual interviews and key informant interviews) and observations.

3.8.2. Qualitative interviews

- **In-depth individual interviews:** These were used because of their power to produce quality data. This qualitative data collection method has a distinct advantage of enabling respondents to provide their own views vis-à-vis the research problem without feeling ill-at-ease and overwhelmed by group dynamics as is the case in focus group discussions[102]. Furthermore, the unstructured nature of in-depth interview questions provides respondents with the power to direct the interview as well as to select the sequence of data delivery. It should however be noted that individual interviews have inherent limitations. Self-consciousness associated with individual interviews may limit the amount of information interviewees are likely to provide[103]. An interviewer therefore needs to make the respondent as much comfortable as possible.

- **Key informant interviews with CHWs:** These interviews aimed at substantiating the data obtained through in-depth interviews. The power transfer from the researcher to the respondents enables respondents to own the interview process[104]. However, key informant interviews may equally carry the same limitations as those mentioned in the case of in-depth individual interviews. The interviewer-respondent relationship therefore has to be as much friendly and comfortable as possible.

3.8.3. Observations

This method sought to describe the food purchasing milieu, observed price differences between healthy foods and their relatively less healthy counterparts, the nutritional nature of foods that are readily available to the community and therefore the study participants, locations of food shopping outlets in relation to the geographic arrangement of the community as well as the availability of a variety of food items sold therein. The observational method carries the advantage of allowing the researcher to view the environment within which participants make decisions e.g. food purchasing environment, thereby allowing him to generate his own perspective of the research problem. Observations may, however, be subjected to bias if they are not validated by another data collection method.

3.9. Development of data collection instruments

Four data collection tools were developed for the study. Drawing on the objectives of the study these tools were developed as follows:

Objective 1, 2 & 3

The survey questionnaire covered the first three objectives of the study. *Questionnaires are designed to discover what respondents know about events, how they know about them and the source of the information"*[104]. In order to develop a suitable quantitative questionnaire, a number of published literature[69, 71-81, 109-110] and established research tools[105] around the same research problem were reviewed. Relevant questions and statements were extracted to constitute 20 questions which collected data on HCMs ability to access, afford and find healthy food in their community.

The questionnaire entailed mainly closed-ended questions aimed at providing a set of fixed answers to the questions (See Appendix 1). The merit of closed-ended questions stems from their advantage of ruling out vague responses when structured properly and a relatively shorter time they take to answer[106]. This in turn may increase reliability since there is little variation in answers[107]. An attempt was made to follow Babbie's recommendation to structure questions with all possible responses for data gathering[108]. Some questions were structured in such a way that they comprised response categories which were closed-ended and another open-ended category, for example "Other- Please, specify". An open ended category was added in order to give each respondent a chance to provide a response which the researcher was not able to identify.

Based on the literature, the following subject matters guided specific questions that were included in the questionnaire (refer to Appendix 1 for specific questions asked):

- Demographic and socioeconomic characteristics
- Shopping outlets where research participants buy their food stuffs
- Participants' perceived price differences between certain healthy foods and their less healthy counterparts

- Interpersonal factors of food purchasing within participants' households
- Participants' elementary knowledge of healthy eating
- General assessment of participants' ability to acquire healthy food for consumption in the community where they live.

Objective 2 & 3

Objective 2 and 3 were also covered by interviews. With the help of a health economist, the researcher developed two sets of interview guides and an observation check list. Descriptions of each tool and how they were developed are outlined below.

- **Interview guide for HCMs:** Designed with semi-structured questions, this tool was geared towards an in-depth enquiry into HCMs' opinions about factors that restrain them to access and afford healthy foods around the environment surrounding them. Six key themes were developed in order to guide specific questions to be asked. Under each question, specific probes were outlined so as to steer the data collector through the interview process (See Appendix 2). For example a question was asked: "Tell me how the recent hike in food price has affected your household purchasing habits". Probes included: how did it affect the frequency with which you purchase fruits and vegetables? What are the kinds of food retail outlets you now visit to buy food? Probes were meant to be derived from the answer given by the participant.

Objective 4

- **Interview guide for key informants (CHWs):** This tool consisted of 7 questions, the fundamental purpose of which was to validate the findings from in-depth interviews with HCMs. Although the content of this tool was somewhat similar to that used to guide interviews with HCMs (see appendix 3), the primary aim was to establish an understanding of CHWs' perceptions of the context within which HCMs acquire the food they eat. A question like; "Can you please comment on HCMs' ability in terms of mobility and accessibility to acquire healthy food"? Probing ensued depending on the direction of the interview.

Objective 5 & 6

- **Observation sheet**: A sheet with a description of key environmental characteristics of the food shopping milieu was developed to collect information pertinent to objective number 5 and 6 (see appendix 4). For instance the observed nutritional quality of food which can be easily accessible by community members within their immediate food retail environment (informal food-vending market places, sit-down restaurants, fast-food outlets etc) was noted. Of interest was also the geographical location of the supermarkets and other retail outlets that stock healthy foods in relation to the location of households in the community. Similarly, price variability of healthy foods and their less healthy counterparts (purposely selected and modeled based on foods mostly consumed by community members of this area) between smaller shops and other informal food markets in the community and larger supermarkets were also observed and compared. Availability of healthy foods was also noted. In order to minimize investigator bias, this data was

collected by an independent research assistant who gathered data at different days of the data collection period.

3.10. Validity and trustworthiness of the study

In order to ensure validity and trustworthiness a number of precautions were taken throughout the study. Method triangulation using four different methods (in-depth individual interviews, Key informant interviews, a survey and observations) to investigate the issue was used to increase validity of the study. The use of more than one method of data collection in triangulation to answer a question may carry an advantage of increasing rigor[111]. Data source triangulation using data from 13 food market places as well as interviews with 2 key informants was another technique used to provide the credibility and corroboration of the research findings. It must however be noted that the use of different data collection techniques supplied parallel datasets, each providing only a fractional view of the whole picture[111].

Content validity of the quantitative questionnaire was enhanced by adopting some questions from published work around the same topic and incorporating them in the current study. For the most part, a questionnaire developed from the School of Public Health and Centre for Health and Biomedical Innovation at Queensland University of Technology for a Brisbane food study[105] was used. An epidemiologist based in the School of Public Health at the University of the Western Cape and a health economist from the South African Medical Research Council were also consulted for peer input to the research tool and some questions were fine-tuned to suit the study objectives. The instrument was also piloted among four HCMs prior to the official administration to all respondents. This was performed as a way of checking for the tool's reliability which

Currier[91] defined as the consistency an instrument has in providing similar results from the same population when administered at different times. Standard Operating Procedures were also adapted for interviewing, data entry and analysis. The field workers and a field supervisor were reasonably experienced in data collection and had previously worked on a similar project in the same community.

For qualitative data, saturation point was allowed to be reached during the 10 in-depth interviews conducted with HCMs. Respondent validation (cross-checking interim findings) was conducted by means of reflection to ensure that information reported by participants had been accurately understood. Qualitative data was collected and translated by one interviewer thereby minimizing inter-investigator bias. To ensure the internal consistency of data coding and analysis, the researcher did all the coding and analysis himself. However, a peer reviewing process was undertaken whereby the supervisor reviewed the steps taken to analyze as well as interpret data. This was important to further ameliorate the "inter-rater reliability" of the study findings[112].

3.11. Data collection process

3.11.1. The quantitative data collection process

This process extended over a period of two weeks (from mid to end October 2008). Using a list containing names and addresses of all HCMs, the researcher and the field workers devised a plan and map to follow in order to survey all concerned households. The researcher prepared the questionnaires, participant information sheets and consent letters (See Appendices 1, 6 and 5 respectively) and handed them to the field workers. Field workers scheduled appointments with HCMs and on the day of the interview they paid each one of them a visit to their respective

households and at their convenient time of the day. Consent forms and participant information sheets, both of which were translated in IsiXhosa, were handed over to the participants and the former was signed prior to data collection. For participants who could not read, information contained therein was read out to them. After respondents consented to participating in the study, data collection followed by means of a face to face questionnaire interview. The same procedure was followed until all 50 respondents had been interviewed. Every respondent was also asked if they will be willing to participate in the qualitative phase of the study should they qualify to do so. Their responses were noted in a diary for later reference.

3.11.2 Qualitative data collection process

The process of qualitative data collection followed a week after quantitative data had been gathered. Ten female participants, aged between 40 to 65 years, were interviewed. All interviews were conducted in participants' respective dwelling places where they felt more comfortable. Verbal appointments were first scheduled with those participants who had been selected to participate in interviews. On the day of the interview, the researcher and another field researcher visited the participant's homes and started off by explaining to the interviewee the purpose of the research as had previously been done during the quantitative data collection process. The same consent form as the one used in the quantitative phase of the study (Appendix 5) was issued and participants expressed their willingness to participate by hand-signing it.

Before interviews with the two CHWs began, the researcher contacted them and asked about their willingness to participate. Upon agreeing to participate, specific dates for interviews were scheduled. These in-depth interviews required that the researcher uses unstructured questions to

enable respondents to direct the interview. Conversations were tape-recorded then later translation and transcription executed.

Prior to the commencement of all interviews, the researcher checked the tape recorder for any faults and ensured that new batteries were used to tape-record the conversations. The interview process began first by introducing non-threatening questions then questions more specific to the study problem. Eight of the ten interviews with health club members were conducted in IsiXhosa whereas the remaining two were conducted in English based on the respondent's language preference. All ten interviews took one week to complete (from early to mid November 2008) and on average every interview lasted between 30 to 40 minutes. The two interviews with CHWs were conducted in IsiXhosa, each lasting for less than 30 minutes. Nonetheless every interviewee was allowed to talk exhaustively.

3.11.3. Observations

Observations were undertaken by the researcher and his assistant who visited the research setting at different days of the study period to observe the food shopping milieu. The following steps were followed for this process:

(a) The community area of Harare to be assessed was first defined. Characteristics that were taken into account to define this area included the availability of residential and commercial areas as well as comparable socioeconomic characteristics of the community residents. Additionally it was important that residents of this area at least be in a position to access similar goods and services for this area to be assessed.

(b) In order to establish the extent to which community members of this area are able to access various food-market places, the geographical arrangement of the area was observed to determine the centrality of the food retail environment relative to the residential area as a subjective measure of food access. The distance from the community to the nearest central market place (not beyond the precincts of Harare) as well as smaller neighborhood food-vending stores was roughly estimated. Similarly, public transport routes that serve central market places were assessed and modes of transport likely to be utilized by the community residents were noted. The ratio of bigger supermarkets and smaller/convenient grocery stores was also noted. The number of accessible fast food outlets as well as other restaurants that sell food was equally established.

(c) Assessment of availability of healthy foods was executed using a checklist of various fruits and vegetables as well as other healthy food items (see appendix 4). Seasonal foods were however not included on the list of inventory. The researcher identified a nearby local supermarket (the only one in Harare), 4 medium/small grocery stores and 3 street vendors from which the residents of Harare are likely to purchase common fruits and vegetables as well as other healthy foods. Using a list containing these food items, the researcher observed and noted physical availability of these foods. Other characteristics of these foods observed were the physical quality (in terms of physical damage) as well as the nutritional labels for packaged foods. The number of stores visited was also recorded.

Four local fast-food outlets as well as 2 restaurants were also visited to observe healthiness of menu options and portion sizes available.

(d) In order to compare price differences between healthy foods and their less healthy counterparts, a costing technique was used. Only foods that were packaged and whose weights were indicated were subjected to costing. For example some smaller stores do not always package fruits and vegetables whereas supermarkets often do. An attempt was also made to cost the cheapest brands of each food category available. Foods that were on "sale" were not included.

Since weight variations between packets of healthier foods and their regular counterparts of the same brand may have an influence on their respective prices, costing required that the researcher calculates the cost of each food **per 1 gram *OR* litre/millilitre** and establish a standard unit price that will enable comparison between the two choices. The potential contribution of the packaging material to the overall price of each food item was not accounted for. The percentage price difference was calculated using the following formula adapted from Giskes et al[105].

$$\text{\% price difference} = \frac{\text{(Price of healthier food alternative - price of regular choice)}}{\text{Price of regular choice}} \times 100$$

The stores audited for availability of healthy foods were the same ones in which costing of foods were done. Details of food items audited are provided in appendix 4.

3.12. Data handling and analysis

SPSS (Statistical Package for the Social Sciences) software Version 16.0 was used to capture and sort all the quantitative data. Variables were created chronologically into SPSS data base for each question and each questionnaire was assigned an identity code for quick reference where

there were mismatches or missing values in the tools. Majority of the variables were entered using numerical codes.

Quantitative analysis was performed using SPSS software Version 16.0 and Microsoft Excel for Office 2007. Data was subjected to descriptive statistical analysis to express independent variables as frequencies, and percentages. For continuous variables such as age and income per month, means, median, percentiles, maximum and minimum values, mode, and standard deviation were calculated.

Preliminary analysis to select participants for qualitative interviews

An extensive review of literature was undertaken to identify indicators of a typical healthy eating pattern in an average household. Using a graded Likert-scale (Never, Sometimes, Regularly, and Always), 19 questions were tabulated so that respondents would respond to each one of them using this scale. A question "I can generally say that in our household we:" was first stated then followed by each assertion as described in appendix 1 question number 20.

Questions were posed against a graded scale of 1 up to 4. For some assertions, Never (=1) implied bad compliance to healthy eating guidelines and Always (=4), good compliance. For other assertions however, it was the opposite trend wherein Never (=1) implied good compliance and Always (=4) bad compliance. This was done as way of avoiding bias which would otherwise have resulted from a unidirectional flow of questions to which they answered.

Scores were developed for each response category with an assumption that there is no assertion that was more important than another. This assumption stemmed from the fact that there was no

available literature to support and rank all the assertions in order of importance. Consequently, instead of a weighted analysis, individual scores for all assertions listed were summed up to constitute a value which was compared to the total possible score each respondent could attain. Table 1 below illustrates how each question was scored and the total possible value any participant could have reached.

Three points were allocated for better compliance and a zero for bad compliance to the dietary guidelines. Two points were allocated to indicate a relatively good compliance whereas one point implied inadequate compliance. After all scores had been summed up, percentage scores were calculated for each individual. Using a "Criterion sampling method" in which cases that meet a certain set of criteria are selected, participants who had scored the lowest percentage score were identified to constitute the qualitative sample.

The selection process involved the first ten participants who scored the lowest percentage scores. Table 2 illustrates the distribution of percentage scores among all the 50 participants.

Table 1: Development of scores for the question from which the qualitative sample was drawn

Question number as described fully in table 1 above	Score under each response category			
	Never	Sometime	Regularly	Always
1	0	1	2	3
2	0	1	2	3
3	0	1	2	3
4	0	1	2	3
5	0	1	2	3
6	0	1	2	3
7	0	1	2	3
8	0	1	2	3

9	0	1	2	3
10	0	1	2	3
11	0	1	2	3
12	0	1	2	3
13	3	2	1	0
14	3	2	1	0
15	3	2	1	0
16	0	1	2	2
17	0	1	2	2
18	0	1	2	2
19	0	1	2	2
Total points attainable	**= 3 (maximum score possible per assertion) ×19 (number of assertions) = 57 points**			

Table 2: Distribution of percentage scores among all the 50 participants

Categories of percentage scores (%)	Distribution of participants per percent score category	
	Frequency	Percentage %
50 ≥	0	**0**
50-54	2	**4**
55-59	10	**20**
60-64	13	**26**
65-69	11	**22**
70-74	6	**12**
75-79	3	**6**
80 ≤	2	**4**
Missing	3	**6**
Total	**50**	**100**

The process of qualitative data handling and analysis was executed by the researcher. The preliminary step involved sequential/interim analysis wherein the researcher constantly reflected on and refined the way questions were being asked based on how and what respondents were answering. This, according to Miles and Huberman enables the researcher to identify talks or events that run counter to the emerging propositions[113].

Qualitative raw data was translated from IsiXhosa to English by an external individual then data transcription followed. Subsequent analysis sought to interpret the meaning of the transcribed data and how these related to the study objectives. In order to analyse data from interviews with HCMs, the researcher used the "framework analysis" technique which, according to some authors[114, 115], is an analytical technique geared towards generating policy and practice-orientated findings. The technique bears the advantage of preserving the integrity of individual respondents' accounts throughout the analytical process[115]. Added to this is the ease it provides in giving a precise reconsideration and reworking of ideas due to its inherent clearly-defined procedure[114]. It entails a systematic process of sifting, charting and sorting material according to key issues and themes[115].

Figure 5 below illustrates all the five steps the researcher used as a guide to analyze data. These have been comprehensively described by Pope, Ziebland, and Mays[114]as well as Ritchie and Spencer[115].

Box 2: Five stages of data analysis in the framework approach

- **Familiarization:** immersion in the raw data (or typically a pragmatic selection from the data) by listening to tapes, reading transcripts, studying notes and so on, in order to list key ideas and recurrent themes
- **Identifying a thematic framework:** identifying all the key issues, concepts, and themes by which the data can be examined and referenced. This is carried out by drawing on a priori issues and questions derived from the aims and objectives of the study as well as issues raised by the respondents themselves and views or experiences that recur in the data. The end product of this stage is a detailed index of the data, which labels the data into manageable chunks for subsequent retrieval and exploration
- **Indexing:** applying the thematic framework or index systematically to all the data in textual form by annotating the transcripts with numerical codes from the index, usually supported by short text descriptors to elaborate the index heading. Single passages of text can often encompass a large number of different themes, each of which has to be recorded, usually in the margin of the transcript
- **Charting:** rearranging the data according to the appropriate part of the thematic framework to which they relate, and forming charts. For example, there is likely to be a chart for each key subject area or theme with entries for several respondents. Unlike simple cut and paste methods that group verbatim text, the charts contain distilled summaries of views and experiences. Thus the charting process involves a considerable amount of abstraction and synthesis
- **Mapping and interpretation:** using the charts to define concepts, map the range and nature of phenomena, create typologies and find associations between themes with a view to providing explanations for the findings. The process of mapping and interpretation is influenced by the original research objectives as well as by the themes that have emerged from the data themselves

(Adapted from Pope, C., Ziebland, S. and Mays, N. (2000)

Data from interviews with Community Health Workers was analyzed using content analysis wherein the researcher repeatedly went through transcribed notes from the two respondents. Related information was identified, coded and grouped together into various categories which then were sorted according to predetermined themes.

3.13. Ethical consideration

An application for ethics approval was submitted to the University of the Western Cape (UWC) Ethics committee to obtain clearance to conduct the study. Using a participant information sheet (see Appendix 6) the purpose and nature of the study were explained to the study participants prior to the commencement of the interview, and hand-signed consent forms (see Appendix 5) were obtained thereof. Respondents were also informed about the confidentiality of the study and that they had an option to discontinue participating at any time. Participant were informed that in the event of any difficulties arising from the research, they would be referred to the appropriate persons or organizations. Participants were also informed that no direct benefits and harm were to be anticipated from the study and that it was being conducted for academic purposes. Participation was voluntary, with no form of coercion used against participants and they were reassured of confidentiality. Permission was also sought to tape-record the interviews. Owners or managers of stores which were audited for price and availability of foods were also notified of the research activity and permission was granted thence. After data collection, the researcher collected and locked all the data in a place with restricted access.

3.12. Limitations of this study

The population size from which the sample was drawn for the quantitative phase was small and therefore the study findings that relate to this sample cannot be generalized to a larger community. The qualitative sample was also drawn using an assessment method which did not take into account the fact that various questions to which respondents answered had different levels of importance and therefore required a weighted analysis.

Furthermore, even though interviews were conducted by an experienced person, in some transcripts it appeared that some probes were not in line with the research objectives probably due to the data collector's insufficient conversancy vis-à-vis the research aim and objectives. This was apparent in some of the answers given by respondents which were somewhat off-topic. The result of this was a compromised volume of the final dataset to be analyzed.

Observations were made around the food market place to examine what kind of food was sold, where and at what price, but it would be hard to tell whether or not the food substances observed were in fact consumed by the study participants. It only gave a picture as to what kinds of foods they are exposed to and the ease with which they can access and afford them.

The researcher also recognizes the fact that prices of foods may fluctuate from time to time. Similarly availability of certain foods may also vary depending on how much stock was ordered and the demand for those particular foods. Consequently a once-off price and availability audit may potentially give rise to an inaccurate picture of price and availability of the food substances under study. Therefore observations should have been done over an extended period of time in order to factor in dynamics in price and availability of foods over time. This was however not possible to carry out due to fiscal and time constraints that were attached to the study.

Figure 4 below provides a concise and chronological diagrammatic illustration of various methodological steps taken during the study.

Figure4. Model summarizing the process of data collection, handling and analysis

CHAPTER FOUR

FINDINGS OF THE STUDY

4.1. Introduction

This chapter presents a summary of the findings of the study. Presentation and interpretation of the quantitative and qualitative results will be done separately using tables and charts for the former and quotes for the later. The first results to be presented will be demographic and socioeconomic characteristics followed by shopping outlets where participants buy their food, participants' perceived price differences between certain healthy foods and their regular counterparts, interpersonal factors of food purchasing within participants' households, participants' elementary knowledge of healthy eating and, lastly, a general assessment of participants' ability to acquire healthy food for consumption in the community where they live. Qualitative findings will be presented under categories and themes by means of quotes and diagrams. Lastly, observations made from the study will be described.

4.2. Part one: Quantitative findings

The present study had a relatively high response rate. Forty-six (92 %) out of 50 HCMs recruited completed the quantitative questionnaire whereas only 4 (8%) refused to participate. Those who refused to participate stated that they could not do so because there were no material benefits to be earned from participation in the study..

4.2.1 Demographic and socioeconomic characteristics

Table 3: Participants' socioeconomic and demographic characteristics

VARIABLE		Frequency	Percent
Gender	**Male**	3	6.4
	Female	**44**	**93.6**
Level of education attained	**Standard 5/Primary**	**16**	**35.6**
	Standard 7	**15**	**33.3**
	Passed matric	**13**	**28.9**
	Tertiary education	0	0
	No education	1	2.2
Marital status	**Single – Never married**	11	24.4
	Married-Monogamy	**22**	**48.9**
	Married-Polygamy	0	0
	Widowed	7	15.6
	Divorced- separated	5	11.1
	Co-habiting	0	0
Employment status	**Paid full/part time job**	**15**	**32.6**
	State pension/grant	**19**	**41.3**
	Casual paid job	2	4.3
	Unemployed	3	6.5
	Retired	2	4.3
	Contribution from others	3	6.5
Kind of grant/pension	**Child support grant**	**5**	**43.2**
	Elderly pension	10	11.4
	Disability pension	**10**	**22.7**
	Foster care grant	0	0
Type of energy sources	**Electricity**	45	**97.8**
	Gas	22	47.8
	Paraffin	14	30.4
	Charcoal	46	0
	Wood	1	2.2
	Animal dung	0	0

With respect to gender, a considerable number of HCMs were women (93.6%), with a minute proportion of men (6.4%). About a third (35%) of respondents attained primary school level, 33.3 % completed standard 7 and 28.9% passed Matric. There was no one who went as far as undergraduate or postgraduate education and only one person never attained any level of education. About 50% of respondents were in a monogamous relationship, 24% were single and never married, 16% were widows and 11% divorced. There was no one co-habiting, or in a polygamous relationship. In relation to employment status, majority (41%) relied on state pension/grant. Of these respondents, 43.2% received child support grant whereas close to 23% were on disability grant and only 11% on elderly support grant. Thirty-two percent had either a paid full time or part time job and only about 6% were unemployed. There was 4.3% of retired HCMs and another 4.3% for those on casual labor. Table 3 summarizes these demographic and socioeconomic findings. Majority (97.8%) of HCMs use electricity at homes as their primary source of energy. About a half (52.2%) of these however also use gas sometimes whereas paraffin is used by 30.4%. None of the participants reported to be using either animal dung or charcoal as a source of energy to prepare food, and a very negligible proportion (2.2%) were using wood.

As can be seen from table 4 below, the mean age was approximately 54 years (SD 10.3) whereas that of the monthly household income was R 1440 (SD 1513.7). However, five respondents did not report their monthly income. The maximum amount of monthly income reported was R8900 – which was reported by only one individual - and the minimum R550. The eldest respondent surveyed was 90 years old whereas the youngest was 34 years old. It should also be noted that majority of HCMs were about 56 years (Mode 56) as also illustrated in the histogram (Figure 5).

With respect to monthly income, there were more participants earning R940 per month (Mode R950 & Figure 6). The maximum number of adults and children living in households was 6 in both cases and the minimum was 2.

Table 4: Descriptive statistics of some socioeconomic and demographic characteristics of the study participants (n=48)

		Variables			
Descriptive statistics		**Age**	**Household income per month**	**Number of children in the household**	**Number of adults in the household**
N	**Valid**	48	41	45	45
	Missing	2	9	5	5
Mean		53.94	1930.68		
Median		53.00	1440.00	2.00	2.00
Mode		56	940	2	2
Std. Deviation		10.340	1513.707		
Minimum		34	550	0	0
Maximum		90	8900[†]	6	6
Percentiles	**25**	47.25	940.00	1.00	1.00
	50	53.00	1440.00	2.00	2.00
	75	59.50	2500.00	3.00	3.00

[†]This maximum value is an outlier: There was only one individual earning that amount of money

Figure 5: Histogram illustrating age distribution in years among study participants (n=48)

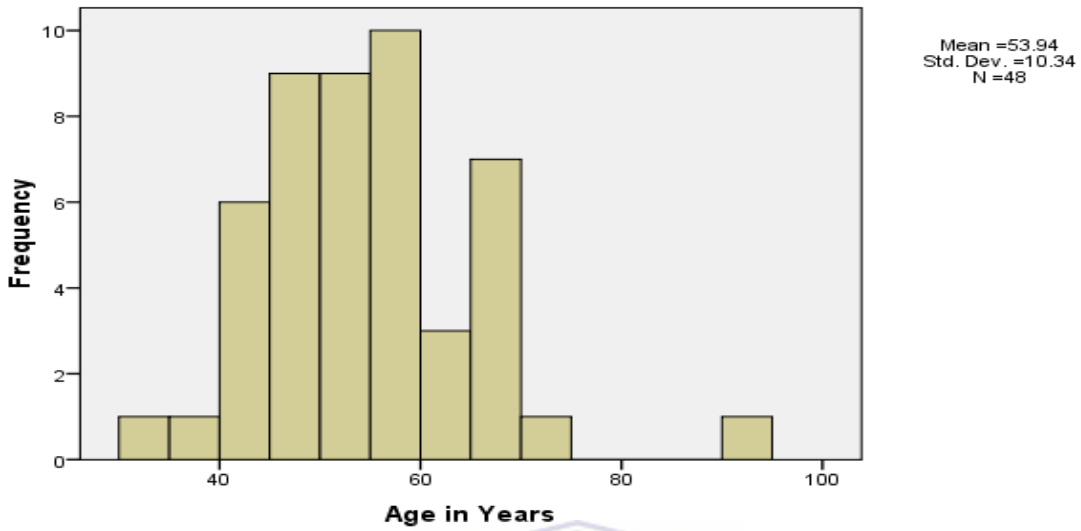


Figure 6: Distribution of household income -in Rand-per month among study participants (n=41)

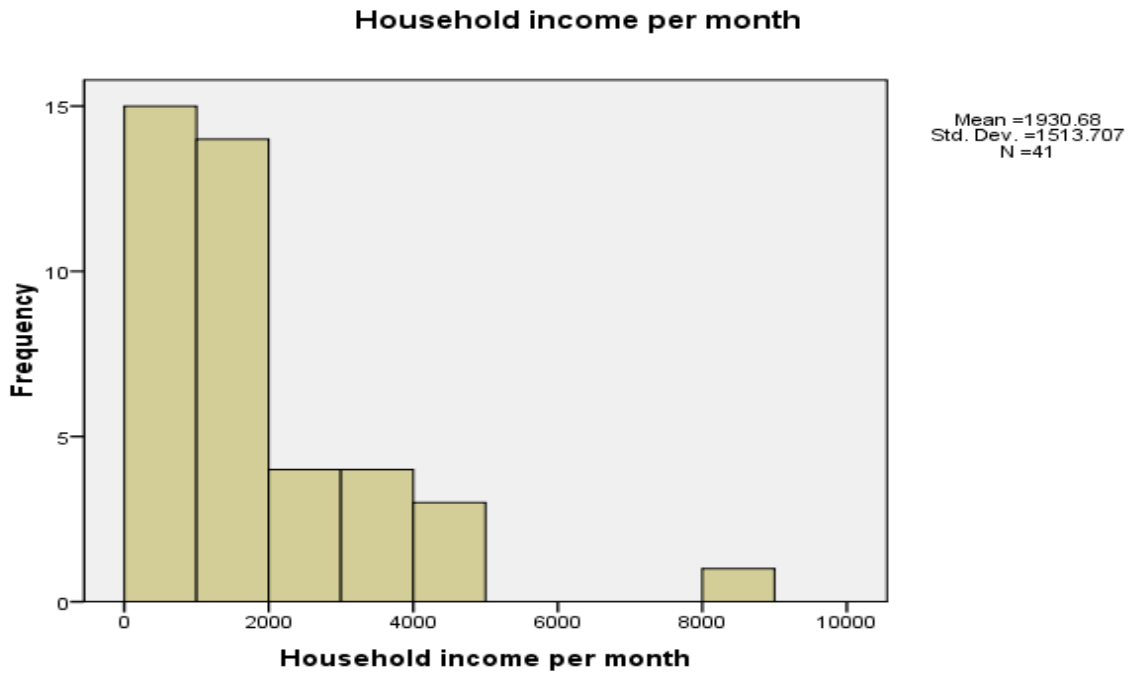
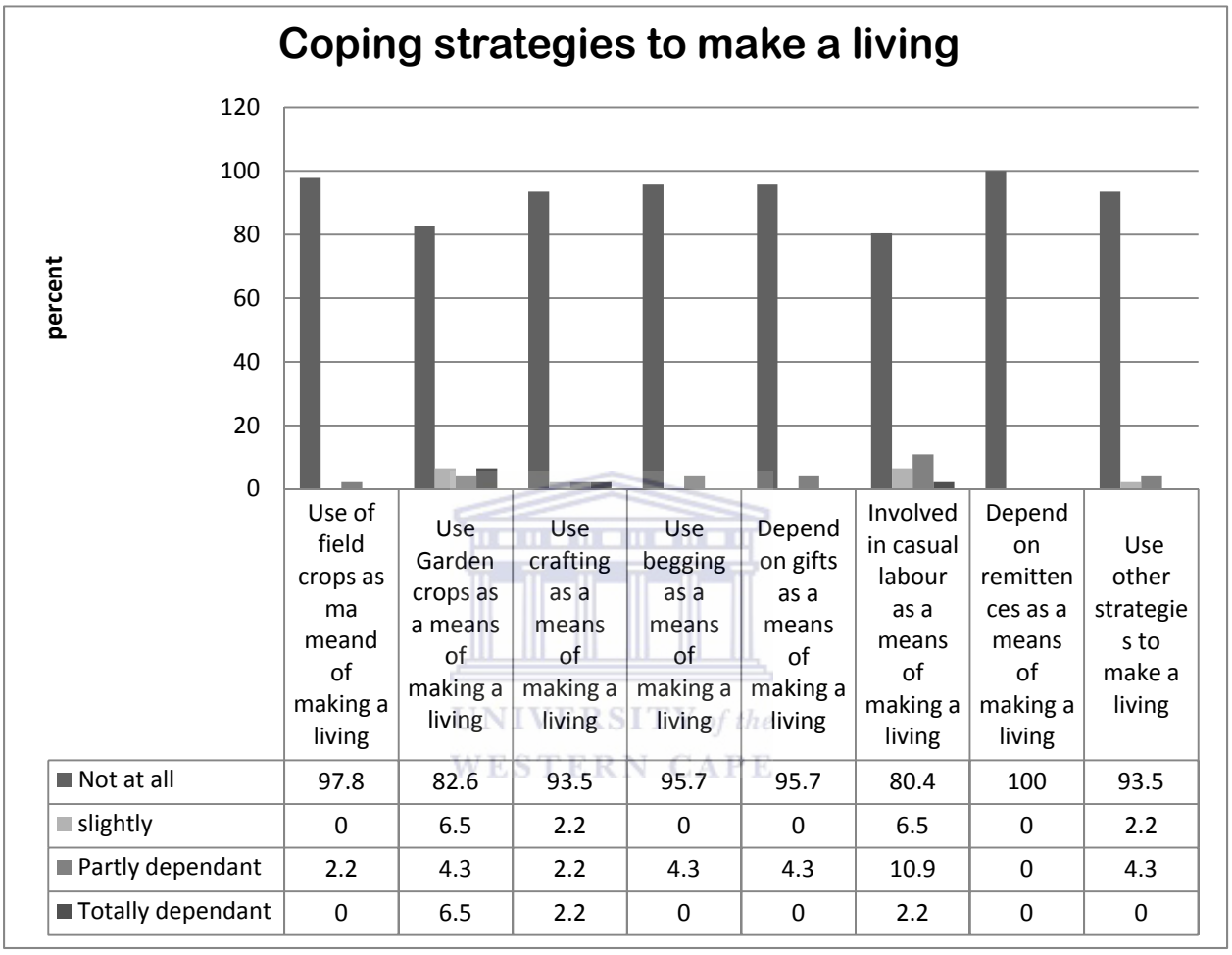


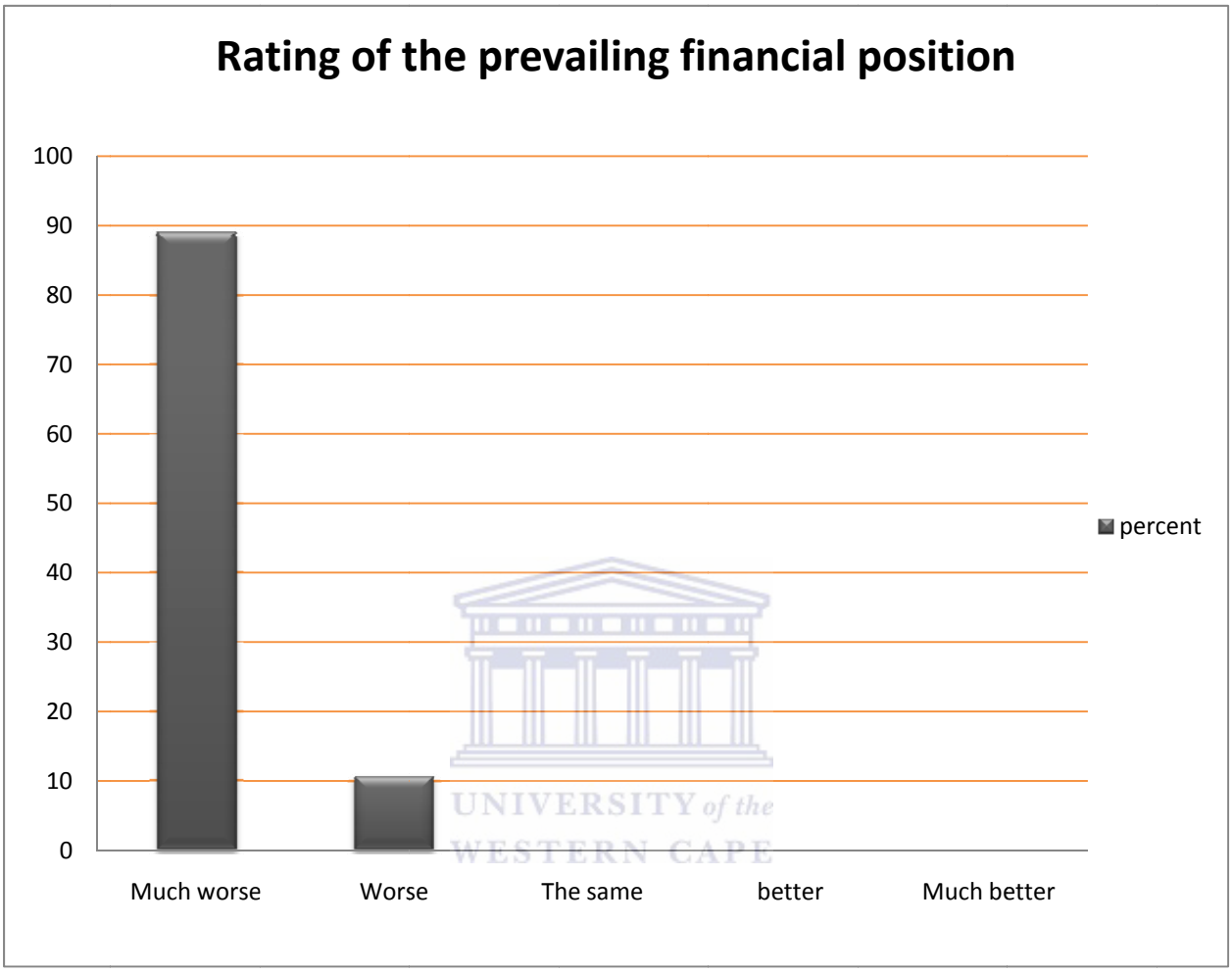
Figure 7: The extent to which households use some coping strategies to make a living (n=48)



	Use of field crops as ma meand of making a living	Use Garden crops as a means of making a living	Use crafting as a means of making a living	Use begging as a means of making a living	Depend on gifts as a means of making a living	Involved in casual labour as a means of making a living	Depend on remittences as a means of making a living	Use other strategies to make a living
Not at all	97.8	82.6	93.5	95.7	95.7	80.4	100	93.5
slightly	0	6.5	2.2	0	0	6.5	0	2.2
Partly dependant	2.2	4.3	2.2	4.3	4.3	10.9	0	4.3
Totally dependant	0	6.5	2.2	0	0	2.2	0	0

The above figure depicts the extent to which participants use various coping mechanisms to earn an income or acquire food for consumption at home. It appeared that majority did not have to use these coping mechanisms as a means of acquiring healthy foods.

Figure 8: Rating of self-reported household financial position



When participants were asked to rate their current household economic conditions as compared to a year ago, majority (89%) seemed to perceived it as being much worse (see figure 8). Ten percent thought it was worse and no one rated it as being the same, better or much better as compared to the preceding year.

4.2.2. Shopping outlets where participants buy their food

Figure 9: Shopping outlets where participants purchase food for consumption at or away from home (n=45)

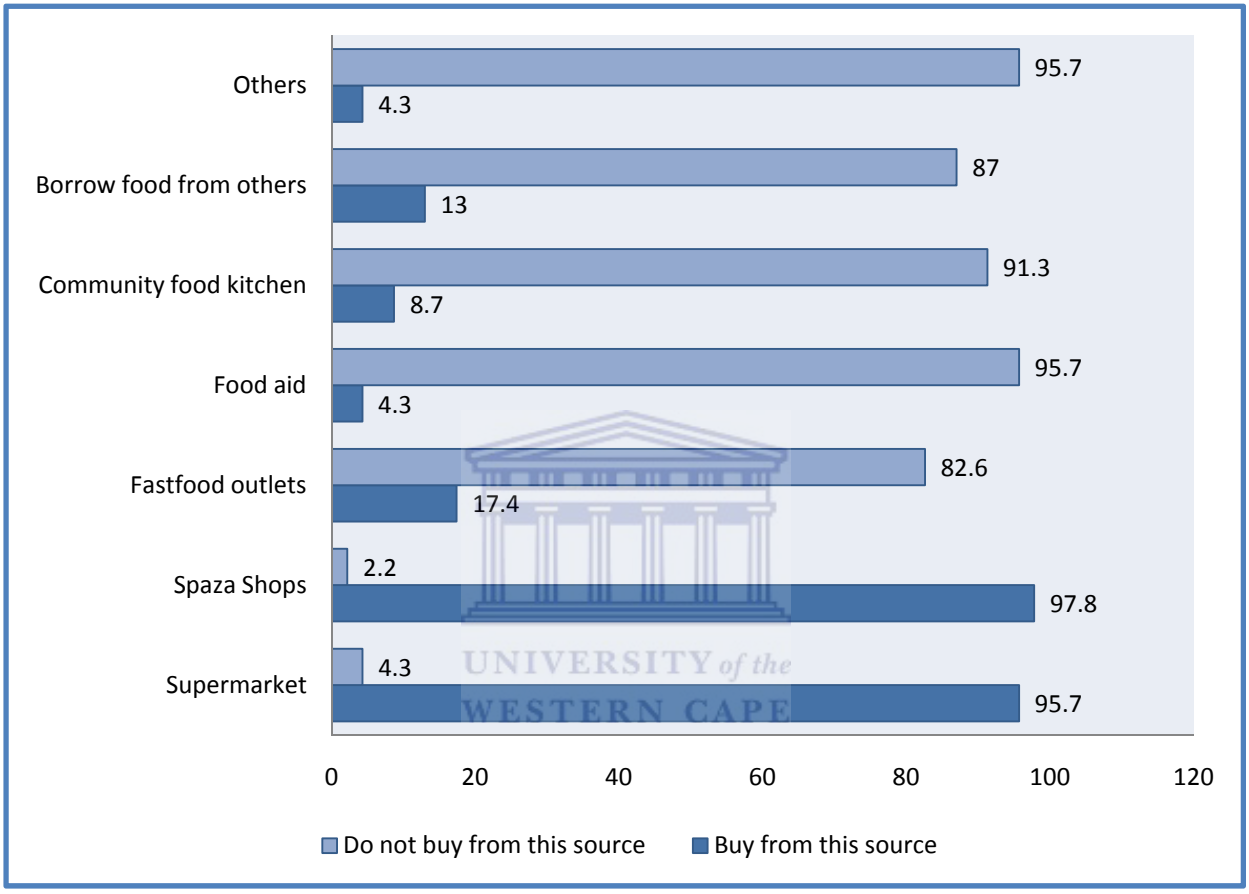


Figure 9 above shows that the frequently utilized shopping outlets as reported by HCMs are Spaza shops[‡] and supermarkets[§]. Ninety nine percent of surveyed participants were using Spaza shops for food shopping, and 95.7% supermarkets. Although somewhat negligible, 17.4% of participants reported to use fast-food outlets to buy food whereas about 13% borrowed food from others. Reported use of other unspecified shopping places was negligible.

[‡] **These are smaller independently owned retail outlets.**

[§] **These are larger retail chain stores like Shoprite, Pick n Pay, etc.**

Table 5: Participants' frequency of acquiring food from various food sources

Source of food	% participants who obtained food from each source and the number of times they did					
	At least five days a week	At least once a week	At least once a month	At least once six months	Less than once a year	Never
Supermarkets	8.7	19.6	67.4	0	0	4.3
Spaza shops	63	22.6	2.2	0	0	2.2
Fast-food outlets	8.7	6.5	0	0	2.2	82.6
Food aid	0	0	0	2.2	2.2	95.6
Community food kitchen	2.2	2.2	0	2.2	2.2	91.3
Borrow food from others	0	2.2	8.7	0	2.2	87
Other (specify)……	0	0	2.2	0	2.2	95.7

Of the 95% of participants who reported to use supermarkets as their food sources, 67.4% indicated that they do so at least once a month. Only 8 % reported to be using this food source at least five times a week, 19% at least once a week and 4% never. On the other hand, 63% of the 99% of participants who reported to use Spaza shops, use this food source at least 5 days a week whereas only 32% use this source at least once a week. Other food sources, including food aid, community food kitchen were used by a minute number of participants to buy food. Of the 13% of participants who reported to borrow food from others only 8.7% do so at least once a month.

Table 6: Number of minutes it takes to get to food stores (n=46)

Amount of time it takes subject to get to food stores	Number of subjects	Percentage of subjects
2	1	2.2
3	1	2.2
5	1	2.2
8	1	2.2
10	**21**	**45.7**
15	**11**	**23.9**
20	6	13
25	2	4.3
30	1	2.2
60	1	2.2

Table 6 shows that majority of HCMs take between 10 and 15 minutes to get to the stores where they buy their food. As depicted in table 7, most HCMs reported to be spending between R10 and R15 to get to these stores. It is also worthy of note that a notably small proportion spends more than R15.

Table 7: Expenditure on transport to food stores in Rand (n=44)

Amount of money spent on transport to get to food stores	Number of subjects	Percentage of subjects
3	**2**	**4.5**
7	**1**	**2.3**
8	**12**	**27.3**
10	**23**	**52.3**
17	**1**	**2.3**
20	**2**	**4.5**
25	**1**	**2.3**
30	**1**	**2.3**
40	**1**	**2.3**

A large percentage (82%) indicated that they frequently use taxis as a mode of transport to get to food stores. Forty three percent walked to get to these stores whereas 10% and 13% were using

buses and trains respectively. About 13% used their own private transport and only 2% used donkeys.

Figure 10: Mode of transport used to get to stores where participants buy their food

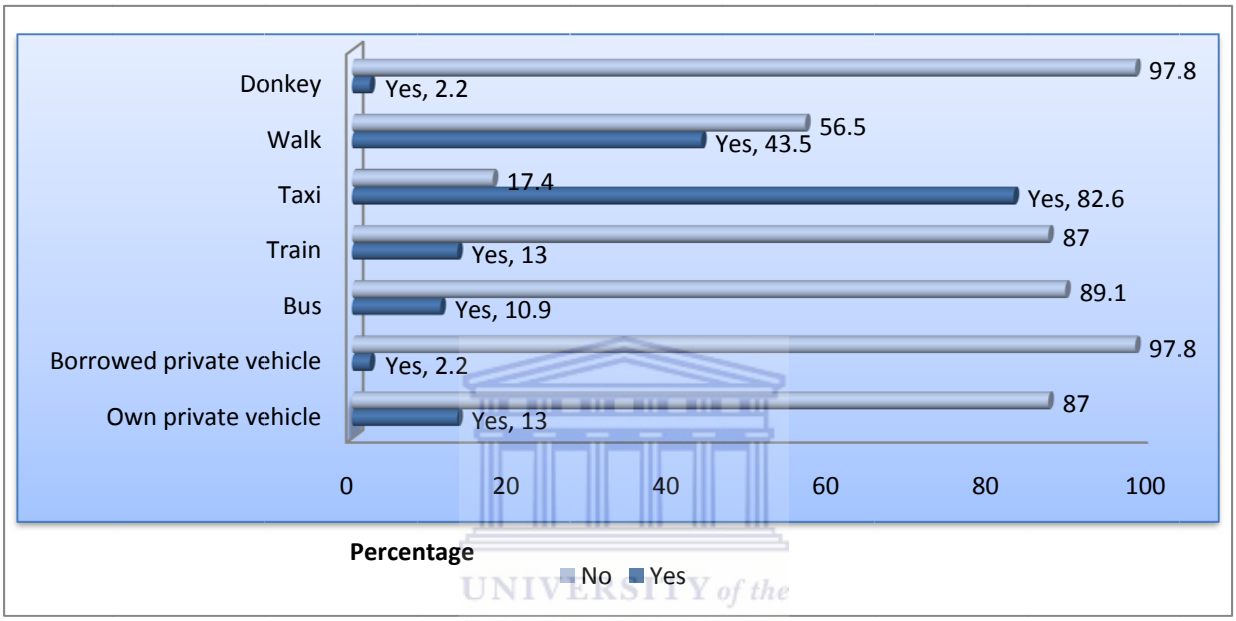


Table 8: Participants' perceived qualities and convenience of larger retail chain stores from which they buy food for their households

PERCEPTIONS	AGREE	NOT SURE	DISAGREE
Are easily accessible	71.1	21.7	6.5
Stock a wide range of fresh vegetables	47.8	23.9	28.3
Stock wholemeal or brown bread	89.1	8.7	2.2
Sell food at cheaper prices than smaller stores	89.1	4.3	6.5
Stock reduced fat or low fat dairy foods	50	39.1	10.9
Have convenient opening hours	93.5	6.5	0
Stock salt-reduced or unsalted foods	76.1	19.6	4.3
Are well served by public transport	100	0	0
Stock a wide range of fresh fruit	52.2	23.9	23.9

Table 8 shows nine positive characteristics of larger retail chain stores from which participants buy their food. A list of these characteristics was presented to participants to choose from and when they were asked whether or not they were of the view that large supermarkets in their area had these characteristics, the response from majority of them was in the affirmative. Few exceptions immerged for characteristics such as stocking low fat dairy food whereby only half of them agreed to this view and the storage of a wide range of fresh vegetables where slightly less than half were in accord with this opinion. In addition to this only 52% thought large supermarkets stock a wide range of fresh fruits.

It is noted that about 40% of the participants were not sure as to whether or not large supermarkets in their area stock reduced fat or low fat dairy foods. About 23% disagreed with the opinion that large supermarkets stock a wide range of fresh fruits and another 23% weren't sure. Interestingly, even though all participants were for the view that supermarkets were well served by public transport, 21% still thought they were not easily accessible.

4.2.3. Participants' perceived price differences between certain healthy foods and their less healthy counterparts

Table 8 below illustrates a categorisation of food items into healthy types and their regular counterparts. In this table food items were selected arbitrarily based on the literature and the south african FBDGs and paired in such a way that they reflect what would be a healthier choice and what would be a less healthy/regular one.

Table 9: Categorization of food items into healthier and regular choices

Food category	Healthier type	Less healthy/regular counterpart
bread	Whole meal/brown bread	White bread
Orange fruit juice/drink	100% pure orange juice with no added sugar	Orange fruit drink with added sugar
Milk	Low fat milk	Full cream milk
Rice	Whole meal rice (brown)	Regular white rice
Chicken	Chicken thigh fillet (no skin)	Chicken thigh fillet with skin
Spaghetti	Whole meal spaghetti (brown)	Regular spaghetti (white)
Cooking oil	Sunflower vegetable oil	Animal cooking oil e.g. chicken or pork-derived fat

Figure 11: Comparison of various pairs of food items with respect to their perceived market price

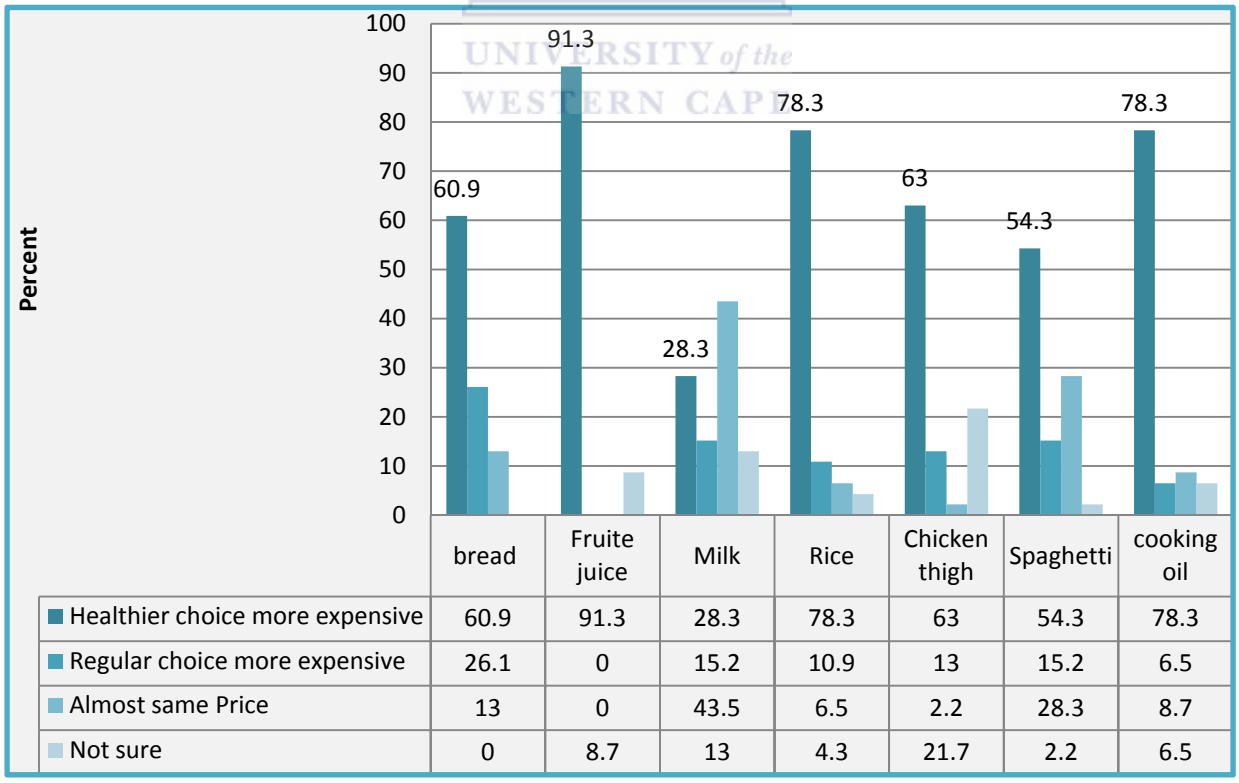


Figure 11 reports findings from a comparative analysis of various pairs of food items in terms of their perceived market prices. Participants were asked to mention which one between the healthy type and regular counterpart of the same food item was more expensive to purchase. Results established a clear perceived distinction between the price of orange fruit drink with added sugar (regular type) and 100% pure orange juice with no added sugar (healthier type) the latter being perceived by 91% of participants as more expensive. About 78% of the participants thought the healthy type of both cooking oil and rice categories were more expensive to purchase than their regular counterparts. Healthier bread was perceived by 60% as more expensive to purchase whereas only 28% perceived healthy milk as being more expensive.

4.2.4. Influence of family members on food purchasing decision

Table 10: Distribution of household members by who make/s a decision about what kind of food to buy at home

FAMILY MEMBER	Yes	No
The respondent	89.1	10.9
The respondent's partner	28.3	71.7
The respondent's children	58.7	41.3
The respondent's inlaws	4.3	95.7
The respondent's other relatives	0	100
The relatives from the respondant's partner	0	100

Table 10 illustrates which family member in the household has the most influence in deciding what food to purchase for consumption at home. Results show that the respondents themselves were more influential in food purchasing decision (89%) followed by respondents' children (58% of households). Respondents' partners participated in 28% of households in making food

purchasing decision. On the other hand households wherein respondents' in-laws had a say in what kind of food should be bought constituted only 4%.

4.2.5. Participants' elementary evaluation of healthy eating tips

Table 11: Assessment of participants' elementary knowledge about healthy eating tips

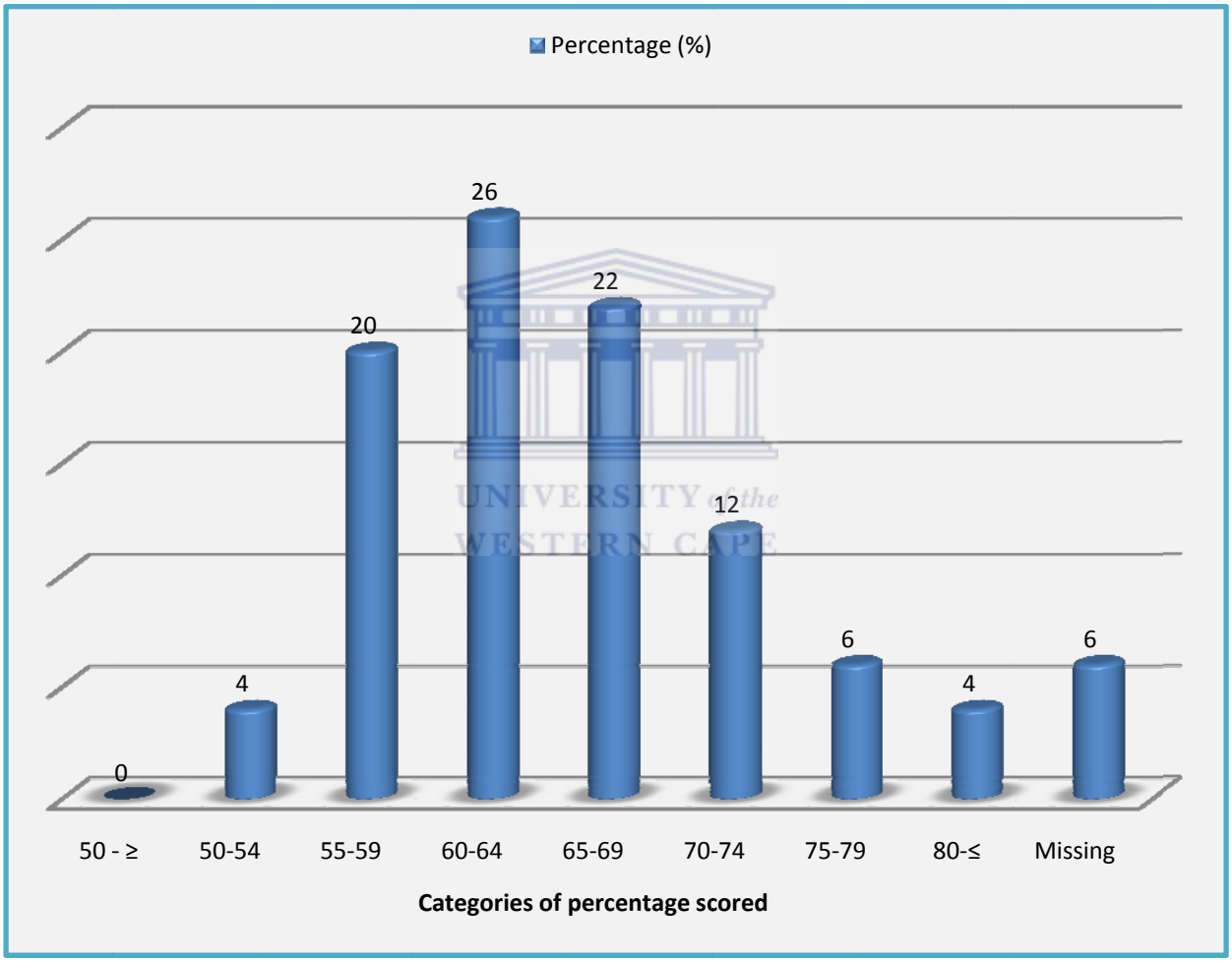
Questions	% 0f participants who got it right	% of participants who weren't sure	% of participants who got it wrong
1.A high intake of plant food combined with a low salt intake may protect against high blood pressure	91.3	6.5	2.2
2.It is better for health to choose lean meat (with little visible fat)	65.2	8.7	26.1
3.Choosing salt-reduced food provides no health benefits	97.8	2.2	0
4.Fruit is a poor source of vitamin C	93.5	4.3	2.2
5.Reducing consumption of food items with high fat/oil content such as fatcooks is better for our health	58.7	4.3	37
6.Choosing brown bread for consumption provides no health benefits	89.1	4.3	6.5
7.Brown breads are good sources of fibre	95.7	0	4.3
8.Adults should choose full cream milk instead of skim or trim milk	52.2	41.3	6.5
9.A high intake of solid fat can protect against heart disease	54.3	32.6	13

Table 11 above depicts results from an evaluation of participants' knowledge about certain healthy eating principles as had been indicated to them during routine training sessions. It appears that a great deal of them was fully informed about most concepts. There were, however, two evaluative questions (Question 8 and 9) for which only about half of participants got the right answer. For both these questions, between 30 and 40% of participants were not sure about

the answers and only about 6% and 13% did not know the answer for question 8 and 9 respectively.

4.2.6. General assessment of participants' practice of healthy food consumption.

Figure 12: Groups of percentage scores representing the distribution of HCMs' ability to acquire healthy foods



An assessment was undertaken to evaluate the extent to which participants rate their ability to comply with healthy eating guidelines/messages. Figure 12 above shows categories of percentages participants scored during the assessment. It appeared that participants who scored

80% and above constituted less than 5% and those who scored between 70 to 79% less than 20%. The rest scored less than 70%, majority of whom fell under the 65-69% score category (22%) and 60-64% category (26%). Twenty percent of participants scored between 55 to 59% percent whereas only 4% fell under the 50-54% category.

4.3. Part two: Qualitative findings

The following section will report on findings from the qualitative enquiry with HCMs and CHWs as well as observations made from the study site. Data from interviews with HCMs is presented by means of quotes which highlight views and comments from respondents. These quotes are presented under their corresponding themes and index categories developed as shown in a thematic framework below (See figure 16). Results from interviews with CHWs are equally presented by means of quotes under different categories whereas observation results are laid out in a tabulated form.

The thematic framework outlined in figure 13 shows four themes and their respective index categories which emerged during analysis of data from interviews with HCMs.

Figure 13: Development of thematic framework and index categories

Food purchasing and consumption patterns	
1.1	A narrative of the types of food participants often eat
1.2	Income expenditure on food and other non-edible groceries
Day to day experience buying healthy food	
2.1	Impact of the hike in the price of foods on the purchase of fruits and vegetables
2.2	Perceived ability to afford healthy food in general
Observed differences in availability and affordability of healthy food between larger and smaller food stores	
3.1	Observed differences in availability
3.2	Observed differences in affordability
Individual level factors of food choice	
4.1	Who decides what food to buy at home?
4.2	Ability to read and understand food labels

4.3.1. Results from interviews with health club members

4.3.1.1. Food purchasing and consumption patterns

A narrative of the types of food participants often eat

In order to generate a general view of the types of food participants often purchase for consumption at home, each HCM asked to give a retrospective narrative of the types of food they had consumed over a period of one week prior to data collection. Results indicated that most HCMs had not consumed food that is consistent with Food-Based Dietary Guidelines. For example about eight of them had not had nutritionally diverse meals. In addition to this, the number of meals eaten by majority of them varied from nothing to two meals on a particular day, and many of them did not include a portion of any kind of vegetables or fruits. Below are some quotes summarizing respondents' views.

> *"Hahahahah…….. I laughed because we didn't eat because we didn't have food to eat".*
>
> *"During the day we didn't eat food other than bread and egg in the morning and potato chips for supper".*
>
> *"We always eat bread in the morning sometime rice and stiff pap in the evening with chicken".*
>
> *"We always have sour milk…… we eat stiff pap everyday because my husband likes to eat stiff pap everyday".*

One respondent, however, indicated a somewhat diverse meal pattern over the preceding week even though it was not mentioned how the food was prepared before consumption and how much of it was eaten for each meal:

> *"First day I ate samp with beans, second day stiff pap pumpkin, third day spinach, fourth day cabbage, bread, meat"*

Income expenditure on food and other non-edible groceries

Although participants were generally able to purchase basic food items for household consumption, majority of them relied on a meager income if one is to consider their household size and needs. This resulted in a limited amount and quality of food they could afford. A bigger proportion of them had this to say when a question was asked on how much money they spend on food and other non-edible groceries:

> *"No, what happened is that before my husband died, he was working at Old Mutual. So every month I get R500.00 from them and pay our policies for my family and the rest I contribute to the food groceries".*

> *"Yhooo, sometimes my son gives us R300.00 or R200.00 it depends".*

> *"I spend R500.00 per month on everything"*

One participant reported that she needs to borrow money that she has to pay back with interest in order to afford basic household needs:

> *"I spend R500.00 on food and pay debts with other money that I borrow to Mashonisas (money paid with interest)".*

Two participants however claimed to have bought most of the things they needed:

"When I go to buy myself , most of the time I normally use R1000 for my stuff because I am the one who is unhealthy, so I only buy for myself because it's me and my daughter that eat most of the time".

"Not really I managed to buy every food I needed".

4.3.1.2 Day to day experience in buying healthy food

Impact of the hike in food price on the purchase of fruits and vegetables

Respondents were also asked about their day to day experiences in securing healthy food such us fruits and vegetables given the prevailing economic conditions in which prices of most food commodities have been hiked. Almost every respondent reported that their financial position was not good enough to enable them to buy such food as regularly as they require.

"It is very expensive. So we try and eat what we can afford".

"Yes I did buy vegetables, but I only buy them when I have money".

"Not really, I don't really eat that because, eh, eh, eh, I don't have money to buy the, the,… the….some vegetables like lettuce, cucumber all the time but the tomatoes stay in the house all the time. But I always make it a point that if I buy them I buy two of each so that it lasts. Especially cauliflower, but it's not like I don't eat them, when money is there

I can buy them… I borrow money on credit in order to buy other staff like fruits and spinach".

It was also noted that some of them had to borrow money from other sources in order to secure some rather indispensable food items for good nutrition like vegetables and fruits.

"After I borrow money, I buy vegetables and sometimes fruits".

"I have to borrow money on credit in order to buy other stuff. After I borrow money, I buy vegetable and meat".

"It is not easy these days. I buy the food that I can afford and the vegetables when I have money".

Perceived ability to afford healthy food in general

Securing enough healthy food items for every day's meal was not an easy routine for most participants. Some of them had to borrow money to secure healthy food and for others it seemed as though the amount and type of foods they bought depended on how much less of other groceries they had to forego. One of them had this to say when she was asked to comment on her day to day experiences in shopping for healthy food within their budget:

"I can only buy the food that I can manage to buy…….. It also depends on other things I need at home like soap, salt washing powder and other things".

For almost eight respondents, a major deterrent to securing nutritionally diverse foods was money. The following quotes substantiate this observation:

"No I don't buy a balanced basket of food but my daughter when she has money she does"

"I only buy quality food when I have money otherwise I just buy".

"No they don't last, if it's finished I borrow money to other people if they don't have it, I wait for the end of the month".

4.3.1.3. Observed differences in availability and affordability of healthy food between larger and smaller food stores.

It appeared that participants had mixed opinions about the differentials in food price and availability between large and smaller food retail outlets. The following response categories and quotes represent participants' views and opinions:

Observed differences in affordability

When participants were asked to share their views on the differences in prices of healthy food between bigger supermarkets and smaller local Spaza shops, majority of them subscribed to the view that bigger chain retail outlets in their communities stock cheaper food stuffs than do smaller Spaza shops. Below are some of the comments they made on this matter:

"Yes, spazas are not so clean and so expensive compared to bigger shops".

"The Spaza Shop, I really don't go to buy food there because they are expensive……. and when you go to Super Market you don't have to go to Spaza shops you can buy everything there"

"I bought vegetables from Spar because it's cheap"

"The spaza's are expensive and malls they have "sale"".

Observed differences in availability

With regards to availability of healthy food, it also appeared that majority of respondents thought bigger supermarkets in their area stocked more healthy food as opposed to smaller food shopping outlets. The following quotes summarize their views on this subject:

"I am not sure but I think when you visit Spar you find different kinds of food more than Spaza shops because they are smaller".

"Spar and Shoprite sell lots of healthy food"

"The Spaza Shops, they don't really sell healthy food……."

"…… and when you go to Super Market you don't have to go to Spaza shop you can buy everything there".

Few others on the other hand thought there was no difference between spaza shops and larger supermarkets with regards to food availability and affordability:

"Yes they (Bigger shops) have healthy food but even Spazas have good food".

"Yes Spaza shops they have healthy food but not more than Shoprite and Spar".

4.3.1.4. Individual level factors of food choice

Ability to read and understand food labels

Participants were asked to comment on their propensity to check food labels when they go shopping for packaged food items. Majority of them indicated a disinclination to take some time checking for nutritional values and content of such foods. Participants' justification for this behavior ranged from negligence to inability to interpret the labels due to the fact that they do not have sufficient formal education on nutrition and health in general. The following three quotes provide a summary of participants who thought they were not adequately knowledgeable about the skills to read and interpret food labels:

> *"No I don't know that because we are uneducated".*
>
> *"I just buy without looking what is written there. I don't know how to look".*
>
> *"I went to the dieticians for my health and she told us as we are uneducated, we must always look for foods that have a picture of knife and fork".*

Few of the respondents on the other hand admitted they did not know how to check for food labels:

> *"I don't even look at that I just buy, the children choose without looking".*
>
> *"No I don't have time but I know those foods which have a heart on them are good for us".*

Who decides what food to buy at home?

Some respondents reported that particular individuals in their households influenced what kind of food they have to buy for consumption at home. Results from six of the ten interviews conducted indicated that either the children or the respondents themselves had unique food

consumption patterns which had an influence on what they have to buy. In summary this is what they had to say:

"I buy the same food it's only me who needs different food.……..."

"No except me they eat everything whereas my husband eats meat and bread…"

"No we eat what is available except the young children like umvubo (bread with milk)"

"No but I cook porridge and Corn flake for children's"

On the other hand however, four respondents indicated that in their households the presence of other family members did not influence what they have to eat. They generally eat whatever is there regardless of who wants what. The following quote provides a compendious account of this view:

"No it doesn't, we eat the same things……"

4.3.2. Results from key respondent interviews

The following section presents results from a thematic content analysis of data from interviews with two CHWs to elicit their perceptions about HCMs' ability to acquire healthy foods. Content analysis of the two respondents' accounts yielded four key themes under which recurrent concepts were classified, compared and described as follows:

Means of transport to food retail outlets

From the viewpoint of CHWs, health club members generally use both public transport -particularly taxis for which they have to pay- as well as walking -which sometimes their children

do- in order to access food retail outlets where they buy their food. The two respondents mentioned the following:

> *"They walk to acquire healthy food, those who live nearby walk and those from far take taxies, it costs R4.00……When going to the malls they walk especially those from nearby and others coming from other places like Kuyasa take taxies".*

> *"……They take R4.00 taxies and come back with another R4.00; others send their children to walk to the mall"*

Community health workers also indicated that HCMs visit both smaller and larger food retail outlets to buy their food:

> *"…..They get healthy foods from the nearby tuck-shops (spaza) and others buy them from the malls….."*

> *"……They buy from spazas around the area and others go to the mall is Khayelitsha….."*

Kinds of food often eaten by health club members

According to one CHW, health club members were advised to eat vegetables and fruits as frequently as possible. They however have to buy these vegetables from a nearby garden which does not grow a variety of them.

> *"We, (the Community Health Worker) suggest that they eat vegetables, so there is nearby garden around the area it has spinach and most of them buy spinach".*

Another CHW however mentioned that they sometimes eat vegetables that are no longer fresh. In her view, this could be due to the fact that they are unable to buy them daily due to financial constraints and as a result they opt to buying them in large quantity:

> *"They buy spinach in bunches and green onion. They also buy cabbage but because they don't have enough money they buy them in bulk and even if it's not fresh any more they continue eating it".*

CHWs' perceived differences in price and availability of healthy food between smaller and larger food stores where HCMs buy food

It was noted that CHWs shared same views with HCMs with respect to price and availability discrepancies between smaller and larger food retail stores in and around Harare. As one CHW put it, HCMs prefer to forgo nearby smaller shops and travel to bigger stores which are relatively far in order to find food that is cheaper:

"The tuck-shops around the areas tend to be expensive than going to the mall, so they prefer going to the malls where there are sales sometimes and they leave the ones nearby.…"

However, the same respondent also mentioned that some of them go to smaller local shops (spazas) because of other services these particular shops offer to their clients:

> *"……It's not that they do not go to the spazas nearby, these spazas also help them because when they don't have money they buy on credit while they are waiting for their pay days or pension…."*

This was confirmed by the second CHW who also indicated that even though local Spaza shops sell healthy food at expensive prices some HCMs still buy their food from these food stores. She had this to say:

> *"The food in the location is said to be expensive but they prefer it because it's in bulks (all in one) so they believe in 12.5kgs of maize meal, so they usually get that in the location. It is expensive but they try to talk to the shop owners to allow them to buy on credit…."*
>
> *"…..Big supermarkets like pick n' pay food is less expensive but they cannot buy everything there because they usually buy on credits"*.

The issue of availability of healthy food was also mentioned by one of the respondents. In her view local/smaller food stores do not sell healthy food that HCMs need:

> *…..The other problem with the nearby Spazas they don't always have what they want so they need to go to the malls, and sometimes the vegetables in the Spazas are not always fresh….."*

Other HCMs' barriers to eating healthy and some of their coping mechanisms as perceived by community health workers

Interviews with key informants unpacked some other socioeconomic barriers perceived to impinge on HCM's ability to eat healthy. According to CHWs, income levels for some of the

HCMs are meager to such a magnitude that they have to develop some coping mechanisms in their attempt to secure healthy foods such as vegetables for a longer period of time. :

> *"…..when they get their pension/ get paid, they buy a lot at the same time so most of the veggies are not fresh anymore by the end of the week as they were bought because they were there for a long time. Others don't have refrigerators and they keep veggies in veg-rags. So even if their veggies are not fresh they don't throw them away because they bought them with their own money…."*

> *"……from that R940.00 they cannot get fresh food the way they were taught their money is less so they have to go back to the Spaza shops where the food is not fresh".*

One respondent also mentioned that some have to seek financial help from their families to secure money to eat as they have been taught by community health workers:

> *"….They are also told to get help from their families and that is how they get support and get correct things to eat….."*

Household size was also one issue raised by CHWs as a socioeconomic barrier to eating healthy. Some households are composed of grandmothers who have to take care of their grand children despite the fact that their income is not adequate to meet household food needs:

> *"Majority of them does not afford because they depend R940.00 of pension and they also have grand-children that depend on them too for the same money. Even when these children get their own grants the mothers usually take the money and use it and leave the grand-children with their grand-mothers in that way it is difficult for them to afford and food is expensive".*

"80 to 90 per cent does not afford because most of them support their grand children and they end up not affording their own needs".

When a question was asked to estimate the proportion of HCMs perceived to afford healthy food, there was some consistency in the answers offered by both CHWs. The following quote summarizes respondents' views:

"80 per cent of them have a problem of getting healthy food because most of them depend on their pension. In other words 80 percent of these women cannot afford to get these healthy foods while 20 per cent can…"

4.3.3. Observations

Observations were done in different locations of the food retail environment in Harare with a fundamental objective to describe characteristics that may impact the purchase of healthy food by dwellers of this community.

(a) Observed access to various retail stores/markets that sell food

Observation revealed that Harare is a fairly non-centered community wherein both informal and formal commercial areas are *mixed* with residential areas. Commercial areas include large and medium/small[**] retail outlets where food can be obtained. Most of the medium/smaller shops observed were generally located at less than 500 meters away from most households. Many of them are situated on street corners and they appeared to be more abundant compared to larger chain supermarkets. Majority of medium/small grocery stores are individually owned and sell a variety of goods including basic food substances. It was also noted that a fairly high number of street markets/vending stands within the community are within easy reach. Observed formal and informal take-away/restaurants were sparsely located within the area of Harare.

On the other hand larger supermarkets are very few in Harare compared to medium/smaller-individually owned Spaza shops. In Harare, only one large supermarket situated between Makhaza and Litha Park was located. According to the researcher's subjective observations, it would require at most approximately 4 kilometers for majority of HCMs to get to this market place in order to do some food shopping.

[**] The study combined medium and small retail outlets as one type of grocery store often referred to as "Spazza Shop"

Taxis and buses are the fastest mode of transport available to the community to travel to more distant locations (e.g. the supermarket). Furthermore, taxis are more frequent than buses in terms of transportation and reach areas that are not customarily served by buses.

(b) Assessment of availability of healthy food

Table 12: Number of audited retail outlets and availability of specific types of fruits in these market places

	Larger supermarkets	Medium and Small grocery stores	Street markets/ vending stands	Fruit and vegetable stores
Type of fruits	**(n=1)**	**(n=4)**	**(n=3)**	**(n=0)**
	Number of supermarket/s where item available	**Number of medium/small grocery store where item available**	**Number of street vending stand where item available**	**Number of fruit and vegetable store where item available**
Orange	**1**	**2**	**2**	N/A[††]
Strawberry	**1**	0	0	N/A
Grapefruit	**1**	0	0	N/A
Guava	**1**	0	1	N/A
Banana	**1**	**1**	**3**	N/A
Pineapple	0	0	0	N/A
Nartdjie	**1**	0	**2**	N/A
Pear	**1**	0	**0**	N/A
Peach	**1**	0	0	N/A
Apple	**1**	1	**2**	N/A

As shown in table 12 above, at the time of the assessment, the only one large supermarket audited (Shoprite supermarket) had majority of the listed fruits available for sale. Interestingly, more street markets/vending stands had more types fruits than medium and small grocery stores. There was no retail outlet that uniquely sells fruits and/or vegetables in the study area. Overall

[††] N/A means that no retail store that particularly deals with fruits and vegetables was located in the observed area

only traditional fruits such as bananas, apples, and orange were available for purchase in most retail places.

Table 13: Number of audited retail outlets and availability of specific types of vegetables in these market places

	Larger supermarkets	Medium/Small grocery stores	Street markets/ vending stands	Fruit and vegetable stores
Type of fruits	**(n=1)**	**(n=4)**	**(n=3)**	**(n=0)**
	Number of supermarket/s where item available	**Number of medium and small grocery store where item available**	**Number of street vending stand where item available**	**Number of fruit and vegetable store where item available**
Broccoli	**1**	0	0	N/A
Brussels sprouts	**1**	0	0	N/A
Sweet potato	**1**	**1**	**2**	N/A
Spinach	**1**	**2**	**2**	N/A
Peas	**1**	0	0	N/A
Chinese cabbage	**1**	0	0	N/A
Cabbage	**1**	1	2	N/A
Pumpkin	**1**	0	0	N/A
Carrots	**1**	0	1	N/A
Cauliflower	**1**	0	0	N/A
Green beans	**1**	0	0	N/A
Tomatoes	**1**	0	**2**	N/A
Cucumber	**1**	0	0	N/A
Potatoes	**1**	**1**	**2**	N/A
Lettuce	**1**	0	0	N/A
Onion	**1**	1	**2**	N/A
Mushrooms	**1**	0	0	N/A
Beetroot	**1**	0	0	N/A
Celery	**1**	0	0	N/A

The supermarket had all types of vegetables which were audited. Observations within medium and small grocery stores as well as informal street markets revealed a limited *variety* of most vegetables types on the check-list except a few such as onion, tomatoes, spinach, cabbage, and

potatoes. However, more street markets/vending stands audited compared to small/medium grocery stores had the aforementioned types of vegetables available.

Table 14: Number of audited retail outlets and availability of specific types of healthy foods in these market places

	Larger supermarkets	Medium/Small grocery stores	Street markets/ vending stands	Fruit and vegetable stores
Type of fruits	**(n=1)**	**(n=4)**	**(n=3)**	**(n=0)**
	Proportion of supermarket/s where item available	**Proportion of medium and small grocery store where item available**	**Proportion of street vending stand where item available**	**Proportion of fruit and vegetable store where item available**
More than two types of whole-wheat brown bread	**1**	1	0	N/A
Whole meal rice (brown)	**1**	1	0	N/A
Fresh fruits and vegetables	**1**	1	1	N/A
100% pure fruit juice (with no added sugar)	**1**	0	0	N/A
Salt-reduced poly or monounsaturated margarines	**1**	**2**	0	N/A
Tinned fruit in natural juice	**1**	1	0	N/A
Wholegrain or multigrain breakfast cereals	**1**	**3**	0	N/A
Chicken breast fillet/drumstick without skin	**1**	1	0	N/A
Fresh fish	**1**	**2**	0	N/A
Salt-reduced baked beans	**1**	**3**	0	N/A
Whole meal pasta (brown)	**1**	1	0	N/A
Canola, olive, sunflower, safflower oils	**1**	**3**	0	N/A
Fat-reduced poly or monounsaturated margarines	**1**	**4**	0	N/A
Lean beef meat	**1**	0	0	N/A
Low fat/2% milk	**1**	0	0	N/A

Street markets or vending stands had none of the healthier food alternatives mentioned in table 14 above except for one place out of the three audited which had fresh fruits and vegetables. Most of these market places rather had some of the regular types on the list available; for example chicken and beef with visible fat. The supermarket had all the listed healthy food types on the available for purchase, whereas few of the audited medium/small grocery stores had these foods.

(c) Assessment of price differences between healthy foods and their less healthy counterparts in various shops

Table 15 below shows the differential pricing of healthy food items and their regular counterparts among two different kinds of grocery stores. Price audits of these foods in the only one supermarket located around the study area revealed that generally healthier food options were more expensive than their regular counterparts by between 3 to 22 %.

On the other hand it was not possible to determine percentage price differences of most of the foods among medium/small stores because there was either no healthy or regular choices of each food category available for comparison. There was however one exception whereby for the bread category the regular white bread was more expensive than its healthier type (whole-wheat brown bread) by about 8% on average in the three stores where both types were available.

Table 15: Percentage price differences between purposefully selected recommended foods and their regular counterparts in one supermarket and four medium/small grocery stores in Harare – Khayelitsha.

Foods		Objective price audits of the supermarket (n=1)	Objective price audits of medium/smaller grocery stores(n=4)
Food category	Food type (the cheapest option available)	Percentage price difference between the recommended and regular food types (%)[‡‡]	Average percentage price differences between the recommended and regular food types (%)[§§]
1. Bread	Whole-wheat brown bread Regular white bread	4*[***]	8.04
2. Orange juice	Orange fruit drink with added sugar 100%pure orange juice with no added sugar	8.47*	Healthy choice not available
3. Liquid milk	Full cream milk 2% fat milk	3.05*	Healthy choice not available
4. Rice	Whole meal rice White rice	9.75*	Healthy choice not available
5.Chicken breast	Chicken breast fillet with skin Chicken breast fillet without skin	12*	Healthy choice not available
6. Cooking oil	Animal cooking oil e.g. lard Sunflower vegetable oil	Regular choice not available	22*

[‡‡] Only one supermarket was audited (the only one located in the study area) therefore there was no need for finding an average.
[§§] There were four medium/small grocery stores that were audited for price differences therefore an average was determined.
[***] Asterisked figures indicate by how much % the healthier choice was more expensive than its regular type and the one that is not asterisked indicates otherwise. Shaded areas indicate that there was absence of either the healthy type or its regular counterpart for comparison to be done.

(d) General assessment of the quality of food within different food retail outlets

Table 16: Food hygiene, Physical integrity, packaging (where applicable) and presence of nutrition labels

Retail outlet	Description
Informal/street vending stands	Although majority of the places where street vendors sell food appeared to be very busy, they were not visibly dirty. It was however noted that some of the foods like meat, vegetables and fruits sold there were not adequately preserved. They are sold in an open space which would potentially compromise their freshness as well as their cleanliness should customers fail to purchase them in time. Much of the meat (both cooked/fried and raw) had high visible fat content. Figure 14 shows two CHWs standing in front of a stand belonging to one of the street venders who runs a business of selling raw and cooked meat in Harare, Khayelitsha.
Medium/small stores and large supermarkets	Hygiene and storage conditions for food substances in these stores were to a reasonable degree desirable even though smaller independent food stores still needed to improve on their hygienic practices. In both store categories there were a reasonable proportion of packaged food items with visible food labels although some bottled food items observed – e.g. milk, fruit drinks/juice - in smaller stores did not carry labels.

(e) Restaurant assessment

Table 17: Description of the nutrition quality of restaurant/take-away foods as well as the quantity and types of these foods

Type of restaurant	Kinds of portion sizes on offer	Observed healthiness of the menu(fat/salt content, salad menu)
Sit-down restaurants (n=2)	I both restaurants assessed they had two portion sizes on offer, one medium and another large.	Available menus at the time of the study generally constituted fatty foods such as fried chicken, chips and pork chops. One restaurant however had vegetable salad, boiled rice, pasta and traditional Samp and beans on offer
Take away/ fast food restaurant (n=4)	The portion sizes were determined by a combination of food customers wanted to buy. Otherwise there were no specifically pre-determined portion sizes as for example in the case of restaurants.	Available take-away foods in all outlets audited generally ranged from pies, sausage rolls, samoossa, fried chicken, chips, fried sausages and beef stew all of which have a high fat content..

Figure 14: Photos showing a street vendor (middle) selling raw meat (right) on a stand on the streets of Harare in Khayelitsha

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter will discuss the findings of the study in relation to the research aims and objectives. The discussion will combine both quantitative and qualitative findings which were found to be somehow complementary.

The quantitative component was introduced in this study on the basis of the fact that certain characteristics of the study population as a whole were still unknown and therefore required numerical description. For example, it would have been assumptive to consider that all individuals in the study population (which was also a quantitative sample) had similar experiences with regard to the ease/difficulty with which they acquire healthy food. Similarly, a presumption that they were at the same socioeconomic level was just as unreasonable. Hence, it was imperative to quantify certain aspects of the study population in order to generate a sample whose characteristics related more to the study problem. The generated sample was then subjected to qualitative enquiry which set out to establish deeper insights into the problem under study.

5.2 Demographic characteristics of health club members

This study accomplished a good response rate during the quantitative enquiry. This could somehow justify the assumption that findings that were attained during the study provided the

actual picture of almost the entire study population. The mean age of the quantitative sample was 53 years (Mode = 56 years) which could be an indication that the sample primarily consisted of less economically active individuals who are bound to be of a lower socioeconomic status. Almost half of HCMs who completed the quantitative questionnaire received a child support grant and about 25% depended on disability grant. This could be a sign of a certain degree of financial dependence on the part of both the children and mothers/guardians in some households. The fact that 93.6 % were women may also, as traditionally perceived, imply that they are responsible for food purchasing at household level, and thus their relevance to the study. This was confirmed by the findings of this study which revealed that 89% of respondents, majority of whom were women, were responsible for making decisions about what kind of food to be purchased.

5.3 Compositional socioeconomic effects on the purchase of healthy food

The current study, to some degree, extends and complements findings from earlier work that looked into the relationship between individual level characteristics and food purchasing behavior. Although this subject has been explored using different methodological approaches, most findings seem to consistently point to the idea that compositional socioeconomic factors can impact on food purchasing behaviour through a number of characteristics such as, *inter alia*; family background, educational level, employment status, financial position (which is a function of access to resources) and other facilities needed to acquire healthy food [38].

Educational attainment is a crucial determinant of many other aspects that may directly or indirectly impact on dietary behaviour and yet it is itself determined by several other underlying

parameters. According to White[38], the family background of an individual may determine that individual's educational achievements. Parents' social class establishes the kind of aspirations and expectations they have for their children which may in turn determine how far their children go with education. The current study revealed that none of the HCMs attained a tertiary level of education. About two-thirds of the whole quantitative study sample had completed standard seven or below whereas only 28% had graduated high school but did not go further. It follows that under current competitive conditions wherein good education is an imperative to obtain formal employment, such levels of education may not be adequate to secure employment that generates a sustainable and reasonable income, more so when there is limited use of other coping mechanisms such as crafting, casual labour, remittances and begging as was reported by majority of study participants.

Educational level is also bound to influence dietary knowledge as well as food purchasing norms. During the qualitative enquiry it was established that some HCMs were not in a position to read and interpret food labels despite their awareness of basic healthy eating tips. This is an indication of low education level and may potentially impact on the healthiness or/and kind of the food they purchase when they visit food retail outlets (e.g. content of fat/empty calories, salt, additives, preservatives etc). One of the few studies that have attempted to establish the link between level of education and ability to read food labels as an indicator of food choice did not, however, confirm this likely relationship[116]. Even for subjects who only attained primary level education, ability to read nutritional content of food did not come up as one of the top three out of fifteen factors believed by study subjects to have the greatest influence on their food choice. Food quality, taste and trying to eat healthily were the three top-ranking reasons for this

behavior. Comparison of the findings from the current study and this Irish survey may nevertheless be a lot more complex. It may go beyond the level of formal education to involve the aspect of language proficiency in order to account for the discrepancies between the two studies.

Compositional socioeconomic position is believed to be a primary driver of access to resources such as home food storage facilities, private car and kitchen food preparation facilities[38]. Similarly, it may impact on the perceptions individuals have on their ability to access and afford certain types of shops that sell healthy food. The study established that the lowest aggregate household income per month was R550 and the most frequently reported was R940. There was nonetheless an outlier of R8900 reported by one individual who is presumed to have over-reported. In addition to this, the rating of households' financial position at the time of the study showed that close to 90% of participants agreed with the fact that their financial status was much worse. With such little income, it is most probable that few will be able to own facilities such as food storage devices which determined the frequency with which they shop for food and the amount they can bring home and safely store. This was in fact apparent during the current study where CHWs pointed out that some HCMs do not have refrigerators and thus when they buy perishable foods such as vegetables, onions and fruits they keep them in what they term "veg-rags" which would not prevent them from deteriorating. These findings corroborate those from a study by Giskes et al[117] which revealed that lower socioeconomic groups of Australian adolescents and adults were less likely to consume fruits or vegetables and consumed fewer varieties than higher socioeconomic groups. They argue that limited storage facilities were a

barrier to increasing consumption of fruits and vegetables, complementing two other studies[118, 119] which also reported similar findings.

Mode of transport may also be an important determining factor of whether individuals can use less accessible supermarkets known to sell healthy foods, or local convenient stores generally known to stock less healthy food and readily accessible as will be discussed later. Results from quantitative enquiry showed that even though most HCMs buy food from local convenient stores (Spazas) and larger supermarkets (97.8% and 95.7% respectively), the frequencies of purchase in both markets vary. Sixty-seven percent of the 95% HCMs who reported to use larger supermarkets as their food source reported that they do so at least once a month whereas 5% indicated that they use this food source five times a week. On the other 63% of the 97% of HCMs who reported to acquire food from convenient stores indicated that they do so at least five times a week. Thus, there is more frequency of food purchase from convenient stores than there is from larger supermarkets which is a suggested indication of their ability to access larger retail outlets. Most of them would have to spend between 10 and R15 and use between 10 to 15 minutes to travel to and from larger supermarkets by taxi as opposed to convenient stores which are in close proximity.

The research also revealed that taxis are a major mode of transport to the only available supermarket, followed by walking. The fact that some would have to walk a long distance to get to the supermarket also justifies the assumption that they are less likely to visit this type of retail outlet and instead choose to go to less distant and easily accessible convenient stores (Spazas) to purchase food, more so when they have to pay between 10 and 15 Rand to get to this supermarket. It is not surprising that there have been a limited number of studies that assessed

this relationship in developed and developing countries alike. Access to retail stores has mainly been measured by estimating the distance between residential and commercial areas and little attention has been paid to what type of transport is used to travel this distance. In the developed world, this gap could possibly be accounted for by their developed transport systems. Researchers may as a result feel disinclined to study it as an important factor.

It is interesting to find that in spite of these barriers to get to the supermarkets, majority of HCMs who participated in both phases of the study subscribed to the view that larger retail chain stores sell a wide range of fresh fruits and vegetables as well as other healthy foods such as whole meal or brown bread, salt and fat reduced dairy foods, and that they sell food at a cheaper price, have convenient opening hours and are well served by public transport. This could imply that even though they find it hard to get the supermarket, they know they could get healthier food choices if they accessed this retail store. This underscores the importance of the type of food retail outlets in accessing healthy foods.

All in all, the study showed that a lower socioeconomic status of study subjects contributed to their poor food purchasing behavior. Majority of them purchase food as their primary means of acquiring food. When they were asked to describe the types of food they had consumed at home a few days prior to the study, it was noted that their diet lacked variety, contribution from fruits and vegetables, as well as inadequate frequency of consumption of certain types of foods as promulgated in the South African FBDGs. These findings are not new to the South African context. Previous work by Bourne et al[120] on food and meal patterns in the urban African population of the Cape Peninsula and another study by Vorster et al[121] which analyzed the nutrient intake of South Africans, have also revealed that meal patterns in low socioeconomic

groups were confined to a relatively narrow range of foods. Bourne and colleagues[120] go further to argue that poverty, lack of knowledge and social instabilities in the black population militate against healthy eating practices. Such poor dietary patterns bear undesirable health implications. It is for example known that insufficient or lack of consumption of fruits and vegetables may contribute to the development of cardiovascular diseases[122, 123]. Antioxidants and other non-nutrient components of fruits and vegetables are believed to be protective of cardiovascular diseases and may contribute to lower risks of these diseases[122, 124].

5.4 Contextual effects of food purchasing

Positive individual behavior to make healthy food choices may not occur without supportive environments wherein there is availability of and access to affordable healthy foods. Contextual factors such as physical environments (where people eat or procure food such as home, supermarkets, restaurants), and macro-level environments (these are more distal and include economic policies, food distribution systems, agricultural policies etc) may play a crucial role in determining what kind of food is available, accessible and at what price [125].

5.4.1 Effect of differential pricing of healthy foods and their regular counterparts on food purchasing behavior in various food retail markets.

French et al[126] argue that food pricing strategies have the potential to be broad-based and effective means of promoting healthy eating behavior. In their study on why Americans eat what they do, Glanz and colleagues [127] found that the cost of food was the second most important determining factor of food choice after food taste. Healthy foods have also been found to cost more than their regular counterparts[105, 128]. The work by Drewnoski and Specter[129] around the

effect of energy density and energy cost also showed that foods with higher energy density such as refined grains or fats may present lower cost options for consumers. These views were confirmed by the findings of the current study. Majority of subjects who were asked to compare the perceived market price of healthy food items and their regular counterparts indicated that healthy options were the most expensive to purchase. Objective measures of the prices of purposely selected food items also showed that healthier options were more expensive than their regular counterparts in the only one supermarket available in the study setting. This would suggest that an ordinary individual on a meager income would have to forgo the costly yet healthier choice and opt to buying what is more affordable despite the fact that it is less healthy.

As was revealed in the work by Blisard et al [130], low income families are more likely to spend less on healthy food such as fruits and vegetables than high income families. This was indeed the case for some subject who participated in individual interviews. A major deterrent of frequent consumption of fruits and vegetables was lack of money. Borrowing money from friends and family or forgoing other groceries necessary for home use were some of the predictors of what kind and quantities of food they could buy. It is therefore likely that reducing the price of healthy food such as fruits and vegetables, in addition to increased availability and access, may promote increased consumption among these people.

Variability of prices of foods between larger and smaller food stores is also another important determinant of food purchasing behavior. This view is corroborated by findings from a USA study[43] which established that in areas served by smaller retail shops such as low income settings, access to healthier food alternatives is limited and a healthy basket is more expensive. The current study also showed that some subjects who participated in qualitative interviews

believed that food in medium/smaller shops (Spazas) in their communities was in general more expensive than in large retail outlets. They also mentioned that bigger shops have "sale" (promotional discount on certain groceries) for certain healthy foods.

The above findings may translate to a possibility that failure to access healthy food at a relatively cheaper price could have dietary implications on families of some HCMs. There is likelihood to resort to buying energy dense foods which contain higher levels of sugar and fat as a coping mechanism to save money. Previous work by Puoane et al[67] in a similar setting of Khayelitsha has supported this conjecture. The study established that community members sometimes prefer to buy cheap foods that have high fat content such as fried meat and fat-cooks. Drewnowski and Darmon have also argued that the link between poverty and obesity is primarily accounted for by the higher cost of energy from healthy foods relative to unhealthy ones[127]. More work by Drewnowski has further confirmed the relationship between obesity prevalence and the economics of food choices, asserting that foods with high content of sugar and fat provide calories at the lower cost[23, 42].

5.4.2 Differentials in food accessibility and availability between large and medium small food retail outlets

Glanz and Yaroch[131] argue that the presence of food stores and availability of healthy food choices in those stores are important indicators of healthy food purchasing behaviour. Qualitative findings of the present study revealed that most subjects perceived bigger food retail outlets (Supermarkets) in their area to stock more healthy food as opposed to smaller and medium grocery stores (Spazas). These perceptions were confirmed by observations which showed that

the audited supermarket had all the fruits and vegetables as well as other healthy foods on the audit list available. Contrary to this was a paucity of these foods in most Spaza shops and informal street markets wherein there were limited types of fruits and vegetables and more of less healthy food choices than their healthier counterparts.

According to some HCMs, the frequency of food purchase from Spaza shops was five times higher than from supermarkets. CHWs who were interviewed to give their opinion on where these HCMs buy their food indicated that some of them prefer to buy food from Spazas because shop owners allow them to purchase food on credit and pay back when they have received their pension money. Such kind of business arrangement may however render HCMs captive to Spaza shops and deprive them from visiting other grocery stores such as supermarkets which arguably stock more healthy food and in variety. HCMs also prefer Spazas because they are more accessible than supermarkets in spite of the fact that the latter stocks more healthy food than the former. It is therefore logical to speculate that continued exposure to food retail stores that stock more of the less healthy foods than their healthier counterparts, may deter these HCMs from adopting healthy food purchasing practices. This, in the long run, would most likely reflect in their diet and health. Results from the study by Powel et al showed that increased access to chain supermarkets was associated with lower adolescence BMI and that BMI increased with increased availability of convenient stores[132]. Cheadle and colleagues also argue that there is a relationship between staying in a neighborhood where supermarkets stocked more healthful food products and being healthy[133].

Observation of the neighborhood food retail environment also showed that there was only one supermarket and numerous Spaza shops in addition to informal street markets and fast food

outlets. Assessment of availability of healthy foods also revealed that the large supermarket audited had a wide range of healthy foods under each food type which would give consumers options to choose the type of food substance they perceive appropriate for their health. Smaller shops on the other hand had a limited range of foods which implies that there is less food options to choose from. Restaurants and fast food outlets that were audited also showed limited availability of healthy food options, as most of the food substances on offer consisted primarily of food with high fat and empty calorie content. This may show challenges this community is facing to easily access food retail outlets that stock and sell a variety of healthy foods. It is important however to note that these observations do not necessarily imply that study subjects of the area observed buy and eat food from these sources. They only provide a possible food retail environment exposed to subjects and their families which can promote unhealthy food purchasing behaviour.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

The present study complemented previous studies by highlighting the relevance of the context within which HCMs live as well as their individual socioeconomic positions in determining what kind of food they usually purchase for consumption. Findings of this study, particularly those from observations as well as qualitative enquiry, to some degree support the hypothesis of the study that "*challenges of HCMs to consume healthy food were probably centered on their failure to access, afford, and find healthier foods and various other indispensable resources for adoption of healthy eating habits within the communities where they live*". The study established that low socioeconomic status, poor access to healthier food choices, and lack of constant availability of such foods were primary challenges facing some of the HCMs in their quest to afford and access healthy food. The possibility of other determinants of healthy eating practices such as food taste, culture and religion, convenience in preparation, presentation/packaging and many more can nonetheless not be ruled out.

While the study does not provide a causal relationship between HCMs' poor or obesity-promoting diet and prevailing compositional and contextual aspects, it suggests possible factors that could justify this relationship. Findings should therefore not be interpreted as weak evidence around the concerned subject. Health Club Members' perceptions of the food shopping environment surrounding them as well as their individual socioeconomic positions logically warrant an inference that not everyone has reasonable access to affordable and readily available healthy food.

The findings of this study are also relevant to developers of public health interventions and policy makers. If compositional and contextual factors suggested in this study (in addition to more upstream ones at macro-level) are explored more at causal level in similar and wider communities in South Africa, it may lead to further understanding of complexities around communities' access to healthy food as well as availability and affordability of such foods thereby giving a rational platform upon which individual healthy food choices can be fostered.

In order to improve dietary quality as a way of preventing and reducing obesity among HCMs and their families as well as the community in which they live, it may require multi-facetted public health interventions which do not only tackle individual dietary behavior but also address upstream environmental determinants of diet and health.

Even though all the factors identified during this study may not singly account for HCMs' likelihood of developing obesity, they may predispose these individuals to such a health condition as well as related chronic NCDs. A comprehensive intervention encompassing other facets of health such as physical activity may be required to effectively address this issue. In order to address challenges that the current study identified the following strategies can be initiated as a way of improving and promoting healthy food choices among health club members and other communities equally faced with such challenges:

- Strong advocacy needs to be initiated to achieve a certain level of political commitment that brings into existence policies that lay out nutrition standards to which all food and beverage manufacturing/producing institutions should subscribe before food is release onto the market for sale to the public. This would promote availability of healthier foods

to the community. Such standards should place emphasis on the need to produce foods and beverages that are not calorie-dense and nutrient poor.

- Policies that discourage selling of unhealthy foods and promote selling of healthy ones can also be implemented. This can be achieved for example by providing incentives to food retail businesses which sell healthy foods and beverages at cheaper prices relative to unhealthy ones. This could ultimately encourage consumers to purchase healthier foods/beverages and less unhealthy ones.

- Similarly, interventions should be developed to target retail shop owners who sell food items and alert them to the communities' potential willingness to purchase healthy food. This may in turn increase supply and therefore availability of healthy foods with an eventual increased in demand of these foods by community members.

- Local government can also look into ways of cooperating with business unions and other food retailers in order to decentralize to low-income and underserved communities more supermarkets and grocery stores that sell and stock a wide range of healthier foods and beverages at a reasonably low price. This could in turn promote not only good access to healthy food but also availability as well as affordability.

- Other strategies may involve non-governmental organizations' initiative to involve communities in instituting cooperative food stores, food banks, as well as encouraging community members to run local fruit and vegetable gardens to ensure constant availability of healthy vegetable and fruit produce at a relatively cheaper price.

- Business relationships can also be established between commercial farming associations and local grocery/corner store (Spaza shops) owners in order to guarantee regular supply of fresh and healthy farm produce.

REFERENCES

(1) Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation. 2003 01/01. Available from: http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf [Downloaded: 05/08/08 11:09 AM].

(2) Cade J, Booth S. What Can People Eat to Meet the Dietary Goals: and How Much Does it Cost? *Journal of Human Nutrition and Dietetics* 1990; **3**: 199-207.

(3) Swinburn B A, Metcalf P A, Ley S J. Long-term (5- year) Effects of a Reduced-fat Diet Intervention in Individuals with Glucose Intolerance. *Diabetes Care* 2001; **24**: 619–624.

(4) Taubes G. New Study Says Low-Fat Diet can lower Blood Pressure, *Science*. 1997; 276-350.

(5) Jones W O, Brown J. The Relationship of Diet to Blood Pressure Control. *Journal of Natural Medical Association* 1979: **71**: 1146–1148.

(6) Willet W C, Trichopoulos D. Nutrition and Cancer: A Summary of the Evidence. *Cancer Causes Control 1*996; **7**:178–180.

(7) Hercberg S, Galan P, Preziosi P, Alfarez M, Vazquez C. The Potential Role of Antioxidant Vitamins in Preventing Cardiovascular Diseases and cancers. *Nutrition* 1998; **14**: 513–520.

(8) Rexrode K M, Manson J E. Antioxidants and Coronary Heart Disease: Observational Studies. *Journal of Cardiovascular Risk* 1996; **3**: 363–367.

(9) Kok P, Collinson M. Migration and Urbanization in South Africa. Report 03-04-02, Pretoria: Statistics South Africa; 2006 [cited 2008 May 12]. Available from http://www.statssa.gov.za/publications/Report-03-04-02/Report-03-04-02.pdf

(10) Bradshaw D, Groenewald P, Laubscher R, Nannan N, Nojilana B, Norman R, Pieterse D and Schneider M. Initial Burden of Disease Estimates for South Africa 2000. Cape Town: South African Medical Research Council, 2003. Available from http://www.mrc.ac.za/bod/initialbodestimates.pdf

(11) Gibney,M, Vorster H. South African Food-Based Dietary Guideline. *The South African Journal of Clinical Nutrition* 2001; **14**(3): S1 - S80.

(12) Reddy SP, Panday S, Swart D, Jinabhai CC, Amosun SL, James S, Monyeki KD, Stevens G, Morejele N, Kambaran NS, Omardien RG and Van den Borne HW. Umthenthe Uhlaba Usamila. The South African Youth Risk Behaviour Survey 2002. Cape Town: South African Medical Research Council, 2003. Available from http://www.mrc.ac.za/healthpromotion/healthpromotion.htm

(13) Scientific and Industrial Research and Development Centre. *Nutrition Guidelines for Zimbabwe'* (Unpublished) 2002. Harare: Food and Nutrition Council of Zimbabwe.

(14) Human Sciences Research Council. January 2004. *Integrated Rural and Regional Development.* Position paper. Food Security in South Africa: Key policy issues for the medium term, Pretoria, South Africa. Available from: http://www.sarpn.org.za/documents/d0000685/Food_security_SA_January2004.pdf

(15) Raynor H A, Kilanoski C K, Esterils I Epistein LH. A Cost analysis of Adopting a Healthful Diet in a Family-based Obesity Treatment Program. *Journal of American Dietetics Association* 2002; **102**: 645–58.

(16) Puoane T, Zulu J, Tsolekile L, Bradley H A, Hughes G. Promoting Healthy Lifestyle: *Community Health Workers' Intervention Program for Primary Prevention of Non-Communicable Diseases in Khayelitsha, an Urban Township in Cape Town*. 2007. Cape Town, School of Public Health, University of Western Cape.

(17) Health Nexus and Ontario Chronic Disease Prevention Alliance. Primer to Action*: Social Determinants of Health.* 2008 Toronto. Available from: www.healthnexus.ca/projects/primer.pdf

(18) *The Concise Oxford English Dictionary.* 2006. Available from: http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t23.e3549>

(19) Elinder L S, Jansson M. Obesogenic Environments – Aspects on Measurement and Indicators. *Public Health Nutrition* 2007; **12**(3): 307–315.

(20) The World Health Report: Reducing Risks, Promoting Healthy Life. 2002 Geneva, World Health Organization, pg 181-9

(21) The World Health Report. Life in the 21st Century: A Vision for All. 1998 Geneva, World Health Organization.

(22) Choi BCK, Bonita R, McQueen DV. The Need for Global Risk Factor Surveillance. *Journal of Epidemiology and Community Health* 2001; **55**:370.

(23) Drewnowski A, Darmon N. The Economics of Obesity: Dietary Energy Density and Energy Cost. *American Journal of Clinical Nutrition.* 2005; **82**: Suppl. 265S–273S.

(24) Barker D J P. Fetal Origins of Coronary Heart Disease. *British Medical Journal* 1995; **311**: 171--174.

(25) Godfrey K M, Barker D J. Fetal Nutrition and Adult Disease. *American Journal of Clinical Nutrition* 2000; **71**: Suppl. 5. 1344-1352.

(26) Barker D J P et al. Growth in Utero and Serum Cholesterol Concentrations in Adult life. *British Medical Journal* 1993; **307**: 1524-1527.

(27) Simopoulos AP, Pavlow KN, eds. Nutrition and Fitness: Diet, Genes, Physical Activity and Health. Proceedings of 4th International Conference on Nutrition and Fitness, Athens, May 2000. *World Review of Nutrition and Dietetics* **89**. New York, NY, Karger.

(28) Blair S N, Cheng Y, Holder J S. Is Physical Activity or Physical Fitness more Important in Defining Health Benefits? *Medical Science and Sports Exercise* 2001; **33**: 379-399.

(29) Health Nexus and Ontario Chronic Disease Prevention Alliance. *Primer to Action: Social Determinants of Health.* 2008. Toronto. Available from: www.healthnexus.ca/projects/primer.pdf.

(30) Pereira MA, Kartashov AI, Ebbeling CB, Slattery ML, Jacobs DR, Ludwig DS. Fast-Food Habits, Weight Gain, and Insulin Resistance (The CARDIA Study): 15-year prospective analysis. The *Lancet* 2005; **365**: 36–42.

(31) Malik VS, Schulze MB, Hu FB. Intake of Sugar Sweetened Beverages and Weight Gain: a systematic review. *American Journal of Clinical Nutrition* 2006; **84**: 274–288.

(32) Kumanyika SK. Minisymposium on Obesity: Overview and some Strategic Considerations. *Annual Review of Public Health* 2001; **22**: 293–308.

(33) Bourne L, Lambert E V, Steyn K. Where Does the Black Population of South Africa Stand on the Nutrition Transition? *Public Health Nutrition* 2002; **5**(1A): 157-162.

(34) Joint WHO/FAO Expert Consultation on Diet, Nutrition and Prevention of Chronic Diseases. Geneva: World Health Organization. 2004. Available online: http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf

(35) Elinder L S, Jansson M. Obesogenic Environments – Aspects on Measurement and Indicators. *Public Health Nutrition* 2007; **12**(3): 307–315

(36) Feldman PJ, Steptoe A. How Neighborhoods and Physical Functioning are related: The Roles of Neighborhood Socioeconomic Status, Perceived Neighborhood Strain, and

Individual Health Risk Factors. *Annals of Behavioral Medicine: a Publication Of The Society Of Behavioral Medicine* 2004; **27**(2): 91-99.

(37) Swinburn B, Egger G. Preventive Strategies against Weight Gain and Obesity. *Obesity Reviews* 2002; **3**(4):289-301.

(38) Donkin, JM, Dowler E A, Stevenson S J, Turner S A. Mapping Access to Food in a Deprived Area: The Development of Price and Availability Indices. *Public Health Nutrition* 1999; **3**(1): 31–38.

(39) Food and Agricultural Organization. Growing Demand on Agriculture and Rising Prices of Commodities. *An Opportunity for Smallholders in Low-income, Agricultural-based Countries*. The Trade and Markets and Agricultural Development, Economics Divisions of the Food and Agricultural Organization of the United Nations. 2008. Available online: http://www.fao.org/copyright_en.htm.

(40) Food and Agricultural Organization. Action Needed to Improve Access to Inputs to Boost Local Food Production in most Affected Countries. Food and Agricultural Organization of the United Nations. 2007. Available online: http://www.fao.org/newsroom/en/news/2007/index.html.

(41) Cassidy D, Jetter K, Culp J. Is Price a Barrier to Eating More Fruits and Vegetables for low- income Families? *Journal of American Dietetic Association* 2007; **107**: 1909-1915.

(42) Drewnowski A, Darmon N, Briend A. Replacing Fats and Sweets with Vegetable and Fruits – A Question of Cost. *American Journal of Public Health.* 2004*;* **94**(2).

(43) Jetter K M, Cassady D L. The Availability and Cost of Healthier Food Alternatives. *American Journal of Preventive Medicine* 2006; **30**(1): 38–44.

(44) Cummins S, Macintyre S. Food Environments and Obesity—Neighborhood or Nation? *International Journal of Epidemiology* 2006; **35**: 100–104.

(45) Barratt J. The Cost and Availability of Healthy Food Choices in Southern Derbyshire. *The journal of Human Nutrition and Dietetics* 1997; **10**: 63-69.

(46) Cummins S, MacIntyre S. A Systematic Study of an Urban Food Landscape: The Price and Availability of Food in Greater Glasgow. *Urban Study* 2002; **39**: 2115–2130.

(47) Darmon N, Ferguson EL, Briend A. A Cost Constraint Alone has Adverse Effects on Food Selection and Nutrient Density: An Analysis of Human Diets by Linear Programming. *Journal of Nutrition* 2002; **132**: 3764–3771

(48) Regmi A, Deepak M, Seale JL, Bernstein J. Cross-country Analysis of Food Consumption Patterns. In Changing Structure of Global Food Consumption and Trade, pp. 14–22. [A Regmi, editor], (2001). Washington DC: Economic Research Service, US Department of Agriculture.

(49) French SA .Pricing Effects on Food Choices. *Journal of Nutrition* 2003; **133**: 841S–843S.

(50) Renzaho A. Is a Healthy Diet Affordable and Accessible in the City of Yarra, Victoria-Australia? An Analysis of Cost Disparity and Nutrition Choices. *Ecology of Food and Nutrition* 2008; **47**: 44–63.

(51) Harnack L, Block G, Lane S. Influence of Selected Environmental and Personal Factors on Dietary Behaviour for Chronic Disease Prevention: A Review of the Literature. *Journal of Nutrition Education* 1997; **29**: 306–312.

(52) Sooman A, Macintyre S, Anderson A. Scotland's health – A More Difficult Challenge for some? The Price and Availability of Healthy Foods in Socially Contrasting Localities in the West of Scotland. *Health Bulletin* 1993; **51**: 276–284.

(53) Guy CM. The Food and Grocery Shopping Behaviour of Disadvantaged Consumers: Some Results from the Cardiff . *Trans Inst Br Geogr* 1985; **10**: 181–190.

(54) White M, Bunting J, Raybould S, Adamson A, Williams E, Mathers J. *Do Food Deserts Exist? A Multi-Level, Geographical Analysis of the Relationship between Retail Food Access, Socio- Economic Position and Dietary Intake.* Final Report to the Food Standards Agency, UK. Newcastle University: Newcastle upon Tyne, 2004.

(55) Guy CM, David G. Measuring physical access to 'healthy foods' in areas of social deprivation: a case study in Cardiff. *International Journal of Consumer Studies* 2004; **28**: 222–234.

(56) White, M. Food access and Obesity. *Obesity Reviews* 2007; **8**: (Suppl. 1).

(57) Morland K, Diez Roux AV, Wing S. Supermarkets, Other Food Stores, and Obesity: the Atherosclerosis Risk in Communities Study. *American Journal of Preventive Medicine* 2006; **30**: 333–339.

(58) Galvez MP, Morland K, Raines C, Kobil J, Siskind J, Godbold J, Brenner B. Race and Food Store Availability in an Inner-city Neighborhood. *Public Health Nutrition* 2007. (Epublication ahead of print version).

(59) Morland K, Wing S, Diez Roux A, Poole C. Neighborhood Characteristics Associated with the Location of Food stores and Food Service Places. *American Journal of Preventive Medicine* 2002; **22**: 23–29.

(60) Pearce J, Blakely T, Witten K, Bartie P. Neighborhood Deprivation and Access to Fast-Food Retailing: A National Study. *American Journal of Preventive Medicine* 2007; **32**: 375–382.

(61) Cummins SCJ, McKay L, MacIntyre S. McDonald's Restaurants and Neighborhood Deprivation in Scotland and England. *American Journal of Preventive Medicine* 2005; 29(**4**):308-310.

(62) White M, Bunting J, Raybould S, Adamson AJ, Williams L, Mathers JC. Do Food Deserts' Exist? A Multi-level, Geographical Analysis of the Relationship between Retail Food Access, Socio-economic Position and Dietary Intake: Final Report Food Standards Agency; 2004.

(63) Pearson T, Russell J, Campbell MJ, Barker ME. Do 'Food Deserts' Influence Fruit and Vegetable Consumption? – A cross-sectional Study. *Appetite* 2005; **45**: 195–197.

(64) Macintyre S, McKay L, Cummins S, Burns C. Out-of-home Food Outlets and Area Deprivation: Case Study in Glasgow, UK. *International Journal of Behavioral Nutrition and Physical Activity* 2005; 2(**1**):16.

(65) Turrell G, Blakely T, Patterson C, Oldenburg B. A Multilevel Analysis of Socioeconomic (small area) Differences in Household Food Purchasing Behaviour. *J Epidemiol Community Health* 2004; **58**: 208–215.

(66) Macintyre S, Ellaway A, Cummins S. Place Effects on Health: How can we Conceptualize, Operationalize and Measure them? *Social Science Medicine* 2002; **55**: 125–139.

(67) James WP, Nelson M, Ralph A, Leather S. Socioeconomic Determinants of Health. The Contribution of Nutrition to Inequalities In health. *British Medical Journal* 1997; **314**: 1545–1549.

(68) Groth MV, Fagt S, Brondsted L. Social Determinants of Dietary Habits in Denmark. *European Journal of Clinical Nutrition* 2001; **55**:959–966.

(69) Blaylock J, Smallwood D, Kathleen K, Variyam J, Aldrich L. 'Economics, Food Choices, and Nutrition. *Food Policy* 1999; **24**:269–286.

(70) Marshall T. Exploring a Fiscal Food Policy: The Case of Diet and Ischaemic Heart Disease. *British Medical Journal* 2000; **320:301**–5.

(71) Vorster HH, Love P, Browne C. Development of Food-based Dietary Guidelines for South Africa — The Process. *An SAMJ Publication* 2001; **14** (3) (Supplement).

(72) Stats SA. Consumer Price Index (CPI) for Metropolitan Areas, June 2002, Release No. P0141.1, Statistics South Africa, Pretoria.

(73) May J. *Experience and Perceptions of Poverty in South Africa*. 1998, Durban: Praxis Publishing. Available from: http:experiences+and+perceptions+of+poverty+in south+Africa.

(74) Labadarios D, Steyn N, Maunder E, Maclntryre U, Gericke G, Swart R, Huskisson J, Dannhauser A, Vorster HH, Nesmvuni AE. Nel JH. The National Food Consumption Survey (NFCS): South Africa. *Public Health Nutrition* 1999; **8**(5): 544-543.

(75) Love P, Maunder E, Green M, Ross F, Smale-Lovely J, Charlton K. South African Food-based Dietary Guidelines: Testing of the Preliminary Guidelines among Women in KwaZulu-Natal and the Western Cape. *South African Journal Clinical Nutrition* 2001; **14:** 9-19.

(76) Watkinson E, Makgetla N. South Africa's Food Security Crisis. National Labour & Economic Development Institute (NALEDI) July 2002Available online: http://www.naledi.org.za/pubs/2002/watkinson.pdf

(77) De Swart C, Puoane T, Chopra M, Du Toit A. Urban Poverty in Cape Town. *Environment & Urbanization* 2005; **17**(2): 101-112.

(78) Swinburn B, Egger G. Preventive Strategies against Weight Gain and Obesity. *Obesity Review* 2002; **3**: 289–301.

(79) Robert W Jeffery. Environmental Intervention for Weight Gain Prevention (HealthWorks). National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), 2008. (Unpublished paper). Available on: http://clinicaltrials.gov/ct2/show/NCT00708461.

(80) Madore O. The Impact of Economic Instruments That Promote Healthy Eating, Encourage Physical Activity and Combat Obesity: Literature Review. *Parliamentary Information and research service.* 2007. *Library of Parliament.* Available on: http://www.parl.gc.ca/information/library/PRBpubs/prb0634-e.htm.

(81) Schultz S. Increasing Access to Healthy Food. Washington state budget and policy centre. *Policy Brief*. June 29, 2009. Available online: http://www.budgetandpolicy.org/documents/Food.pdf.

(82) http://www.dchunger.org/projects/cornerstore.htm12. l

(83) Horgen KB, Brownell KD. Comparison of Price Change and Health Message Interventions in promoting Healthy Food Choices. *Health Psychology* 2002; **21**: 505–12.

(84) Robinson N, Caraher M, Lang T. Access to Shops: The Views of Low-income Shoppers. *Health Education Journal* 2000; **59**: 121–136.

(85) Piacentini M, Hibbert S, Al-Dajani H. Diversity in Deprivation: Exploring the Grocery Shopping Behaviour of Disadvantaged Consumers. *International Review of Retail Distrib Consum Res* 2001; **11**: 141– 158.

(86) Dibsdall LA, Lambert N, Bobbin RF, Frewer LJ. Low Income Consumers' Attitudes and Behaviour towards Access, Availability and Motivation to Eat Fruit and Vegetables. *Public Health Nutrition* 2002; **6**: 159–168.

(87) Hitchman C, Christie I, Harrison M, Lang T. *Inconvenience Food: The Struggle to Eat Well on a Low Income*. Demos: London, 2002; pg 16-18.

(88) Polit D F, Beck C T, Hungler B P. *Essentials of Nursing research, methods, appraisal, and utilization* fifth edition. Philadelphia: 2001 Lippincott Publishers. Pg 12-13.

(89) Reaves CS. Quantitative research for the behavioral sciences. 1992. New York: Wiley. Pg: 112-4.

(90) Kirkwood BR. Essential of medical statistics. Oxford: 1988. Blackwell Science. Pg 67.

(91) Currier D P. *Elements of Research in physical Therapy* second Edition. Baltimore: 1984. Williams and Wilkins. Pg 77-78.

(92) Maxwell JA. Qualitative Research Design: An Interactive Approach. Thousand Oaks California, 1996; Sage production. Pg 33-34.

(93) Hicks C M. *Research Methods for Clinical Therapists: Applied project design and analysis. Third edition.* Edinburgh: 1999. Churchill Livingstone. Pg 70.

(94) Burns R B. *Introduction to Research methods fourth edition*. London: 2000; Sage. Pg 98-100.

(95) Parahoo K. *Nursing research: Principles, Process and Issues*. Basingstoke: 1997; Macmillan Press. Pg 102.

(96) De Vos AS. *Research at grass root: A primer for the Caring Professionals.* Pretoria: 2001. Van Schaik. Pg 77.

(97) Treece E W, Treece J W. *Elements of Research in Nursing.* Fourth edition, ST. Louis: 1986. Mosby Company. Pg 80-81.

(98) Information and knowledge Management Department Socioeconomic Profiling of Urban Renewal Nodes – Khayelitsha and Mitchell's plain. 2006, Cape Town.

(99) Burns R B. *Introduction to Research Methods: fourth Edition*. London: (2000) Sage.pg 34.

(100) Liamputtong PR, Ezzy D. Ch 2- Rigour, Ethics and Sampling. In Qualitative Research Methods. Sydney: 2005; Oxford University Press: Pg 44-52.

(101) Gorman GE, Clayton P. Qualitative Research for the Information Professional. London: 1997; Library Association. Penny. Pg 65.

(102) Mies M. Towards Methodology for Feminist Research. In *Theories of Women's studies.* (eds). Bowels G, Duelli Klein R. London: 1983; Routledge & Keegan Paul: Pg 117-139.

(103) Patton M Q. *How to Use Qualitative Methods in Evaluation*. London: 1987. Sage; Pg: 165-8.

(104) Schnetler J. Ed. Survey Methods and Practice. Pretoria: 1989, HSRC; Pg: 56-7.

(105) Giskes K, Van Lenthe F J, Brug,J, Mackenback JP, Turrell G..Socioeconomic Inequalities in Food Purchasing: The Contribution of Respondent-Perceived and Actual (objectively measured) Price and Availability of Foods. *Preventive Medicine* 2007; **45**: 41–48.

(106) Neuman LW. Social Research Methods: Qualitative and Quantitative approaches, 4th ed. Boston, Mass: 2000. Allyn & Bacon; Pg 43.

(107) Powell RR. Basic Research Methods for Librarians. 2nd ed. Norwood; 1991. N.J: Ablex, pg 7-9.

(108) Babbie E. The Practice of Social Research. 7th. ed. Belmont, Calif: 1994.Wadsworth. Pg 21.

(109) Turrell G, Hewitt B, Patterson C, Oldenburg B, Gould T. Socioeconomic Differences in Food Purchasing Behavior and Suggested Implications for Diet-related Health Promotion. *Journal of Human Nutrition and Dietetics* 2002; **15**: 355–364.

(110) Turrell G, Kavanagh A M.Socio-economic Pathways to Diet: Modeling the Association between Socio-economic Position and Food Purchasing Behavior. *Public Health Nutrition:* 2006; **9**(3): 375–383.

(111) Barbour R S. Checklists for improving Rigor in Qualitative Research: A Case of the Tail Wagging the Dog? *British Medical Journal* 2001; **322**: 1115-1117.

(112) Daly J, McDonald I, Willis E. Why don't you ask them? A qualitative Research Framework for investigating the Diagnosis of Cardiac Normality. In: Daly J, McDonald I, Willis E, eds. *Researching Health Care: Designs, Dilemmas, and Disciplines.* London: Routledge, 1992:189-206.

(113) Miles M. Huberman A. Qualitative Data Analysis: London: Sage. 1999. Pg 22-24.

(114) Pope C, Ziebland S, Mays N. Qualitative Research in Health Care: Analyzing Qualitative Data. *British Medical Journal* 2000 **320**: 114-116.

(115) Bryman A, Burgess R. Qualitative Data Analysis for Applied Policy Research: In Analyzing Qualitative Data: Routledge, New York 1994: Pg 164-180.

(116) Kearney M, Kearney JM, Dunne A, Gibney MJ. Socio-demographic Determinants of Perceived Influences on Food Choice in a Nationally Representative Sample of Irish Adults. *Public Health Nutrition* 1999; **3**(2): 21-226.

(117) Giskes K, Turrell G, Patterson C, Newman B. Socio-economic Differences in Fruit and Vegetable Consumption among Australian Adolescents and Adults. *Public Health Nutrition* 2002; **5**(5): 663–669.

(118) Reicks M, Randall JL, Haynes BJ. Factors Affecting Consumption of Fruits and Vegetables by low Income Families. *J. Am. Diet. Assoc* 1994; **94**: 1309–11.

(119) Treiman K, Freimuth V, Damron D, Lasswell A, Anliker J, Havas S, et al. Attitudes and Behaviours to Fruits and Vegetables among Low-income Women in the WIC program. *Journal of Nutrition Education.* 1996; 28: 149–56.

(120) Bourne LT, Langenhoven ML, Steyn K, Jooste PL, Nesamvuni AE, Laubscher JA. The Food and Meal Pattern in the Urban African Population of the Cape Peninsula. The BRISK Study. *Central African Journal of Medicine*. 1994; **40**: 140–8.

(121) Vorster HH, Jerling JC, Oosthuizen W, Becker P, Wolmarans P. Nutrient Intakes of South Africans: An Analysis of the Literature. SANSS Group Report to Roche Products, Potchefstroom, 1995; 41.

(122) Ness AR, Powles JW. Fruit and Vegetables, and Cardiovascular Disease: A Review. *International Journal of Epidemiology* 1997; **26**(1): 1–13.

(123) Steinmetz KA, Potter JD. Vegetables, Fruit, and Cancer Prevention: A review. Journal of American Dietetic Association 1996; **96**: 1027–39.

(124) Nestle M. Fruit and Vegetables: Protective or just Fellow Travelers? Nutrition Review 1996; **54**: 255–7.

(125) Story M,. Kaphingst M K, O'Brien R R, Glanz K. Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. *Annual Review of Public Health* 2008; **29**.

(126) French SA, Story M, Jeffery RW. Environmental Influences on Eating and Physical Activity. *Annual Review of Public Health* 2001; **22**: 309–335.

(127) Glanz K, Basil M, Maibach E, Goldberg J, Snyder D. Why Americans eat what they do: Taste, Nutrition, Cost, Convenience, and Weight Control Concerns as Influences on Food Consumption. *Journal of American Dietetic Association* 1998; **98**:1118–26.

(128) Kearney J, McElhone S. Perceived Barriers in Trying to eat Healthier— Results of a Pan-EU Consumer Attitudinal Survey. *British Journal Nutrition* 1999; 81: s133–s137 (suppl).

(129) Drewnoski A, Specter SE. Poverty and Obesity: The Role of Energy Density and Energy Cost. *American Journal of Clinical Nutrition* 2004; **79** (1): 6-16.

(130) Blisard N, Stewart H, Joliffe D. Low-income Households' Expenditures on Fruits and Vegetables. *Agric. Econ. Rep* 2004; **833**.Washington, DC: USDA.

(131) Glanz K, Yaroch AL. Strategies for Increasing Fruit and Vegetable intake in Grocery Stores and Communities: Policy, Pricing, and Environmental Change. *Preventive Medicine* 2004; **39** (Suppl. 2):S75–80.

(132) Powell LM, Auld MC, Chaloupka FJ, O'Malley PM, Johnston LD. Associations between Access to Food Stores and Adolescent Body Mass Index. *American Journal of Preventive Medicine* 2007; **3**: 12.

(133) Cheadle A, Psaty BM, Curry S,Wagner E, Diehr P, et al. Community-level comparisons between the grocery store environment and individual dietary practices. *Preventive* Medicine 1991; **20**:250–61.

APPENDICES

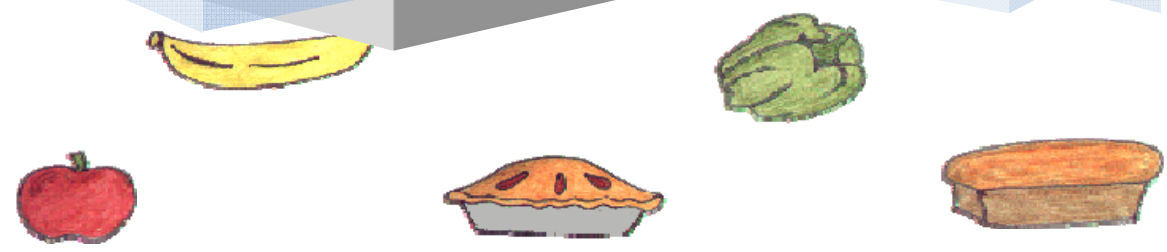
Appendix 1

School of Public Health-UWC

THE QUANTITATIVE QUESTIONNAIRE FOR RESEARCH PARTICIPANTS

A Household Food Accessibility, Affordability and Availability Study Khayelitsha

2009



Participant's name

Participant's Code ☐☐☐☐

Interview number ☐☐☐☐

Household number ☐☐☐☐

Date of interview ☐☐ ☐☐ ☐☐☐☐

Day Month Year

Interview status [=Completed; 2=Refused; 3=Not at home]

Name of interviewer

Interviewer's comments:

……
……
……

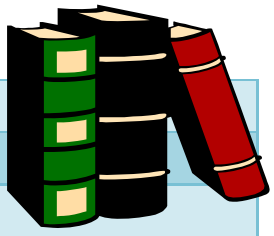
a. Demographic and socioeconomic characteristics

1.How old are you?

☐Years.

2. What is you gender? (tick one option)

Male	☐1.
Female	☐2.



3. What is the highest standard you have passed? (Tick one response only)

Standard 5/ Primary	☐1.
Standard 7	☐2.
Passed Matric	☐3.
Tertiary diploma	☐4.
Undergraduate University Degree	☐5.
Postgraduate University Degree	☐6.
No education	☐7.

4. What is your marital status? (Tick one response only)

Single – Never married	☐1.
Married- monogamous relationship	☐2.

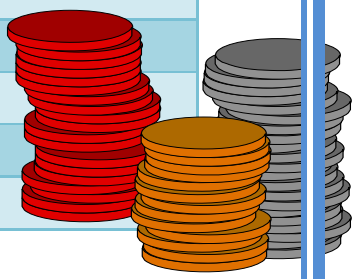
Married-polygamous relationship	☐3.
Widowed	☐4.
Divorced/separated	☐5.
Co-habiting	☐6.
No response.	☐7.

5. Which one of the following best describes your current employment status (Tick one)

Paid fulltime/part-time job	☐1.
State pension/grant	☐2.
Casual paid work job	☐3.
Unemployed looking for work	☐4.
Retired	☐5.
Contribution from others	☐6.
Student	☐7.

6. If you ticked "State pension/Grant" in section 5 what kind(s) of grant/pension do you receive in your household?

Child support grant	☐1
Elderly pension	☐2.
Disability pension	☐3.
Foster care grant	☐4.
Don't know	☐5.



7. What is your household income per month?

Rand…….. Per month

☐1. Don't know.

8. What is the number of children residing in your household?

……...Children

9. What is the number of adults residing in your household?

……Adults

10. What is the main source of energy do you use at home for food preparation?

Electricity	☐1.
Gas	☐2.
Paraffin	☐3.
Charcoal	☐4.
Wood	☐5.
Other (specify)……..	☐6.

11.To what extent do people in your household use the following strategies to make a living?

Way to make a leaving	Not at all	Slightly	Partly dependant	Totally dependant
Field crops	1	2	3	4
Garden crops	1	2	3	4
Craft	1	2	3	4
Begging	1	2	3	4
Gifts	1	2	3	4
Casual labor	1	2	3	4
Remittances	1	2	3	4
Others (Specify)	1	2	3	4

12. How would say the economic conditions of your household are today compared to a years ago (circle one answer only)

Much worse	☐1
Worse	☐2
The same	☐3
Better	☐4
Much better	☐5

b. Shopping outlets where participants buy their food stuffs.

13. Approximately how much money would your household spend on food on an average week?

R…… Per week

14a. Where does this household normally obtain its food? (Read the list of all food sources to the respondent and circle the food source if they answer YES to the food source on the list.

14b. How often does the household normally obtain its food from these sources? (Read out possible number of times mentioned in the table and circle the appropriate scale).

Source of food	(a) Food code	(b) number of times food obtained from this source					
		At least five days a week	At least once a week	At least once a month	At least once six months	Less than once a year	Never
Supermarkets	1	1	2	3	4	5	6
Spaza shops	2	1	2	3	4	5	6
Fast-food outlets	3	1	2	3	4	5	6
Food aid	4	1	2	3	4	5	6
Community food kitchen	5	1	2	3	4	5	6
Borrow food from others	6	1	2	3	4	5	6
Other (specify)……	7	1	2	3	4	5	6

15. What type of transport do you usually use when you go to this supermarket? (You can tick more than one)

Own private vehicle	☐1.
Borrowed private vehicle	☐2.
Bus	☐3.
Train	☐4.
Taxi	☐5.
Walk	☐6.
Donkey	☐7.
Other (specify)…..	☐8.

a. How long does it take you to get there?

…….Min

b. How much do you spend on transport?

...……..Rand

16. Do you agree or disagree with these statements about large SUPERMARKETS in your area (Circle ONE number on each line)

Large USPERMARKETS in my area:	Agree	Not sure	Disagree
Are easily accessible	1	2	3
Stock a wide range of fresh vegetables	1	2	3
Stock whole meal or white bread	1	2	3
Sell food at cheaper prices than smaller stores	1	2	3
Stock reduced fat or low fat dairy foods	1	2	3
Have convenient opening hours	1	2	3
Stock salt-reduced or unsalted foods	1	2	3
Are well served by public transport	1	2	3
Stock are wide range of fresh fruits	1	2	3

c. Participant's perceived ability to afford certain food items.

17. Which one of the following pairs of foods do you believe is the most expensive to purchase?

On each line, please tick the food which you think costs more. If you think the foods cost about the same, or are not sure, tick one of the boxes to your right instead.

Is it this one?	OR This one?	OR… Almost same price	Not sure
☐ Whole meal bread	☐ White bread	☐	☐
☐ Orange fruit drink with added sugar	☐ 100% pure orange juice with no-added sugar	☐	☐
☐ Full cream milk	☐ low fat milk	☐	☐
☐ Regular rice (white)	☐ Whole meal rice (brown)	☐	☐
☐ Chicken thigh fillet (no skin)	☐ Chicken thigh fillet (with skin)	☐	☐
☐ Whole meal spaghetti	☐ Regular spaghetti (white)	☐	☐

(brown)	
☐ Animal cooking oil e.g. chicken fat ☐ Sunflower vegetable oil	☐ ☐

d. Interpersonal factors of food purchasing among households

18. Please indicate which member of your family has the most influence when it comes to deciding which foods to buy for consumption in your household. (You can tick more than one option where necessary)

Yourself	☐1.
Your partner	☐2.
Your children	☐3.
Your in-laws	☐4.
Your other relatives	☐5.
Relatives from your partner's side	☐6.

e. Participant's elementary knowledge about healthy eating

19. What do you think about the following statements? (Circle one number on each line)

	True	Not sure	False
1. A high intake of plant food combined with a low salt intake may protect against high blood pressure	1	2	3
2. It is better for health to choose lean meat (with little visible fat)	1	2	3
3. Choosing salt-reduced food provides no health benefits	1	2	3
4. Fruit is a poor source of vitamin C	1	2	3
5. Reducing consumption of food items with high fat/oil content such as fat cook is better for our health	1	2	3
6. Choosing brown bread provides no health benefits	1	2	3
7. Brown bread are good sources of fiber	1	2	3
8. Adults should choose full cream milk instead of low fat milk	1	2	3
9. A high intake of solid fat can protect against heart disease	1	2	3
10. Meat, fish, chicken and eggs should make up the largest part of our diet	1	2	3

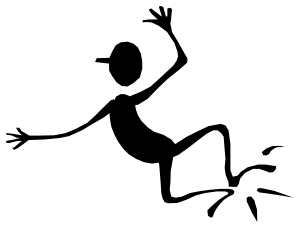
We have come to the last question of the survey……

f. General assessment of participants' practice of healthy food consumption

20. I can generally say that in our household we

List of assertions	Never	Sometimes	Regularly	always
Eat fruits for a snack	1	2	3	4
Try new ways of preparing fruits and vegetables	1	2	3	4
Buy new kind of fruits and vegetables	1	2	3	4
Eat fruits for dessert	1	2	3	4
Eat salad or other vegetables for lunch	1	2	3	4
Drink 100% pure fruit juice instead of fizzy drinks (e.g. Coke)	1	2	3	4
Keep fruits and vegetables handy and in sight around the house	1	2	3	4
Have at least three meals a day	1	2	3	4
Often have our meal at home	1	2	3	4
Can easily access healthy food for consumption at home in the community where we live	1	2	3	4
Can afford healthy food for consumption at home	1	2	3	4
Can find healthy and nutritious food in shopping outlets where we always buy food for consumption at home	1	2	3	4
Buy fast food for consumption at home	1	2	3	4
Eat fried meat with fat	1	2	3	4
Drink more of fizzy drinks than pure fruit juice	1	2	3	4
Eat brown bread instead of white bread	1	2	3	4
Try to buy food that is low in fat when buying food for the family	1	2	3	4
Need to spend a lot of money to buy healthy and nutritious food	1	2	3	4
Have a diet that consists of healthy and nutritious foods.	1	2	3	4

You have finished the survey!



Thank you very much for your participation. We are aware of the fact that you have given up some of your time to participate in this survey. We would like you to know that the findings of the survey might help health professionals come up with new ways of promoting your family's health with regard to nutrition.

Appendix 2

INTERVIEW GUIDE FOR HEALTH CLUB MEMBERS

Theme 1: Description of participant's living conditions with respect to their socioeconomic status

1.1 I would like you to describe to me a few things about yourself and your household,

How many people live there?

How are you related to them?

How many adults and children/infants? What type of household do you live in (e.g. Shack, room in a back yard etc)?

What forms of water and sanitation facilities do you use?

How many people in your household are dependants?

1.2 How does your household manage to financially sustain itself on a daily basis?

How many household members are working?

What is their source of income e.g. grants, occupation (specify type – casual labor, permanent employment, etc).

Is there a portion of your household income that you allocate to some extended family members?

If so, how much per month?

Theme 2: Participant's overview of the food purchasing and consumption pattern

2.1Can you describe the kind of meal you had yesterday for lunch and/or super

Who did you share the meal with? (Where the meal is not consistent with the dietary guidelines - Can you tell me why you had this particular food instead of – a much healthier food item will be mentioned)?

2.2 Can you describe the kinds of food you have consumed in the past 7 days?

How often do you eat these at home?

Tell me about the reasons why you chose these foods for consumption in your household.

2.3 Tell me about your household income expenditure per month

Approximately how much do you earn (overall)?

Approximately how much do you spend on food in general?

How much do you spend on food you perceive healthy?

What about other non-edible groceries?

Have you ever had to forgo some types of food items because you had to spend your income on other important expenses, which ones are these and why?

2.4 Tell me how the recent hike in food prices has affected your food purchasing habits

How did it affect the frequency with which you purchase fruits and vegetables?

What about other healthy foods (e.g.: Whole wheat brown bread)?

How often you visit the market to buy food you perceive healthier, the kinds of food retail outlets you now visit to buy food.

Theme 3: Participant's ability to afford healthy food

3.1 Can you describe your day to day experience in shopping for healthy food within your budget?

Would you say you are managing?

If Yes/No, please explain why.

One guideline in the South African food based dietary guidelines encourages us to eat a variety of food. Tell me about your day to day experiences in affording nutritionally diverse meals for consumption at home with regards to quantity and quality.

You are also encouraged to have at least 4 meals a day (breakfast, lunch, super and in-between snack) and lots of fruits and vegetables.

Can you comment on your ability to afford food that you can consume this often?

Theme 4: Participant's ability to access healthy food

4.1 Can you tell me about your experiences getting to the nearest shopping outlet that sells fresh fruits and vegetables

Comment on the amount of time and money you spend to access these shopping outlets.

What mode of transport do you use to get there?

4.2 Can you comment on the difference in accessibility (in terms of distance to be traveled) between large supermarkets and small supermarket?

Which ones are closer? And which ones do you think have healthier food items and why?

Theme 5: Participant's perceived availability of healthy food in the community he/she lives in

5.1 Do you ever visit both large and small shopping outlets within and around your community? If yes comment on the following:

Can you describe the difference you observed between the small shopping outlets (e.g. Spaza shops) and large supermarket (e.g. Shoprite) in terms of availability of healthy foods?

What do you like about shopping for food in either of the two?

Theme 6: Participant's ownership/possession of material resources important for healthy eating

6.1 Tell me about your experience in storing perishable goods

Can you tell me how you store food items such as milk (e.g. clover) some fruits and vegetables?

6.2 Tell me about the way you prepare your food before consumption.

Comment on your ability to secure cooking utensils to make a variety of food enough for your household consumption.

Do you ever experience shortages of energy source to prepare and cook your food?

If yes how often and what coping strategies do you use in such times?

6.3 Comment on the sufficiency of water you require while preparing some of the food items

Do you ever have problems securing enough water to do this?

If yes how do you respond to this challenge?

Theme 7: Participant's intrapersonal and interpersonal characterizes that impact food choice.

7.1 Can you describe the size of your household? How many are there?

7.2 How does this affect your food choice?

Who has the biggest say in choosing what to buy and why can't other household members have a say too?

How does it affect how much food you buy?

7.3 If there are children, do you buy separate food items for children?

Can you comment on your experience in securing various types of food for different people in your house?

How does this influence preparation of your meals?

7.4 Comment on your ability to read and understand food labels

Would you say that you find it easy to check for instance the energy or protein content of the food item?

If not, what challenges do you have in achieving this?

Appendix 3

INTERVIEW GUIDE FOR COMMUNITY HEALTH WORKERS

Q1. Please comment on the health club member's ability in terms of their mobility and accessibility to acquire healthy food in the community where they live?

Q2. From your own information as a CHW, what sorts of food do they normally eat?

Q3. In your own view, which socioeconomic and environmental factors do you think influence the kinds of food health club members buy?

Q4. Tell me about the variety and price of healthy food stuffs available in local stores situated in the community where the HCMs reside. How do they compare to those in larger supermarkets?

Q5. What barriers/ enablers do you think influence HCM's ability to increase consumption of fresh fruits and vegetables?

Q6. Are there ways in which you are able to determine if HCMs have difficulties in accessing or affording healthy foods? What are these?

Q7. What percentages of HCM would you say have and don't have problems accessing/affording healthy foods?

Appendix 4
OBSERVATIONAL CHECKLIST

Availability of fruits

Type of fruits	Availability in larger supermarkets		Availability in medium/small grocery stores		Availability on street markets stands		Availability in fruit and vegetable store	
	Yes	No	Yes	No	Yes	No	Yes	No
Orange								
Strawberry								
Grapefruit								
Nartdjie								
Banana								
Pineapple								
Pear								
Peach								
Apple								

Availability of vegetables

Type of vegetable	Availability in larger supermarkets		Availability in medium/small grocery stores		Availability street market/ stands		Availability in fruit and vegetable store	
	Yes	No	Yes	No	Yes	No	Yes	No
Broccoli								
Brussels sprouts								
Sweet potato								
Spinach								
Peas								
Chinese cabbage								
Cabbage								
Pumpkin								
Carrots								
Cauliflower								
Green beans								
Tomatoes								
Cucumber								
Potatoes								
Lettuce								
Celery								
Onions								
Mushrooms								

Availability of healthier food choices in general

Food types	Availability in larger supermarkets		Availability in medium/small grocery stores		Availability street markets/vending stands	
	Yes	No	Yes	No	Yes	No
Whole-wheat brown bread						
Whole meal rice (brown)						
Fresh vegetables						
100% pure fruit juice (with no added sugar)						
Salt-reduced poly or monounsaturated margarines						
Wholegrain or multigrain breakfast cereals						
Chicken breast fillet/drumstick without skin						
Salt-reduced butter						
Fresh fish						
Salt-reduced baked beans						
Whole meal pasta (brown)						
Canola, olive, sunflower, safflower oils						
Fat-reduced poly or monounsaturated margarines						
Lean beef meat						
Low fat/2% milk						

Comparison of the food price between healthy food and their less healthy counterparts

Foods		Food price in large supermarket in Rand	Food price in medium/small grocery stores in Rand
Food category	Food type		
Bread	Whole-wheat brown bread		
	Regular white bread		
Orange juice	Orange fruit drink with added sugar		
	100%pure orange juice with no added sugar		
Liquid milk	Fool cream milk		
	2% fat milk		
Rice	Whole meal rice		
	White rice		
Chicken breast	Chicken breast fillet with skin		
	Chicken breast fillet without skin		
Cooking oil	Animal cooking oil e.g. lard		
	Sunflower vegetable oil		

General assessment of quality of foods

Quality	Description in large supermarket and medium grocery stores	Description in street markets. Vending stands
Hygiene		
Physical integrity + Packaging were applicable		
Availability of nutrition label		

Assessment of restaurants

Type of restaurant	Kinds of portion sizes on offer available	Observed healthiness of the menu(low fat/ salt, salad menu)	Availability of buffets

Appendix 5

CONSENT FORM (ENGLISH)

UNIVERSITY OF THE WESTERN CAPE

School of Public Health

A WHO Collaborating Centre for Research and Training in Human Resources for Health Development

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592809, Fax: 27 21-9592872

CONSENT FORM

"Contextual and Socio-economic Factors that Impact Food Purchasing Patterns of Health Club Members residing in a predominantly Black- Urban Township in South Africa"

The study has been satisfactorily described to me in language that I understand to indicate that the research is entirely voluntary. Having read and understood the information contained in ***the participant information sheet***, I hereby freely and voluntarily agree to participate.

My questions about the study have been clearly answered. I understand that my identity and information collected in this interview will not be disclosed and that I may withdraw from the study without giving a reason at any time and that this will not negatively affect me in any way. I am also aware of the fact that should there be anything I am not willing to discuss, I am allowed to say so.

My signature says that I consent to participate in this research.

Participant's Name……..

Participant's signature…….

Researcher's Signature…….Consent Date……

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: M. MUZIGABA

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-2243

Cell: 0731651833

Email: mochemoseo@yahoo.co.uk

Appendix 6

PARTICIPANT INFORMATION SHEET (ENGLISH)

UNIVERSITY OF THE WESTERN CAPE

School of Public Health

A WHO Collaborating Centre for Research and Training in Human Resources for Health Development

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592809, Fax: 27 21-9592872

PARTICIPANT INFORMATION SHEET

"Contextual and Socio-economic Factors that Impact Food Purchasing Patterns of Health Club Members residing in a predominantly Black- Urban Township in South Africa"

The purpose of this research

I am Moise Muzigaba, a student studying towards a Masters of Public Health at the University of the Western Cape. We are inviting you to participate in this research project because you have been identified as one of the health club members whose challenges related to food consumptions are to be addressed by the study. The purpose of this research project is to understand the challenges you and other health club members are facing in trying to eat healthy. It is anticipated that your participation will lead to a better understanding of factors that influence your accessibility to, affordability and availability of healthy foods in Khayelitsha. This research may also in the future help health professionals working in your community develop advocacy tools that aimed at ameliorating strategies to address these challenges

What you will be asked to do if you agree to participate

You will be asked to sit in discussions with other health club members. The discussion will be led by the researcher and all the information you will provide will be tape-recorded and written down for review by the researcher at a later date. You will also be asked to provide general information about yourself and your family e.g. sex, marital status, gender, income, etc. The discussions will last one hour and the questions will require less than 10 minutes.

Confidentiality

We will do our best to keep your personal information confidential. To help protect your confidentiality, maximum effort will be made to keep your name confidential. No name will be used in any of the information collected.

Information recorded will be kept locked away in a place only accessible by me and my supervisor. If we decide to write a report or article about this research project, your identity will be protected to the maximum extent possible.

Benefits and risks of this research

There are no known or anticipated risks associated with participating in this research project. However, should any risks arise during the course of this research; you will be attended to by a responsible individual. You are also free to contact the principle researcher using contact details outlined at the end of this document. You may not get any direct benefits from this study because it is not designed to help you personally. However, information that will emerge from this study may guide health professionals in understanding challenges you are facing and possibly attempt to initiate change. There are no costs associated with participation in this study other than the time you will spend in the group discussion or interview.

Voluntary participation and withdrawal

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

Questions

This research is being conducted by Mr. M. MUZIGABA a student at the University of the Western Cape. In the event that you wish to ask further questions about this study, I can be contacted as follows:

Moise Muzigaba

Student Number 2768076

Cell Phone No: 0731651833

E-mail: mochemoseo@yahoo.co.uk

University of the Western Cape

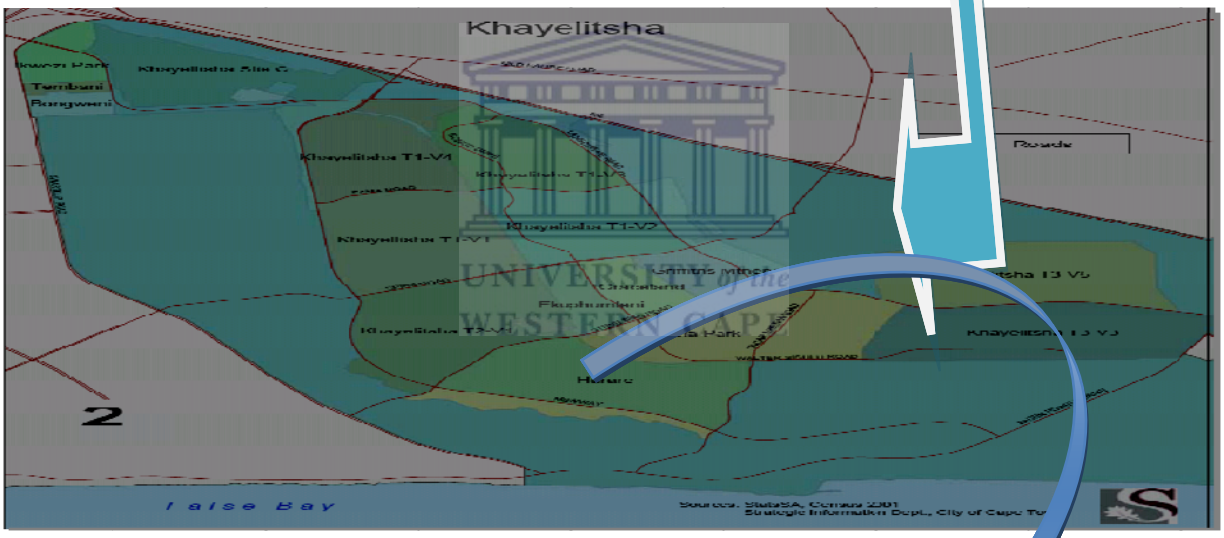
Private Bag X17, Belville 7535

Telephone: (021)959-2243

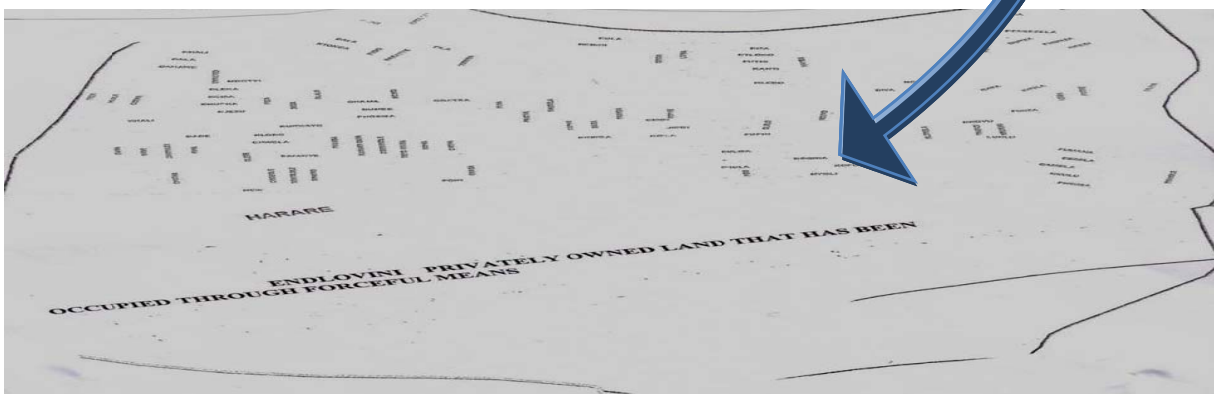
Appendix 7

MAP FOR THE STUDY SETTING

Map 1: Orientation map of Khayelitsha Node in the city of Cape Town



Map2: Location of Khayelitsha node from which the study population was selecte



Map 3: location of Harare in khayelitsha